

December 2003

Information Technology Project Escalation: Effects of Decision Unit and Guidance

Ranida Boonthanom
Florida State University

Follow this and additional works at: <http://aisel.aisnet.org/icis2003>

Recommended Citation

Boonthanom, Ranida, "Information Technology Project Escalation: Effects of Decision Unit and Guidance" (2003). *ICIS 2003 Proceedings*. 32.
<http://aisel.aisnet.org/icis2003/32>

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICIS 2003 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

INFORMATION TECHNOLOGY PROJECT ESCALATION: EFFECTS OF DECISION UNIT AND GUIDANCE

Ranida Boonthanom
College of Business
Florida State University
Tallahassee, FL USA
rrb3311@garnet.acns.fsu.edu

Abstract

This study investigates the escalation of commitment of IT project development. A two-phase 2×2×2×2 laboratory experiment was conducted to examine the impact of sunk cost (low vs. high), percentage of project completion (low vs. high), de-escalation strategy (presence vs. absence), and decision unit (individual vs. group) on the escalation behavior. The results indicated that both project factors, e.g., sunk cost and percentage of project completion, have significant influences on the escalation of commitment. Groups, in general, exhibited higher escalation behavior than individual decision makers. In addition, providing explicit decision guidance was able to attenuate the behavior, especially at the individual level. The study concludes with limitations and implications for future research.

Keywords: IT Project escalation, individual, group, decision guidance, de-escalation strategy, experiments

Introduction

Picture yourself as the manager of a significant information system development project, which was initially expected to yield substantial benefits to your company. However, unanticipated problems have caused the project to run behind schedule and the costs of development are likely to exceed the budget. As a manager directly responsible for the project, what would you do? What would you decide between continuing to invest in the project or suspending the project and abandoning the previous investment?

Regardless of negative feedback during development, many projects of this type continue to consume the valuable resources of organizations, including money, time, and effort. This management scenario, termed escalation of commitment, has received attention from researchers for the past several years. Survey results indicate that between 30 percent and 40 percent of all information technology projects exhibit some degree of escalation (Keil et al. 2000a). To address the issue, this study investigates (1) whether project factors (e.g., sunk costs and percentage of project completion) influence management decisions to escalate their commitment; (2) whether the unit of decision maker, individual vs. group, differently affects the escalation behavior; and (3) if decision guidance can de-escalate the decision. Specifically, escalation behavior will be studied separately for individuals and groups under manipulated situations to investigate the influence of project factors on managers' decisions. Then, individual and group decisions are compared because, although the decision to continue or terminate a project is usually made by an individual, it frequently involves many people either as members of the project team, as project consultants, or as outside stakeholders. Further, decision guidance is proposed as a potential de-escalation strategy, and it is tested at both levels of decision making.

The paper is organized as follows. The next section presents the theoretical background of escalation behavior and reviews previous research, including escalation of IT projects. A research model and hypotheses are developed in the third section, followed by a description of the research methodology. The results of the experiment are then discussed followed by conclusions and implications for future research.

Theoretical Background

Escalation of Commitment

Individuals or organizations demonstrate escalation behavior when they become overly committed to losing courses of action and, as a result, continue investing substantial amounts of valuable resources, including money and time, regardless of negative feedback information (Staw 1976). This phenomenon is seen to be a nonrational decision because sunk costs, or costs incurred from a previous decision that cannot be recovered, are irrelevant to and should be omitted from subsequent decisions. However, many empirical studies confirm that sunk costs are one of the significant factors influencing escalation behavior.

Determinants of escalation are laid down by Staw and Ross (1989). Four factors influencing escalation behavior are project, psychological, social, and organizational factors. Focusing on the project factor, five variables leading to escalation are project history, problems with the project, profits, expenses, and efficacy (Hollar et al. 2000).

The evidence of escalation behavior has been repeatedly found in broad domains of study, indicating robustness of the phenomenon across disciplines such as psychology (Moon 2001; Schoorman and Holahan 1996), management (Brockner 1992; Conlon 1999), accounting (Brody and Kaplan 1996), and information systems (Keil 1995; Keil et al. 2000a; Keil et al. 2000b; Keil et al. 1995; Montealegre and Keil 2000; Newman and Sabherwal 1996). Escalation behavior is also recognized in all levels of decision unit including individuals (Keil et al. 2000b), groups (Street and Anthony 1997; Whyte 1993), and organizations (Conlon 1999; Debondt and Makhija 1988). The regularly employed research techniques to study escalation behavior are lab experiments (Keil et al. 2000b; Keil et al. 1995) and case studies (Keil 1995; Montealegre and Keil 2000). Subjects include students (Keil et al. 2000b; Moon 2001), business professionals (Brody and Kaplan 1996; Staw et al. 1997), and nonprofit administrators (Hollar et al. 2000). Results from both cross-sectional (Moon 2001; Schoorman and Holahan 1996) and longitudinal studies (Montealegre and Keil 2000; Newman and Sabherwal 1996; Staw et al. 1997) indicate that escalation behavior occurs in a variety of decision time frames.

