Allocation of Responsibility for Product Safety

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Three studies were carried out to explore how people allocate responsibility for safety during product use. In Study 1 29 consumer products were named and subjects apportioned safety responsibility to the manufacturer, the retailer, the user, and a potentially relevant organization not in the stream of commerce (e.g., FDA, CPSC, Underwriters Laboratories). The mean percent responsibility allocated to these four alternatives was 43%, 9%, 27% and 21% respectively. A significant interaction indicated that the allocation varied across products. In Study 2 safety responsibility for the same products was allocated to the manufacturer, retailer and user, but the "outside" organization was omitted. The mean percent allocated was 51%, 20% and 30% respectively. In this study, additional questions assessed various perceptions of the products and the subject's familiarity with the products. The results indicated that responsibility allocation was a function of perception of product hazardousness; the more hazardous a product is perceived to be, the more responsibility is allocated to the user. Study 3 investigated some of the attributes of high hazard products which are associated with various allocations of product safety. For high hazard products with open and obvious risks (chain saws, cutting torches), more responsibility was allocated to consumers as opposed to manufacturers. On the other hand, for those high hazard products with "hidden" risks (pesticides, antifreeze), manufacturers were typically allocated a much higher degree of responsibility.

Introduction

This article reports the results of three studies carried out to explore how people allocate responsibility for product safety. The safety issues of interest focus on the use of the product; that is, the safety of the user or others who may be at risk when the product is being used. There are several potential sources of safety responsibility in product use. Certainly the manufacturer must consider user safety during design as well as in the manufacture and marketing of a product. In many cases, the manufacturer may have special knowledge about the product that distributors, retailers, or consumers may not have. Distributors and retailers have a responsibility for ensuring that safety information and materials are passed on to users. The user, of course, has responsibilities for safety during use.

The above entities may be thought of as in the main stream of commerce for a product. But there may be other entities or organizations that have a role in product safety as well. Government agencies, for example, may set guidelines and regulations and/or collect and analyze accident data. The Food and Drug Administration (FDA) and the Consumer Product Safety Commission (CPSC) are examples. Other non-government institutions may also be involved, such as Underwriters Laboratories (UL), the American Society for Testing Materials (ASTM), and the American National Standards Institute (ANSI). These organizations provide guidelines and standards and in some instances may carry out tests in their product safety roles.

The basis of our interest in these issues is twofold. First, the greater the extent to which a product user allocates responsibility to manufacturers, retailers or other agencies, the less carefully he/she may behave while using the product. The second reason for our interest in the allocation of product safety responsibility concerns jury decisions. In civil litigation, many product liability cases involve a jury allocating responsibility for product safety (or more precisely, fault for the injury event) to manufacturers, distributors, retailers and/or users. Thus, a better understanding of how people perceive and allocate such responsibilities could ultimately lead to improved user safety as well as a better understanding of jury decision making.

Study 1

This study explored the allocation of product safety responsibility across the manufacturer, retailer, user, and an agency or organization that is not directly in the stream of commerce.

Method

A questionnaire was employed in which subjects allocated responsibility for product safety to the various entities noted above. A variety of products, 29 in all, were represented.

Subjects. Thirty-five students, 13 men and 22 women, enrolled in introductory psychology courses at the University of Houston served as subjects. They received course credit for participating. The mean age was 23.1, with a range of 18 to 38.

Materials and Procedures. The questionnaire consisted of three parts. Part 1 contained four demographic items: age, gender, type of living situation (apartment, house, alone, etc.), and marital status. Part 2 was designed to obtain information about the subject's knowledge and/or understanding about

various organizations that may be related to product safety: Consumers Union (CU), Underwriters Laboratory (UL), American National Standards Institute (ANSI), Environmental Protection Agency (EPA), Consumer Product Safety Commission (CPSC), Bureau of Alcohol, Tobacco and Firearms (BATF), Food and Drug Administration (FDA), Department of Transportation (DOT), and the Poison Control Center. Seven questions were asked about each of the organizations, addressing the degree of familiarity with each organization and the types of roles (setting standards, collecting data, etc.) it serves. The questions were:

