

Hierarchical Position, Gender, Accident Severity, and Causal Attribution

DONGO RÉMI KOUABENAN¹

*UFR Sciences de l'Homme et
de la Société
Grenoble, France*

DANIEL GILIBERT

*Laboratoire de
Psychologie Sociale
de la Cognition
Clermont-Ferrand, France*

MURIEL MÉDINA

*UFR Sciences de l'Homme et
de la Société
Grenoble, France*

FRÉDÉRIC BOUZON

*UFR Lettres, Langues,
et Sciences Humaines
Chambery, France*

The two studies reported here confirmed the role of the attributor's hierarchical level in causal attributions about accidents in different types of organizations. In both studies, supervisors vs. subordinates had to analyze a minor work accident vs. a serious one. The first study used male vs. female subjects, whereas the second compared the target's position in the same (in-group) vs. different (out-group) hierarchical level as the attributor. In all cases, more internal attributions than external ones were given to explain the accident. These results demonstrate a tendency toward defensive attribution, whereby people tend to protect themselves or their group from blame or prejudice (Shaver, 1970a). This self-protective attribution bias was found to increase with accident severity, particularly in Study 2. The conclusion offers some suggestions for accident analysis and prevention.

Understanding and preventing accidents are one of the major concerns of organizations that are confronted daily with multiple malfunctions, despite the progress of science, and sometimes even because of it. An accident is undeniably one of the most obvious and troubling events contributing to abnormal operations. In addition to the disruption it causes in the normal flow of activities (e.g., production), an accident is likely to be detrimental to the feeling of control and order of the persons involved in the situation, and to have a negative effect on their sense of psychological stability. In order to keep some feeling of control over their environment, and also no doubt for other reasons (e.g., avoiding being held responsible), members of an organization engage more or less actively in the search for the causes of accidents, those unforeseeable and troubling events.

¹Correspondence concerning this article should be addressed to D. R. Kouabenan, Université Pierre Mendès France, Laboratoire de Psychologie Sociale (LPS), UFR Sciences de l'Homme et de la Société, Département de Psychologie, B.P. 47, 38040 Grenoble cedex 9, France.

Some studies have nevertheless shown that explanations of an accident or negative event within an organization vary with a number of factors, including the social role of the persons involved in the accident, their social status, and their hierarchical position within the organization (Dejoy, 1987, 1994; Hamilton, 1986; Kouabenan, 1985a, 1985b, 1990, 1996, 1998, 1999; Lacroix & Dejoy, 1989; Mitchell & Wood, 1980; Niskanen, 1994; Salminen, 1994; Salmi, 1992). The present article specifically examines the conditions that trigger defensive explanations by taking into account the perceived similarity between the attributor and the person involved in the accident. The variables manipulated are the hierarchical position and gender of the subjects, and accident severity. The interactions between them are analyzed.

Hierarchical Position as a Defensive Explanation Factor

The effect of hierarchical level on the explanation of accidents had already been documented in 1960. Turbiaux (1971) reported a 1960 study by Hagbergh, which made it quite clear that

etiological judgments concerning accidents vary according to hierarchical level: [he said that] according to Hagbergh, engineers more often blame worker carelessness and their failure to use the means of protection at their disposal; foremen, the lack of training; and workers, working rhythms and workload. (p. 953)

In the same way, a 1969 report by the European Coal and Steel Community (CECA) indicated that, with respect to explanations of accidents by ordinary workers in the mining industry, "management personnel more often quoted factors inherent in working personnel characteristics (qualification, instability), whereas workers mainly called into question those factors relative to working conditions and organization" (CECA, 1969, p. 59).

Such a tendency to attribute accidents to persons with a different rank than oneself, which Walster (1966) and Shaver (1970a) called *defensive attribution*, was observed in an empirical study (Kouabenan, 1982, 1985a, 1985b) on a group of French telecommunications workers. In this study, subjects were asked to explain the types of accidents that generally occurred at their workplace, along with any accidents in which they were involved, either as a victim or as a witness. No matter what experimental design was used, subjects as a whole made more internal attributions than external ones, thereby involving the target subordinate in the causes of the accident. However, close examination of the results for each hierarchical level showed that supervisory staff more often attributed accidents to factors involving subordinates (e.g., lack of attention, carelessness, violation of safety rules, inexperience), whereas the subordinates

themselves had a greater tendency to attribute accidents to external factors by blaming the work situation (e.g., poor working conditions, defective equipment), inadequate safety instructions, or simply bad luck.

This tendency of supervisory staff to preferentially rely on internal explanations that blame the subordinate is also supported by several studies (Dejoy, 1987; Hamilton, 1986; Lacroix & Dejoy, 1989; Mitchell & Wood, 1980; Niskanen, 1994; Salminen, 1992). In two studies, Mitchell and Wood showed that superiors judging nurses involved in work accidents more often attributed the causes to internal factors (subordinate-related) than to external ones, and gave little consideration to extenuating circumstances. Dejoy, who had subjects analyze work accidents presumably resulting from a chain of several causes, showed that whatever the causal chain, hierarchical superiors always attributed a more important causal role to subordinates, and did so even when the causal data were confusing. It would seem that what is important is not so much the chronological position (immediate or prior) of the cause, but rather its internal or external character (Brickman, Ryan, & Wortman, 1975).

In short, these studies show beyond all doubt that the hierarchical position within the organization influences naïve causal explanations of accidents, and also that such explanations may determine attitudes about safety problems and preventive measures on the job. This finding is consistent with studies on the norm of internality stipulating that supervisors generally make more internal attributions (Beauvois & Dubois, 1988). It is also consistent with self-other attribution by which the actors or victims of accidents (generally subordinates) tend to attribute their misfortune to situational factors, while observers tend to view it as caused by factors internal to the actors (Jones & Nisbett, 1972). More importantly, we can see that explanations given by supervisors are defensive and tend to be the opposite of those given by subordinates. This finding is consistent with studies on accident responsibility judgments, where people generally make external attributions or pass the fault on to others in order to deny or reduce their own implication. These defensive attributions are usually aimed either at upholding self-esteem or at persuading the attributor that such an accident could not happen to himself or herself (Walster, 1966). Defensive explanations of accidents indeed seem to be motivated not only by the attributor's hierarchical position, but also by the severity of the accident.

