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# Risk Perception of Common Consumer Products: Judgments of Accident Frequency and Precautionary Intent

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This research examined people's accuracy in judging the risk of common consumer products. In two experiments, participants estimated the frequency of product-related injuries at a quick pace, slow pace, and following lengthy analysis of accident scenarios. Participants' estimates of injury were then compared to objective injury rates compiled by the U.S. Consumer Product Safety Commission. The results showed that participants were able to assess relative levels of risk quickly and accurately, but additional time and analysis had no effect on estimation accuracy. Perceived injury severity was strongly related to both participant's risk estimates and their precautionary intent ratings, but no relationship was found between precautionary intent and the objective risk data. The practical importance of precautionary intent over risk perception is discussed. Implications for product warnings and safety education programs are described.

## INTRODUCTION

Accidents involving consumer products represent a persistent, serious problem. The U.S. Consumer Product Safety Commission (CPSC) has estimated that consumer products are associated with over 10 million injuries that require emergency room care, as well as thousands of fatalities in the United States (CPSC, 1987, 1990). While these injuries can be attributed to a multitude of causations, many may be due to people failing to recognize the risks or likelihood of being injured. If, for example, people believe that one category of products is associated with fewer injuries than another, they may behave less cautiously with the former product than with the latter. There could be unfortunate consequences if the actual risks differ from their perceptions.

Most previous research on risk perception has focused on people's abilities to estimate the likelihood of technological, health, and environmental hazards (e.g., Combs & Slovic, 1979; Fischhoff, Slovic, & Lichtenstein, 1978; Lichtenstein, Slovic, Fischhoff, Layman, & Combs, 1978). Risk perception for common consumer products, however, has not received much attention. A better understanding of how people judge product risks could lead to the development of intervention strategies that might reduce injury rates. Two experiments

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are reported that examine some of the factors involved in people's judgments of consumer product risk using the techniques developed in technological risk literature.

Several issues are addressed in these experiments. The first is whether people can accurately assess the relative risk of consumer products, where accuracy is determined by comparing estimates of injury frequency to objective injury data. Earlier research on technological risk (e.g., Fischhoff, Slovic, Lichtenstein, Read, & Combs 1978; Lichtenstein et al., 1978) indicates that people are reasonably accurate in estimating the risk of fatal injury, but they tend to overestimate the likelihood of infrequent causes and to underestimate the likelihood of frequent causes. The present research seeks to determine whether people's perception of risk for common consumer products follows a similar pattern.

The second issue concerns whether people's risk assessments can be improved when they are given additional time to consider potential accidents. In formal assessments of technological risk, it is presumed that breaking down potential risks into fundamental events or scenarios is the best way to make probabilistic assessments of risk (Hammond, Anderson, Sutherland, & Marvin, 1984). While most technological-risk-assessment techniques used by experts are based on such analyses, little is known about how lay people assess common risks. They may systematically consider the various ways one can get injured, or they may use a more holistic or intuitive strategy. One way to study the processes involved in risk perception is to examine the time used to make risk judgments. Responses that are made very quickly are likely to be based on readily accessible (intuitive) knowledge, while those that involve lengthy consideration are likely to be based on analytical strategies. If slower responses are more accurate than faster responses, then this would suggest, for example, that analytical consideration of potential accidents could serve as a useful strategy for improving lay risk perceptions.

A third, but related, issue addresses whether having people explicitly analyze accident scenarios would improve risk-perception accuracy. If analysis leads to improved risk perceptions, then these findings would have implications for safety education programs and consumer product warnings. However, if estimations following lengthy scenario analyses are no different than those made after little or no analysis (hurried estimations), then this would suggest that risk knowledge is accessible without considering potential accidents.

Three additional issues are addressed in Experiment 2: (a) The first is whether processing time and analysis of accident scenarios influence people's intentions to behave cautiously; (b) the second is whether precautionary intent relates to risk and to other product-related dimensions (e.g., severity of injury); and (c) the third is whether previous injury experience influences perceived risk and precautionary intent. These three issues will be discussed in more detail later.

