Escalation of Commitment and the Framing Effect: An Empirical Investigation

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Research and theory are reviewed which consider two decision biases: escalation of commitment and decision framing. Some authors (Bazerman, 1986; Whyte, 1986) have suggested that escalation of commitment may be explained by the decision framing used in the research paradigms. A study was conducted which simultaneously manipulated both responsibility for a prior decision and decision frame. Results show a main effect on resource allocation for responsibility and no effect for decision frame. A follow-up study found that amount of information provided systematically affected the framing bias, and that when responsibility was added to a large amount of contextual information, the framing effect became nonsignificant. These results suggest a need to further examine the boundary conditions of framing.

The study of systematic biases indecision making is of considerable importance for both theoretical and practical reasons. The better such biases are understood, the more clearly the overall decision-making process can be understood. Further, knowledge of how biases operate and when they are likely to have an impact on decisions may allow for decision-making situations to be structured in ways that keep the biases in check.

Two such systematic biases which are considered in this paper are escalation of commitment (Staw, 1976) and decision framing (Kahneman & Tversky, 1979). While each of these topics continues to receive a fair amount of attention individually (e.g., Garland & Newport, 1991; Kerman & Lord, 1989; Parks & Conlon, 1990; Walsh & Henderson, 1989; Whyte, 1991), much less has been done to consider them together. This paper will first briefly review each of these decision biases and the major research that has investigated them. Next, existing research which examines these biases in tandem will be described. Finally, the present studies which address both biases will be discussed.

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Escalation of Commitment and Decision Framing

Staw (1976) observed that subjects who were responsible for an initial decision to commit resources subsequently tended to commit more resources to an apparently failing course of action than did subjects who were not responsible for the initial decision. Much of the escalation literature is based on laboratory studies which utilize a decision-making case developed by Staw (the Adams and Smith case). Subjects read historical information about the performance of two divisions (Industrial Products and Consumer Products) within a company. In one condition (high responsibility), subjects choose which of the two divisions should receive an allocation of research funds. They are then asked to write a paragraph defending their funding decision. In the other condition (low responsibility), subjects are informed that the decision on the allocation of those funds was *made by a predecessor.* After that point, subjects in both conditions are treated equally. Feedback is provided that indicates that the funded division has fared poorly since the original funding decision. Subjects are asked how much of an additional sum of money they would choose to reinvest in the previously chosen division. It has been found that subjects who are responsible for the initial decision to fund the chosen division allocate more money to the division than do subjects who are told that their predecessor made the original decision (e.g., Staw, 1976).

Escalation of commitment has been found in numerous situations other than in the paradigm described above. Such situations include loan decisions (Lewicki, 1980), competitive bidding (Teger, 1980), personnel decisions (Bazerman, Beekun, & Schoorman, 1982), impression management (Caldwell & O'Reilly, 1982), entrapment situations (Brockner & Rubin, 1985), and public-sector decision making (Davis & Bobko, 1986). Escalation has also been found in field settings by various authors (Arkes & Blumer, 1985; Ross & Staw, 1986; Schoorman, 1988; Staw & McClane, 1984). Although the effect size has not generally been large in magnitude, the diversity of contexts in which escalation has been found to occur and the fact that it has been found in the field as well as in the laboratory are evidence that it is a fairly robust phenomenon.

The second decision-making bias examined in this paper is that of decision framing. Kahneman and Tversky (1979) have shown that whether a problem is worded positively or negatively affects what decision is made. If a choice involves gains (is positively worded), risk-averse behavior is induced; if a choice involves losses (is negatively worded), behavior which is more risk-seeking is induced.

The typical research paradigm for escalation involves decision feedback

that is *both* objectively negative *and* negatively worded. The fact that such negative wording may well explain part of the risk-seeking escalation behavior has been noted in the decision-making literature. Bazerman (1984) suggests that the framing of feedback could influence the results of escalation studies. He notes that, in most escalation-of-commitment studies, the negative feedback provided to subjects creates a negative frame. According to prospect theory, this would lead to a bias toward risky choices, such as the reinvestment in the failing course of action. Similarly, Arkes and Blumer (1985) and Whyte (1986) use similar arguments to show that prospect theory could explain such behavior.