Accident Severity as a Stressing Factor for Defensive Explanations

Sometimes the seriousness of an accident also seems to reinforce defensive attributions. The existence of an accident severity effect on naïve explanations of it, although plausible, has not been shown in a conclusive manner. Certain studies have found an increase in causal attributions to the victim as the severity of the

accident also increased (e.g., Baldwin & Kleinke, 1994; Dejoy, 1985; Dejoy & Klippel, 1984; Gleason & Harris, 1976; Medway & Lowe, 1975; Schroeder & Linder, 1976; Taylor & Kleinke, 1992; Walster, 1966), others have claimed the opposite effect (e.g., McKillip & Posavac, 1976; Shaw & McMarn, 1977; Walster, 1967), while still others have noted the lack of an accident severity effect on causal attributions (e.g., Kanekar & Sovani, 1991; Lacroix & Dejoy, 1989; Shaver, 1970a, 1970b; Walster, 1967).

The most convincing studies appear to be Shaver's (1970a, 1970b) and Shaw and McMarn's (1977), which demonstrate that personal relevance (i.e., perceived similarity between the target and the attributor) and situational relevance (the fact that the accident could involve the subject as well) are determining factors in the direction or intensity of victim-directed attributions. Shaver (1970a) assumed that experiments where no accident severity effect on causal attributions was observed were probably perceived by the subjects as irrelevant (and, hence, nonthreatening). According to Shaver, the relevance of the situation to the subject is a necessary condition for triggering self-protective or defensive attribution. When this condition is satisfied, there are two defensive-attribution tendencies that account for the effect of accident severity, which depend on the degree of perceived similarity between the stimulus person and the observer (Shaw & McMarn, 1977): (a) an attributional tendency toward harm avoidance in cases of low personal relevance, which shows up as an increase in responsibility attribution to the target as the accident becomes more and more serious; and (b) an attributional tendency toward blame avoidance, manifested as weak attribution of responsibility to the target in an attempt to protect oneself from potential blame in cases of personal relevance.

Failure to take the relevance dimension into account may be another reason why past results have been inconsistent. Note, however, that a noticeable number of these studies have used simple experimental designs (few interaction effects were examined). What is more, it seems that certain factors that are relevant in the study of intergroup relations have not been taken into account, or have been studied separately. A case in point is when a given subject must analyze an accident involving an actor from his or her own group or from some other group, irrespective of his or her status (Hewstone, 1990). Most known studies in the area of accident analysis have been limited to the case of an actor or a stimulus person with a subordinate status. Another example is the fact that little attention has been paid to gender categorizations, despite their well-known impact in everyday situations and at work. It is highly likely that these variables, alone or in interaction with accident severity, can account for defensive attributions.

Role of Gender Categorization in Accident Explanation

Relatively few studies have examined the role of gender in the causal attribution of accidents, and even less so the joint effect of gender and hierarchical

position. Research on the role of this variable has led to differing, even widely discrepant results. Some authors (Baldwin & Kleinke, 1994; Kanekar & Sovani, 1991; Shaw & McMarn, 1975; Shaw & Skolnick, 1971; Sundvik & Lindeman, 1993; Walster, 1966; Whitehead & Hall, 1984) have concluded that gender does have an effect on attribution, while others have not found such an effect (Dejoy, 1985; Shaw & McMarn, 1977; Taylor & Kleinke, 1992; Whitehead & Smith, 1976). For example, men were found to attribute less causal responsibility to an actor who had an accident while executing a female-related job than were women (Whitehead & Hall, 1984).

Concerning car accidents, males attributed less responsibility than did women to a male stimulus person involved in a car accident when that person had no insurance (Shaver, 1970a) or when he was drunk (Baldwin & Kleinke, 1994; Kanekar & Sovani, 1991). In an experiment, Shaw and Skolnick (1971) confirmed partially the defensive-attribution hypothesis. They noted not only that, compared to women, men identified more with the victim (who was a man), thinking that they too might act in the same way, but also that men blamed the victim for the accident only when its consequences were not serious. This is in line with Walster's (1966) results showing that, unlike men, women attribute increasingly more responsibility to the stimulus person involved in an accident (a man) as the severity of the consequences of the accident increases.

These results lead to the conclusion that women are more severe or internal in their attributions than are men. Although not all authors have interpreted such attributions in defensive terms (Shaw & McMarn, 1975), the fact that the victim of the accident was always a man suggests that we are dealing here with a defensive bias based on gender categorization.

The Present Paper

In light of this body of data, it appears that gender, like the attributor's hierarchical position and the severity of the accident, affects causal attributions in a defensive way. However, these effects and their interpretation are still far from being proven. It should be noted that in past studies the gender effect on causal explanations has always been examined independently of hierarchical position. It is therefore still legitimate to wonder how male and female supervisors and subordinates explain an accident whose victim is a male and a subordinate. For these reasons, the first study is designed to examine the effects on causal explanations of hierarchical position, attributor's gender, and accident severity.

Furthermore, although the defensive effect of hierarchical position has been observed in several studies, it should be noted that in the earlier work all of the people involved in the accidents were subordinates. But several authors have nevertheless noted that when subjects are asked to explain an undesirable event in which the stimulus person can be identified as being a member of the same

group as themselves (the in-group) or as being a member of a different group (the out-group), they tend to make attributions less severe for their own group than for other groups (Deaux & Emswiller, 1974; Devos, Comby, & Deschamps, 1995; Greenberg & Rosenfeld, 1979; Howard, 1984; Kelley & Michela, 1980). Thus, in a second study, we examine this joint effect of the victim's hierarchical level with respect to the attributor's hierarchical level (in order to create conditions for in-group/out-group identification) and the effect of the severity of the accident.

Study 1

Hierarchical Status, Gender, and Accident Severity in Naïve Explanations

Using a professional setting that is different from that of previous studies, this first study investigates the effects of hierarchical position, attributor gender, and accident severity on causal explanations of accidents. In light of the earlier remarks, it is predicted that supervisors will be more internal than will subordinates in their explanations of accidents. Likewise, in accordance with the previous finding that women are harsher in their causal judgments than are men, females with a job status equivalent to that of the victim are expected to be more internal than males, with accident severity being a potential factor that might enhance these effects.

