Continuing Investment Under Conditions of Failure: A Laboratory Study of the Limits to Escalation

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Previous research has indicated that escalating commitment occurs early in the process of continuing investment but disappears quickly. Drawing on a related area of research, this article suggests that continuing financial support of a failing investment involves two distinct stages. Although escalation occurs during the first stage of investment, a process of de-escalation may be typical later on. Attribution theory provides a theoretical basis for this postulated sequence of escalation followed by de-escalation. One hundred business students participated in a laboratory experiment designed to test for limiting factors in the process of escalation. The empirical results of this study supported the hypothesized de-escalation process and showed that the availability of alternative investments also limited escalation. Furthermore, a survival analysis of subject investments suggested that commitment may not be the dominant process in escalation and de-escalation. The implications of these findings for future escalation research are discussed.

In recent years scholars have studied the special way that decision makers respond to failure (e.g., Conlon & Wolf, 1980; Rubin & Brockner, 1975; Staw, 1976; Staw & Ross, 1978; Teger, 1980). A stream of research begun by Staw (1976, 1981) postulated that people attempt to justify (Aronson, 1968; Festinger, 1957) unalterable mistakes by committing additional money (Fox & Staw, 1979; Staw, 1976, 1981; Staw & Fox, 1977; Staw & Ross, 1978, 1980). As failure continues, however, the additional investments simply add to the original pressure for self-justification and draw the decision maker deeper into a recurring cycle of investment and failure. Staw called this "escalating commitment."

Escalation signifies that an investor has invested more money than the information or situational circumstances surrounding the investment warrant. Staw (1976) and Staw and Fox (1977) demonstrated that subjects who were both (a) committed to an investment and (b) failed subsequently invested more money than subjects who were not committed or who did not fail. Because each experimental group received the same information, the researchers interpreted the difference between the allocations of high- and low-commitment subjects as evidence of self-justification. Other studies have tried to elaborate on this finding by studying high-commitment subjects' reactions to specific information or situational circumstances (Conlon & Wolf, 1980; Fox & Staw, 1979; Staw & Ross, 1978; Staw & Ross, 1980). The studies by Fox and Staw (1979) and Staw and Ross (1980), however, involved justification of investments to other people and thus reflected far more than justification of an investment to the

self. Moreover, other studies within this group apparently contradicted the self-justification interpretation. The study by Conlon and Wolf (1980), for example, demonstrated that subjects sometimes adopt problem-solving strategies that preclude the effects of self-justification, and Staw and Ross (1978) concluded that a reactance interpretation described their data better than a self-justification interpretation.

Empirical demonstrations that committed subjects invest more than uncommitted subjects (Staw, 1976; Staw & Fox, 1977) have constituted the major evidence for a self-justification process of escalation. Unfortunately, by this operational definition, there has been little evidence that escalation persists over repeated investments. Staw and Fox (1977) recorded three sequential decisions after failure began and found that escalation disappeared after only one supplemental allocation. In that study, the committed, high-choice subjects restricted their investments in the project sharply after the first allocation. The low-choice subjects, by contrast, increased their allocations only slightly. The high-choice subjects' declining funding implies that those subjects became less willing to invest in the failing project as they made repeated investments. This suggests that a process of "de-escalation" supplants escalation as investing continues.

Research on a process similar to escalation also supports a possible de-escalation process. Brockner, Rubin and their colleagues have published numerous investigations of entrapment (e.g., Brockner et al., 1982; Brockner, Rubin, & Lang, 1981; Brockner et al., 1984; Rubin & Brockner, 1975). In entrapment, as in escalating commitment, persistence at a goal magnifies losses. The major operational difference has been that entrapment studies have made increasing investment a strict function of waiting time, whereas escalation studies have made the amount of investment an independent decision. Although entrapment studies have shown that subjects pursue goals despite mounting costs, they have also shown that most subjects quit before they must stop. Brockner et al. (1982), following Teger (1980), have also specifically suggested that entrapment involves two distinct stages. In the first stage subjects respond primarily to economic

incentives, whereas self-justification supposedly governs the second. Brockner et al. found that cost salience significantly reduced entrapment early on but had little effect in later periods.

