Effects of Warning Quality and Expert Testimony on Allocation of Responsibility for Consumer Product Accidents

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ABSTRACT

The purpose of this experiment was to examine the effects of warning quality and human factors expert testimony on decision making in consumer product injury cases. Participants read summaries of consumer product accidents, where a no, poor or good warning was present. In two conditions, human factors (HF) expert testimony was included, giving an opinion on the quality of the product warnings. Participants allocated percentages of responsibility to the manufacturer, retailer, and consumer, as if they were jury members assigned to the cases. Results showed differences in allocations of responsibility among conditions. Manufacturers were allocated more responsibility when there was no warning on the product or when a poor warning was present and a HF expert testified that a better warning could have been used. Allocations did not differ between poor and good warning conditions, possibly because participants viewing poor warnings lacked knowledge of the way a good warning would look. The results have implications for warning design, the use of HF expert witnesses, and jury decision making.

INTRODUCTION

Perceived responsibility is an important concern in the safety area for several reasons. For example, if the manufacturer of a product believes that the consumers of its product are primarily responsible for safety during use, the manufacturer may give less attention to safety in the design and/or marketing of the product. If, however, the consumer perceives the manufacturer to be more responsible, s/he may exercise less caution in using the product. In either case, false perceptions may lead to accidents and injuries. In addition to its implications for safety, perceptions of responsibility are an important consideration in understanding jury decision making in assignment of product liability awards. In recent years, warnings have been a significant issue in such litigation, as juries are often charged with taking into account the availability and quality of warnings when allocating responsibility for personal injury and property damage. Juries may also consider human factors expert testimony. This testimony may influence their decisions about the quality of the warnings and, ultimately, allocation of fault.

There are various individuals and organizations that might be responsible for accidents involving consumer products (Laughery, Lovvoll, & Wogalter, 1995). For example, manufacturers must consider safety during design, as well as the manufacturing and marketing of a product. Distributors and retailers are responsible for ensuring that safety information is passed on to users. Finally, the users are responsible for reading manuals and labels and using products reasonably and responsibly. In some situations, other entities play a role in safe use of products. For example, employers share responsibility for safe use of products in work environments (Lovvoll, Laughery, McQuilkin, & Wogalter, 1996) and caregivers have supervisory responsibility when their children use products (Laughery, Lovvoll, & McQuilkin, 1996).

Several recent studies have reported results regarding responsibility allocation for safety during consumer product use. Laughery et al. (1995) found that consumers were assigned greater responsibility for more hazardous products and for products where the hazards are more obvious. Laughery, Laughery, Lovvoll, McQuilkin, and Wogalter (1998) found that more responsibility was assigned to the consumer and less to the manufacturer when products were accompanied by a warning (76% to 94% to the consumer) compared to a no warning condition (41% to 68%). However, there were no differences in allocations for good warnings versus poor warnings when warning quality was manipulated as a between-subjects factor. When warning quality was a within-subjects factor, where participants could see both types of warnings, consumers were assigned more responsibility (83%) with good warnings than with poor warnings (69%). Results also showed that warnings played a smaller role with more obvious hazards (Laughery et al., 1998).

These past studies offer insight into how people perceive and allocate responsibility for product safety. While previous research confirms the role of warnings in responsibility allocation, no research to date has examined the role of expert testimony in responsibility allocation. In product liability cases, HF safety experts are sometimes called upon to assess the need for and the quality of product warnings. The

purpose of the expert opinion is to aid the court and jury in understanding the safety issues in the case; and presumably, such testimony may influence decision making. In the present research, we examine the effect of HF expert testimony regarding warning quality on responsibility allocation. In one condition, a human factors expert testifies that the product warning was poorly designed and shows an example of a good warning that the manufacturer could have developed and used. In another condition, the expert testifies that the manufacturer's product warning was well designed. These conditions are compared to other conditions where no expert testimony is given.

METHOD

Participants. Sixty undergraduate students (35 men, 25 women) from introductory psychology courses at North Carolina State University participated for class credit (M = 19.9 years old, SD = 3.8). The sample was composed of 10% African American, 8% Asian, 68% Caucasian, and the remaining participants (14%) listed other ethnic/racial categories. All but 20% were from various cities and towns in North Carolina. Sixty percent were in the freshman year of college, and reported intentions to major in a diverse cross-section of fields in the university curriculum (e.g., 20% business/accounting, 18% engineering, 17% biology, chemistry or physics). Participants were randomly assigned to one of the five conditions in equal proportions (ns = 12).