1. *How much do you know about this organization?* (anchored scale of 1, low, to 9, high)
2. *What kind of organization is it?* (a government group, a private group organized by industry, a private group organized by consumers, a manufacturer of products, do not know)
3. *Does this organization test products?* (yes, no, do not know)
4. *Does this organization collect safety data on products?* (yes, no, do not know)
5. *Can this organization ban a product from the marketplace?* (yes, no, do not know)
6. *Does this organization deal with products before or after they enter the marketplace, or both?* (before, after, both, do not know)
7. *If you can, please list three products this organization would normally be concerned with.*

Part 3 of the questionnaire obtained ratings of responsibility for product safety during use. Twenty-nine products were listed. For each product subjects allocated a percentage of the total responsibility for product safety (the numbers had to total 100) to the manufacturer, the retailer, a relevant potential oversight organization (such as the FDA), and the user. Two allocations were made for each product: responsibility as the subjects perceive it to exist, and responsibility as the subjects think it should be. The products and the averages of the "is" and "should be" allocations are listed in Table 1. Four child-related products were included; for these products subjects allocated responsibility to the child (with a specific age defined) as well as the four previously mentioned entities. One prescribed drug was included; for this product an additional allocation was made to the prescribing physician. These products and the allocations are found in Table 2.

Results

None of the demographic variables produced significant differences; all further analyses represent the total sample.

The levels of knowledge associated with various agencies associated with product safety was quite variable. Ratings of knowledge (Question 1) in ascending order were: UL (1.4), ANSI (1.6), CU (3.5), CPSC (3.6), ATF (4.4), EPA (4.9), Poison Control Center (5.1), DOT (5.6), and the FDA (6.2). The percent of subjects correctly identifying the kind of organization the groups were (Question 2) in ascending order were: UL (9%), ANSI (9%), CU (46%), CPSC (46%), Poison Control Center (54%), BATF (66%), EPA (74%), FDA (85%), and DOT (85%). Results indicated that subjects knew very little about whether the organizations tested products, collected safety data, banned products, and dealt with products before and after they entered the marketplace were generally lower.

Table 1 shows the allocation of responsibility to the various agents by product. Table 2 shows the allocations for products used by children, as well as valium, a product with an additional party in the stream of commerce (physician). Overall (collapsed across who is and who should be responsible), subjects usually allocated the most responsibility for product safety to the manufacturer (43%), with the second largest amount to the consumer (27%). The various agencies followed (21%) with retailers (9%) making up the remaining allocation. Not surprisingly, allocations varied across products. The smallest amount of responsibility was allocated to manufacturers for beer (30%), while a baby car seat received the largest amount (55%). For consumers beer received the highest allocation (44%); the lowest allocation to consumers was for snow tires (19%). There was not a great deal of variability in the allocations given to

Table 1. Allocation of responsibility for safe product use (%)

Product	Manufacturer	Agency	Retailer	Consumer
Beer	32/32	17/	9/25	43/44
Gun	36/28	19/	10/20	37/51
Hatchet/Ax	36/41	19/	10/20	35/41
Antihistamine	40/55	24/	11/23	26/23
Food Coloring	41/62	29/	8/15	24/24
Sun Lamp	42/46	21/	13/30	24/24
Kerosene	42/49	21/	9/21	29/31
Pillow	42/53	24/	10/23	25/25
Bicycle	43/51	18/	10/19	29/31
Chainsaw	44/49	19/	11/15	27/38
Aspirin	44/55	26/	10/17	21/29
Fireworks	46/49	16/	8/19	30/33
Deodorant	46/58	21/	10/18	25/24
Vacuum Cleaner	47/53	21/	10/23	23/24
Oven Cleaner	47/54	22/	8/18	23/29
Electric Toaster	47/58	20/	11/18	29/25
Lawn Mower	49/53	20/	8/20	23/27
Extension Cord	49/56	21/	9/22	23/23
Laundry Detergent	49/59	22/	8/18	23/24
Pesticide	50/55	21/	8/20	22/25
Snow Tires	50/57	19/	13/22	19/21
Microwave	51/55	17/	10/21	22/24
Baby Car Seat	56/54	18/	7/16	21/30
Cigarette	57/40	18/	7/12	39/48