Using public-sector decision making as the task, Davis and Bobko (1986) manipulated responsibility, decision alternative, decision framing, and affective state (mood). They found a significant main effect on resource allocation for responsibility ($p < .01$), but not for framing or the other factors. This may have been due, in part, to the brevity of their frame manipulation. Still, they found significant interactions between responsibility and decision framing ($p < .005$) and between responsibility and decision alternative under the positive framing condition ($p < .05$). Davis and Bobko noted that more work was needed to understand the conditions under which escalation is likely to occur. Apparently, in some situations, framing may influence what decision is made, but one cannot tell from these data whether the way the decision is framed is more important than the level of responsibility of the decision maker. This is, in fact, the explanation Whyte (1986) implied in his consideration of the Arkes and Blumer (1985) research.

In summary, there is sufficient theoretical reason to speculate that escalation may occur more because of how a decision problem is framed than because of a need to justify past decisions (Bazerman, 1984; Northcraft & Neale, 1986), but there is a need for research which addresses this question directly (e.g., Brockner, 1992).

The Research Paradigms

The work on prospect theory which has found framing to have a significant effect on decision making has generally used short descriptions with clear choices which have identical expected utility, but one option involves risk and the other is riskless. The escalation paradigm generally involves a lengthier context for the decision. The main difficulty in attempting to study both biases concurrently is that it necessarily involves some departure from one or both paradigms. This necessitates that the essential features from both research paradigms be identified and incorporated into the current design.

In escalation research, the development of responsibility necessitates a reasonable amount of contextual information such that subjects feel they are making a realistic choice. In the framing paradigm, the frame of the decision is made either positive or negative by suggesting its consideration as either a gain or a loss. Since the scenarios used are quite short, a change in a few words (e.g., stay open/close, live/die) changes a significant part of the decision context which assures the framing manipulation will be salient to the decision maker. Because the context for the current research was precluded from being short so that responsibility could be effectively manipulated, the frame needed to be manipulated in more than one place to ensure its salience.

The intent of the current research is to examine the effect of decision framing on the escalation of commitment. Previous theory and research on escalation of commitment indicate that high-responsibility subjects commit more resources to a course of action after negative feedback than do low-responsibility subjects. Previous theory and research on prospect theory indicate that decision makers for whom a problem is negatively framed are more apt to choose a risky course of action than are decision makers for whom the same problem is positively framed. Thus, both responsibility and framing should be expected to produce main effects on subsequent allocation of resources. There is insufficient theoretical reason to expect an interaction between responsibility and framing on subsequent resource allocation, but one study found such an interaction (Davis & Bobko, 1986). Therefore, in this study, main effects were hypothesized for both responsibility and framing. Due to the lack of supporting theory for an interaction, none was hypothesized.

Hypotheses

Hypothesis 1: It was expected that high-responsibility subjects would commit more resources than would low-responsibility subjects.

Hypothesis 2: Subjects for whom feedback was negatively framed were predicted to commit more resources than subjects who got feedback that was objectively the same but positively framed.

The first hypothesis represents a replication of previous escalation research. The second was based on the rationale that according to prospect theory, subjects who adapt a point of reference of already having lost some amount of resources (i.e., a reference point on the "loss" area of the theory's decision curve) would not perceive the value of the potential further loss to be as large as the value of the potential gain. A positive frame would lead subjects to see the current position as a gain, and they would tend to respond by withdrawing from further investment (i.e., a risk-averse choice with a certain

outcome). On the other hand, a negative frame would lead subjects to see the current position as a loss, and they would tend to respond by allocating additional resources to negate the loss (i.e., a risk-seeking choice with an uncertain outcome).

Study 1

Method

Subjects and research design. A 2 × 2 laboratory study was conducted which simultaneously manipulated responsibility and framing. One hundred and eighty-seven undergraduates at a mid-sized midwestern university read a brief history of a company and its two divisions (an adaptation of the Adams and Smith case; Staw, 1976), with a history of 11 years' earnings data for the divisions. Some were asked to make an initial funding allocation decision (high-responsibility condition), while others were told that a predecessor had made a decision on how much money to allocate to R&D for each of the two divisions (low-responsibility condition). All subjects were then given performance data from the three subsequent years. While the data were objectively the same for all subjects, the performance feedback was framed positively for some, and it was framed negatively for others. All the subjects were then asked to make a final allocation decision for R&D for the next year, indicating how much of the available $20 million was to be spent on the previously chosen division. This final allocation was used as the dependent variable in testing the hypotheses.

Framing manipulation. The Adams and Smith case (Staw, 1976) was adapted in several ways for the current study. The case presents a company history, including a change in its top management team. The history was adapted in the current study to integrate the following statement: "The new management has determined that the division which received the additional funding must show a minimum earnings of $1 million per year in order to remain viable." This statement allowed a means of framing the subsequent performance feedback as positive or negative.

