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Effects of Absolute and Relative Sunk Costs on the Decision to Persist with a Course of Action

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Two experiments were designed in order to examine how D. Kahneman and A. Tversky's (1979, 1984) assertions from prospect theory, that mental accounts are organized topically, might relate to sunk cost effects in decision-making. In each experiment, the absolute magnitude (dollars) and the relative magnitude (dollars in proportion to an overall project budget) of sunk costs were manipulated independently across four different decision problems. Subjects responded to each problem with the probability that if faced with the situation described, they would commit the remaining funds to the action that they had initiated. The subjects in Experiment 1 were undergraduate business students, fulfilling a course requirement. Those in Experiment 2 were MBA students, participating on a purely voluntary basis. Very consistent findings emerged across both experiments, where relative rather than absolute magnitude of sunk costs had a significant impact on subjects' reported likelihood of committing additional funds to some action. These findings support the idea that a topical organization of mental accounts, where existing investments are compared with a reference state in a manner consistent with that prescribed by prospect theory, underlies sunk cost effects in decision-making.

There is a considerable amount of evidence that when individuals are faced with decisions involving the continuance or discontinuance of a previously initiated course of action, sunk costs count. A sunk cost, as defined by Arkes and Blumer (1985), involves any prior investment of "money, effort, or time" (p. 124).

Sunk cost effects on decision-making are, of course, irrational from the perspective of both classical economic and normative decision theories,

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where individuals are assumed to evaluate decision alternatives on the basis of incremental gains and losses. By definition, any sunk cost related to some course of action is a constant, whether or not one chooses to continue the action; thus, consideration of sunk costs should not enter into decisions to continue or abandon an activity.

Common parlance recognizes both the existence of and irrationality of sunk cost effects with aphorisms like "don't throw good money after bad." Despite this caution, numerous examples of apparent sunk cost effects exist in the public record. For one example, in the banking world additional funds are sometimes loaned to businesses or to foreign nations that have failed to pay off existing debts in the hope that just a few thousand or hundred million more may be all that is needed for economic solvency. Apart from a multitude of anecdotal accounts of sunk cost effects that we might cite, recent experimental work by Arkes and Blumer (1985) leaves little doubt about the reality and robustness of these effects.

Sunk Costs and Escalation of Commitment Research

Early experimental research by Staw (Staw, 1976; Staw & Fox, 1977; Staw & Ross, 1978) investigated, within an investment decision framework, the influence of a variety of manipulated variables on the probability of renewed or escalated commitment to a chosen course of action. The results of these early escalation studies suggested that unprofitable investments receive more additional funding than profitable ones; personal responsibility for an initial investment results in a greater willingness to commit additional funds, especially when the investment proves to be unprofitable; commitment to a course of action can change over time with repeated negative feedback and may also be dependent on the perceived cause of feedback. Staw's (1981) preferred explanation for escalation in the face of loss involved the notion of self-justification, where an individual attempts to demonstrate the rationality of some initial decision to him/herself and/or to others; however, norms for consistency are also considered to be an underlying cause.

Additional work by Brockner and his colleagues on entrapment (Brockner, Shaw, & Rubin, 1979; Brockner *et al.*, 1984) suggested that other social psychological factors (e.g., audience effects) can also influence the escalation phenomenon.

In a recent review of the escalation literature, Staw and Ross (1987) suggest that commitment to a current course of action is a function of the comparison between the perceived utility of continuing with the action and the perceived utility of withdrawal and/or changing the action. Numerous factors are proposed to determine these utilities. For purposes of exposition, Staw and Ross divide these factors into four categories:

"project determinants," "psychological determinants," "social determinants," and "structural determinants."

Escalation research by Staw and his colleagues certainly demonstrates that people do "throw good money after bad." In the typical escalation study, however, sunk costs are not manipulated. Rather, subjects are presented with a fixed sunk cost and feedback about the profitability of returns is manipulated.

Sunk Costs and Information Processing

In the present research, we are concerned with sunk costs as one major determinant of action persistence. It is our belief that the influence of sunk costs on the perceived utilities of persistence and withdrawal is to some extent a function of the way individuals organize and process information in their decision-making behavior.