Note: The first number in each cell is from Study 1; the second number is from Study 2

Table 2. Allocation of responsibility for safe use for prescribed drug and child-related products (%)

Product	Manufac-turer	Agency	Retailer	Consumer	Child or Doctor
Valium	30/35	21/	8/9	16/20	26/37
Go Cart	41/41	16/	18/29	21/24	6/7
Wading Pool	42/36	19/	9/16	27/44	4/4
Trampoline	43/43	18/	8/17	25/32	8/9
Chemistry Set	47/43	20/	7/16	22/34	6/7

Note: The first number in each cell is from Study 1; the second number is from Study 2

retailers; cigarettes (5%) were the lowest and snow tires were the highest (15%). Variability in assignments were also low for the various public and private agencies associated with product safety; fireworks received the lowest amount of responsibility (15%) and food coloring received the highest (31%).

A three-way analysis of variance (ANOVA) was conducted to test the effects of the following three factors on the allocation of responsibility: product, agent (manufacturer, agency, retailer, and consumer), and the nature of responsibility (is currently responsible vs. should be responsible). No differences existed between the is and should be conditions as well as the products themselves. On the other hand, the difference in agent was significant, $F(3,75) = 28.74$, $p<.001$. The only significant interaction was between the agent and products, $F(69, 1725) = 4.09$, $p<.001$.

Discussion

This study showed that subjects assigned the greatest responsibility for product safety during use to the manufacturer and secondly to the users. The significant interaction indicates that the responsibility allocation varied with product, which raises the question as to what are the characteristics of products or of people's perceptions of products that influence their views about responsibility. This question led to the second study.

Study 2

In this study subjects again allocated responsibility for product safety. It differed from Study 1 in that only the entities in the stream of commerce were included; that is, organizations such as FDA, CPSC, CU and ANSI were *not* included. Also, information was obtained regarding subjects' perceptions of and experiences with the products.

Method

A questionnaire was employed in which subjects allocated responsibility for product safety to the manufacturer, retailer and user. Additionally, information on various dimensions of product risk and subjects' perceptions of and experiences with the products were collected.

Subjects. The subjects consisted of two samples. Sixteen students, 7 men and 9 women) enrolled in introductory psychology courses at the University of Houston served as subjects for course credit. The mean age was 22.4, and ranged from 18 to 33. The second sample was 70 students enrolled at North Carolina State University, 40 men and 30 women. The mean age was 20.4 and ranged from 18 to 47.

Materials and Procedure. The questionnaire consisted of three parts. Parts 1 and 2 were identical to Parts 1 and 3 in the previous study except that the organizations not directly in the stream of commerce (FDA, UL, CPSC, ANSI, etc.) were excluded. Part 3 of the questionnaire had subjects rate each of the 29 products on eight dimensions using a 9-point scale, with 0 (low) to 8 (high) as anchors. The eight dimensions were: cautious intent, frequency of use, dread of risks, voluntariness of the risks, number of people who could be killed by the product, familiarity, severity of potential injury, and hazardousness. These dimensions or questions have been shown by Young and Vaubel (1992) to be useful in assessing people's perceptions of product risk.

The procedure was similar to Study 1's.

Results

Table 1 shows the allocation of responsibility to the various agents by product. Table 2 shows the allocations for products used by children as well as valium, a product with an additional party in the stream of commerce (physician). As was seen in Study 1, consumers typically allocated most responsibility to the product manufacturer (50%), followed by the consumer (30%), and the retailer (20%). Again, the allocations differed between products.