The feedback given prior to the final allocation decision differed in two ways between framing conditions. The first difference was in the introduction to the funded division's sales and earnings figures after the original allocation. The positively framed financial results were introduced as reflecting a positive profit with the following sentences: "The (Consumer/Industrial) Products Division has once again become a profitable venture for the company, earning an average of over half a million dollars for the years 1972-73, in spite of the loss incurred in 1971." In the negative frame condition, the

same financial results were introduced as a loss by the following sentence: "The (Consumer/ Industrial) Products Division has consistently been unable to earn the $1 million per year deemed necessary by the company to remain viable."

The manipulation described is a framing of outcomes, or a shift in the decision maker's reference point. Bazerman (1986) explains that "the location of the reference point is critical to whether the decision is positively or negatively framed and affects the risk preference of the decision maker" (p. 54). By framing the current status as a loss, decision makers will tend to be risk seeking. Conversely, if the current status is framed in positive terms, decision makers will tend to make more risk-averse decisions. The type of framing manipulation described above is consistent with Tversky & Kahneman's (1981) description of framing of outcomes (p. 211).

To increase the salience of the framing manipulation, a second addition to the original case was made. Subjects were told that they had recently seen two close friends at an MBA reunion and had discussed the situation. These friends gave the same advice in both framing conditions: One advocated reinvesting in the previously chosen division (a risky choice), and the second advised not reinvesting in the division (a riskless choice). The only difference between the two conditions in the advice given by the friends was how the recommendations were framed.

In the positive-frame condition, the alternatives were described in terms of profits or gains. The first friend offered that "if you were to allocate the $20 million to the (Industrial/Consumer) Products Division, there is a 50% chance of earning the required $1 million annual profit, and a 50% chance of earning $200,000 annual profit." The position taken by the second friend was that "by allocating the funds to other projects, you would earn a $600,000 annual profit on the investment." In the negative-frame condition, the same options were set out. However, instead of considering the outcomes in terms of profits, they were described in terms of losses. The first friend offered that "there is a 50% chance that annual profits would not fall short of the required $1 million annual profit and a 50% percent chance of falling $800,000 short of the required $1 million annual profit." Similarly, the second friend indicated that "by allocating funds to other projects, you would fall $400,000 short of the $1 million required annual profits on the investment." These recommendations are summarized in Table 1.

In both framing conditions, the expected utility of either renewed funding or allocation to other projects is $600,000. What differs *between the two alternatives* within each condition is whether the alternative involves risk or is riskless. What differs *between the framing conditions* is whether the alternatives are considered as losses or gains. As Table 1 illustrates, this pattern of

Table 1

Study 1 Outcome Frames

	MBA 1 If use allocation on division:	MBA 2 If use allocation elsewhere:
Positive frame	50% chance of $1 million profit 50% chance of $200 K profit	$600 K profit
Negative frame	50% chance would not fall short of required $1 million profit, 50% chance would fall $800 K short	fall $400 K short of required $1 million profit

advice replicates the choices presented to subjects in much of the research on framing.

Measures. At the experiment's conclusion, subjects responded to four questions as manipulation checks. One question queried how responsible the subject felt for the funded division's performance, and another asked how committed the subject was to the division's future. Responses were combined to form a manipulation check for responsibility. To check the framing manipulation, one question assessed agreement with a statement that the division's performance has become profitable since the last funding, while the second measured agreement with a statement that the division has performed below expectations since the last funding. The latter question was reverse-coded, and the two were combined.

Results

Manipulation checks. As can be seen in Table 2, the differences between the responsibility conditions on the responsibility manipulation check and between the framing conditions on the framing manipulation check were strongly significant ($p < .001$). Both differences were in the predicted directions. Thus, both the manipulation for responsibility and for framing produced the intended effects.

Reinvestment decision. A two-way ANOVA on the allocation for the division revealed a significant main effect of responsibility, $F(1, 185) = 5.65$, $p < .05$. As predicted, subjects in the high-responsibility condition allocated more funds to the chosen division than did subjects in the low-responsibility condition (Table 3).