## EXPERIMENT 1

In Experiment 1, participants made risk judgments by estimating injury frequencies (the number of hospital emergency room admittances in the United States for 1 year) associated with a set of common consumer products. Judgments were made at a fast pace, at an unhurried pace, and after generating and organizing the elements of potential accidents. These conditions represent a manipulation of processing time and cognitive analysis. Responses in the first set of risk judgments (hurried pace) are likely to be based on initial reactions, with little or no analysis of potential accidents. Responses in the second set of judgments (unhurried pace) are likely to be based on at least a cursory analysis. Responses in the final task are likely to be based on a more extensive analysis, because participants generated fault trees before making the estimates.

Fault trees are routinely constructed by risk experts in industrial settings to analyze where and how errors in a system may occur (e.g., for nuclear power plants) (Green, 1982). Fault trees organize possible sources of trouble or alternative solutions into a branching structure. The top of the fault-tree hierarchy presents the problem, the level below it describes major sources of trouble or alternatives, and the level below that branches out further by listing specific items. In this experiment, fault-tree construction served as a method of invoking participants to think analytically about potential accident scenarios (ways accidents could occur) before they performed the final set of risk judgments. Figure 1 shows a fault tree for swimming pool accidents.

## Method

*Subjects and materials.* Participants were 30 Rice University students who received course credit for participation. Ten product categories taken from the National Electronic Injury Surveillance System (NEISS) database were used. This database, maintained by the U.S. Consumer Product Safety Commission, contains the number of emergency room injuries associated with consumer products in the United States. The products listed in Table 1 are associated with over 1,500,000 emergency room injuries annually in the United States (CPSC, 1984). The NEISS data served as the objective or reference risk values that were compared to participants' estimates.

*Procedure.* Each participant performed a sequence of four tasks, summarized as follows:

1. *Hurried estimation.* Participants estimated the annual frequency of emergency room injuries for each product category as quickly as possible. The experimenter read aloud the products in a random order, and each participant responded vocally with a numerical estimate. Before beginning the task, participants were told that 115,000 emergency room injuries were associated with swimming pools annually, and that they could use this number as an anchor in making their estimates. The instructions emphasized that responses should be made very quickly.
2. *Unhurried estimation.* This task was similar to the first except that responses were not hurried. Participants gave frequency estimates at a relaxed pace.
3. *Fault-tree construction.* The experimenter described the concept of fault trees and provided an example of a fault tree for swimming pool accidents. Participants were asked to create a fault tree for each product