Method

Participants

Participants in this experiment belonged to the staff of the leading electrical production and distribution company in France. The sample consisted of 80 subjects chosen at random from a list of 815 staff members from one of the company's large regional administration offices. Subjects were divided into four groups of 20 subjects on the basis of their gender and hierarchical level: 20 male workers, 20 female workers, 20 male supervisors, and 20 female supervisors. In order to avoid any interference effects as a result of personal factors, such as sympathy or antipathy for the victim, the subjects were chosen in such a way that they could not know or identify the accident victim. This was achieved by having them analyze an accident that had taken place on a different site than their own. All of the subjects were volunteers.

Materials

Two accounts of real accidents that had occurred on one of the company's sites were submitted to the participants for analysis. Each event was assigned a

level of severity (mild vs. serious) that differed across subjects. Half of the subjects were asked to consider an accident that was described as mild (electrocution, without serious consequences) and the other half were asked to consider an accident described as having had serious consequences (electrocution of the victim).

Example of account: Mild accident. A defective circuit breaker was reported in Unit U of Company S on March 30, 1994. That is why, the same day, Mr. X's team changed the oil in the circuit breaker. After this operation, the equipment was switched on again. One of the individuals on the surveillance staff, Mr. Y, who had begun working for the company in May 1993 at the age of 29, noticed a spot of oil on the bottom of the circuit breaker (it turned out that oil had already started dripping from the device during repair). Being highly conscientious, and without informing his colleagues, Mr. Y started to clean it up. Not knowing (according to him) the risks he was running and being in a hurry, he went over the minimal safety limits and was electrified, fortunately without serious consequences.

Example of account: Serious accident. The account of the serious accident was identical in all respects except for the consequences, which read: "Suffering from third-degree burns on the arm, hand, and trunk, he was taken to hospital where he died 3 weeks later as a result of his injuries."

Experimental Procedure

The subjects were contacted by telephone in order to arrange a convenient time to meet. The interviews took place individually and lasted an average of 15 min. After they read an account of an accident, subjects were asked to estimate the importance of the various possible causes of the accident by completing an attribution questionnaire. The questionnaire had been pretested for comprehension by 15 subjects and was composed of eight possible causes, divided into three internal causes (inexperience, carelessness, violation of safety regulations) and five external causes (lack of communication within work teams, defective installations, lack of information about occupational hazards, poor work organization, bad luck). The subjects were asked to indicate the causal role of each of these factors using a 4-point Likert-type scale ranging from 1 (*totally unimportant role*) to 4 (*very important causal role*). The dependent variable was the average internal score expressing the mean degree of agreement with internal attributions, from which we subtracted the average score for external attributions (minimum = -3, maximum = +3)²; the higher the score, the more internal the preferred explanations.

²The average internal attribution agreement score ranged from +1 to +4. The average external attribution score, after inversion, ranged from -4 to -1. The total score thus ranged from -3 to +3.

Table 1

Average Internal Attribution Scores by the Attributor Gender, Hierarchical Position, and Accident Severity

	Male				Female			
	Supervisory attributors		Subordinate attributors		Supervisory attributors		Subordinate attributors	
	Supervisory attributors	Subordinate attributors						
Serious	.62	-0.45	0.67	0.18				
Mild	.91	-0.61	0.05	0.52				

Results

Table 1 presents the average scores for internal attributions, by the attributor's hierarchical status and gender, and the severity of the accident. Remember, that in this case, the independent variables used to test the hypotheses about the attribution process were the subject's gender (male vs. female), the subject's hierarchical status (supervisor vs. subordinate), and accident severity (mild vs. serious). These were between-subject variables. The factorial design was $2 \times 2 \times 2$ (Subject Gender \times Subject Status \times Accident Severity). The data were processed in an ANOVA with the internal attribution score as the dependent variable.

Effects of Subject's Hierarchical Position and Gender on Causal Explanations

Analysis of the results shows a simple hierarchical position effect, $F(1, 72) = 10.70, p = .002$. Supervisors were more internal than were subordinates in their causal attributions (.56 vs. -.09). A significant interaction between hierarchical position and subject gender was noted, and indicated that the differences between supervisors and subordinates depended on gender, $F(1, 72) = 10.30, p = .002$. Female supervisors did not explain an accident in a significantly more internal manner than did female workers (.36 vs. .35), $F(1, 72) = 0.00, ns$. Likewise, female supervisors did not significantly differ from male supervisors in their causal explanations (.36 vs. .76), $F(1, 72) = 2.04, p = .15$. But male supervisors were clearly more internal in their attributions than were male subordinates (.76 vs. -.53), $F(1, 72) = 21.00, p = .002$, and female subordinates were more internal than were male subordinates (.35 vs. -.53), $F(1, 72) = 9.72, p = .05$.

Effects of Subject's Hierarchical Position and Gender by Accident Severity

A marginally significant interaction was observed between hierarchical position, gender, and accident severity, $F(1, 72) = 3.20, p = .08$. The difference in

attributions between male and female subjects was not significantly affected by severity when subordinates were involved, $F(1, 36) = 0.60, ns$. On the other hand, these differences were significant when supervisors were involved, $F(1, 36) = 4.70, p = .04$. Thus, when the consequences of the accident were mild, male and female supervisors did not differ (females = 0.67, males = 0.62), $F(1, 36) = 0.03, ns$. On the other hand, when the accident was serious, female supervisors made attributions that were clearly less internal than did male supervisors (0.05 vs. 0.91), $F(1, 18) = 8.30, p < .01$. No other accident severity effects were found.

Discussion

The results of Study 1 confirmed a number of previous observations. First, we noted an overall tendency of subjects to ascribe the causes of an accident to its victim. This result corroborated the well-known claim that people generally tend to attribute events to the individuals involved in them, rather than to situational factors, thereby making what is called the *fundamental attribution error* (Ross, 1977). Another explanation that might be proposed here is the existence of an internality norm, which accounts for the highly prevalent tendency that people have of placing value on internal explanations of positive or negative events, especially people with a high status (Beauvois & Dubois, 1988). In any case, this first finding seems to show that for the observers of an event, the actors involved in it are, in some sense, responsible for what happens to them, even in cases where the events are negative and thus undesirable.