Table 2

Study 1 Manipulation Checks

	M	*SD*	*t*	*df*	*p*
Responsibility					
High responsibility	5.20	.98	4.24	185	<.001
Low responsibility	4.53	1.16			
Framing					
Positive	4.57	1.29	3.69	185	<.001
Negative	3.87	1.30			

Table 3

Study 1 Allocation Cell Means and Standard Deviations

		Responsibility	
		High	Low
Decision frame	Positive	13.95	11.85
		(4.54)	(5.78)
	Negative	14.50	12.95
		(5.54)	(5.14)

Note. Standard deviations are listed in parentheses.

No significant main effect of framing on the funding allocations was found, $F(1, 185) = 1.14$, n.s., nor was the interaction between responsibility and framing significant, $F(1, 185) = .124$, n.s. The strongly significant difference in the framing manipulation check between the two framing conditions indicates that the framing of the problem was successfully manipulated between the two groups, but this difference in decision frame did not cause differences in the allocations.

Discussion

The finding of a main effect for responsibility is consistent with the prior research on escalation of commitment. The demonstration of the escalation effect in this study, however, extends the boundaries of the extant research on escalation in that it demonstrates that the escalation effect was observed independently of the framing effect. This finding suggests that the psychological processes associated uniquely with responsibility for an initial course of action are sufficient to induce escalation of commitment. This provides evidence that escalation does not appear to be caused by the framing of the problem as has been suggested (e.g., Bazerman, 1984; Whyte, 1986).

What was surprising was the lack of behavioral effect from framing. A considerable body of research has demonstrated that the way a decision scenario is framed has a significant impact on decision making. The lack of support here for the framing hypothesis leaves some unanswered questions.

The first such question must necessarily focus on the adequacy of the framing manipulation. The manipulation check showed that the manipulation apparently had the intended effect. In this study, as in previous research, subjects are presented the same *objective* data, with choices framed either as a gain or as a loss. Given that the presentation of the choices mirrored that of Kahneman and Tversky (1982) and that the manipulation check for framing was highly significant, it seems that the lack of framing effect was due to reasons other than the manipulation.

This decision scenario left a second question regarding the explicitness of opportunity costs. In a laboratory experiment, Northcraft and Neale (1986) found that decision makers always considered out-of-pocket expenses, but opportunity costs tended to be considered in project-continuance decisions only when such costs were made explicit. When opportunity costs were made explicit, the option of persisting on the project was rated significantly more negatively. Northcraft and Neale argue that presentation of opportunity costs alters the framing of decisions, since it highlights the "certain loss" aspect of persistence. Were the results of Study 1, with respect to the framing bias, affected by the explicit presentation of opportunity costs? A replication of Study 1 was performed using 119 undergraduates, but the scenario was altered slightly to make the opportunity costs implicit rather than explicit as they were in Study 1. The results were the same: responsibility had a significant main effect on allocation, while framing did not. Thus, it appears that the explicitness of the opportunity costs does not help to explain the lack of significant results for framing.

A third unanswered question from the study described above is the extent to which differences in the context and procedure between the prior framing

research and the study described above may have been responsible for the lack of framing effect. Is it possible that both escalation and framing biases are so "paradigm bound" that they occur only under highly controlled conditions? A better understanding of such differences may help to advance our understanding of both biases.

A review of the literature on escalation shows that while the Adams and Smith case is clearly the most commonly used scenario, there have been a large number of studies that have demonstrated escalation in different contexts using different cases. It is interesting to note, however, that most of the decision cases used in this research were modeled after the Adams and Smith case and are similar in several respects. They provide a brief history or context for the decision problem, a brief description of the choices available, and some data that accompany each alternative. The feedback data provide additional numerical information about the success of the chosen course of action over a period of time.

Research on framing has also been conducted in a number of contexts, including personnel decisions (Huber, Neale, & Northcraft, 1987), gambling (Levin, Johnson, & Davis, 1987; Levin et al., 1986), social dilemmas (Brewer & Kramer, 1986; Rutte, Wilke, & Messick, 1987), and negotiation (Bazerman, Magliozzi, & Neale, 1985, Neale, Huber, & Northcraft, 1987). Following a similar pattern of development, the decision problems are based on the early work of Kahneman & Tversky (1979). One distinctive difference between these cases and those described in the escalation research is that the framing cases tend to be much shorter (a sentence or a paragraph) and do not provide a historical context or much background information, but give the subjects specific alternatives (and their associated probabilities).

