The Effect of Framing on Layoff Decisions: Are More-Experienced Managers More Rational? Does Computerized Data Make Any Difference?

by

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The effects of framing on decisions has been widely studied, producing research that suggests individuals respond to framing in predictable and fairly consistent ways (Bazerman, 1984, 1990; Tversky & Kahneman, 1986; Thaler, 1980). The essential finding from this body of research is that "individuals treat risks concerning perceived gains (for example, saving jobs and plants) differently from risks concerning perceived losses (losing jobs and plants)" (Bazerman, 1990, pp. 49-50). Specifically, individuals tend to avoid risks concerning gains, and seek risks concerning losses.

Though framing applications have frequently appeared, most of them focus either on pure gambles (e.g., the amount one would need to receive to forego/assume a gamble in with a certain probability of winning/losing some amount). Two studies have addressed the effects of framing on human resource management decisions about workforce reductions. Specifically, Bazerman (1983) posed the following problem:

A large car manufacturer has recently been hit with a number of economic difficulties, and it appears as if three plants need to be closed and 6,000 employees laid off. The vice-president of production has been exploring alternative ways to avoid this crisis. She has developed two plans:

Plan A: This plan will save one of the three plants, and 2,000 jobs

Plan B: This plan has a 1/3 probability of saving all three plants and all 6,000 jobs, but has a 2/3 probability of saving no plants and not jobs.

Which plan would you select?

An alternative version had the following two choices:

Plan C: This plan will result in the loss of two of the three plants and 4,000 jobs.

Plan D: This plan has a 2.3 probability of resulting in the loss of all three plants and all 6,000 jobs, but has a 1/3 probability of losing no plants and no jobs.

Bazerman (1990, p. 49) reports that "most individuals (over 80 percent) choose plan A in the first set and plan D in the second set. This would suggest that the framing effect holds just as strongly for layoff decisions as for other decisions. Yet, these investigations did not compare the relative susceptibility of experienced decision makers to naive decision makers. In fact, these studies relied on samples of business school students who probably had little experience making layoff decisions. An important question is whether the framing effect is as strong when investigated in samples of more experienced decision makers, who may be less susceptible to the framing manipulation, perhaps because they are more likely to consider other factors in the decision.

Existing literature does not paint a hopeful picture regarding the effects of training and experience in reducing biases such as framing. Kahneman & Tversky (1984, p. 343) stated that violations of invariance, such as susceptibility to the framing effect, are "as common among sophisticated respondents as among naive ones, and it is not eliminated even when the same respondents answer both questions within a few minutes." There are few studies available that test the effects of learning or experience in susceptibility to decision biases. Ball, Bazerman & Carroll (1991) investigated whether or not students learned to avoid the "winner's curse" by considering the negotiating behavior of the other party. Using undergraduate student samples in two experiments, they found no evidence of learning with only 5 out of 72 students exhibiting any learning over repeated trials, and only a slightly percentage learning after practice playing both the role of the buyer and the seller. Northcraft & Neale's (1987) study of anchoring and adjustment in real estate agents asked to set a price on properties suggests that even these experienced decision makers faced with a familiar task were quite affected by the anchor provided. Neale and Northcraft (1986) examined the effects of framing and goal setting on the number of transactions, individual profit and total profitability, comparing both executives and students. Their investigation did not directly compare the difference between experts and

students on the framing effect, but found that the main effect of expertise was significant for individual profit and total profit outcomes, and the main effect for framing was significant for the number of transactions and total profit. Finally, Fagley and Miller (1987) investigated framing effects among MBA students enrolled in a statistical decision theory course. The students completed the framing problem first at the beginning of class, and at the end of the 10-week class. The problem involved cancer treatment, and thus did not fall within the students' expertise. Results suggested that the framing effect was less pronounced than expected, and non-significant in both the pre-test and post-test conditions. Thus, though some existing research suggests there will be little effect of experience on susceptibility to decision biases, no study has examined the effects of experience on the framing bias, especially as it pertains to layoff decisions. No study has directly examined the interaction between expertise and framing to determine if naive and experience subjects differ.

Organizations are increasingly using computerized information systems to present information about potential consequences of managerial strategies. The framing studies described above used paper descriptions of the decision as their stimulus. However, managers frequently would now receive such information through computerized information systems, often as the result of a computerized forecasting program or data base search. There is a need to examine whether managers react differently to information received on computers than they do to paper-and-pencil presentations.