Materials. The materials included: a demographic questionnaire (asking participants questions about their age, sex, etc.), a booklet containing eight accident scenarios, a responsibility allocation answer sheet, and a final rating question. The accident scenarios were court case summaries describing personal injury accidents involving various consumer products. They were based on the scenarios used by Laughery et al. (1998). The scenarios described injury events associated with the use of eye protection equipment, a diving board, cooking oil, infant cradle, carpet cleaner, electric sander, trampoline, and a vehicle. The case summaries contained specific names of products (in some cases, actual brands), manufacturers, retailers, and consumers in order to increase realism. An example scenario is given in Table 1.

Table 1. Example Scenario (Infant Cradle)

CASE #16

In preparation for the birth of their first child, Gina Dickinson and her husband Michael purchased a cradle at the Tiny Tots Superstore the week before their son, Mickey, was born. The cradle was manufactured by Grayco. One of the features that influenced the Dickinsons to buy this particular model was that the cradle would swing from head to foot similar to a rocking chair motion. As they unpacked the cradle to set it up in the nursery in their home, they noticed the statement "Sleeping baby cradle bed" printed on the side of the box. As part of Gina's routine for the past two months since her son's birth, she put Mickey in the cradle for his afternoon nap at 1:00 PM, and when she went to check on the baby at 2:30 PM, she found him limp. The rocking motion caused Mickey to slide into the side pad of the cradle and he died of suffocation as a result of his face being positioned against the pad.

Scenario order was counterbalanced across participants according to a Latin-square. After each case summary, the responsibility allocation answer sheet asked, "Who is responsible for this accident?" Specific, potentially responsible parties were listed: the manufacturer, the retailer, and the consumer. For the cradle example, participants allocated responsibility by responding to the item below:

CASE #16: Who is responsible for this accident?

The company (Grayco) that manufactured the cradle	____
The store (Tiny Tots) that sold the cradle	____
The consumer (Gina Dickinson) who used the cradle	____
	100%

Five versions of the case summaries were presented that varied according to the warning and expert testimony variables. These versions differed according to: presence versus absence of the warning, the quality of the warning (poor vs. good), and the content of the HF expert testimony. Good warnings were based on the ANSI Z535.4 (1991) warning standard for consumer products, and contained enhancement features such as color, icons, pictorials, and organized text. Poor warnings lacked the enhancement features and contained text only. Figure 2 shows an example of a poor and good warning.

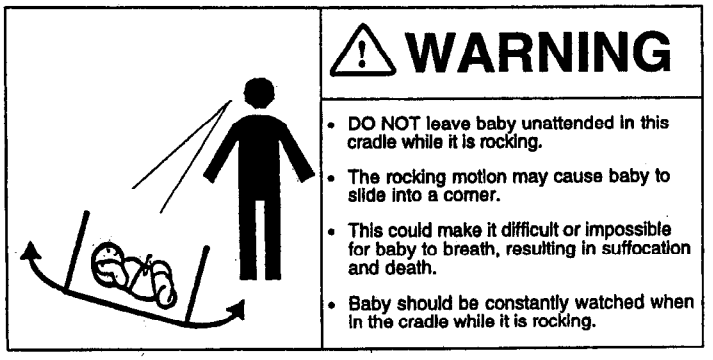
Procedure. Participants were assigned randomly to one of five between-subjects conditions. In the No Warning condition, a statement was added to the text of each scenario indicating that the product lacked a warning about the hazard. In the Poor Warning and Good Warning conditions, information was added to the scenario that stated that a warning about the hazard was present. and an actual warning was displayed on the case summary sheet. No statement was given about the quality of the warning in either of these conditions. Expert testimony was manipulated in the other two conditions. In the Poor Warning/HFE condition, participants were shown a poor warning (the same as those shown in the Poor Warning condition), followed by a statement that a HF expert testified that the warning was poorly designed, who, in turn, shows an example of a good warning (the same as shown in the Good Warning condition) that the manufacturer could have used. In the Good Warning/HFE condition, participants were shown a warning that came with the product (the same as those in the Good Warning condition) with the statement that a HF expert

Figure 1. *Example Poor vs. Good Warnings used in Cradle Accident Case Study. Note that the background of the signal word panel in the good warning was colored orange.*

Poor Warning

CAUTION: DO NOT LEAVE BABY UNATTENDED IN CRADLE. DO NOT USE AS A NIGHT OR EXTENDED-TIME BED.

Good Warning



testified that the warning was good and the manufacturer made a reasonable effort to prevent accidents.

Initially, participants completed a demographics questionnaire. They were then given one of the five booklets. Participants were told to assume they were assigned to be a jury member in the civil suit trials described in the case summaries. They were instructed to read each scenario carefully and consider all of the information presented. After reviewing each case summary, participants allocated percentages of responsibility to the manufacturer, retailer, and consumer. Participants were told that their responsibility allocations must total 100.