Another difference between the types of scenarios is that in the escalation paradigm, the decision maker is faced with a judgment, such as how much money is to be invested or how much of a salary increase is to be awarded; whereas, in the framing paradigm, the decision maker is faced with a choice (e.g., pick one of the two options). It seems clear that the decision faced by the subject in the escalation paradigm involves the consideration of more data as well as a more complex decision than in the choice faced by the subject in a framing study.

An interesting study of consumer decisions conducted by Bettman and Sujan (1987) may shed some light on this issue. They compared the decision making of novice and expert consumers under conditions that varied the difficulty of the decision and the amount of information available. They found that when consumers were unfamiliar with a product or found it difficult to compare products because of lack of experience (novice condition) or information, the framing of the problem had stronger effect. This study, although not

in the traditional framing paradigm, lends some support to the notion that the framing effect may be limited to decision situations in which there is limited information. The research described in the current study raises some new questions for the study of decision making. Given these findings, it would appear to be a critical next step to test Kahneman and Tversky's findings in a situation where there is a relatively greater amount of information.

Since the amount of information may moderate the framing bias, it can be argued that studies which have attempted to generalize the framing bias by differing the research samples and the problem contexts have not provided sufficient evidence regarding this generalizability. It is possible that the framing effect might decrease or become nonexistent when more information is provided to participants. This should be a vital concern to all interested in how this bias affects real-life decisions. Business decisions are typically associated with a great deal of information. Therefore, issues of generalizability will remain unresolved until there is an examination of framing effects in decisions associated with varied amounts of information. To better understand whether the framing effect is most likely to occur in problems with descriptions that do not contain much history or related data, a second study was conducted.

Hypotheses

Hypothesis 1: Subjects in the positive-frame condition would be more likely to choose the less risky alternative than subjects in the negative-frame condition.

Hypothesis 2: The magnitude of the framing effect would be moderated by the amount of information presented in the problem. Specifically, as the amount of information increases, the framing effect would decrease.

Study 2

Method

Subjects. The subjects in this study were 274 undergraduate students enrolled in introductory business courses who agreed to participate for extra course credit. All participants were asked to play the role of an advertising company vice-president in an acquisition decision-making exercise.

Acquisition case. The need to vary the amount of information presented to subjects across conditions (in order to test the information effect) and to provide the subjects with a dichotomous choice (consistent with the framing paradigm) required the development of a new case (the Adams and Smith case did not lend itself to these manipulations). The new case is described below.

The Asher Advertising case was developed, for which a dichotomous choice would be logical. Participants were provided with descriptions of two comparable companies (a toy company and a sports company) that were acquisition candidates for an advertising firm. Both the company descriptions contained: (a) a general description of the company, including information about size, location, consumer market and products; (b) acquisition costs; (c) industry analysis; (d) industry characteristics; and (e) financial statements for the past three years. While the descriptions of the two companies were slightly different, due to the different nature of the products, they were very similar in basic format. Both companies had the same acquisition price of $3 million. Both had comparable sizes, markets, assets, liabilities, and potential for future growth and profit. In addition, both companies had equivalent costs and represented comparable acquisitions for the advertising company. The descriptions of the companies had been scaled during the development of the case such that they were equally attractive.

The case was pilot tested with a sample of 134 undergraduate business students to verify that escalation would work in this experimental context. Subjects either were asked to choose between the two potential acquisitions (high responsibility) or were told such a choice had been made by their predecessor (low responsibility). Subjects were then told 18 months had elapsed since the acquisition, and some information about the overall performance of the acquired company was available to them in their roles as vice-presidents. The information they received was negative; the acquired company had performed poorly over the past 18 months with substantial decreases in overall sales and profits, increased accumulated debts, and very poor return on investment. After receiving the feedback, subjects were asked to indicate a minimum price for which they would be willing to sell the company.

In the acquisition case developed in this study, subjects were asked to make a decision about continuing in a failing course of action. Given the opportunity to sell the ailing company, those who were responsible for its initial purchase were less likely to sell the company than those who were not responsible for the initial acquisition. This was reflected in their higher estimate of the minimum acceptable price. The pilot study verified that low-responsibility subjects were willing to sell the acquired company for significantly less money than were subjects who were responsible for the initial acquisition. Thus, while Study 2 utilized a different case and different dependent variable (i.e., minimum selling price versus reinvestment allocation) than Study 1, both the case and dependent variable are consistent with the escalation literature and reflect the same process and outcome as the Adams and Smith case.