The awareness of costs could also be an important factor in escalation and may govern the transition from escalation to de-escalation. Whereas committed investors might overlook the costs of investment at first, repeated setbacks should make those costs salient and should reduce the investors' willingness to invest more. If so, attempts to make costs more salient should have little effect after escalation ends. This suggests, however, that self-justification may not adequately model de-escalation, because investors supposedly deny failure in that process. Although investors may try to save face during the second stage of investment (Brockner et al., 1982), they may also try to minimize additional investment while they search for ways to reduce their losses. Alternatively, if investors recognize possible failure, they should search for ways to minimize their losses. Thus, a process that reflects efforts to *learn* both what caused the setbacks and the implications of that cause for future action may provide a better model of de-escalation.

Several theoretical perspectives could be used to model this learning process. Attribution theory (Kelley, 1973; Weiner, 1979), social learning theory (Bandura, 1977), expectancy theory (Porter & Lawler, 1968), and operant conditioning (Skinner, 1969) all provide theoretical formulations that could model de-escalation. Attributional models are particularly appealing, however, because some of these models (e.g., Kelley, 1973) posit two stages in the attribution process: the first a response to limited observations, the second enabled by multiple observations. Thus, attribution theory could explain both escalation and de-escalation. When an investment first shows signs of failure, information vital to the attribution process is often unobtainable (e.g., Kelley's consistency information). This forces the attributor to rely on schema (Kelley, 1972) or other interpretive frameworks. During this period investors may rely heavily upon subjective impressions that could be influenced by the investor's own choice of the investment. Over time, however, some of the missing information should become available, clarifying both the problem and the investment's prospects. Thus, if missing information promotes escalation, escalation should be largely restricted to the initial stage of continuing investment.

Although repeated investment should limit escalation over time, other factors may restrict escalation during the first stage of investment. For example, escalation may be reduced if the costs associated with a specific expenditure become salient (Brockner et al., 1982). Although a number of factors might influence the salience of these costs, the availability of alternative investments would be particularly important. If nothing else, the opportunity costs of alternative investments should make investors more aware of the costs of their investments. An attributional perspective, however, suggests that comparing an investment's performance with the performance of alternate investments (i.e., consensus information, Kelley, 1973) also helps to specify the cause of a setback. If other investments perform well, it implies something may be seriously wrong with the investor's own investment, and investors should be more likely to refuse additional support than if all investments perform poorly. Thus, when the previously chosen investment is the only one that suffers a setback, alternative investments should limit escalation.

Finally, characterizing escalation and de-escalation as a learning process suggests a fundamental difference between the self-justification and attribution models. The self-justification model posits that people become committed through their own investments. Thus, the probability that investors will continue investing should increase with each successive investment. Because repeated actions strengthen commitment (Kiesler, 1971) repeated investments would increase an investor's commitment, especially when the investments are costly (i.e., large). Also, once weakly committed investors drop out, those who remain would be more strongly committed to supporting the investment. Accordingly, the self-justification perspective predicts that the percentage of investors who quit funding an investment should be comparatively high initially but should decline over successive investments. The learning model suggested by attribution theory, on the other hand, predicts just the opposite. The attributional perspective postulates that investors eventually learn they must abandon an investment when setbacks occur repeatedly. Thus, the longer someone invests, the more likely he or she would be to stop. This means that the quit rate should start out low, then rise.

Method

Subjects and Procedure

One hundred business students at a large midwestern university participated as subjects in this experiment. Most of the students were either junior or senior business majors and were between 20 and 22 years of age. There were nearly equal numbers of males and females in this study. Most of the students participated in the study as a course assignment, and the rest received extra credit for their participation.

Subjects signed up for the experiment in their classes and met the experimenter in the computer lab. All subjects were required to make at least three decisions beyond the initial setback, although they could refuse to give the chosen division additional money. After the third decision subjects could quit the simulation entirely, or, they could make up to 10 decisions if they continued to the end.

The materials used in this study were similar to those used by Staw and Fox (1977). Each subject assumed the role of Financial Vice President for a large conglomerate. The materials explained that the company had declined in recent years and that management had identified several divisions that might benefit from developmental investment. Subjects decided how to spend a developmental budget and typed their decisions into a computer. The computer gave them immediate performance reports. Whichever division subjects started out with continued to decline, whereas alternative divisions, if there were alternatives, improved. A questionnaire was administered when the simulation ended.