Second, and this is the most important result, the hierarchical position of individuals within the organization was a determining factor in the internality or externality of the attributions. More specifically, subjects with a high hierarchical position made more attributions blaming the victim (a worker) than did subjects with a subordinate position. Male subordinates were the ones who made attributions that placed the least amount of blame on the victim (who not only occupied the same hierarchical level as themselves, but was also of the same gender). Their attributions were closer to the external end of the internality scale. These results can also be explained in terms of situational and personal relevance, which may trigger defensive attributions aimed at avoiding incrimination. On the whole, these results confirm those of earlier studies showing that the defensive-attribution tendency is related to the hierarchical position held within the organization (Dejoy, 1987; Kouabenan, 1985a, 1985b; Lacroix & Dejoy, 1989; Mitchell & Wood, 1980).

Moreover, gender only affected causal explanations in interaction with hierarchical position. Male supervisors were more inclined to attribute the accident to the victim than were male subordinates, whereas women with different hierarchical positions could not be distinguished. However, it should be noted that, as a

whole, the women felt that the victim caused the accident. It is likely that, in this case, gender differentiation with the male victim had more weight than the hierarchical difference. Despite the fact that the subordinate women had the same job status as the victim, they may not have considered the accident to have much situational self-relevance (different occupations). But the female supervisors' lesser incrimination of the victim than the males' when the accident was serious remains intriguing, unless we assume that the severity of the event compelled them to feel compassion for the victim. Far from amplifying their defensive attitudes, the seriousness of the accident seems to have spurred some leniency. This finding goes against Waister's (1966) and Shaver's (1970a) results showing that women attribute greater responsibility to a male victim when the accident is serious or when the event is negative.

Thus, it would be worthwhile to examine the effect of gender membership on causal explanations in an experiment where both the attributor's and the victim's genders are manipulated. This would be one means of testing for the effect of gender membership in a more direct way. We applied this idea to the second experiment on hierarchical position. This allowed us to test for the effect of the victim's social membership, compared to the social membership of the attributor (in-group vs. out-group), along with the probable impact of accident severity.

Method

Participants

Participants consisted of 80 volunteer subjects, all of whom were employees of a ski-lift company based in a well-known ski resort in Savoie (southeastern France). There was an equal number of subjects from each of two hierarchical levels, making one group of 40 subordinates and one group of 40 supervisors. The subordinate group was composed of ski-lift and cabin-lift operators and ski-pass checkers. They were chosen at random while also paying particular attention to the degree of personal and situational relevance with respect to the victim of the accident in question. The group of supervisors contained nearly all of the supervisors in the company, given its small size. The 80 subjects were divided into eight groups of 10 subjects each on the basis of the hierarchical position of the victim (same hierarchical level vs. different hierarchical level), the hierarchical position of the attributor (supervisor vs. subordinate), and the severity of the accident (mild vs. serious). No particular attention was paid to the subjects' age or gender. Note, however, that the majority (81.25%) of the subjects were males between the ages of 22 and 58 years.

Materials

Social Membership of the Target and the Attributor, Accident Severity, and Causal Explanations

Study 2 is designed to analyze more precisely the defensive attributions that are observed when people of differing hierarchical levels are given explanations of accidents. One of its specific features is that all combinations of the hierarchical positions of the attributor and the victim are considered. By doing this, we are able to determine whether being a member of the same social group (in-group) or a member of a different group (out-group) could trigger defensive attributions.

We expect stronger defensive-attribution tendencies to avoid prejudice (or derogation of the out-group) when subordinates explain an accident involving a supervisor and when supervisors explain an accident involving a subordinate (weak personal-relevance condition). On the other hand, when subordinates or supervisors explain accidents involving subjects with the same hierarchical level as their own, it is predicted that they will be more indulgent and make fewer internal attributions blaming the victim (strong personal-relevance condition). The effect of accident severity on defensive attributions, as well as its interaction with group membership, is also examined.

As in Study 1, the materials consisted of accounts of an accident that varied across experimental conditions, and an attribution questionnaire. There were, in fact, four different accounts of the skiing accident: (a) a mild accident with a member of the supervisory group as the victim, (b) a serious accident with a member of the supervisory group as the victim, (c) a mild accident with a subordinate as the victim, and (d) a serious accident with a subordinate as the victim.

All accounts related a typical skiing accident in which certain elements resurfaced in each report. The choice of what typical accident to use was based on an examination of the company's statistical data and of several real accident reports from within the company or from insurance inquiries about the frequency and kinds of accidents in the company, the circumstances involved, the types and severity of injuries, and so forth. The type of accident selected for the stimulus represented an average of 30% of all accidents that had occurred in that company and was just as likely to happen to subordinates as to supervisors. The accident was a fall caused by the skis ramming up against a bump as the victim (either a subordinate or a supervisor) was skiing from one work site to another. The consequences were either mild (bruising with no sick leave) or serious (torn right knee ligaments with sick leave). Finally, the accident reports were generated so as to take situational and personal-relevance criteria into account, in accordance with the experimental design. In our investigation of defensive biases in relation

to the severity of the accident and the different group distinctions, the term *in-group* will be used to refer to subjects from the same hierarchical level as the target person, and *out-group* to refer to subjects from a different hierarchical level from the target.

The accident report for the mild accident that happened to a subordinate read as follows:

On the 25th of February 1994 at 1:00 p.m. (good weather conditions), Mr. Thomas, who has been a ski-lift operator for Company X for several years and who was also a good skier, fell while skiing and injured himself. The skis he was using had been supplied by the company, Company X. He had just left his work site for the company cafeteria (realizing that he had only 1 hour to eat) when, on a hard-packed run that was used daily, his right-hand ski fastening came undone as his ski hit a natural bump formed by the continuous passage of skiers at that particular place. He then fell and slid along the ground for a few meters. Note that Mr. Thomas, who no doubt was worried about getting back to work late, was skiing rather quickly. After consulting a doctor, it became clear that Mr. Thomas was only slightly injured, with merely a bruised shoulder as a result of the fall. He didn't need sick leave and was able to return to work shortly after the accident.