In a series of questionnaire studies and ingenious field experiments, Arkes and Blumer (1985) demonstrate sunk cost effects over a wide variety of situations and decision problems. In exploring underlying explanations for sunk cost effects, these authors propose Kahneman and Tversky's (1979) prospect theory as a possible explanation, although they prefer an explanation based upon a motive to avoid appearing wasteful.

Prospect theory has also been proposed by Whyte (1986) as an explanation for much of the escalating commitment research. According to Whyte, a major difference between Staw's self-justification explanation for sunk cost effects and his own explanation based on prospect theory is that the former invokes a motive to be rational (i.e., in retrospect), while the latter relies on information-processing heuristics.

Three propositions from prosect theory, when taken together, can be used to explain sunk cost effects on decision-making. First, individuals are hypothesized to evaluate decision outcomes as gains and losses from some reference point. Second, individuals are hypothesized to be influenced by a "certainty effect," in which probable outcomes are underweighted in comparison to certain outcomes. Finally, in prospect theory the utility function for gains is proposed to be concave, while that for losses is proposed to be convex and steeper than that for gains.

The typical situation in which sunk cost effects are observed is one in which some decisionmaker is faced with the choice of withdrawing from a course of action, where an initial investment has been made and returns have not resulted in recovery of that investment, or making an additional investment in order to continue with the action. Prospect theory helps to explain why sunk costs may play a major role in these decisions. First, the extant investment in the absence of returns is likely to be viewed as a loss from a reference point determined by the decisionmaker's initial asset position. Second, withdrawal from the action creates a situation in which

this perceived loss is incurred with certainty. Finally, convexity of the value function for losses results in a decreasing rate of disutility as further investments are made.

The choice is thus framed as withdrawal, with a sure loss of sunk costs, versus persistence, with some chance of recovery and a higher chance of additional loss. The effect of this decision "frame," as it is termed by Kahneman and Tversky (1981, 1984), coupled with the proposed convexity of the value function under loss, can help to explain why one might be more likely to "throw good money after bad" as the amount of "bad" money expended increases.

Northcraft and Neale (1986) have pointed out the fallacy of framing decisions between persistence and withdrawal as a choice between sure loss and possible recovery with the chance of even greater loss. As they point out, the above decision frame ignores the opportunity costs associated with persistence that come from an inability to diversify remaining resources.

Absolute or Relative Sunk Costs

Despite a growing research literature, numerous questions remain about aspects of the decision situation that influence the importance of sunk costs. One major question about sunk cost effects that has not yet been answered in the literature is whether absolute or relative sunk costs are more important in the decision to continue investing in a course of action.

In their presentation of prospect theory, Kahneman and Tversky (1979) propose that the value function for changes in money (e.g., a loss of $1000) will vary with an individual's initial asset position (e.g., $1000 vs $10,000) (p. 277). In a more recent article, Kahneman and Tversky (1984) assert, based on Thaler's (1980) work in the area of consumer behavior, that mental accounts are organized topically. According to these authors, in topical accounting, the consequences of an alternative are compared with some relevant reference state. This "leads people to evaluate gains and losses in relative rather than absolute terms" (p. 347).

Thus, prospect theory posits that gains and losses will always be evaluated with respect to some reference point. One logical reference point with respect to a given project would be the total amount of resources (e.g., money) allocated to that project. If this is the case, then it may be reasonable to assume that people compare sunk costs with some total budget in ratio terms. That is, given an equal number of dollars expended, individuals should be more likely to persist in a course of action when these dollars represent a higher proportion of their anticipated budget (i.e., when the overall budget is lower).

The existence of relative sunk cost effects, as described above, would

not only be consistent with prospect theory but also consistent with a wealth of literature in psychophysics, where sensitivity to changes in various stimuli has been found to vary as a ratio of the magnitude of change to the magnitude of the reference stimulus.

An alternative to the topical organization of mental accounts, as proposed by Kahneman and Tversky, is the minimal account. In a minimal account of sunk costs, the individual would consider the absolute value of effort or resources spent on some action. To the extent that decisions to persist in that action were influenced by sunk costs, the probability of persistence should be a function of the magnitude of these costs.