Framing manipulation. The case was structured to parallel Kahneman and Tversky's (Kahneman & Tversky, 1979, 1982) framing studies. Subjects were

told that a predecessor had made the acquisition decision, and they were given the subsequent financial feedback. Subjects were then told that Asher Advertising had received an offer of $2 million for the previously acquired company, and this was framed positively or negatively. The positive frame focused only on the selling price (e.g., Accept the offer, Asher Advertising will receive $2 million), whereas the negative frame viewed the selling price relative to the original acquisition cost (e.g., Accept the offer, Asher Advertising will take a loss of $1 million). Subjects in positively framed conditions were asked to make a choice between (a) receiving $2 million, or (b) taking some risk to receive more money (i.e., a two-thirds probability to gain $3 million and a one-third probability to gain nothing). Subjects in negatively framed conditions were asked to make a choice between (a) losing $1 million, and (b) taking some risk in the hopes of losing no money (i.e., a one-third probability of losing $3 million and a two-thirds probability of losing nothing). Both framing conditions represented the same selling price and the same original $3 million purchase price.

Information manipulation. In addition to the framing manipulation, the decisions also contained different amounts of associated information. There were three levels of amount of information: no-information, limited-information, and much-information. In the no-information conditions (i.e., positive and negative frames), subjects were asked to make their choice *without any additional information.* This is similar to the structure of Kahneman and Tversky's problem statements.

In the limited-information conditions, each subject was first asked to read a brief problem definition before making a decision. It explained that the advertising company had invested $3 million in an acquired company (either a toy company or a sports company), and that the acquired company had not met expectations over the past 18 months. In addition, they were told that the advertising company wanted to sell the acquired company and that there was only one interested buyer. If the acquired company were not sold to this buyer, it would soon have a net worth of zero collars. Paralleling the no-information conditions, these subjects made a choice between (a) accepting a $2 million offer, or (b) making a counteroffer of $3 million with a two-thirds probability that the offer will be accepted and a one-third probability that the counteroffer will not be accepted. These alternatives were also framed either negatively or positively.

The two much-information conditions mirrored those in the limited-information condition in the presentation of the alternative choices. In the much-information conditions, however, subjects were given a greater amount of background information to consider before being asked to make a decision.

Finally, there were two additional much-information conditions, identical

to those just described but in which subjects also made the initial choice of which company to acquire (these will be referred to as much-plus, for much-information-plus-choice). Subjects in the much-plus conditions were asked to play the role of the advertising vice-president and initially choose either the toy company or the sports company for acquisition, instead of being told that a predecessor had made those decisions, as in all of the other conditions. It is important to note that since each of the choices had identical expected value, it was not possible for an escalation effect to occur and confound the framing bias.

Results

Figure 1 is a graphic representation of the results of this study. Averaged over all the conditions, there was no observed preference for either of the companies to be acquired. However, there are strong preference differences between conditions. As can be seen from the figure, strong framing effects were observed for no-information conditions and limited-information conditions. As predicted, these framing effects decreased as additional information was provided. In addition, the framing effects further decreased when subjects perceived higher levels of responsibility for the initial acquisition decision.

Chi-squared tests were performed to test the main hypotheses of this study. The effect of framing was analyzed independently for each of the "information" conditions. It was predicted that strong framing effects would be observed in comparing the positively and negatively framed conditions. As predicted, in each of the three "information" conditions, the effect was statistically significant. Strong framing effects were observed for the framing decisions in which no additional information was provided, χ^2 (1, $N = 69$) = 29.9, $p < .005$. Strong framing effects were also observed for the framing decisions in which very limited information was provided, χ^2 (1, $N = 66$) = 25.9, $p < .005$. As predicted, the strength of the framing effects decreased when much information was provided to the subjects, χ^2 (1, $N = 70$) = 7.36, $p < .01$. Finally, framing effects further decreased when subjects made the original acquisition choice, χ^2 (1, $N = 66$) = 1.16 n.s.