FIGURE 1
AN EXAMPLE FAULT TREE SHOWING ACCIDENT SCENARIOS FOR SWIMMING POOLS

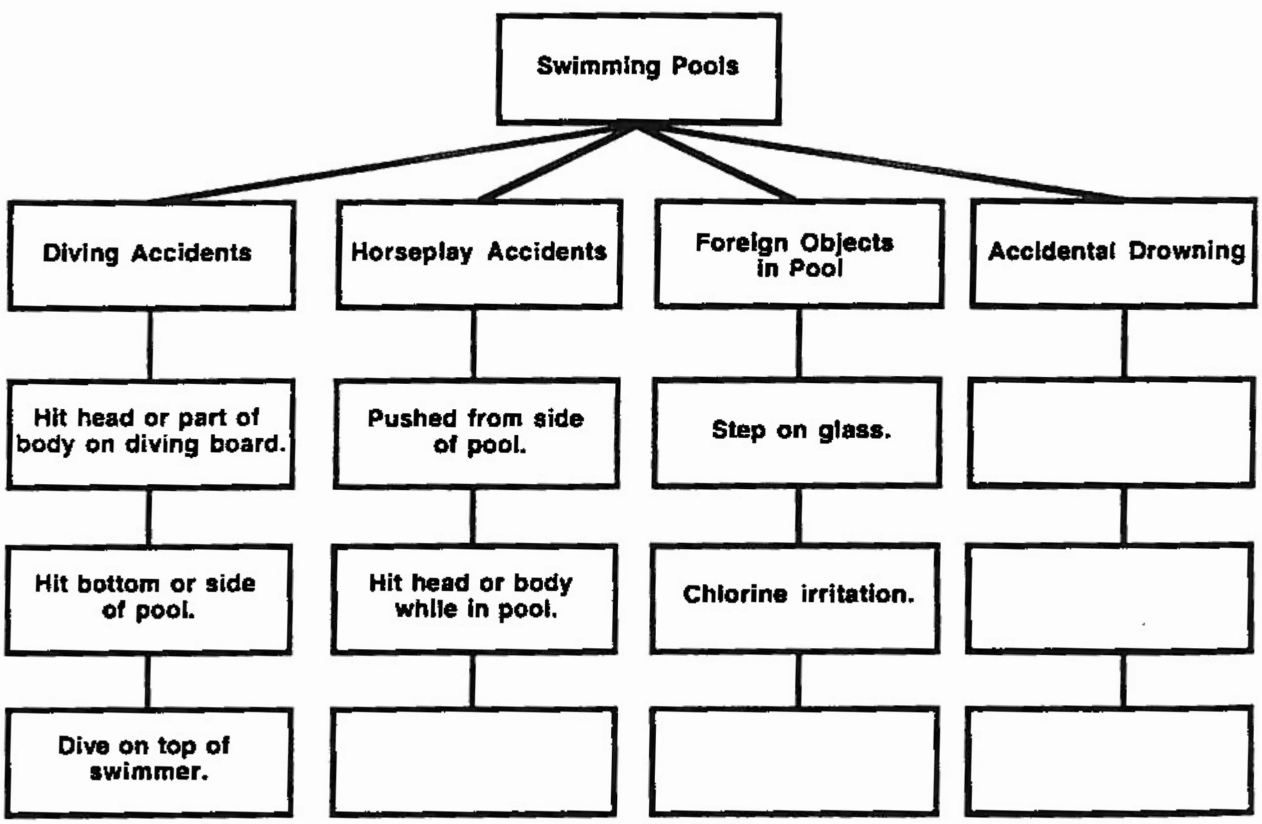

TABLE 1
NEISS FREQUENCIES AND MEAN ACCIDENT ESTIMATES AS A FUNCTION OF PRODUCT CATEGORY TASK (EXPERIMENT 1)

| | | Estimation Task | | |
|---|---|---|---|---|
| Product Category | NEISS Frequencies | Hurried | Unhurried | Final |
| Fans | 14,078 | 15,068 | 29,630 | 38,892 |
| Television sets | 24,962 | 10,876 | 14,887 | 12,516 |
| Razors and shavers | 37,859 | 48,980 | 56,977 | 76,733 |
| Cooking ranges | 48,026 | 74,303 | 99,682 | 147,146 |
| Lawn mowers | 72,543 | 50,646 | 79,776 | 64,336 |
| Bathtubs | 100,618 | 70,106 | 102,140 | 104,720 |
| Glass bottles and jars | 101,678 | 83,572 | 89,617 | 102,186 |
| Glass doors and windows | 205,537 | 54,296 | 86,136 | 77,996 |
| Cutlery and knives | 350,076 | 110,966 | 146,406 | 126,278 |
| Bicycles | 566,682 | 72,647 | 78,877 | 118,515 |

category on sheets with multiple columns and rows of boxes (but were not required to complete all boxes on the sheets). They were told to include only those accidents that might lead to injuries requiring emergency room care.

4. *Final unhurried estimation.* Participants wrote down their estimates on a sheet that listed the products in a random order. The pace was not hurried, and participants were allowed to examine the fault trees that they had constructed.

Different sets of random orders of products were used for each participant and for each task. Participants' responses were tape recorded and timed.

## Results

Because high-frequency estimates are usually more variable than low-frequency estimates, risk data are typically transformed to logarithms before analysis (e.g., Lichtenstein et al., 1978). Analyses showed the same pattern of results with or without the transformation. In keeping with convention, only analyses of the log data are reported.

*Accident estimation and accuracy.* Table 1 shows the objective NEISS frequency data and mean participant estimates for each product category and task. Participants tended to overestimate the risk of products with objectively lower NEISS frequencies and underestimate the risks of products with higher NEISS frequencies.

The correlations between participants' estimates and the NEISS data were .75, .70, and .64, for the hurried, unhurried and final tasks, respectively. While all of these correlations are significantly different from 0 ($ps < .05$), they do not significantly differ from each other ($ps > .05$). Analyses on the mean correlations for individual participants showed the same pattern.

*Response time.* Response times were measured from the end of the product-category name, as spoken by the experimenter, to the beginning of the participant's response. The mean latency per product was significantly faster for the hurried task than for the unhurried task (2.1 vs. 3.9 s, $t[9] = 9.09$, $p < .0001$). This result, a manipulation check, simply means that the experimental instructions had the expected influence on participants' task performance.