Independent Variables

Commitment was manipulated as it had been in previous studies (Staw & Fox, 1977). In the first period, half of the subjects chose the failing company themselves. The other subjects inherited the failing company as part of their initial portfolio and made an innocuous choice for their first decision.

The second manipulated variable concerned the investment alternatives available to the subjects. One group of subjects could only fund the failing division or return the money, unused, to their company headquarters. This was comparable to the situation that the Staw and Fox (1977) subjects faced. The other subjects could invest in the failing division or in three others, yet, they also retained the option of returning the money unused.

Dependent Variables

The first dependent measure in this study, as in past studies of escalating commitment, was the amount of money allocated to the failing company. The amount of money subjects gave to the failing company each period was recorded.

From a practical standpoint, however, the amount invested in a failing venture in any one period is less important than the amount invested overall. Hence, the allocations made during each period were summed to form a second measure.

Finally, low-commitment investors should not fund their investment as long as high-commitment investors. In this experiment, quits were recorded whenever a subject gave no money to the investment in that period or subsequent periods. Thus, subjects who refused to fund the failing division in any of the 10 experimental conditions were recorded as quits for the first period; subjects who allocated money the first period but in no subsequent periods were recorded as quits in the second period. Subjects did not necessarily leave the simulation, however, when they quit funding the failing company.

Results

Manipulation Checks

Two questions on the postexperimental questionnaire tested whether subjects in the high-choice condition recalled (initially) choosing the failing division. Subjects who had chosen the division were more certain that they had chosen it, $F(1, 81) = 31.0, p < .001$, and felt they had more choice in its selection, $F(1, 80) = 23.90, p < .001$.

The manipulation of alternatives was also confirmed. Subjects who had four alternatives indicated that they were asked to consider more divisions than subjects who had considered only the failing division, $F(1, 81) = 319.07, p < .001$. High-alternative subjects also reported that they were allowed to invest money in more divisions, $F(1, 81) = 14.28, p < .001$.

Dependent Measures

According to the analysis presented earlier, the escalation effect should occur during the early stages of investment in a failing course. The 2 × 2 (Choice × Number of Alternatives) analyses of variance (ANOVAs) performed on the allocations to the failing company showed that high-choice subjects ($M = \$8.13$) allocated more money to the failing course the first period after failure than low-choice subjects ($M = \$6.22$), $F(1, 96) = 5.35, p < .10$, $\omega^2 = .042$. None of the subsequent nine allocations showed effects for choice, however. A repeated-measures ANOVA also showed that choice did not interact significantly with time or with the number of alternatives. Not surprisingly, therefore, choice did not significantly affect the total allocation (Means: high choice = $39.98, low choice = $42.96), $F(1, 96) = 0.17$. Overall, high-choice subjects did not invest more money than low-choice subjects invested after the first period.

The ANOVA also showed quite clearly that the number of alternatives had a strong and pervasive effect on the allocations subjects made to the failing division. Subjects who could invest in alternative divisions allocated less to the failing division in the first, $F(1, 96) = 37.75, p < .001, \omega^2 = .269$, second, $F(1, 96) = 26.78, p < .001, \omega^2 = .205$, third, $F(1, 95) = 25.33, p < .001$, $\omega^2 = .197$, fourth, $F(1, 69) = 24.66, p < .001, \omega^2 = .242$, fifth, $F(1, 56) = 16.39, p < .001, \omega^2 = .201$, seventh, $F(1, 31) = 5.01$,

Table 1
Mean Allocations and Number of Subjects by Condition

Period and no. of subjects	Commitment and alternatives			
	Chose/ Three	Assigned/ Three	Chose/ None	Assigned/ None
Period 1	$4.88	$4.28	$11.04*	$ 8.25*
No.	24	25	27	24
Period 2	$4.63	$3.48	$ 9.11	$ 9.75
No.	24	25	27	24
Period 3	$4.25	$3.24	$10.31	$ 8.79
No.	24	25	27	24
Period 4	$4.07	$2.75	$10.00	$10.14
No.	14	20	17	22
Period 5	$4.75	$3.00	$10.08	$11.21
No.	12	16	13	19
Period 6	$6.27	$4.69	$ 7.70	$ 8.29
No.	11	13	10	14
Period 7	$7.70	$3.30	$10.00	$10.45
No.	10	10	4	11
Period 8	$5.89	$3.90	$ 6.25	$ 9.22
No.	9	10	4	9
Period 9	$6.50	$1.38	$10.33	$13.50
No.	8	8	3	8
Period 10	$5.43	$1.25	$10.00	$12.00
No.	7	8	2	6

* Contrast significant beyond the .05 level.