The attribution questionnaire was made up of six statements about potential accident factors, presented in a 6-point Likert-type scale ranging from 1 (*of very little importance*) to 6 (*decisive*), on which subjects indicated the importance of the causal role of each factor. The six statements consisted of three internal and three external factors, and were presented by alternating between externality and internality. The internality or externality of the accident factors had been tested by a sample of subjects acting as judges. Of the 10 factors tested, we retained the 3 factors that were judged most often as internal (low score and small standard deviation) and the three factors that were judged most often as external (high score and small standard deviation). The internal factors for the victim were excessive risk taking, overestimation of one's abilities, and neglect of one's equipment. The external factors were bad luck, defective equipment, and poor organization of work time in the company (time pressure). As in Study 1, the dependent variable was the internal attribution score (minimum = -5, maximum = +5).

Experimental Procedure

The experiment was run on one individual at a time. To begin, for all of the subordinates and some of the supervisors, the experimenter skied to meet the

subject at the work site in order to obtain consent to participate in the experiment. The other supervisors were met in the company offices. The study was said to be about skiing accidents. The subjects proved to be very interested in the study and no one refused. Following the subject's acceptance and a brief presentation of the experimental procedure, the experimenter gave the subject the appropriate account of the accident (according to his or her experimental group). At the top of the page, there was a note designed to reassure the subject and to explain what was expected. After reading about the accident, the subject was given the attribution questionnaire, which presented the potential accident factors described previously, and was asked to indicate the causal role in the accident of each of the factors. The subjects could refer to the accident account throughout the experiment, as desired.

Results

The independent variables were between-subject variables. The factorial design was $2 \times 2 \times 2$ (Subject Status: Supervisors vs. Subordinates \times Target Status: In-Group vs. Out-Group \times Accident Severity: Mild vs. Serious), and the data were processed using an ANOVA with the attribution score as the dependent variable.³ Table 2 gives the average internal attribution scores, attributor's status, target's status, and accident severity.

Effects of Subject's Status and Target's Group Membership on Accident Explanations

The analysis of the results yielded a main effect of the subject's hierarchical position, with supervisors being more internal than subordinates in their explanations of accidents ($F(1, 70) = 50.50, p < .001$). A significant effect of target group membership was also found: Attributions were more internal when the target was a member of the out-group rather than the in-group ($F(1, 72) = 1.52$ vs. $0.33, p = .33, p < .0001$). Finally, there was a significant interaction between the target's group membership and the subject's hierarchical position, $F(1, 72) = 6.30, p = .02$. Subordinates tended to make more internal attributions for an accident that happened to an out-group victim (i.e., a supervisor) than to an in-group victim (0.98 vs. -0.78), $F(1, 72) = 28.90, p < .0001$. In the same way, supervisors were inclined to explain an accident that happened to an out-group victim (i.e., a subordinate) in a more internal manner than one that happened to an in-group member, even though the last difference was only marginally significant (2.05 vs. 1.45), $F(1, 72) = 3.30, p = .08$.

³As in Study 1, participants expressed more agreement with internal attributions than with external ones (3.6 vs. 2.7), $F(1, 72) = 63.5, p < .001$.

Table 2

Average Internal Attribution Scores by Attributor Status, Target Status, and Accident Severity

	Ingroup victim				Outgroup victim			
	Supervisory attributors	Subordinate attributors						
Mild	1.73	-0.23	1.73	1.07				
Serious	1.17	-1.33	2.37	0.90				

Effects of Accident Severity on In-Group vs. Out-Group Attributions

The interaction between victim membership and accident severity was significant, $F(1, 72) = 5.30, p = .03$. There was no effect of accident severity on attributions to an out-group victim ($M = 1.63$ for the serious accident vs. 1.40 for the mild one), $F(1, 72) = 0.50, ns$; but attributions to an in-group victim were less internal when a serious rather than a mild accident was at stake ($M = -0.08$ vs. 0.75), $F(1, 36) = 5.30, p = .03$.

Discussion

The results of Study 2 provide striking evidence of the defensive-attribution tendencies of supervisors and of the inclination of subordinates to make attributions that incriminate members of a different hierarchical level (internal attributions), while exempting members of the same level (external explanations). More precisely, when explaining an accident that happened to a subordinate (out-group), supervisors relied more on factors that were internal to the victim, whereas subordinates (who were in the same position as the target; i.e., in the in-group) made attributions that tended to be more external. By contrast, when explaining an accident involving supervisors, subordinate subjects (out-group) made significantly more internal attributions than when the victim was a subordinate, whereas supervisors were less internal with a target supervisor (in-group) than with a target subordinate (out-group).

This conclusion needs to be qualified, however, since while it is true that subordinates explained the accident that happened to another subordinate in a less internal way, the supervisors' explanations were more internal when the accident affected a member of their own group. In short, although supervisors did in fact make slightly more defensive attributions (less internal ones) when a person of their own kind had the accident rather than a subordinate, it should nevertheless be noted that in both cases (in-group and out-group), internal attributions were

strong for these individuals. In other words, while the out-group discrimination bias was observed here, this study provided only very partial confirmation of the in-group favoritism bias.

Study 2 also showed that accident severity is a potential factor in magnifying defensive biases: Attributions may be significantly less internal when the victim of a serious accident belongs to the in-group, whereas when an out-group victim is involved, they may vary little with accident severity and may always be highly internal. Seriousness thus seems to trigger attitudes that are more defensive than they are discriminatory.

Defensive Attributions According to Group Membership

What stands out from these two experiments is that subjects as a whole prefer to give internal explanations rather than external ones. Several theories can be considered in an attempt to account for this result. Granted, the predominance of internal explanations provides support for the fundamental attribution error theory (Ross, 1977), wherein observers are inclined to exaggerate the causal role of the actor and minimize that of situational factors. Similarly, this also suggests the impact of the internality norm described by Beauvois and Dubois (1988), which stipulates that internal explanations are valued socially, especially among persons with a high social status. But the most plausible explanation of these results seems to rely on the idea of defensive attribution.