## Discussion

Participants were quickly able to estimate the risks associated with common consumer products, and these estimates corresponded reasonably well with the objective NEISS frequencies. Nevertheless, participants did overestimate the risk of products with lower objective frequencies, and underestimate the risk of products with higher objective frequencies. This concurs with Fischhoff, Slovic, Lichtenstein, Read, & Combs (1978) and Lichtenstein et al. (1978) who measured similar risk misestimation biases for technological, natural disaster, and disease agents.

No effect of time or cognitive analysis on risk accuracy was found. Estimates made at the quick pace were just as accurate as those made less hurriedly. The response times for both were short, suggesting that participants did not covertly generate or evaluate many accident scenarios before responding. Even after spending about 30 minutes constructing and analyzing accident scenarios, participants' estimation accuracy did not improve. These results suggest that accident scenarios may play little or no role in people's judgments of risk.

One methodological consideration is noteworthy. In this experiment, a repeated-measures design was used in which participants were asked to give frequency estimates three times. In most designs of this type, conditions are counterbalanced so that effects can be attributed to differences in conditions rather than possible order effects. Counterbalancing was not used because it would have made little sense to have participants first make unhurried judgments and then later respond very quickly to the same categories. With this order, participants would probably recall their earlier reasoning when performing the latter task, and the quick responses would probably be based on at least as much analysis as the previous responses.

Nevertheless, it remains possible that the failure to find differences between conditions may be due to participants' reluctance to stray from their first estimations. If so, this would obscure any beneficial effects of additional time and analysis. An experimental design in which no estimations are made before the manipulation of interest would provide a test that alleviates this concern. This is one of the issues addressed in the next experiment.

## EXPERIMENT 2

Experiment 2 examines some of the findings of the first experiment using a design that manipulates conditions between subject groups. Besides the hurried, unhurried, and scenario generation conditions of Experiment 1, this experiment includes a condition in which scenarios are provided to participants. This condition is compared to conditions in which scenarios are not given or are self-generated.

Experiment 2 also addresses three issues not investigated in the previous experiment. The first is whether people's precautionary intentions are affected by time and scenario analysis. In previous research, precautionary intent has been found to have a strong positive relationship with peoples' perception of hazard (Wogalter, Brelsford, Desaulniers, & Laughery, 1991; Young, Brelsford, & Wogalter, 1990). However, no previous research has investigated whether analyzing accident scenarios affects people's precautionary intent. To examine this, participants gave precautionary intent ratings after making risk estimates. A control condition was included in which participants gave precautionary intent ratings but no estimates. It was hypothesized that after considering the ways one might be injured, participants would increase their intent to behave precautiously with the products.

The second issue concerned whether or not the objective NEISS frequencies and participants' estimates relate to people's precautionary intent. If precautionary intent is related to these two risk measures, it would suggest that risk plays a role in people's safety-related decisions and that providing risk information in educational programs and warnings might be a useful way to promote cautionary behaviors. To determine how these variables relate to each other, another group of participants rated the products on several dimensions (e.g., injury severity, frequency of use). These dimensions have been investigated in previous hazard perception research (e.g., Wogalter et al., 1991; Young et al., 1990) and were incorporated into the present study to help determine some of the underlying conceptual relations between risk and precautionary intent.

The third issue was whether previous product-related injury experience would influence people's risk estimations and precautionary intentions. Because previous injury experience has been found to increase cautionary behavior (Otsubo, 1988; Purswell, Schlegal, & Kejriwal, 1986), it was expected that risk estimates and precautionary intent would be affected in the same way.

### Method

*Subjects and materials.* Participants were 135 University of Richmond undergraduates: 80 in the main experiment, 24 in a preliminary scenario generation task, and 31 in a product rating task. All participants received credit in introductory psychology classes and none took part more than once in the study. The 18 product categories used in this experiment are shown in Table 2 (CPSC, 1987).

*Procedure.* Participants were assigned randomly to one of five groups: hurried, unhurried, scenario-generate, scenario-provided, and precaution-only. The first four groups differed with respect to the procedures before or during frequency estimation tasks. All other tasks for these groups were identical. The procedures for the four groups are described below; the procedure for the fifth, precaution-only, group is described later.