$p < .05, \omega^2 = .100$, ninth, $F(1, 23) = 10.73, p < .01, \omega^2 = .258$, and tenth, $F(1, 19) = 9.19, p < \omega^2 = .254$ periods, as well as the total allocation $F(1, 99) = 22.64, p < .0001, \omega^2 = .178$. The question posed in this study, however, was whether investment alternatives limit the escalation effect. Planned contrasts were used to test whether the escalation effect differed for high- and low-alternative subjects. The results showed that subjects who had personally chosen the failing division invested significantly more money than subjects who did not choose the division, but only when alternative investments were not available $t(98) = 2.40, p < .025, \omega^2 = .086$. Choice had no effect in the two high-alternative conditions $t(98) = -0.50$. The means ($20 possible) were as follows: high-choice/no-alternatives = $11.04, low-choice/ no alternatives = $8.23, high-choice/alternatives = $4.88, and low-choice/alternatives = $4.28 (see Table 1). Consistent with the choice main effect, however, this analysis showed no escalation after the first supplemental investment. In fact, analyses of the total allocations showed that the high-choice/no-alternatives subjects ($M = \$48.37$) allocated less $t(98) = -1.92, p < .10, \omega^2 = .050$, in total, than the low-choice/no-alternative subjects ($M = \$65.5$). This latter finding suggests a tendency toward a "reverse" escalation effect. Clearly, though, the presence of alternative investments limited the escalation effect during the first allocation.

Differences in quit rates were tested using a statistical procedure called survival analysis (Mann, Schafer, & Singpurwalla, 1974). Medical researchers have used survival analysis to test whether a drug or other treatment enables subjects in one group to survive longer than the subjects in another group. Within escalation, the question would be whether subjects in the high-choice (high-commitment) groups funded the division longer than subjects in the low-choice (low-commitment) groups. Analysis of the data in this study revealed that there was a significant

Table 2
Hazard Rates for Each Condition by Period

Period	Commitment and alternatives			
	Chose/ Three	Assigned/ Three	Chose/ None	Assigned/ None
0	8.3	0.0	3.7	0.0
1	0.0	0.0	0.0	0.0
2	9.1	4.0	38.5	0.0
3	40.0	29.2	37.5	8.3
4	16.7	5.9	30.0	22.7
5	10.0	25.0	42.9	23.5
6	11.1	25.0	0.0	15.4
7	12.5	33.3	50.0	9.1
8	14.3	50.0	0.0	10.0
9	50.0	0.0	100.0	22.2

Note. Figures are percentages.

difference in the number of periods that high- and low-choice groups funded the failing division for the total sample, χ^2 (1, $N = 100$) = 8.02, $p < .01$. Contrary to a commitment perspective, however, the high-choice groups funded the failing company for a shorter time than the low-choice groups. Separate analyses of the high- and low-alternative data showed no significant difference between the survival patterns of the two high-alternative conditions. The low-alternative conditions were entirely responsible for the difference in the overall survival functions χ^2 (1, $N = 100$) = 9.50, $p < .01$. Thus, although the two low-alternative groups exhibited escalation, the high-choice subjects did not stick with their investment as long as the low-choice subjects.

In survival analysis, the "hazard rate" reveals the percentage of subjects who begin a particular period but quit before the next one. Sometimes inferences can be drawn from the pattern of the hazard rate over time. The escalating commitment perspective suggested that the hazard rate would start out high but then decrease, whereas the attributional perspective suggested just the opposite. Table 2 displays the hazard rates for each of the four groups within this study. The two low-alternative conditions show that the hazard rate started out low and then rose. Within the high-choice group, the hazard rate continued to increase until *all* of those subjects had quit. The hazard rate did not rise as clearly within the low-alternative group, but it did increase over time. The low-alternative group's high hazard rate in the last period suggests that the lower rates observed in Periods 6 through 8 did not reflect escalating commitment.