After the responsibility allocation task was completed for all case summaries, participants were asked to rate the content of each scenario on 9-point Likert-type scale according to the following question: "Was the consumer fully informed about the hazards associated with use of the product?" They responded using a 9-point Likert-type scale (0 to 8) with the even anchors having the following labels: (0) not all informed, (2) somewhat informed, (4) moderately informed, (6) mostly informed, and (8) completely informed.

RESULTS

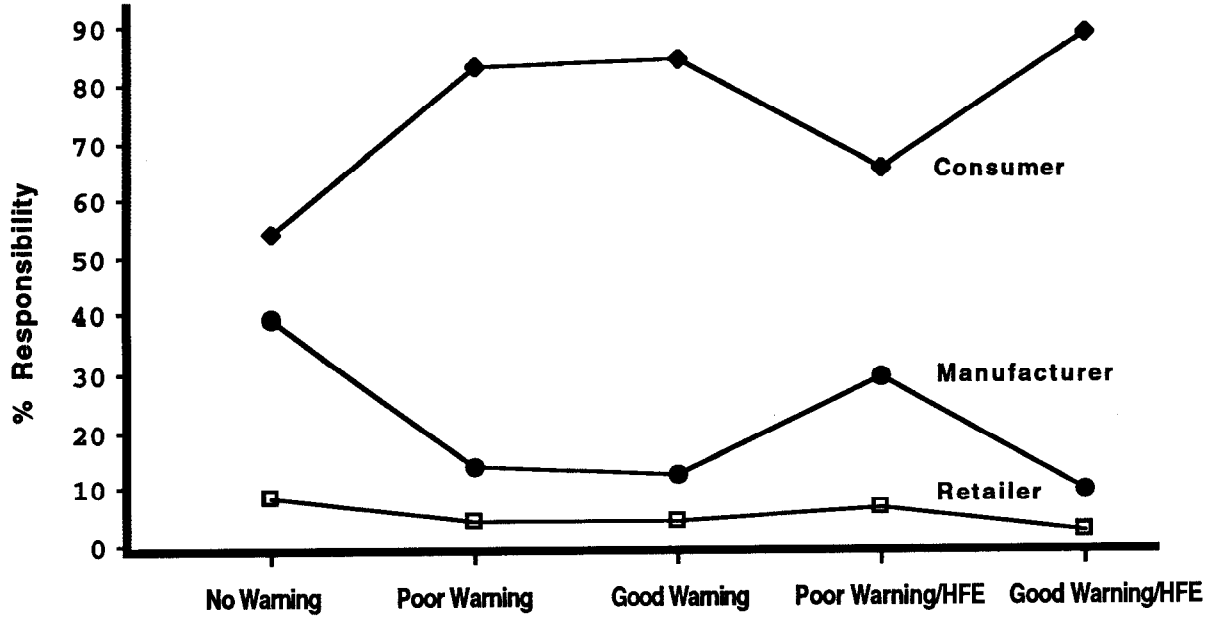
Table 2 and Figure 2 present the mean responsibility allocation to the manufacturer, retailer, and consumer for the different warning conditions. The data shown are collapsed across participants and scenarios.

A 5 (warning condition) X 3 (responsible party) mixed-model analysis of variance (ANOVA) was applied to the data. There was, of course, no main effect of warning condition, as the assignment of allocations always added to 100%. However, there was a significant main effect of responsible party, $F(2, 110) = 336.0$, $MSe = 242.3$, $p < .0001$. On average, the manufacturer, retailer, and consumer were allocated 20.5%, 4.6%, and 74.9% responsibility, respectively. Comparisons among these means using Tukey's Honestly Significant Difference (HSD) test indicated that all differences were significant ($ps < .05$). There was also a significant interaction of warning condition and responsible party, $F(8, 110) = 9.74$, $MSe = 242.3$, $p < .0001$. This interaction was examined using simple effects analyses followed by the Tukey's HSD test for significant effects at $p < .05$. All simple effects were significant, except there was no effect for retailer as a function of warning conditions. As the table and figure show, allocations to the retailer were low and relatively constant. The results of the Tukey's HSD tests showed that manufacturers were allocated significantly more

Table 2. *Mean Percentage Responsibility Allocated to Manufacturer, Retailer, and Consumer as a Function of Warning Condition*

	Manufacturer	*Retailer*	*Consumer*
No Warning	38.9	7.7	53.4
Poor Warning	13.5	3.7	82.8
Good Warning	12.1	3.8	84.1
Poor Warning/HFE	28.9	5.9	65.2
Good Warning/HFE	9.2	1.9	88.8
Mean	20.5	4.6	74.9

Figure 2. *Graph of the Mean Percentage Responsibility Allocated to Manufacturer, Retailer, and Consumer as a Function of Warning Condition*



responsibility in the No Warning condition compared to all warning-present conditions except for the Poor Warning/HFE condition. Manufacturers were also allocated significantly more responsibility in the Poor Warning/HFE condition compared to the Good Warning/HFE condition. Conversely, consumers were allocated significantly less responsibility in the No Warning and Poor Warning/HFE conditions compared to the Good Warning and Good Warning/HFE conditions. Consumers were also allocated significantly less responsibility in the No Warning condition compared to the Poor Warning condition.