1. *Hurried.* Participants in this group were told to give a vocal estimate of the accident frequencies associated with each product as quickly as possible after hearing the product name read aloud by the experimenter.
2. *Unhurried.* Participants in this group were told to take as much time as they needed to make their estimates.
3. *Scenario-generate.* Participants in this group first constructed fault trees that identified all common accident scenarios for each product. Using their fault trees for reference, they made accident estimates for each product.
4. *Scenario-provided.* Participants in this group were given a set of fault trees that were compiled from a preliminary study in which 24 participants constructed fault trees containing all possible accident scenarios that might lead to an injury requiring hospital emergency room treatment. Though probably not exhaustive, this set of scenarios can be considered suitable for use in the scenario-provided condition. Using the fault trees for reference, participants in this condition made accident estimates for each product. Before the estimation task, the experimenter described fault trees to participants in the two scenario conditions using the swimming pool example described earlier.

Following the estimation task, participants gave a rating of *precautionary intent* for each product on a 9-point scale anchored from (1) "no precaution at all" to (9) "extreme precaution." Participants also provided an indication of their previous *injury experience* with each product by responding "yes" or "no" accord-

TABLE 2
NEISS FREQUENCIES AND MEAN ACCIDENT ESTIMATES AS A FUNCTION OF PRODUCT CATEGORY (EXPERIMENT 2)

| Product category | NEISS | Mean estimates |
|---|---|---|
| Vacuum cleaners | 11,117 | 14,385 |
| Fireworks | 12,602 | 59,180 |
| Bleach | 15,109 | 37,259 |
| Fans | 17,454 | 33,428 |
| Gasoline | 17,768 | 64,203 |
| Televisions | 25,435 | 21,654 |
| Chainsaws | 41,387 | 42,077 |
| Hammers | 48,479 | 41,403 |
| Skateboards | 81,066 | 67,112 |
| Drinking glasses | 81,606 | 26,641 |
| All terrain vehicles (ATVs) | 86,400 | 66,961 |
| Ladders | 90,019 | 43,388 |
| Bathtubs and showers | 101,866 | 63,461 |
| Windows and window glass | 128,777 | 55,866 |
| Nails, screws, and thumbtacks | 214,656 | 44,830 |
| Drugs and medication | 216,246 | 187,250 |
| Knives | 333,478 | 103,438 |
| Bicycles | 546,420 | 96,203 |

ing to whether or not they or someone they personally knew had experienced an injury with the product.

Participants in the fifth, *precaution-only*, group answered only the precautionary intent and injury experience items. They did not make frequency estimates.

Different random orders of products were used for each participant and for each task that they performed. Participants' responses were recorded and timed.

*Product ratings.* A separate group of 31 participants rated the products on the six dimensions on the 9-point Likert-type scales shown in Table 3. Raters each received a different random order of questions and one of two product orders.

## Results

*Estimations.* Table 2 shows that participants underestimated the risk of high injury-frequency products and overestimated the risk of low injury-frequency products. Estimation accuracy was determined by correlating the mean estimations produced by participants in the four groups to the actual (NEISS) frequencies. The correlations were: .64, .53, .68, and .66 for the hurried, unhurried, scenario-generate, and scenario-provided groups, respectively. All were significantly different from 0 ($ps < .05$), but none differed from each other ($ps > .05$). Correlations were also calculated for each participant individually. These correlations also failed to differ ($ps > .05$).

*Precautionary intent.* An analysis of variance (ANOVA) on the precautionary intent scores showed a significant effect, ($F[4, 75] = 2.94$, $p < .05$). Comparisons among the means showed that participants in the hurried group ($M = 4.75$) reported significantly lower precautionary intent than participants in the other groups ($Ms = 5.35, 5.69, 5.66$, and $5.49$ for the unhurried, scenario-generate, scenario-provided, and precaution-only groups, respectively).

*Relationship of precautionary intent and accident frequencies.* The precautionary intent ratings were collapsed across participants within each group to produce a set of product means. While no relationships were found between the precautionary intent means and the objective NEISS frequencies for any of the groups, all were significant between the precautionary intent means and participants' frequency estimations: .59, .70, .53, and .55 for the hurried, unhurried, scenario-generate, and scenario-provided groups, respectively ($ps < .05$). This pattern of relationships, plus the finding that participants' risk estimates are positively related to the NEISS frequencies, suggests that NEISS and precautionary intent each account for distinct portions of participants' risk estimates. This suggestion was confirmed by a multiple-regression analysis that showed that 66% of the variance in participants' risk estimates could be accounted by a linear model containing NEISS and precautionary intent as predictors — with each predictor contributing significant unique variance ($ps < .05$).