The preference for internal explanations does not turn out to be the same when group membership is considered. In the present case, the observed tendency toward defensive attribution was such that subjects belonging to a given hierarchical level made more internal attributions blaming the victim (or the actor involved in the accident) when that victim had a different job status. In Study 1, where the victim was a subordinate, subjects with a high hierarchical position were found to make more internal (victim-blaming) attributions than were subjects whose position was subordinate and thus the same as the victim's. This result was confirmed by Study 2, where this time, not only was the hierarchical level of the attributor varied, but also that of the target. In particular, we found that when subjects explained an accident involving an out-group member, they made highly internal explanations, whereas when they explained an accident involving an in-group member, their explanations tended to be less internal. It all appears as though, for self-protection purposes, each group accused the victim belonging to the other hierarchical level and made attributions which, on the contrary, tended to excuse or minimize the causal role of their own group member. This is a case of the defensive-attribution tendency described previously (Burger, 1981; Shaver, 1970a; Shaw & McMartin, 1977; Wilson & McMartin, 1988); that is,

the tendency to avoid blame when an in-group member is involved (less internal attributions) and to avoid prejudice when an out-group member is involved (highly internal attributions).

Different aspects of in-group favoritism are at play here. In line with Walster (1966), one can see such self-protective attributions as being aimed at preserving self-esteem and group esteem (see also Bond, Hewstone, Wan, & Chiu, 1985; Miller & Ross, 1975; Weary, 1979) or at generating a less negative image of one's group (Bradley, 1978). In our case, this type of defensive bias seems to be promoted by the negative nature of accidents and by motivational pressures resulting from the accident's implications at individual, categorical, and corporate levels (Kunda, 1987). This interpretation seems all the more plausible to the extent that, in Study 2, accident severity accentuated the in-group protection tendency, which was manifested (especially for subordinates) by less internal explanations when the in-group member's accident was serious. Finally, the defensiveness of the attributions observed in this study appears to be rooted in the fact that both groups seem to feel that victims of undesirable events only deserve what happens to them if they belong to the out-group, thereby justifying the value granted to their own group of membership. This is reminiscent of a motivational bias caused by what Pettigrew (1979) called the *ultimate attribution error*, described as the tendency to present one's own group positively (Deschamps & Beauvois, 1994; Hewstone, 1990).

Less Pronounced In-Group Favoritism Bias for Hierarchical Superiors

Although the out-group discrimination bias was observed in both studies, the tendency to protect the in-group was not found in all cases in Study 2, where personal relevance between the attributor and the target was manipulated. There was an overall in-group serving bias, but this tendency was less pronounced for supervisors, whose internal attributions regarding the out-group were only marginally different from those made about the in-group. This result is puzzling because it is not fully consistent with the in-group favoritism effects described by many authors (Deaux & Emswiller, 1974; Deschamps, 1982; Greenberg & Rosenfield, 1979; Howard, 1984). One possible explanation is that supervisors tend as a whole to be more internal in their attributions than do subordinates, a finding obtained in most studies on the norm of internality in social groups (Beauvois & Dubois, 1988; Beauvois, Gilibert, Pansu, & Abdellaoui, 1998), or in studies on organizational behavior, especially for subordinate poor performance (Green & Mitchell, 1979; Knowlton & Mitchell, 1980; Mitchell & Wood, 1980). One can also assume, like Mullen, Brown, and Smith (1992), that the favoritism bias does not show up in the same way in the laboratory as in the field. Indeed, as these authors noted, while high-status groups make attributions that favor their

own group in a laboratory setting (artificial groups), the same does not hold true in real-world situations, where groups with a relatively low status would be the ones most likely to strongly favor their own groups.

But especially, one can assume that when high-level staff members are making strong internal attributions, including ones where an in-group member is the target, they usually base their assessments on the consideration that supervisors are *responsible* enough (borrowing the term used in managerial discourse) to have control over what happens to them. In doing this, they are implicitly judging themselves to be different from the supervisor who was the victim of the accident, considering themselves to be more capable of avoiding such an unfortunate experience. This idea may be rooted in the assumption that, as a group, supervisors are less homogeneous than are subordinates. At the same time as it supports the defensive-attribution hypothesis, this explanation is in line with studies showing that dominant groups (here, supervisors) are collection groups whose members are independent, creative, unique, and inclined to avoid blending in with the masses (Devos et al., 1995; Lorenzini-Cioldi, 1991). This desire for self-distinction exhibited by individuals who are high in the company hierarchy was also described by the sociologist Sainsaulieu (1977), who regarded subordinates as forming a mutually supportive group, while considering the supervisory group as being dominated by internal competition.

Very Local Effects of Gender on Causal Explanations

A main effect of gender on attributions was not observed here, but gender did interact with hierarchical position (Study 1). Women seem to occupy an intermediate position, since although the attributions of the two female hierarchical levels did not differ from each other, women as a whole were slightly less internal in their attributions than were male supervisors, but clearly more so than male subordinates. Different interpretations can be entertained here. It is possible that irrespective of the fact that a priori the accident could have happened to a woman as well as to a man, the job held by the victim may have been considered by the women to be typically male, and this gender-differentiation process may have lowered the situational relevance of the accident for female subjects. Moreover, given that the victim was, in fact, a man, the personal relevance to female attributors may have been low. Note, however, that the female supervisors were less internal in their attributions than were the male supervisors when the accident was serious. This result may be a reflection of empathy for the victim of the opposite gender; but why, then, did the same not hold true for female subordinates? The latter were not more mutually supportive of their peer subordinates who were men than were the female supervisors, unless we assume, as did Bourhis (cited by Lindeman & Sundvik, 1994), that men are more prone to ingroup favoritism bias than are women. Given that the victim's gender was not

manipulated in our study, this comparison should be verified in a future study that controls the gender of both the attributor and the target.

To conclude, some important points stand out from these experiments. First, internal attributions prevail in causal explanations of accidents, and, for a large part, they are a manifestation of a defensive desire on the part of attributors to uphold their own self-esteem or that of the group to which they belong. Defensive explanations can have an impact on an individual's attitude toward risk and on the effectiveness of, and abidance by, safety regulations within the company. Not only can erroneous explanations lead operators to misevaluate the risks that they run, but they are also likely to trigger a conflict between operators and their superiors regarding the causes of accidents, and the appropriate preventive measures. A deterioration in the company atmosphere that is detrimental to safety may ensue. From this standpoint, a bias in naïve explanations may be a source of danger and may cause a decline in reliability.