This study attempts to examine the differential effects of framing on naive versus experienced decision makers, and also to examine the differential effect of providing information through computers versus in paper-and-pencil form. Groups of undergraduate students in an introductory personnel management class were compared to groups of high-level and mid-level executive personnel managers. Both groups were presented with a framing problem very similar to that described above, some received the problem via a

computer screen, others received it in paper form.

The extensive literature demonstrating that framing has a pervasive effect on the probability of choosing risky options suggests the following hypothesis:

H1: Subjects receiving a positively-framed decision problem will be significantly less likely to choose the risky option than those receiving a negatively-framed problem.

The literature cited above asserting the general susceptibility to decision biases by both experienced and naive subjects leads to the second hypothesis:

H2: Different levels human resource management experience will not significantly affect the likelihood of choosing the risky option under different framing conditions.

There is very little literature on the potential effects of computer-delivered information on decision behavior in human resource management. However, if experience has little effect, it seems reasonable to expect that simply delivering the decision question on a personal computer would also have little effect. Thus, the following hypotheses:

H3: Those receiving the information and registering their choices via computer will not be more or less likely to choose the risky option than those receiving the information in paper form.

H4: Receiving the information and registering their choices via computer will not significantly affect the likelihood of choosing the risky option under different framing conditions. paper form.

Method

Framing Manipulation

Subjects were presented with the following problem:

Imagine you are the manager assigned to choose between two P/HRM programs applied to a unit with 600 workers. Organizational and market forces have led to a situation in which top management feels they must reduce labor costs by laying off the 600 workers. However, you have identified two optional programs that might change this. Both programs have equal costs, and involve different combinations of compensation and training programs to improve work force value. Based on the experience of companies in your industry, you believe that the options have the following probable outcomes:

(Positive Framing)
Option A offers a 100% chance of saving 200 positions.
Option B offers a 1/3 chance of saving 600 positions, and a 2/3 chance of saving none of the positions.

(Negative Framing)
Option C offers a 100% chance of losing 400 positions.
Option D offers a 1/3 chance of losing no positions, and a 2/3 chance of losing 600 of the positions.

The problem was chosen to roughly replicate earlier work, but the numbers were reduce by a factor of 10 as this was felt to be a more realistic level of decision for the managers involved in the study.

Subjects

Four different groups participated in the study, either as part of executive training programs, or as part of a University class in human resource management, or through a mailed survey. Within each group, the version of the problem was randomly assigned.

Group 1: High-Level HR Executives with Computer Delivery. This group consisted of 52 executives receiving the problem in a University classroom as part of training in computer skills and concepts. The training occurred in three groups, in October 1988 (N=16), January 1989 (N=19), and February 1989 (N=17). These managers received the exercise on their computer screens and were told that their input would be used immediately to create an example data base of results that would be discussed as part of the class session. These executives were between 3 and 7 levels below the CEO. Many were the top personnel executive for a domestic or international business unit.

Group 2: High-Level HR Executives with paper delivery. This group consisted of 24 executives from a single firm, who received the exercise on paper as part of an executive training program. They responded to the exercise and handed in their results, but the results were not tabulated immediately as part of the training. These executives reported to the Vice President of Personnel, and were between 3 and 6 levels below the CEO.

Group 3: Undergraduate Students with computer delivery. This group consisted of 77 students in an introductory undergraduate course on human resource management. They received the decision problem using the same computer program as the executives in Group 1, but without the immediate feedback.

Group 4: Undergraduate Students with paper delivery. This group consisted of 114 students in an introductory undergraduate course on human resource management. They received the decision problem on paper, as an in-class assignment. They returned their choices to the instructor during class. Nine of these students were removed from the analysis because they indicated that they had been asked to respond to this kind of question before. However, the results are not altered if their data is included.

Logit Analysis

The research question posed here can be considered as a test of whether the framing of a decision, as well as the characteristics of the decision makers, affects the propensity to choose the risky option (Option B and D in the present problem). Because the dependent variable is dichotomous, it is appropriate to estimate a multivariate function that predicts the probability of choosing the risky alternative, as a function of the framing manipulation, whether the information was delivered on the computer, and whether the subjects were students, high-level executives, or mid-level executives, as well as the interaction of these characteristics. Maximum-likelihood logit analysis was used to estimate this function, and the significance of the framing manipulation, experience levels, and computer delivery.