The major purpose of the present research will be to examine the independent contributions of absolute expenditures and the proportion of a budget expended on the decision to continue an investment in a questionable course of action. To our knowledge, previous research on sunk cost effects has not examined this question. In the Arkes and Blumer (1985) studies it is not possible to separate relative from absolute sunk cost effects. Most other studies have used either uniformly large dollar amounts when studying strategic choice (Conlon & Parks, 1987; Conlon & Wolf, 1980; Staw, 1976, 1981) or small amounts if studying gambling behavior (Lichtenstein & Slovic, 1973).

A second purpose of our research was to examine the generality of results across decision contexts. In the research to be presented, we varied amount and proportion of sunk cost across four financial decision problems. Two of these problems involved a personal context and the other two involved a business context.

An advantage of using multiple decision problems in this research is that it provides for multiple operationalizations of the two major independent variables being studied, amount and proportion of sunk costs. This helps to overcome a very common construct validity threat in experimental research that Cook and Campbell (1979) call "mono-operation bias."

In addition to creating multiple operationalizations, the experimental design allowed for a comparison of sunk cost effects in the context of a personal decision with those in the context of a business decision. Politically oriented theories of organizational decision-making (Narayanan & Fahey, 1982; Salancik & Pfeffer, 1974; Stagner, 1969) have long recognized that decision-making within and organizational context is more logically a self-preserving process than it is a profit-maximizing one. In a similar vein, Staw (1981) has suggested that external justification and self-presentation concerns may add greatly to escalation decisions in organizations following sunk costs, over and above any concern for self-justification. If this is the case, then we might expect to find greater commitment following a sunk cost for most business decisions than for most personal decisions.

Finally, we conducted our experiment twice, with two samples of respondents. One sample consisted of a group of undergraduate business majors enrolled in an introductory management course. These students had little or no business experience and were required to participate for course credit. The other sample consisted of MBA students, who had more business experience and whose cooperation was purely voluntary. A priori, one might expect the MBAs to have taken the research much more seriously. Although previous research on sunk cost effects (Arkes & Blumer, 1985) has not suggested systematic differences across respondents from different samples, the utilization of two samples in our research was considered a plus from the standpoint of external validity.

EXPERIMENT 1: UNDERGRADUATE STUDENTS

Method

Subjects

The subjects were 88 students enrolled in introductory management classes at a large state university. They agreed to participate in order to fulfill a course research requirement.

Research Design

An experiment was developed utilizing a $4 \times 4 \times 4$ latin square design. Planned contrasts were used for examining the main effects and possible interaction effect of the two major independent variables, amount and proportion of sunk costs, on the dependent variable, which was the reported probability of using the remaining funds in a budget to complete some course of action. Planned contrasts were also used to look at any possible effects of a business versus personal context on decision-making.

The first stage in designing this experiment involved the development of four different decision scenarios, similar to those used in other research (Arkes & Blumer, 1985; Conlon & Wolf, 1980; Staw & Ross, 1978). Two of the scenarios involved business-related decisions: R & D investment in the development of a radar blank plane and remodeling of an office building. The other two scenarios involved personal decisions: a vacation trip and the purchase of a retirement home. The four different scenarios used in this research are presented under Appendix.

Four different versions of each scenario were developed, representing all possible combinations of two different levels of absolute sunk costs and two different levels of proportional sunk costs. In order to manipulate absolute level and proportion of sunk costs independently, we had to let the overall budget for each scenario vary across the four experimental conditions. The resulting combination of four versions of each of the four scenarios resulted in 16 different decision problems. Four different types

of questionnaire protocols were developed using a latin square procedure. Each type contained all four scenarios, with each scenario presented with a different level of amount and proportion of sunk costs. Thus, each subject made four different decisions and across the four types of protocols, all combinations of scenario, amount, and proportion of sunk cost were represented. Within each protocol, the order of decision problems was randomized.

There were two primary reasons for designing this experiment as a latin square. First, the design seemed less likely to create a problem with transparent manipulations than would a completely within-subjects design in which each subject responded to each scenario four times (i.e., under two levels of absolute and relative sunk costs). Second, the design resulted in powerful tests of the main and interaction effects of our two primary independent variables, without requiring the 64 separate conditions that would be necessary for a completely balanced between-subjects design.