Using the ratings, the products were analyzed using principal components analysis. This analysis was used to determine what aspects of the products subjects accessed when making their allocation decisions. The PCA resulted in two components or factors: (1) Hazardousness and (2) Familiarity. For Component 1, products such as cigarettes, beer, chainsaw, kerosene, and handgun were seen as hazardous, dreadful and producing severe injuries, whereas deodorant, pillow, laundry detergent, and oven cleaner were at the opposite end of the hazard dimension of Component 1; that is, low hazardousness. For Component 2, products such as extension cord were seen as being more familiar, whereas chemistry set and valium were less familiar.

Correlations between the factor scores for each product and responsibility allocated showed that Component 1 (Hazardousness) was influential in people's allocation decisions, whereas Component 2 (Familiarity) was not. For products perceived to be more hazardous, subjects allocated more responsibility to the consumer ($r = .665$, $p<.001$) and less to the manufacturer ($r = -.682$, $p<.001$). There was no change in responsibility allocated to the retailer as a function of Hazardousness ($r = -.023$, $p>.05$).

Discussion

These results at first seem counterintuitive. It would seem that the more hazardous a product, the more responsibility the

manufacturer would have in seeing that it was sold and used safely. However, close examination of the products which comprised the high end of this dimension suggest another explanation. The products cigarettes, chainsaw, beer, handgun, and kerosene possess hazards which are inherent in their utility. Handguns are designed to shoot projectiles and kerosene is intended to ignite. These properties lead to a greater onus on the consumer to use and handle them safely (i.e., according to their intended purpose). Products such as deodorant and food coloring do not have such inherent hazards, and, thus, more responsibility may be on the manufacturer to produce them free of defect, contamination, or hidden hazard.

Study 3

This study further explored the allocation of responsibility for products high in perceived hazardousness. Additional dimensions of product risk perception and how these dimensions were related to allocation were investigated. Of particular interest was the influence of perceived obviousness of the hazard.

Method

Subjects. Twenty-eight students, (8 men and 20 women) enrolled in introductory psychology courses at the University of Houston served as subjects for course credit. The mean age was 22.9, and the range was 18 to 43.

Materials and Procedure. The questionnaire consisted of three parts. Part 1 collected limited demographic information. Part 2 requested ratings of responsibility for product safety using the same categories of agents as in Study 2. A total of 32 high hazard products were used. Part 3 of the questionnaire had subjects rate each of the 32 products on five dimensions using anchored 9-point scales, with 0 (low) to 8 (high) as the anchors. The five dimensions were: new/novel vs. old/familiar risks, familiarity, hazardousness, hazard known as a result of experience, and how open and obvious the risk is. The first three dimensions have been shown by Young (1995) to be useful in assessing people's perceptions of product risk.

The procedure was similar to the first two studies.

Results

Table 3 shows the allocation of responsibility for these products. Again, subjects allocated the greatest responsibility to manufacturers (46%), followed by consumers (35%) and then retailers (19%). The 32 high hazard products were ranked according to the level of hazardousness and the 10 higher hazard products were compared with the 10 lower hazard products. Although the subjects were more familiar with the 10 lower hazard products, the hazards appeared less obvious (2.9) to them than the 10 higher hazard products (5.0), $t(18) = 4.862$, $p<.001$. For the lower hazard products subjects allocated a greater amount of responsibility to the manufacturer (48%) than they did to the consumer (33%). The remaining responsibility (19%) went to the retailer. In contrast, the 10 higher hazard products split the allocation between manufacturer (42%) and the consumer (39%) in a more equal fashion. The allocation to the retailer (19%) for the 10 higher hazard products did not differ from the 10 lower hazard products.