As a statistical test of the hypothesis that framing effects decrease as the amount of information contained within the decision problem increases (Hypothesis 2), a one-way ANOVA was performed. For the purposes of this analysis, there were three comparison groups: no-information, limited-information, and much-information. The much-information-plus-choice condition was not included in this analysis in order to eliminate any confounds due to the responsibility manipulation. Within each of these groups, responses were collapsed across negative and positive framing conditions. Responses were

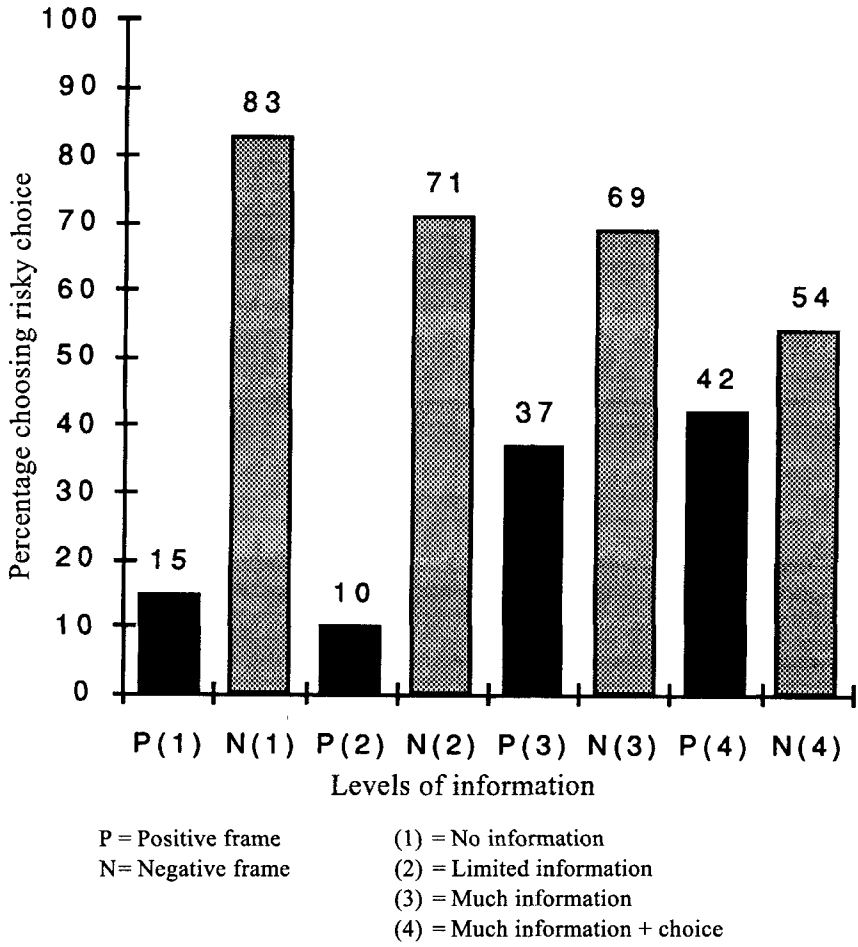

Figure 1. Percentage of subjects choosing risky choices by frame and information level.

coded "1" if they were in the direction consistent with prospect theory (i.e., risky choices in negatively-framed problems or no-risk choices in positively-framed problems). Likewise, responses were coded "0" if they were in the direction inconsistent with prospect theory (i.e., risky choices in positively-framed problems or no-risk choices in negatively-framed problems). According to this coding scheme, responses were coded along a 0-1 continuum (1 represented a framing bias, and 0 represented no framing bias). Thus, the mean

of any one group represents the degree of framing bias exhibited by the participants in that group. (A two-way ANOVA is not feasible with these data since the evidence for a decrease in framing in the positive frame is reflected in *increasing* proportions; for the negative frame, it is reflected in *decreasing* proportions. In a two-way ANOVA, these two trends would cancel each other and confound the analysis.) Figure 2 presents the results of this analysis.

As hypothesized, the ANOVA revealed significant differences among the means of the three groups, $F(2, 197) = 3.49, p < .05$. Table 4 presents the results of this analysis. A Scheffé test indicated a significant difference between the number of subjects who were consistent with the framing bias in the no-information condition and the much-information condition ($p < .05$). As can be seen in Figure 2, the framing effects substantially decrease across the three groups. As problem-related information increased, the magnitude of the framing effect decreased.

Discussion

The results of these studies taken together provide some interesting comparative data between the escalation bias and framing effects. As noted earlier in the paper, much of the research on framing biases has been conducted with short problem descriptions and limited amounts of information. The acquisition case used in the second study was considerably longer (8 pages, single spaced) than those used in either research area, and provided a very typical summary analysis of a company that might be a target for acquisition. It is interesting to note that the escalation effect was observed in Study 2 with a much longer case (much-information-plus-choice condition) than is typical for escalation research. The effect also occurred with a "choice" type of dependent variable. It appears that increasing the levels of information (in this range) does not affect the psychological mechanisms that lead to the escalation bias.