De-escalating Strategies

Following Montealegre and Keil (2000), this paper defines de-escalation as “a reduction of commitment to a failing course of action” (p. 418). In a study by Simonson and Staw (1992), two de-escalation techniques are proposed, and the selected strategies are empirically tested. The first technique involves self- and external-justification reduction. Justification research indicates that when decision makers receive negative feedback, they tend to be more persistent, and, as a result, increase their commitment in order to justify an ineffective course of action. De-escalation strategies that reduce the concern regarding self- or external-justification, therefore, may lead to lower levels of escalation behavior. The second de-escalating technique is to provide external stimuli promoting normative decision making. Examples of the strategies include providing explicit data about the rate of return on additional investment for both current and alternative courses of action, providing decision makers a training session regarding normative strategies, and establishing procedures to ensure a thorough evaluation of alternatives.

The study also investigated two mixed strategies, namely self-diagnosticity and accountability (Simonson and Staw 1992). They are perceived as mixed strategies because both encourage a more accurate decision-making approach leading to de-escalation, and, at the same time, increase justification leading to escalation. Their empirical results indicate that the most effective de-escalation strategy is to make the negative outcomes of a failure less threatening (reduce self-justification). The other two strategies include setting minimum target levels that, if not achieved, would lead to a change in policy, and evaluating decision makers' performance on the basis of their decision process rather than outcome.

IS Research in Escalation of Commitment

Given the relatively high cost of IT development projects, escalation of commitment also influences managers' decisions regarding whether or not to continue the project. Selected influential IS research regarding escalation of commitment includes, but is not limited to, a case study by Keil (1995) investigating the escalation of commitment in an IT project over the 14-year period, an experiment by Keil et al. (1995) examining the joint impact of sunk cost and percentage of project completion, and another lab experiment by Keil et al. (2000b) studying the moderating effect of situational (level of sunk cost) and cross-cultural individual factors (risk propensity and risk perception) on escalation behavior.

Research Model and Hypotheses

This study investigates the influence of the project factors on an escalating decision and the impact of a de-escalating strategy. Two variables associated with the project factors (i.e., project expense and efficacy) are selected as they have a direct impact on the escalating decision (Keil et al. 1995; Moon 2001). The amount of previous investment or sunk cost serves as a proxy for project expenses, and the percentage of project completion is a proxy for efficacy.¹ Based on previous studies (Keil et al. 1995; Moon 2001), both sunk cost and percentage of completion are positively related to escalation behavior. On the other hand, a de-escalation strategy (i.e., decisional guidance) is negatively related to escalation (Simonson and Staw 1992).

In addition, this study examines escalation behavior at two levels of decision making, individual and group. A study by Bazerman et al. (1984) indicates that both individuals and groups demonstrate similar patterns of escalation. However, the degree of escalation is expected to be stronger when the decision is made by groups. Figure 1 presents the research model for the current study.

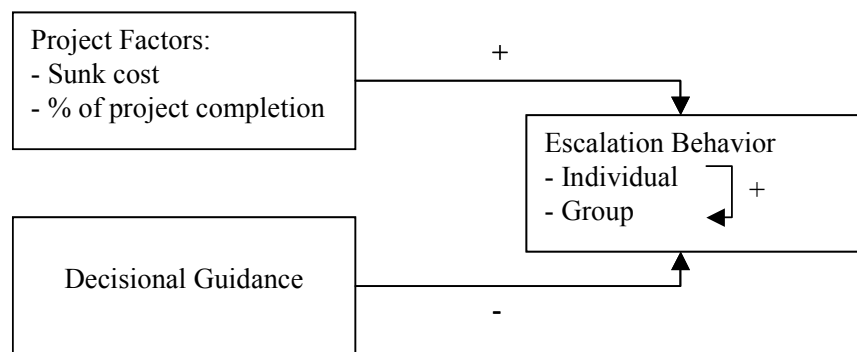


Figure 1. Research Model

Escalation of Commitment in Individual Decision Making

Many escalation studies, especially ones conducted in laboratory settings, focus on escalating decisions of individual decision makers (Keil et al. 2000b; Keil et al. 1995). In addition to the determinants of escalation previously discussed, at least two psychological frameworks are widely accepted as major explanations to the escalation of commitment decision: sunk cost effect and completion effect.