Discussion

The findings of this study clearly showed that the escalation effect, defined by a difference between the allocations of high- and low-choice subjects, was limited to the initial stages of continuing investment. The findings were consistent with previous research (Staw & Fox, 1977) and support the contention that investment in failing projects involves two stages. Clearly, too, the availability of alternative investments limited the escalation effect. When subjects were given alternatives to the failing investment, the difference between the investments of the high- and low-choice groups disappeared. The results showed, as well,

that high-choice subjects who displayed the escalation effect quit funding the failing investment sooner than comparable low-choice subjects, contrary to a commitment perspective. Similarly, the declining hazard rates observed here support a learning model more than they support the self-justification model.

The most important conclusion of this study would have to be that escalation is more limited than we previously have recognized. Staw and Fox (1977) found that escalation disappeared after one allocation, and the present study confirmed that result. Entrapment research has suggested there are two stages in that process, and the similarity of entrapment and escalation suggested that the same should be true of escalation. The attribution model developed here suggests that uncertainty plays an important role in escalation, and that escalation should be largely restricted to the earliest investments. Repeated observations should therefore help to resolve investor uncertainties and bring on de-escalation. The present results indicate that de-escalation can quickly supplant escalation.

The availability of alternative investments also clearly limited escalation. Although this, of course, suggests that escalation may not occur in some settings, it also has important theoretical and methodological implications. Alternative investments may make costs more salient or allow comparisons of performance that help to specify the causes of an investment's setback. Either of these explanations would be consistent with an attributional perspective. Alternatives, however, are also an important factor in irrevocability, an important determinant of commitment (Kiesler, 1971; Salancik, 1977). Thus, self-justification theory could also incorporate this finding. By exploring the role of alternatives, future research may clarify the theoretical mechanism underlying escalation. At the same time, however, this finding suggests that studies of escalation must carefully define the investment context. Some authors (e.g., Northcraft & Wolf, 1984) have suggested that investors react differently to cost overruns than they react to revenue shortfalls, yet many escalation experiments do not clearly specify whether setbacks result from higher than expected costs or from lower than expected revenues. Clearly, if investors are sensitive to uncertainty, as the attributional model suggests, researchers must consider how subjects may respond to an inadequately specified investment context.

At this point, it would seem that the empirical evidence does not support the escalating commitment perspective. If commitment plays an important role in escalation, high-commitment subjects should not stop funding their investment before low-commitment subjects, as they did in this study. Staw and Fox (1977) have noted that low-commitment subjects may become committed through their first investment. But there would be no reason to expect low-commitment subjects to develop *more* commitment through their investments than high-commitment subjects develop as they invest, yet low-choice subjects in this experiment clearly funded the investment longer. Furthermore, a commitment process should also cause hazard rates to decline over time, yet the hazard rates for subjects who exhibited escalation in this study rose. These findings suggest that the escalation effect disappears not because low-choice subjects increase their commitment but because they de-escalate involvement more slowly.

Advocates of the self-justification view of escalation should also be concerned by the low percentage of variance that choice

accounts for. In this experiment, omega squared for choice, in the low-alternatives condition (for the first period) was about 8.5%. Although that adds significantly to the variance explained, it is a disappointing contribution when the alternatives variable explained more than 25% of the variance. Nor does the 8.5% seem out of line with previously published studies. As such, we should ask whether a key variable in a theoretical framework should not explain more. Choice appears to have significant effect on allocations, but that effect is moderated by the presence of alternative investments and does not account for a large percentage of the variance when it does occur. Admittedly, the self-justification perspective may be heavily handicapped by studying escalation in a laboratory. To date, however, the only empirical support for the self-justification view of escalation has come from laboratory studies (e.g., Staw, 1974). The low variance explained and the other evidence presented here suggest that the self-justification perspective may not be the most appropriate theoretical view.

The clearest recommendation for escalation research, therefore, is that alternative theoretical formulations should be aggressively pursued. The evidence in favor of self-justification is not overwhelming, nor does that view give many leads for exploring the possibility that there are multiple stages in the process of continuing investment. Although some researchers have considered alternative formulations of escalation (Conlon & Wolf, 1980; Northcraft & Wolf, 1984), the range of theoretical alternatives has certainly not been exhausted. This article has explored an attributional formulation, and other views should be considered. At this point, the development of new perspectives and the exploration of new variables may be vital to understanding escalation.

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