RESPONSIBILITY FOR PRODUCT SAFETY IN THE WORK ENVIRONMENT

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A study was carried out exploring how people allocate responsibility for the safe use of products in the work environment. Products typically used in different work environments were named and subjects apportioned safety responsibility to the manufacturer of the product, the distributor/retailer, the employer, and the employee using the product. The mean percent responsibility allocated to these four choices was 41%, 11%, 22% and 26% respectively. A significant interaction between the products and the four alternatives indicated that the allocation varied across products. Allocations to manufacturers and employees differed to a large extent between products, but the allocations to retailers and employers remained relatively constant. Additional questions assessed the subjects' perceptions of and familiarity with the products. The results indicated that those products subjects viewed as having newer or more novel risks were also the products for which subjects allocated more responsibility to the manufacturer. For products viewed as having more open and obvious hazards greater responsibility was allocated to the employee.

INTRODUCTION

There are several potential sources of product safety responsibility. The manufacturer must consider user safety during design as well as in the manufacture and marketing of a product. Similarly, distributors and retailers may be responsible for user safety in the marketing stage, such as in providing proper safety information in the form of pamphlets or product demonstrations. Employers are often instrumental in providing instruction and training especially in the case of complicated machinery or products with which the employee may not be familiar. The employee, of course, has responsibilities for safety during use.

Two areas of interest prompted our work on this topic. First, the more responsibility a user allocates to manufacturers, retailers or other groups, the less personal responsibility he/she may exercise when using the product. This could take the form of an employee assuming that certain safeguards are designed into a product when they are not. Similarly, employers may make assumptions about what their employees know which may influence the training or instructions they provide to workers. The second reason for our interest in the allocation of product safety responsibility concerns the decisions of both juries and judges in product liability cases. In civil litigation, many such cases involve a jury allocating responsibility for product safety (or more precisely, fault for the accident) to manufacturers, distributors, and/or users. Workplace compensation laws may cover the liability of employers, yet in some courts the jury is still asked to determine what role an employer played in a specific accident. 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.

METHOD

A questionnaire was employed in which subjects allocated responsibility for product safety to the various entities noted above and answered rating questions about the products. A total of 23 products were represented.

Subjects

Thirty-two students, 17 men and 15 women,

enrolled in various psychology courses at Rice University served as subjects. They received course credit for participating. The mean age was 19.5, with a range of 17 to 23. An additional sample of 30 students at North Carolina State University evaluated the products on another rating question.

Materials and Procedure

The questionnaire consisted of three parts. Part 1 contained two demographic items: age and gender. Part 2 of the questionnaire obtained ratings of responsibility for product safety during use. Twenty-three products were identified, and for each subjects allocated a percentage of the total responsibility for product safety (the numbers had to total 100) to the manufacturer, the retailer, the employer, and the employee. These products are shown in the left column of Table 1. Part 3 of the questionnaire had subjects rate each of the 23 products on four dimensions using a 9-point scale. The four dimensions were:

Cautious intent (How cautious would you be in using this product?, 0=not cautious, 8=extremely cautious)

Familiarity (How familiar are you with this product?, 0=not at all familiar, 8=extremely familiar)

Technological risk (Are the risks associated with this product new, novel ones or are they old, familiar ones?, 0=new/novel, 8=old/familiar)

Hazardousness (How hazardous is this product?, 0=not at all hazardous, 8=extremely hazardous)

These dimensions or questions have been shown by Vaubel and Young (1992) to be useful in assessing people's perceptions of product risk. The NCSU subjects rated the products on a fifth dimension:

Open and obvious (To what extent are the hazards associated with this product obvious from what it does and how it is used? In other words, if a person was using it for the first time would the hazards be understood just by looking at it? 0=not obvious, 8=very obvious)

Subjects were run in groups that varied in size. The questionnaire included instructions, and the experimenter answered any questions regarding the procedure.

RESULTS

Table 1 shows the mean allocation of responsibility to the various agents by product, as well as the mean ratings on familiarity, hazardousness and obviousness. Overall, subjects usually allocated most responsibility to the manufacturer (41%), with the second largest amount to the employee (26%). Employers were assigned 22% and retailers 11%. Not surprisingly, allocations to the 4 entities depended to a large extent on which product was being evaluated. For manufacturers, the smallest amount of responsibility was allocated to a sewing machine (35%), while an x-ray machine received the largest amount (49%). A ladder received the highest allocation for employees (37%); the lowest allocation for employees was pesticide (16%). There was relatively little variability in the allocations given to employers; the ladder (17%) was the lowest and a clothes press machine was the highest (25%). All of the allocations for the retailers fell in the 10% to 12% range.