In order to maximize construct validity and to minimize repetition, variation was introduced into the manipulation of both amount and proportion of sunk costs across scenarios. Table 1 presents the specific sunk cost amounts and proportions as well as the total budgets in each of the experimental conditions for the four decision scenarios used in this research.

The 88 subjects in our sample were randomly assigned to each of the four different protocol groups, with 22 subjects in each group.

Procedure

The subjects reported to a large classroom where they were given one of the questionnaire protocols described above. General instructions on the first page of the protocol indicated that the subjects were to read each scenario and respond as if they were really experiencing the decision situation. After each scenario, they were asked to indicate, on a continuous scale from 0 to 100, the probability that if faced with the situation described they would commit the remaining funds to complete the action they had started. Their response to this question was our dependent variable.

Results and Discussion

As already discussed, the experimental design was developed as a 4 (subject block based upon protocol type) × 4 (decision scenario) × 4 (combination of 2 levels of sunk cost amount and 2 levels of sunk cost proportion) latin square. The first factor was a between-subjects factor and the second and third factors were within subjects factors.

First, a general analysis of variance was performed on the overall latin

TABLE 1
SUNK COST AMOUNT, PROPORTION, AND TOTAL BUDGET ACROSS FOUR DECISION SCENARIOS

	Scenario condition			
	Business		Personal	
	Radar blank plane	Office remodeling	Vacation trip	Retirement home
Low amount invested				
Low proportion				
Dollars invested	9,000	7,500	320	6,300
Percentage invested	10	15	20	10
Total budget	90,000	50,000	1,600	63,000
High proportion				
Dollars invested	9,000	7,500	320	6,300
Percentage invested	90	85	80	90
Total budget	10,000	8,800	400	7,000
High amount invested				
Low proportion				
Dollars invested	9 million	75,000	3,200	63,000
Percent invested	10	15	20	10
Total budget	90 million	500,000	16,000	630,000
High proportion				
Dollars invested	9 million	75,000	3,200	63,000
Percent invested	90	85	80	90
Total budget	10 million	88,000	4,000	70,000

square. Significant effects on any factor were followed by planned comparisons in order to examine our specific experimental questions. For example, a significant effect of our third factor (i.e., amount and proportion of sunk cost) would suggest that, among the four conditions on this factor, at least one is reliably different from the others in average reported probability of continuing with an action. Such a difference could be a function of a main effect of sunk cost amount, proportion, and/or the interaction of these factors. In this case, planned comparisons were used to examine the two possible main effects and the interaction.

Table 2 presents the results of the overall analysis of variance on subjects' reported probability of continuing with a course of action. Inspection of this table reveals only one highly significant effect of the combined sunk cost amount and proportion treatments.

Table 3 presents means and standard deviations in each of the four conditions represented by the sunk cost effect. Planned comparisons were used to examine the three orthogonal contrasts, representing the

TABLE 2
EXPERIMENT 1: ANALYSIS OF VARIANCE ON REPORTED PROBABILITY OF CONTINUING WITH COURSE OF ACTION

Source	*SS*	*df*	*MS*	*F*	*p*
Between blocks	67,313.09	87			
A (Subject Block)	3,670.56	3	1,223.52	1.62	ns
Error	63,642.53	84	1,300.02		
Within blocks	343,204.50	264			
B (Scenario)	6,593.08	3	2,197.67	2.04	ns
C (Amount and Proportion of Sunk Cost)	58,421.84	3	19,473.95	18.06	<.0001
Error (pooled)	278,189.64	258	1,078.25		
Total	410,517.59	351			

main effects of sunk cost amount, proportion, and their interaction. The results of these comparisons revealed only one highly significant effect of sunk cost proportion, $F(1, 258) = 150.51$, $p < .0001$. Neither sunk cost amount effect nor the interaction effect was significant, $F(1, 258) = 2.33$ and 0.67, respectively.

No planned comparisons test was performed to examine the effect of business versus personal decisions on the dependent variable because there was no overall scenario effect. For descriptive purposes only, however, mean reported probabilities of continuing with an action were 49.63 and 47.57 in the two business and two personal scenarios, respectively.