In all warning conditions, consumers were assigned more responsibility than manufacturers. This difference was statistically significant in all warning-present conditions, but not in the No Warning condition. Retailers were allocated significantly less responsibility than manufacturers in all conditions except the Poor Warning and Good Warning/HFE conditions.

When scenario was included as a factor in the ANOVA analysis, the results showed that scenario interacted separately and together with warning condition and responsible party (*p*s < .001). Examination of the means for these effects indicated that some of the scenarios produced somewhat different patterns among the conditions, as would be expected given that they contained different situations. In general, however, the differences among scenarios were mainly differences of magnitude, and for the most part, the pattern of results described in the earlier 5 X 3 ANOVA was preserved.

Analysis of the ratings for the question asking whether the consumer was fully informed about the hazards was conducted using a one-way between-subjects ANOVA. The ANOVA was significant, $F(4, 55) = 13.40$, $MSe = 2.01$, $p < .0001$. Comparisons of the means using the Tukey's HSD test showed that participants believed that the condition where no warning was present ($M = 3.1$) provided significantly less information about the hazard than the the other (warning-present) conditions (Poor Warning/HFE, $M = 5.1$; Poor Warning, $M = 6.3$; Good Warning, $M = 6.4$; and Good Warning/HFE, $M = 6.8$). In addition, the Poor Warning/HFE condition was judged to provide significantly less information to consumers than the Good Warning/HFE condition. When scenarios were included as a factor in the ANOVA, it produced a significant main effect, but did not significantly interact with warning condition.

DISCUSSION

The present results replicate several effects shown in Laughery et al. (1998). First, when no warning was present, manufacturers were allocated more responsibility than when there was a warning present, even if that warning was a poor one. Second, retailers were allocated very small amounts of responsibility. Third, Laughery et al. (1998) found no significant difference in allocations between participants seeing poor vs. good warnings in the scenarios. This outcome

occurred in a between-subjects design experiment where participants in the poor warning condition did not have an opportunity to see the characteristics of a good warning. Without such knowledge, a poor warning may seem like an adequate warning. Fourth, Laughery et al. (1998) conducted another experiment in which participants were given the opportunity to view both a good warning and a poor warning, making the features of a good warning salient. In this condition, the presence of the good warning apparently served as an exemplar that enabled participants to recognize the inadequacy of the poor warnings and allocate more responsibility to the manufacturer.

The present research extends past work in this area by including two conditions in which a HF expert testifies as an expert witness. In the Poor Warning/HFE condition, participants were given scenarios with the poor product warning followed by HFE testimony that the warning was poorly designed and who then displays an example of a good warning that the manufacturer could have used. The results indicated that the level of responsibility assigned to manufacturers was higher in the Poor Warning/HFE condition than in the Good Warning/HFE condition where a good warning was present with the product and the HF expert testifies to its adequacy. A similar pattern of results was seen in participants' responses to the rating question asking whether consumers were fully informed about the hazards. The allocation to manufacturers in the Poor Warning/HFE was not significantly different from the condition where no warning was present. The results also showed that having a good warning and the supporting testimony of a HF expert has the effect of reducing the responsibility allocated to the manufacturer relative to the case where a HF expert testifies that the warning is poor and shows a good warning. Thus, the present research positions the HF expert as having an influential role in educating the jury when an inadequate warning is used.

A few methodological points are noteworthy. The participant sample included only college students; their judgments may or may not reflect the decisions made by individuals in actual juries. Additional research involving a broader range of individuals is planned. Also, the responsibility allocation decisions in this study were made individually instead of a group deliberation. Furthermore, actual juries would hear considerably more details about the cases than were present in our case summaries. Such information could affect the kinds of decisions that juries might make (Kalsher, Braun, Phoenix, & Wogalter, 1998).

It is frequently argued by defense attorneys that the quality of warnings is common sense. The present results dispute this, as the data show that participants did not know what a good warning might look like. If warning quality is common sense, then there would have been no allocation difference between the two poor warning conditions (with and without the HF testimony). The fact that these two conditions differed suggested such testimony can provide relevant information for juries to consider.

The present research is an initial attempt to examine the effect of HF expert testimony on responsibility allocations. Future research could address other HF expert conditions. For example, a No Warning/HFE condition (where the HF expert says a warning was necessary to protect the consumer and shows an example of a good warning that could have been used) may result in even greater manufacturer responsibility allocations than the conditions employed in the present research. Additional research on the effects of expert testimony on responsibility allocations may help reveal the roles different parties play in making decisions about safety.

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