The dependent variable (RISK) was coded zero if the subject chose the certain alternative and one if s/he chose the risky alternative. The framing manipulation was represented by a variable (POS) which was coded as 1 if the two choices were positively framed (in terms of "jobs saved") and zero if the two choices were negatively framed (in terms of "jobs lost"). The computer delivery manipulation was represented by a variable (PC) that was coded one if subjects received the problem and responded to it on a

computer screen, and zero if they received the problem in paper form. The variable EXEC was coded zero if subjects were undergraduate students, and one if subjects were executives. Two-way interaction terms were also constructed as the product of POS with each of the other variables.

Results

Frequencies and Chi-Square Analysis

Table 1 presents the frequencies of responses to each of the choices for each of the groups. For reference, the table also contains the proportions choosing each option in a similarly-worded exercise dealing with saving lives with a vaccine, as reported in Kahneman & Tversky (1984). Each group's pattern of responses was transformed into a two-by-two matrix with Choices A and B as one row and Choices C and D as a the second row. The number selecting each choice was the data in the table. Each group's table was analyzed using a simple chi-squared test to determine whether the responses deviated from what would be expected from a random distribution based on the marginal probabilities.

Insert Table 1 Here

As the table shows, the two high-level executive groups exhibited a choice pattern very similar to what one would expect if they had no particular preferences among the options (Group 1), or if their preferences were consistent across the framing manipulation (Group 2).

Among the students receiving the exercise on the computer (Group 4) and on paper (Group 5), all chi-squared tests reached a significance level of .025 or less. Moreover, the pattern of choices reflects the predictions of framing effects, with Options B and C chosen less often. It appears that those with no executive experience were more susceptible to the

framing manipulation. As a check on the power of the chi-square test to detect framing effects among the high-level managers, the Kahneman & Tversky (1984) proportions were applied to the total number of responses in Group 1 and Group 2. Chi-square analysis on these computed frequencies did reach significance, suggesting that if the expected pattern had emerged it would have been detected.

It is interesting to note the pattern of Chi-square values and significance levels. They suggest that the two high-level executive groups' choices varied far less from what would be expected from a random process than did those of the two student groups. This suggests a systematic effect of managerial experience, which was tested more precisely using maximum-likelihood Logit analysis.

Maximum-Likelihood Logit Analysis

Table 2 contains the maximum likelihood logit results, indicating the coefficients on each of the independent variables. The analysis was conducted by creating a matrix in which each row represented a subject, and the columns contained zeros and ones for each of the independent variables. The framing variable was coded as zero when the problem was presented in a negatively-framed way, and students were coded zero on the EXEC variable. Thus, the comparison group is students who received the problem in paper form, and negatively framed.

Insert Table 2 Here

Regarding Hypothesis H1, a significant negative main effect was detected for of positive framing (POS), in support of the hypothesis. Holding constant experience levels and delivery method, subjects were less likely to choose the risky option when the problem was positively framed.

The main effects for the experience variable (EXEC) was not significant, though

there was a tendency for executives to be less likely to choose the risky option than undergraduate students. This corroborates an interesting rationale offered by several of the high-level executives for their reluctance to choose the risky option even when the options were negatively framed. High-level executives indicated that their experience with layoffs suggested that knowing in advance how many jobs would be lost allowed for more precise planning and assistance to the job leavers, and much more accurate employee communication. This was thought to alleviate so many of the problems inherent with layoffs, that it was judged better to choose the certain option even if it meant "definitely losing 400 positions". Of course the low significance levels and anecdotal nature of this finding suggests extreme caution in generalizing these results.

Hypothesis H2 was tested by incorporating interaction terms for EXEC and POS into the maximum likelihood logit function. The interaction between frame and executive was significant and positive, suggesting that executives were more likely to choose the risky option under positively-framed conditions than were students and vice versa, indicating less susceptibility to the framing manipulation for the executives. This verifies the pattern revealed in Table 1. It appears that experience moderated the effects of the framing manipulation. Hypothesis H2 was rejected.

Hypothesis H3 was tested by incorporating the main effect of computer-based presentation (PC) into the analysis. Subjects receiving the material via a computer exercise were significantly more likely over all conditions to choose the risky option. However, regarding Hypothesis H4, the interaction between computer delivery and framing (POSxPC) did not reach statistical significance, suggesting that this tendency is not more or less pronounced under the positively-framed condition. Hypothesis H3 was rejected, while we did not reject Hypothesis H4.