Table 3. High hazard products

Product	Mfr	Retail.	Consmr	Hazard	Familiar	Obvious
10 Higher Hazard Products						
Cigarette	39	15	46	6.6	4.3	4.4
Chain Saw	41	21	38	6.2	3.1	6.1
Cutting Torch	45	18	38	6.1	2.8	5.9
Portable Circular Power Saw	44	19	36	6.0	3.4	5.9
Fireworks	39	20	41	5.9	6.4	4.9
Hatchet or Ax	37	19	44	5.1	3.7	6.0
Hand Saw	44	19	36	4.9	4.3	5.7
Kerosene	39	19	42	4.8	3.4	3.8
Suntan Booth	39	27	34	4.7	3.3	2.5
Gas Oven	49	20	31	4.6	5.1	4.4
mean	41.6	19.8	38.7	5.5	4.0	5.0
10 Lower Hazard Products						
Lawn Fertilizer	41	24	35	3.6	3.7	2.7
Antihistamine	57	20	23	3.4	4.7	2.5
Elec. Heating Pad	50	18	31	3.4	4.7	2.7
House Paint	42	20	38	3.3	5.3	2.6
Oven Cleaner	49	19	33	3.3	5.1	2.4
Steam Iron	49	20	32	3.3	6.4	4.0
Garbage Disposal	50	22	28	3.1	5.6	3.7
Electric Blanket	55	15	30	3.1	4.6	2.8
Extension Cord	53	16	31	2.9	6.6	3.0
Staples	39	16	45	2.6	6.7	3.2
mean	48.4	19.0	32.5	3.2	5.4	2.9

Note: products are ordered along the hazard dimension.

Table 4 displays the correlations between the rating questions. Obviousness correlated positively with hazardousness and with old familiar risks, and it correlated negatively with knowledge of the risk from experience.

Discussion

One difference between these two sets of products seems to be the obviousness of the hazard itself. Again, many of the higher hazard products, such as the chain saw and the cutting torch, have hazards that are inherent and obvious in their use. On the other hand, subjects may simply be unaware of the exact nature

Table 4. Correlations between rating questions

	Hazardous	Familiarity	Obviousness	New/Old Risk
Familiarity	-.452*			
Obviousness	.741**	-.254		
New/Old Risk	.581**	.038	.656**	
Known from Experience	-.578**	.190	-.849**	-.601**

* $p < .01$
** $p < .001$

of certain hazards found in the lower hazard products, like those associated with an electric blanket or an antihistamine. For such products, consumers may expect manufacturers to play a larger role in product safety.

General Discussion

The results of all three studies indicate that subjects allocated more responsibility for product safety to manufacturers than to users. Furthermore, the "should be" allocation in Study 1 indicated that subjects felt that this distribution of responsibility is the way things ought to be. Certainly this point of view differs from the classic "caveat emptor" (let the buyer beware) perspective of product safety. While these studies do not address historical changes in such attitudes, it may be that the increasing awareness and concern for consumer safety during the past few decades has been accompanied by a broader perspective regarding safety responsibility.

Also of interest is the outcome of Study 1 showing 21% of the responsibility allocated to organizations not in the stream of commerce. It would appear that subjects believe such institutions play a significant role in product user safety. While in some instances such assumptions may be warranted (e.g. the FDA role in foods and drugs), for many products and many organizations, such influence does not exist. The implication of these results is that there may be occasions when people assume there is "someone out there" looking out for their well being when in fact there is not. For example, consumers may believe that certain products in the marketplace are tested for safety, when in reality no such tests exist. To the extent that such assumptions lead consumers to exercise less caution in using products, safety may be compromised.

Studies 2 and 3 showed that people's hazard-level perceptions influenced responsibility allocation; the more hazardous a product is, the more responsibility the user is expected to assume. This raises and interesting question that might be addressed in future research; namely, whether the "true" level of hazard is perceived or known to the user and how this knowledge or lack of knowledge affects the allocation of responsibility. It seems reasonable to assume that to the extent hazards are less known or not obvious, manufacturers would be expected to assume more responsibility for their safe use. The results of Study 3 were consistent with this expectation, although the high correlation between hazardousness and obviousness makes it difficult to draw any straightforward conclusions regarding the latter factor.

The safety responsibility of the product distributor or "middle man" was not addressed in these studies. The reason for this omission was simply to keep the allocation process from becoming overly complex. Future studies should address this area. In general, retailers were allocated a smaller portion of responsibility for user safety than other agents. These results are of interest in the litigation context. Often product distributors and retailers are sued along with manufacturers because of their role in the chain of distribution. For the types of consumer products represented in these studies, the subjects see such responsibility as lying more with the manufacturer.

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