Defensive explanations, like fatalistic ones, could result in neglect of safety measures by subordinates and their superiors, abdication or resignation, and regrettable risk taking. This observation is in line with DeJoy's (1994) contention that managing safety at work is more a question of dealing with causal attributions than with the true causes of accidents. We have seen in particular that hierarchical superiors are more inclined to give internal explanations—that is, to attribute events to causes that can be ascribed to the concerned operators—and that they first advocate measures directed at those operators, whether punitive or instructional (Mitchell & Wood, 1980). Such explanations, which ignore the working conditions and the job environment, may be aimed at removing the responsibility from the supervisory staff, giving them a false sense of security. And above all, this process may lead supervisors to take measures that are not necessarily more effective, but are merely easier and less costly to implement. Likewise, the emotional nature of situations involving a serious accident, along with the need for self-defense, may prevent proper diagnosis and the implementation of the appropriate measures, each individual being tempted to find justifications for the alleged cause if his or her own role or responsibility is thought to be at stake. Naturally, this can jeopardize the quality of any measures that might be taken.

In sum, the explanations given of accidents by persons directly involved in them, which we call *naïve explanations*, as opposed to expert ones, may turn out to be crucial, both in the assessment of occupational hazards and work safety and in the prevention of accidents. Knowledge of naïve explanations could do more than just shed light on the causes of accidents; it could also help improve data collection and analysis in the case of an accident.

An important problem that may arise in inquiries following an accident is the credibility of people's testimonies, given the attribution bias and the many voluntary or involuntary distortions of the information supplied about the accident. An

understanding of the naïve-explanation process may thus prove to be necessary for improving the diagnostic value of the reports that will form the basis for analyzing the accident. It is very often the case that, as a result of the defensive processes described earlier, accident witnesses and victims alike may provide the inquirer or researcher with only whatever information serves their own purposes or prevents them from being accused. Accordingly, when individuals in high positions in the company are writing an accident report, they may try to avoid any indication of "slips" or weaknesses caused by an omission or action on their part. On the other side of the scene, victims may strive to describe the accident in a way that is least likely to jeopardize their chances for compensation (Adams & Hartwell, 1977). Diversification of the data sources and points of view used in accident analysis may be one way of overcoming some of these difficulties.

References

- Adams, N. L., & Hartwell, N. M. (1977). Accident-reporting systems: A basic problem area in industrial society. *Journal of Occupational Psychology*, *50*, 285-298.
- Baldwin, M. R., & Kleinke, C. L. (1994). Effects of severity of accident, intent, and "Alcoholism is a disease" excuse on judgments of a drunk driver. *Journal of Applied Social Psychology*, *24*, 2097-2109.
- Beauvois, J. L., & Dubois, N. (1988). The norm of internality in the explanation of psychological events. *European Journal of Social Psychology*, *18*, 299-316.
- Beauvois, J. L., Gilibert, D., Pansu, P., & Abdellaoui, S. (1998). Internality attribution and intergroup relations. *European Journal of Social Psychology*, *28*, 123-140.
- Bond, M. H., Hewstone, M., Wan, K.-C., & Chiu, C.-K. (1985). Group-serving serving attributions across intergroup contexts. Cultural differences in the explanation of sex-typed behaviours. *European Journal of Social Psychology*, *15*, 435-452.
- Bradley, G. W. (1978). Self-serving biases in the attribution process: A reexamination of the fact or fiction question. *Journal of Personality and Social Psychology*, *36*, 56-71.
- Brickman, P., Ryan, K., & Wortman, C. B. (1975). Causal chains: Attribution of responsibility as a function of immediate and prior causes. *Journal of Personality and Social Psychology*, *32*, 1060-1067.
- Burger, J. M. (1981). Motivational biases in the attribution of responsibility for an accident: A meta-analysis of the defensive attribution hypothesis. *Psychological Bulletin*, *90*, 496-512.
- Communauté Européenne du Charbon et de l'Acier (CECA). (1969). *Recherche communautaire sur la sécurité dans les charbonnages et les mines de fer (1962-1966). Etudes de physiologie et de psychologie du travail*, rapport,

- No. 5, B - Les mines. [Community research on safety in coal mines and iron mines (1962-1966). Studies in occupational physiology and psychology report, No. 5, B—The Mines]. Luxembourg: Service des Publications des Communautés Européennes.
- Deaux, K., & Emswiller, T. (1974). Explanations of successful performance on sex-linked tasks. What is skill for the male is luck for the female. *Journal of Personality and Social Psychology*, **29**, 80-85.
- Dejoy, D. M. (1985, October). *Attribution of responsibility for alcohol-related motor vehicle collisions: Summary report*. Paper presented at the 29th annual proceedings of the American Association for Automotive Medicine, Washington, DC.
- Dejoy, D. M. (1987). Supervisor attributions and responses for multicausal workplace accidents. *Journal of Occupational Accidents*, **9**, 213-223.
- Dejoy, D. M. (1994). Managing safety in the workplace: An attribution theory analysis and model. *Journal of Safety Research*, **25**, 3-17.
- Dejoy, D. M., & Klippel, J. A. (1984). Attributing responsibility for alcohol-related near-miss accidents. *Journal of Safety Research*, **15**, 107-115.
- Deschamps, J. C. (1982). Social identity and relations of power between groups. In H. Tajfel (Ed.), *Social identity and intergroup relations* (pp. 85-98). Cambridge, UK: Cambridge University Press.
- Deschamps, J. C., & Beauvois, J. L. (1994). Attributions intergroupes [Intergroup attributions]. In R. Y. Bourhis & J. P. Leyens (Eds.), *Stereotypes, discrimination et relations intergroupes* (pp. 97-126). Brussels, Belgium: Mardaga.
- Devos, T., Comby, J. C., & Deschamps, J. C. (1995). Appartenances et jugements de variabilité intra-groupe [Group membership and intragroup variability judgments]. *Les Cahiers Internationaux de Psychologie Sociale*, **27**, 9-43.
- Gleason, J. M., & Harris, V. A. (1976). Perceived freedom, accident severity, and empathetic value as determinants of the attribution of responsibility. *Social Behavior and Personality*, **4**, 171-176.
- Greenberg, S. G., & Mitchell, T. R. (1979). Attributional processes of leaders in leader-membership interactions. *Organizational Behavior and Human Performance*, **23**, 429-458.
- Greenberg, J., & Rosenfield, D. (1979). Whites' ethnocentrism and their attributions for the behavior of Blacks: A motivational bias. *Journal of Personality*, **47**, 643-657.
- Hamilton, V. L. (1986). Chains of command: Responsibility attribution in hierarchies. *Journal of Applied Social Psychology*, **16**, 118-138.
- Hewstone, M. (1990). The "ultimate attribution error"? A review of the literature on intergroup causal attribution. *European Journal of Social Psychology*, **20**, 311-335.
- Howard, J. A. (1984). The "normal" victim: The effects of gender stereotypes on reactions to victims. *Social Psychology Quarterly*, **47**, 270-281.