On the other hand, the framing bias shows a different effect. As can be seen in Figure 2, the strength of the framing bias decreases with the addition of information to the problem. The trend across the no-information, limited-information, and much-information conditions is consistent with the predictions of this study, even though the framing effect continues to be statistically significant. Perhaps the most surprising finding of this research occurs in the much-information-plus-choice condition, where the framing effect is not statistically significant. This finding is consistent with the results of Study 1 and appears to explain the lack of an effect of framing on allocations in that study. It appears that the addition of a responsibility manipulation actually decreases the framing effect. This is a curious finding in light of the arguments in the literature that framing biases might be an explanation of escalation effects.

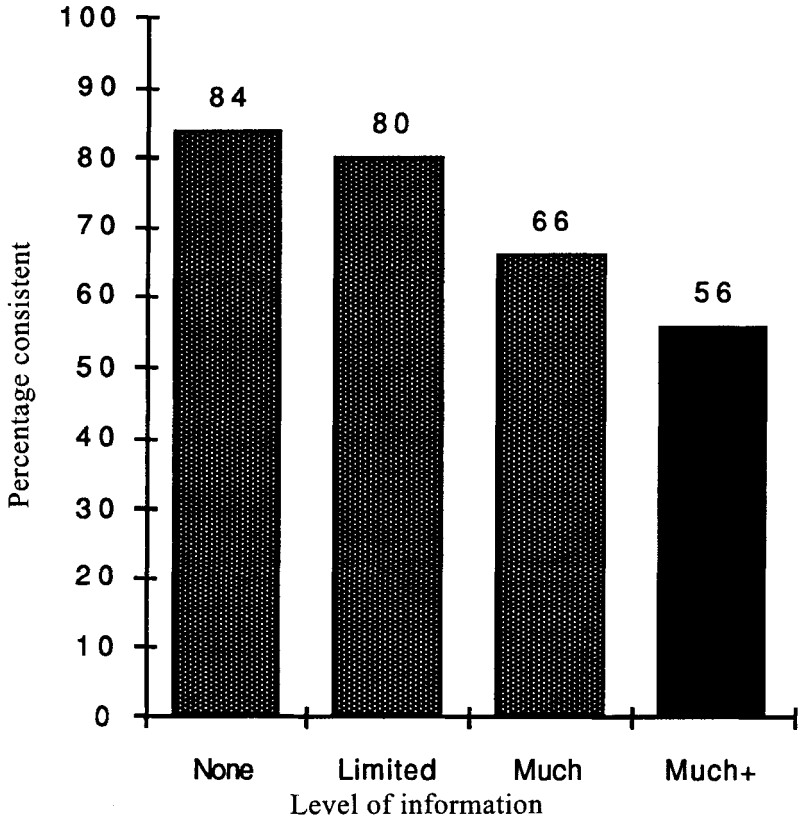

Figure 2. Percentage consistent with prospect theory prediction by information level.

Table 4

Magnitude of Framing Effect by Amount of Information (3 groups)

Source of variation	*df*	*MS*	*F*
Groups	2	.62	3.49*
Residual	197	.18	
Total	199		

*$p < .05$.

The studies in this paper suggest several conclusions. First, escalation does not appear to be a product of the framing of the feedback, as has been suggested in the literature. Second, this research suggests that certain boundary conditions exist for the framing effect. It is too early to know if the constraint of more information will reduce or eliminate framing effects in real-world situations. More research is needed to investigate the generalizability of these results.

One explanation for these results is that decision makers might be induced to "unframe" problems. In other words, when decision makers are presented with a glass that is "half-empty" and are asked to make a decision, their decision making will be affected by that frame. On the other hand, if they give more complete consideration to the problem, they will likely realize that even though the glass is half empty, it is, as well, half full. In such a case, the initial framing of the situation is not likely to matter much.

By itself, the present paper serves to suggest a systematic moderating effect of extra information on framing effects. Research is needed that develops a better theoretical foundation for the conditions under which framing will have either a greater or lesser impact on decision making. Such research would do well to consider various methods of inducing decision makers to think more carefully about the problem at hand.

The main difficulty of the studies described in the current paper lies principally in the attempt to test two paradigms that use very different dependent variables. The research plan attempted to examine the effects of escalation bias and framing bias in the same context and with the same problem, while retaining the integrity of each paradigm. The results of the studies suggest that the two biases are much more different than previously thought, in terms of the boundary conditions and moderators that influence their magnitude, as well as in terms of the psychological processes that are antecedent to the effects.

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