To summarize the results of Experiment 1, there was one strong and significant sunk cost effect on the decision to continue with an unprofitable course of action, based upon the proportion of a total budget expended on that action. This effect was obtained over four very different

TABLE 3
EXPERIMENT 1: AVERAGE REPORTED PROBABILITY OF CONTINUING WITH COURSE OF ACTION ACROSS FOUR CONDITIONS OF SUNK COST AMOUNT AND PROPORTION

Sunk cost proportion	Sunk cost amount		
	Low	High	Combined
Low	34.00[a] (30.89)[b]	38.11 (30.27)	36.06
High	60.52 (34.19)	61.76 (33.52)	61.14
Combined	47.26	49.94	

[a] Mean value (*M*).
[b] Standard deviation (*SD*).

decision contexts. Interestingly, the absolute value of sunk costs had no effect on decisions to remain committed to a course of action.

EXPERIMENT 2: MBA STUDENTS

Method

Subjects

Thirty-six MBA students enrolled in a graduate-level organizational behavior class served as subjects.

Research Design

The research design and protocols were identical to those used in Experiment 1.

Procedure

The only change in procedure from Experiment 1 was that the subjects were given a protocol at random in class and asked to take it home, respond in their spare time at one sitting, and return the completed protocol at the next class.

Results and Discussion

Table 4 presents the results of an overall analysis of variance on subjects' reported probability of continuing with an action. These results are remarkably similar to those found with the larger sample of undergraduate students. Once again, only the composite amount and proportion of sunk cost variable had a significant effect on the dependent variable.

Table 5 presents means and standard deviations in each of the four conditions represented by this effect. Just as in Experiment 1, planned

TABLE 4
EXPERIMENT 2: ANALYSIS OF VARIANCE ON REPORTED PROBABILITY OF CONTINUING WITH COURSE OF ACTION

Source	*SS*	*df*	*MS*	*F*	*p*
Between blocks	29,063.08	35			
A (Subject Block)	4,816.02	3	1,605.34	2.12	ns
Error	24,247.06	32	757.72		
Within blocks	182,463.25	108			
B (Scenario)	2,746.79	3	915.60	.79	ns
C (Amount and Proportion of Sunk Cost)	57,673.85	3	19,224.62	16.07	<.0001
Error (pooled)	122,042.66	102	1,196.50		
Total	211,526.33	143			

TABLE 5
EXPERIMENT 2: AVERAGE REPORTED PROBABILITY OF CONTINUING WITH COURSE OF ACTION ACROSS FOUR CONDITIONS OF SUNK COST AMOUNT AND PROPORTION

Sunk cost proportion	Sunk cost amount		
	Low	High	Combined
Low	22.42[a]	33.97	28.20
	(28.24)[b]	33.83	
High	67.67	67.08	67.38
	(37.26)	(37.09)	
Combined	45.05	50.53	

[a] Mean value (*M*).
[b] Standard deviation (*SD*).

comparisons were used to examine the three orthogonal contrasts, representing the main effects of sunk cost amount, proportion, and their interaction. The results of these comparisons revealed only one highly significant effect of sunk cost proportion, $F(1, 102) = 130.92$, $p < .0001$. Neither sunk cost amount effect nor the interaction effect were significant, $F(1, 102) = 2.56$ and 3.02, respectively.

Replicating the results of Experiment 1, there was no significant overall effect of different scenarios on subjects' reported probability of continuing an action. Mean probabilities for the business and personal decisions were 49.64 and 45.93, respectively.

The results of Experiment 2 are completely parallel to those of Experiment 1. Given the different nature of our samples and somewhat different procedures for administering the experimental protocols, as well as sampling error, the similarity of both mean responses across experiments and the effects obtained give us great confidence in the reliability of these results.

GENERAL DISCUSSION

The major purpose of this research was to examine questions generated from prospect theory about the independent and combined effects of the amount of funds expended and the proportion of a budget expended on the decision to continue with a course of action. Two separate experiments, performed on different subject samples, provided remarkably similar results. These results suggest that sunk cost effects on decision-making are a function of the proportion of allotted resources (e.g., a budget) expended on the project rather than absolute expenditures. This proportional expenditure effect was the only significant factor influencing the decision to continue with a project in our two experiments.