Jones, E. E., & Nisbett, R. E. (1972). The actor and observer: Divergent perceptions of the causes of behavior. In E. E. Jones, D. E. Kanouse, H. H. Kelley, R. E. Nisbett, S. Valins, & B. Weiner (Eds.), *Attribution: Perceiving the causes of behavior* (pp. 79-94). Hillsdale, NJ: Lawrence Erlbaum.

Kanekar, S., & Sovani, A. V. (1991). Attributed fault for and perceived likelihood of an accident as a function of victim's sobriety and behavioral propriety. *Psychologia*, **34**, 69-74.

Kelley, H. H., & Michela, J. L. (1980). Attribution theory and research. *Annual Review of Psychology*, **31**, 457-501.

Knowlton, W. A., Jr., & Mitchell, T. R. (1980). Effects of causal attributions on a supervisor's evaluation of subordinate performance. *Journal of Applied Psychology*, **65**, 459-466.

Kouabenan, D. R. (1982). *Représentations de la Genèse des accidents du travail: Déterminants des attributions causales* [Representations of the genesis of occupational accidents: Determinants of causal attributions]. Doctoral dissertation, Université de Paris V-Ecole Pratique des Hautes Etudes, Paris, France.

Kouabenan, D. R. (1985a). L'analyse des attributions causales [Analysis of causal attributions]. *Le Travail Humain*, **48**, 1-17.

Kouabenan, D. R. (1985b). Degree of involvement in an accident and causal attribution. *Journal of Occupational Accidents*, **7**, 187-194.

Kouabenan, D. R. (1990). Occupational safety and health problems in Côte d'Ivoire. A diagnosis and some possible remedies. *International Labor Review*, **129**, 119-130.

Kouabenan, D. R. (1996). Rôle du statut social dans l'identification des causes d'accidents [Role of social status in explaining the causes of accidents]. *Psychologie du Travail et des Organisations*, **2**, 35-48.

Kouabenan, D. R. (1998). Beliefs and the perception of risks and accidents. *Risk Analysis: An International Journal*, **18**, 243-252.

Kouabenan, D. R. (1999). *Explication naïve de l'accident et prévention* [Naïve causal explanations of accidents and prevention]. Paris, France: Presses Universitaires de France.

Kunda, Z. (1987). Motivated inference: Self-serving generation and evaluation of causal theories. *Journal of Personality and Social Psychology*, **53**, 636-647.

Lacroix, D. V., & Dejoy, D. M. (1989). Causal attributions to effort and supervisory response to workplace accidents. *Journal of Occupational Accidents*, **11**, 97-109.

Lindeman, M., & Sundvik, L. (1994, July). *Evaluative bias and self-enhancement among gender groups*. Paper presented at the 23rd International Congress of Applied Psychology, Madrid, Spain.

Lorenzi-Cioldi, F. (1991). Self-stereotyping and self-enhancement gender groups. *European Journal of Social Psychology*, **21**, 403-417.

- McKilip, J., & Posavac, E. J. (1976). Judgments of responsibility for an accident. *Journal of Personality*, **43**, 248-265.
- Medway, F. J., & Lowe, C. A. (1975). Effects of outcome valence and severity on attribution of responsibility. *Psychological Reports*, **36**, 239-246.
- Miller, D. T., & Ross, M. (1975). Self-serving biases in the attribution of causality: Fact or fiction? *Psychological Bulletin*, **82**, 213-225.
- Mitchell, T. R., & Wood, R. E. (1980). Supervisor's responses to subordinate poor performance. A test of an attributional model. *Organizational Behavior and Human Performance*, **25**, 125-138.
- Mullen, B., Brown, R., & Smith, C. (1992). In-group bias as a function of salience, relevance, and status: An integration. *European Journal of Social Psychology*, **22**, 103-122.
- Niskanen, T. (1994). Assessing the safety environment in work organization of road maintenance jobs. *Accident Analysis and Prevention*, **26**, 27-39.
- Pettigrew, T. F. (1979). The ultimate attribution error: Extending Allport's cognitive analysis of prejudice. *Personality and Social Psychology Bulletin*, **5**, 461-476.
- Ross, L. (1977). The intuitive psychologist and his shortcomings: Distortions in the attribution process. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10, pp. 173-230). New York, NY: Academic Press.
- Sainsaulieu, R. (1977). *L'identité au travail* [Identity at work]. Paris, France: Presses de la Fondation des Sciences Politiques.
- Salminen, S. (1992). Defensive attribution hypothesis and serious occupational accidents. *Psychological Reports*, **70**, 1195-1199.
- Schroeder, D. A., & Linder, D. E. (1976). Effects of actor's causal role, outcome severity, and knowledge of prior accidents upon attributions of responsibility. *Journal of Experimental Social Psychology*, **12**, 340-356.
- Shaver, K. G. (1970a). Defensive attribution: Effects of severity and relevance on the responsibility assigned for an accident. *Journal of Personality and Social Psychology*, **14**, 101-113.
- Shaver, K. G. (1970b). Redress and conscientiousness in the attribution of responsibility for accidents. *Journal of Experimental Social Psychology*, **6**, 100-110.
- Shaw, J. I., & McMarn, J. A. (1975). Perpetrator or victim: Effects of who suffers in an automobile accident on judgment strictness. *Social Behavior and Personality*, **3**, 5-12.
- Shaw, J. I., & McMarn, J. A. (1977). Personal and situational determinants of attribution of responsibility for an accident. *Human Relations*, **30**, 95-107.
- Shaw, J. I., & Skolnick, P. (1971). Attribution of responsibility for a happy accident. *Journal of Personality and Social Psychology*, **18**, 380-383.
- Sundvik, L., & Lindeman, M. (1993). Sex roles and discrimination against same-sex employees. *Journal of Occupational and Organizational Psychology*, **66**,