TABLE 3
DIMENSIONS AND SCALES THAT WERE EVALUATED BY PARTICIPANTS IN THE PRODUCT RATING STUDY

| | |
|---|---|
| a) | *Frequency of use.* "How frequently do you use this product?" anchored from (0) "never" to (8) "extremely frequently." |
| b) | *Knowledge of the hazards.* "How knowledgeable are you about the hazards related to this product?" anchored from (0) "not at all knowledgeable" to (8) "extremely knowledgeable." |
| c) | *Severity of injury.* "How severely might you be injured with this product?" anchored from (0) "no injury at all" to (8) "death." |
| d) | *Read warning.* "How likely are you to read a warning for this product?" anchored from (0) "not at all likely" to (8) "extremely likely." |
| e) | *Likelihood of major injury.* "How likely would it be that you would be severely injured (requiring emergency room care or resulting in permanent injury) by this product in the next year?" anchored from (0) "not at all likely" to (8) "extremely likely." |
| f) | *Likelihood of minor injury.* "How likely would it be that you would receive any sort of minor injury by this product in the next year?" anchored from (0) "not at all likely" to (8) "extremely likely." |

*Product ratings.* Ratings of the six dimensions were correlated with NEISS, participants' estimates, and precautionary intent. Table 4 shows that the NEISS accident frequencies were positively related to likelihood of receiving a major or minor injury but were not related to the other items. This result was expected because likelihood and frequency are conceptually similar. Participants' risk estimates were not only related to the likelihood questions, but were also strongly related to injury severity. Likewise, precautionary intent showed a strong positive relationship with injury severity, but it was also positively related to likelihood of reading a warning and receiving a major injury, and negatively related to frequency of use.

*Injury experience.* For each product, participants were divided into two groups with respect to presence or absence of injury experience. Comparisons indicated that participants with previous injury experience gave significantly higher injury estimates for gasoline and all-terrain vehicles, and gave significantly higher precautionary-intent ratings for gasoline, drinking glasses, ladders, windows and window glass, and nails, screws, and thumbtacks ($ps < .05$). A trend in the same direction was seen for most of the remaining products. An overall sign test showed that participants with injury experience reported greater precautionary intent than those without injury experience (.83 vs. .17, $t[17] = 3.69$, $p < .01$). A similar analysis using the risk estimates failed to show a significant effect.

## Discussion

This experiment confirmed most of the findings of Experiment 1: (a) participants' underestimated the risk of products with high injury frequency and overestimated the risk of products with low injury frequency; (b) their risk estimates were positively related to objective injury frequencies (NEISS); and (c) accuracy did not differ as a function of the time and scenario-analysis manipulations. Thus, the two different experimental designs of Experiments 1 and 2 showed similar results.

While there was no effect of conditions on accuracy, additional processing time influenced the precautionary intent ratings. Participants who spent the least time making estimates gave lower ratings of precautionary intent. This finding suggests that some processing occurred in the time used by participants in the unhurried (3.76 s) compared to the hurried (1.96 s) condition. However, analysis of scenarios did not have any additional influence on precautionary intent.

The strong relation between precautionary intent and severity of injury ($r = .97$) suggests that expectation of how badly one can get hurt is an important determinant of how much precaution one intends to exercise. That people consider injury consequences to a much greater extent than the likelihood is supportive of recent hazard perception research (Wogalter & Barlow, 1990; Wogalter et al., 1991). Additional confirmation is provided by the failure to find a relationship between precautionary intent and the objective NEISS frequencies.

TABLE 4
CORRELATIONS OF NEISS FREQUENCIES, MEAN ACCIDENT ESTIMATES, AND PRECAUTIONARY INTENT WITH VARIABLES ASSESSED IN THE PRODUCT RATING STUDY

| Product ratings | NEISS | Estimates | Precaution |
|---|---|---|---|
| Frequency of use | .09 | -.04 | -.57* |
| Knowledge of hazards | .45 | .38 | .39 |
| Severity of injury | .19 | .66** | .97** |
| Read warning | -.12 | .46 | .77** |
| Likelihood of major injury | .61** | .71** | .50* |
| Likelihood of minor injury | .58* | .53* | .31 |

* $p < .05$
** $p < .01$

The pervasiveness of injury severity is also evident in participants' risk estimates. These estimates should have been a pure measure of injury frequency, but the results indicate that participants' numerical responses were influenced or biased, in part, by injury severity. Fischhoff, Slovic, Lichtenstein, Read, & Combs (1978) also found this influence on participants' risk estimates of technological, natural disaster, and disease agents.