Our results are highly consistent with assertions from Kahneman and

Tversky's (1979) prospect theory as well as with their later analysis of mental accounting (Kahneman & Tversky, 1984). With respect to sunk cost effects, the results of the present research suggest that individuals evaluate the lost investment from abandoning some project with a reference state that includes the total resources that they had initially allocated to the project.

A second purpose of our research was to examine the possible impact of decision contexts on sunk cost effects by presenting subjects with four very different decision scenarios. Across both experiments, we did not find any significant effect of this variable. Two of the four scenarios used in this research involved personal decisions, while the other two involved business decisions. The fact that there was no reliable variation attributable to different decision contexts in the present studies is consistent with the idea that some basic information-processing phenomena underlie the sunk cost effects that we observed.

This does not mean that political and self-presentational concerns are unrelated to individual decisions to persist or withdraw from a course of action. Earlier research would clearly suggest that they are. What it does mean, however, is that in attempting to understand sunk cost effects on decision-making, fundamental psychological processes that relate to the way in which humans organize and respond to information should be considered.

It should be pointed out that a desire to avoid wastefulness, a motive for self-justification, and information-processing heuristics are not contradictory explanations for sunk cost effects. Having seen our results, it is possible to argue that concerns about wastefulness and self-justification may vary as a function of relative, rather than absolute, sunk costs. It is also true, that prospect theory is probably not the only information-processing theory that can account for these results. Nevertheless, it was our reading of prospect theory that resulted in the derivation of our primary research question. Other approaches to the study of sunk cost effects, while not inconsistent with our results, have not been expressly concerned with examining the issue of absolute vs relative sunk costs.

The results of this research also provide an important base of empirical support for Kahneman and Tversky's (1979) proposition that the evaluation of changes in monetary position is covered by the same principles that have been found to apply to responses to change on many sensory and perceptual dimensions in psychological research (p. 278). Thus, we can now clearly state, in the form of an hypothesis for future testing, that when a budget has been established for some course of action, the impact of sunk costs on any decision to continue that action is an increasing function of the ratio of that cost to the original budget.

Knowing that sunk cost effects on decisions to continue with a course

of action are influenced by the amount of past expenditure relative to some budget for the action or other topical account, future research on sunk cost effects might examine the relation between amount expended and the decision to continue with a project when total budget is held constant and sunk costs are varied parametrically. With this kind of study one could examine whether such relationships are linear or, as prospect theory might suggest, logarithmic.

Future research might also attempt to explore those factors that cause individuals to stop "throwing good money after bad" and abandon an action. Such research would help us to both understand the limiting conditions of the sunk cost effect and might prove fruitful in attempts to counteract this potentially costly bias in real-world decision-making. In this regard, Northcraft and Neale (1986) found that providing individuals with information about alternative opportunities for achieving returns on funds that had been committed to unprofitable real estate project resulted in a significant increase in the likelihood writing off sunk costs and selling the unfinished project.

APPENDIX

Four Decision Scenarios

Scenario 1

You are the president of Aero-Flite Corporation, an airplane manufacturer. You have spent ____ of the ____ budgeted for a research project to develop a radar-scrambling device that would render a plane undetectable by conventional radar (in effect, a radar blank plane). The project is ____% complete. Another firm has begun marketing a similar device that takes up less space and is much easier to operate than Aero-Flite's.

Scenario 2

You are the owner and manager of Security Tower, an older downtown office building that overlooks several square blocks in an area that has been slated for urban renewal over the next three years. The City Council has indicated that it would like to create a "greenway" with grass, trees, and a small lake networked with bicycle and jogging paths. You have begun remodeling your building, anticipating renewed interest in downtown offices, with convenient parking, good access to the cross-town freeway, and a nice view. You have spent ____ of the approximately ____ you had budgeted for remodeling and the project is ____% complete. You have just learned that the "greenway" plan has been voted down in favor of a sports stadium that will give all 15 floors of your building a view of cement walls and/or parking lots. Additionally, the increased traffic in

the area will clog the freeway access for years, even with the plans to widen adjacent streets.