Correlations were performed between the allocation responses and the product rating questions collected in Part 3 of the questionnaire. Of particular interest is the question where subjects were asked whether the risks from the product were new/novel risks (low end of the scale) or old/familiar ones (high end of the scale). Subjects allocated more responsibility to the manufacturer if the product was perceived as having new/novel risks (r=-.74, p<.001), while the employee received an increased allocation if the products were viewed as having old/familiar risks (r=.81, p<.001). Responsibility to the employer was also somewhat higher if the product was seen as having new/novel risks (r=-.43, p<.05).

Additionally, products viewed as having open and obvious risks increased allocations to the employee (r=.45, p<.05) and decreased allocations to the manufacturer (r=-.54, p<.01). When the products were ranked by their hazardousness and the 14 most hazardous products were analyzed, these correlations became stronger. For these high hazard products, allocations to the employee were much higher (r=.68, p<.01) and much lower to the manufacturer (r=-.72, p<.01) when the risks associated with those products were viewed as more open and obvious. In other words, manufacturers would not be held to as high a

Table 1. Allocation of responsibility to various agents by product.

Product	Manufacturer	Retailer/ Distributor	Employer	Employee	Familiarity	Hazard	Open/ Obvious
Sewing Machine	35	11	24	30	5.0	2.2	3.5
Ladder	36	10	17	37	6.8	3.4	4.4
Nail Gun	36	10	18	34	3.9	5.6	5.9
Coffee Machine	36	12	22	30	6.3	1.5	3.0
Soldering Iron	37	12	21	29	2.7	4.8	5.6
Weedeater	37	10	22	30	5.7	3.8	5.5
Food Processor	38	11	19	32	5.1	2.2	3.8
Clothes Press Machine	38	11	25	26	1.3	3.5	4.5
Jackhammer	38	10	21	30	2.3	6.3	6.0
Welding Machine	39	12	23	26	1.8	6.3	5.9
Chain Saw	39	11	23	28	3.7	6.9	6.9
Air Wrench	39	11	22	28	1.7	4.4	3.9
Punch Press	39	12	23	26	1.3	5.0	4.7
Bulldozer	40	10	24	27	2.7	6.3	6.2
Tire Mounting Machine	41	11	25	23	1.6	5.4	4.4
Auto Lift	41	11	23	24	1.9	6.1	5.8
Metal Lathe	42	10	23	24	1.1	5.8	3.8
Hair Dye	43	10	21	25	4.3	1.8	1.8
Film Developer	47	10	23	21	2.9	3.6	1.8
Pesticide	49	12	23	16	3.8	5.9	3.8
Fertilizer	49	10	24	17	4.3	4.2	1.9
Solvent	49	11	20	20	3.3	4.4	2.4
X-Ray Machine	49	10	22	18	3.7	5.7	4.0

level of responsibility for the safety of products whose risks are plain for everyone to see. Consider the comparison of an auto lift and a pesticide. Both products were ranked high along the hazardousness dimension, 6.1 and 5.9 respectively. However, the auto lift (5.8) was ranked much higher than the pesticide (3.8) on the open and obvious dimension. In turn, the manufacturer was allocated a higher percentage of responsibility for the pesticide (49%) than the auto lift (41%). On the other hand, the employee received a higher allocation for the auto lift (24%) than for the pesticide (16%).

Previous research (Laughery et al., 1995) found a positive correlation between responsibility allocations to individuals using consumer products and the hazardousness of that product. However, all of those

products were items that consumers would expect to find in grocery or retail stores. Therefore, although the hazardousness of those products varied (ranging from pillows to chainsaws), subjects were relatively familiar with all the items, and most likely allocated responsibility strictly on the basis of hazardousness. The items in this study included products that differed in familiarity as well as hazardousness; no systematic relationship between hazardousness and the allocations to manufacturers (r=.18, p=.40) or employees (r=-.26, p=.24) was found.

DISCUSSION

This study showed that subjects assigned the greatest responsibility for product safety to the manufacturer followed by the employee and then the employer. Somewhat surprising was the lack of variability in the responsibility assigned to employers, since the products differed dramatically in the training and instructions that would be required for use. However, a moderating effect may have occurred with the employers when high risk products are considered. For those products with new and novel risks, like a pesticide, the manufacturer will be held most responsible, as manufacturers are most familiar with the specific hazards and properties of chemicals. On the other hand, subjects may think that the employees who use high risk products with mechanical hazards are in the best position to exercise responsibility for the safety of the product, since the hazards in those products were viewed as open and obvious. It is quite possible that had we selected products even more unfamiliar, such as a piece of equipment in a petroleum refinery, the employer may have been assigned more responsibility.

One extension of the design process in which we are especially interested involves warnings that are either placed on the product or included along with the product. Manufacturers need to be aware of not only how their "target audience" views their product, but even more importantly what assumptions they make about the knowledge levels of their target audience (Laughery, 1993). It seems reasonable that where hazards are less known or not obvious, manufacturers would be expected to assume more responsibility by providing good warnings.

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