Additional analyses showed a positive relationship between previous injury experience and precautionary intent. This result supports earlier research showing that cautionary behavior is enhanced by injury exposure (Otsubo, 1988; Purswell et al., 1986), and suggests that some form of positive learning occurred from previous negative consequences.

## GENERAL DISCUSSION

These two experiments suggest that people do not consider accident scenarios in determining risk. Quick estimates of risk were just as accurate as those made after lengthy construction and analysis of accident scenarios. The short times involved in making the hurried and unhurried estimates suggest that few, if any, scenarios were spontaneously generated. However, aside from the fact that analysis did not improve performance, the estimates were fairly accurate — in the range of .60. If these frequency estimates are not based on an analysis of scenarios, then what are they based on?

One possibility is that individuals gain general knowledge of relative risks through experience, and that this information is retrievable with little or no analytical thought. This idea can be conceived in a model where each product has a "mental tag" that summarizes much of what the individual has learned into a simple index of risk. This notion would help to explain participants' risk estimation accuracy at the fast pace, as this information is an intimate part of their conceptual memory of the product, which is easily accessible when given brief consideration.

A second, slightly more complicated explanation includes an intervening step. Individuals may very briefly consider one general accident scenario. For example, when presented with a category such as "cutlery and knives" the individual may briefly consider that knives can injure by cutting the skin; when presented with "bicycles" the individual may briefly consider that it is possible to fall off of a bicycle. Consideration of other more specific scenarios may provide no further useful information. This interpretation has some support in that previous research shows that perception of hazard is strongly predicted by the severity of the first scenario recalled by participants (Wogalter et al., 1991). Moreover, it also helps to explain the finding of Experiment 2 showing lower precautionary intent for hurried participants. The fast pace might have hindered processing of the single generic scenario.

In either case, whether the name or evaluation of a single scenario evokes the risk level of products, risk knowledge appears to be distilled into a simple index that is accessible without lengthy consideration or analysis. Given the short period of time involved in frequency estimates at the fast pace, the entire process is probably not much more complicated than this.

The findings also suggest that the mental processes used to evaluate common risks are different than the analytical procedures that experts use in technological risk assessment. It helps to explain why experts and lay persons often differ in their assessments of technological risk, (e.g., nuclear power) (Lichtenstein et al., 1978; Oppe, 1988; Young et al., 1990). While experts strive for analytical, step-by-step strategies to assess risks (Hammond et al., 1984), lay perception of risk appears to be accomplished in a more holistic manner.

The results of these two experiments have implications for future research directed at ways to improve risk-perception accuracy. This and previous research (e.g., Lichtenstein et al., 1978) have shown no success in changing people's estimation accuracy. While participants' estimates are reasonably well correlated to the objective NEISS frequencies, the results suggest that lay risk judgments are not pure measures of likelihood, as they should be. They are also influenced by the consequences of injury. It is possible that future research might show greater success at improving risk perception accuracy by telling people that they can avoid risk misperceptions by excluding injury severity from their estimates.

However, it is not clear that knowledge of risk plays an influential role in people's everyday judgments of how careful to be, especially considering the finding that objective risk has no relationship to precautionary intent. Severity of injury consequences appears to be the most salient cue that people use, and it is perhaps this variable that should be emphasized in attempts to encourage safe behavior. Thus, it might not be useful or prudent to have people disregard severity even for the purpose of improving risk perception accuracy.

A practical implication of the injury-severity/precautionary-intent relationship is to enlist educational systems and warnings for the purpose of communicating the appropriate level of injury that might result from careless behavior. An additional, related implication can be derived from the significant relationship between injury experience and precautionary intent. Whereas, giving people direct injury experience is not a viable solution, less direct experience of this kind, such as simulations and demonstrations that dramatize the extent of injury that might result, may be useful in promoting cautious behavior.

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