Scenario 3

You have decided to treat yourself to a long overdue ski vacation in _____ during Christmas break. You have already paid your travel agent ____ of the ____ that the trip will cost, as a nonrefundable deposit. The trip is thus ____% paid for. This morning, your aunt Helen called to say that she is giving your parents a special 40th anniversary party over the holiday and that over 50 out-of-town guests have made plans to attend the party on December 28th. This date falls in the middle of your planned vacation but you could never forgive yourself if you missed this special event. The _____ trip on which you have a deposit cannot be transferred or rescheduled because it was a special price package of which you took advantage.

Scenario 4

You and your spouse have always planned to retire to a place up in the mountains near a lake. You looked for several years before you found the perfect site: a half-acre of wooded property at Shadow Mountain Lake. Your lot fronts on the main access road to the lake. It is near enough to the major resort businesses to make them convenient but just far enough to allow you freedom from the noise and garbage generated by year-round tourists. You have spent ____ of the ____ you planned to spend building on your property, so it is ____% finished. Your mail today informed you that in spite of your strong opposition, the zoning committee of the Shadow Mountain Council has voted to rezone the lot next to yours so it can be used for a gas station/convenience store business.

REFERENCES

Arkes, H. R., & Blumer, C. (1985). The psychology of sunk cost. *Organizational Behavior and Human Decision Processes*, **35**, 124–140.

Brockner, J., Nathanson, S., Friend, A., Harbeck, J., Samuelson, C., Houser, R., Bazerman, M., & Rubin, J. (1984). The role of modeling processes in the "Knee-deep in the Big Muddy Phenomenon." *Organizational Behavior and Human Performance*, **33**, 77–99.

Brockner, J., Shaw, M. C., & Rubin, J. Z. (1979). Factors affecting withdrawal from an escalating conflict: Quitting before it's too late. *Journal of Experimental Social Psychology*, **15**, 492–503.

Conlon, E. J., & Parks, J. M. (1987). Information requests in context of escalation. *Journal of Applied Psychology*, **3**, 344–350.

Conlon, E. J., & Wolf, G. (1980). The moderating effects of strategy, visibility, and involvement on allocation behavior: An extension of Staw's escalation paradigm. *Organizational Behavior and Human Performance*, **26**, 172–192.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation*. Boston: Houghton Mifflin.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decisions under risk. *Econometrica,* **47,** 263–291.

Kahneman, D., & Tversky, A. (1981). The framing of decisions and the psychology of choice. *Science,* **211,** 453–458.

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

Lichtenstein, S., & Slovic, P. (1973). Response-induced reversals of preference in gambling: An extended replication in Las Vegas. *Journal of Experimental Psychology,* **101,** 16–20.

Narayanan, V. K., & Fahey, L. (1982). The micro-politics of strategy formulation. *Academy of Management Review,* **7,** 25–34.

Northcraft, G. B., & Neale, M. A. (1986). Opportunity costs and the framing of resource allocation decisions. *Organizational Behavior and Human Decision Processes,* **37,** 348–356.

Salancik, G. R., & Pfeffer, J. (1974). The bases and use of power in organizational decision making: The case of a university. *Administrative Science Quarterly,* **19,** 453–473.

Stagner, R. (1969). Corporate decision making: An empirical study. *Journal of Applied Psychology,* **53,** 1–13.

Staw, B. M. (1976). Knee-deep in the big muddy: A study of escalating commitment to a chosen course of action. *Organizational Behavior and Human Performance,* **16,** 27–44.

Staw, B. M. (1981). The escalation of commitment to a course of action. *Academy of Management Review,* **6,** 577–587.

Staw, B. M., & Fox, F. V. (1977). Escalation: The determinants of commitment to a chosen course of action. *Human Relations,* **30,** 431–450.

Staw, B. M., & Ross, J. (1978). Commitment to a policy decision: A multi-theoretical perspective. *Administrative Science Quarterly,* **23,** 40–64.

Staw, B. M., & Ross, J. (1987). Behavior in escalation situations: Antecedents, prototypes, and situations. In B. M. Staw (Ed.), *Research in organizational behavior* (Vol. 9, pp. 39–78). Greenwich, CT: Jai Press.

Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization,* **1,** 39–60.

Whyte, G. (1986). Escalating commitment to a course of action: A reinterpretation. *Academy of Management Review,* **11,** 311–321.

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