Discussion

Although previous research on preferences has addressed the issue of layoffs, and

has compared naive and experienced samples, this is the first study to examine the layoff decision among both naive and experienced decision makers. Moreover, this is the first study to examine whether receiving the choices and information on a computer affects the pattern of responses. The results suggest that computer delivery did induce a significant overall tendency to select the risky option, across all framing and experience conditions. However, using a computer did not make a difference in susceptibility to the framing effect. The present study was probably a conservative test of computer effects because subjects simply received the same material on a computer screen that was present on paper. A more realistic computer manipulation would take advantage of particular advantages of computer-delivered information, such as the ability to see the information in various forms, or the ability to derive the information from original data.

Kahneman & Tversky (1984, p. 343) stated that framing effects are "both pervasive and robust. It is as common among sophisticated respondents as among naive ones." Our results suggest that susceptibility to framing effects was less for sophisticated decision makers than naive ones. Yet, the present results demonstrate a significant interaction between the framing manipulation and experience. Executives were significantly more likely to choose the risky alternative under positive framing, and vice versa. This was despite a tendency (though not significant at $p,<.05$) for executives to be less likely to choose the risky option. The anecdotal explanation given by executives for preferring certainty as a way to mitigate negative reactions from employees seems plausible, and reflects their expertise.

Though the small samples and unique sample characteristics of this study require that interpretation be cautious, these factors also characterize much of the literature on the framing effect. Thus, future research on human resource management decisions might fruitfully examine whether experienced managers behave differently in other settings and, if so, what factors explain those behaviors. This study's results suggest that for practical

problems about which experts have knowledge, it may dangerous to presume framing effects are pervasive based on data from naive student decision makers.

References

Ball, S. B., Bazerman, M. H. & Carroll, J. S. (1991). An evaluation of learning in the bilateral winner's curse. Organizational Behavior and Human Decision Processes, 48, 1-22.

Bazerman, M. H. (1990). Judgment in managerial decision making (2nd ed). New York: John Wiley.

Bazerman, M. H. (1984). The relevance of Kahneman and Tversky's concept of framing to organization behavior. Journal of Management, 10, 333-343.

Bazerman, M. H. (1983). Negotiator judgment: A critical look at the rationality assumption. American Behavioral Scientist, 27, 211-228.

Fagley, N. S. & Miller, P. M. (1987). The effects of decision framing on choice of risky vs certain options. Organizational Behavior and Human Decision Processes, 39, 264-277.

Neale, M.A. & Northcraft, G. B. (1986). Experts, amateurs, and refrigerators: Comparing expert and amateur negotiators in a novel task. Organizational Behavior and Human Decision Processes, 38, 305-317

Northcraft, G. B. & Neale, M. A. (1987). Experts, amateurs and real estate: An anchoring-and-adjustment perspective on property pricing decisions. Organizational Behavior and Human Decision Processes, 39, 84-97.

Thaler, R. (1980). Toward a positive theory of consumer choice. Journal of Economic Behavior and Organization, 1, 39-80.

Tversky, A. & Kahneman, D. (1986). Rational choice and the framing of decisions. Journal of Business, 59, 251-294.

Tversky, A. & Kahneman, D. (1984). Choices, values and frames. American Psychologist, 39, 341-350.

Table 1. Frequency of Options Chosen by Each Group, and Chi-Square Tests

	Options				Chi-	Sig.
	A	B	C	D	Squared	Level
Group 1	11	14	13	14	.09	.70
Group 2	9	4	7	4	.08	.70
Group 3	23	15	13	26	5.72	.025
Group 4	42	14	25	33	11.96	.005
K & T (1984)	.72	.28	.22	.78		

Note: Degrees of freedom on all tests equal 1.

Table 2. Maximum Likelihood Logit Predicting the Probability of Choosing the Risky Option (N=267)

Variable	Coefficient	Std. Error	T-ratio	Significance
POS	-1.15	.29	-3.96	.00
PC	0.68	.31	2.22	.03
EXEC	-0.59	.40	-1.50	.13
POSxEXEC	1.12	.57	1.96	.05
POSxPC	.10	.49	0.20	.84
Log-Likelihood	-173.19			