Sunk cost effects, initially documented by Arkes and Blumer (1985), state that the higher the level of previous investments, the more likely an individual will be to continue investing in the project. This phenomenon is in fact contrary to normative decision-making strategy in which prior investment is not relevant and should be ignored when making subsequent decisions. Completion effects, found in a study by Conlon and Garland (1993), assert that “motivation to achieve a goal increases as the individual gets closer to that goal” (p. 403). Consequently, the higher the percentage of project completion, the greater the tendency that individuals will engage in escalation behavior. Conlon and Garland (1993) also found that in some situations, degree of project completion may dominate the sunk cost effects. Therefore, the first hypothesis in an alternate form is

H1: Individuals will exhibit more escalation behavior given (a) high level of sunk cost and (b) high percentage of project completion.

Moon (2001) suggests that sunk cost and completion effects are both independent and interactive. Specifically, he found that sunk costs demonstrate a curvilinear influence on commitment and also moderate the completion effect. However, due to a limited

¹One of the factors influencing decisions to continue the project is whether further investment is likely to be efficacious (Bateman 1986; Staw and Fox 1977; Staw and Ross 1989). Since project progression, in conjunction with the project cost, is most always used in the analysis of investment, this study employs the percentage of project completion as a proxy for efficacy.

number of empirical studies regarding the joint effects, this study takes an exploratory position. In particular, both sunk cost and completion effects are hypothesized to have equal impacts on the decision.

H2: Individuals will exhibit a relatively equal level of escalation behavior given either (a) high sunk cost and low percentage of project completion or (b) low sunk cost and high percentage of project completion.

Escalation of Commitment in Group Decision Making

Compared to individual decisions, group decisions are relatively complicated due to interactions among members. Bazerman, et al. (1984) found that escalation behavior occurs for both individuals and groups. Escalation of commitment in an individual was driven by a cognitive dissonance or self-justification. Similarly, “groups should exhibit escalation patterns similar to individuals to the extent that the group as a unit experiences dissonance” (Bazerman et al. 1984, p. 143). Taking together the effects of sunk cost and percentage of project completion previously described, hypotheses three (alternate form) and four are

H3: Groups will exhibit more escalation behavior given (a) higher level of sunk cost and (b) higher percentage of project completion.

H4: Groups will exhibit a relatively equal level of escalation behavior given either (a) high sunk cost and low percentage of project completion or (b) low sunk cost and high percentage of project completion.

Individual vs. Group Escalation Behavior

Several studies examine individual versus group decisions involving escalation of commitment. Whyte (1993) investigates the phenomena in individual and group decision making based on a prospect-theory approach. Using six decision scenarios, he found that escalating commitment occurred in both individual and group decisions. Specifically, groups tend to escalate their commitment more often than individuals and in relatively higher amounts. Besides, a recent study by Seibert and Goltz (2001) comparing allocation decisions between individuals and interacting three-person groups concludes that groups escalate their investments more than individuals.

Bazerman et al. (1984) noted that two streams of research, namely risky-shift and groupthink, have made significant contributions to the degree of escalation behavior in groups relative to individuals. The risky-shift research concludes that groups make riskier decisions than the mean of decisions made by individuals (Vinokur 1971). Escalation of investment is considered to be risk-seeking: risking a bigger loss to compensate for an initial loss. Therefore, according to the risky-shift literature, groups will be more risk-seeking and will escalate their decisions more than individuals. In addition, the groupthink (Janis 1972) paradigm theorized that in order to maintain a group’s unanimity, members tend to stay committed to the group’s decision and abandon rational decisions that deviate from group consensus. Therefore, based on the notions of risky-shift and groupthink, and supporting results from the previous literature, the fifth alternate hypothesis is

H5: Groups will exhibit more escalation behavior than individuals on average given the same information regarding sunk cost and percentage of project completion.

De-escalation Strategies

A de-escalation technique proposed by Simonson and Staw (1992) will be examined in this study. In particular, by providing external stimuli promoting normative decision making, or decisional guidance, both individuals and groups are expected to express less escalation behavior. In addition, Tan and Yates (1995) found that instructions regarding normative economic principles effectively reduced the sunk cost effects. Examples of the strategies include providing explicit procedures for decision making and encouraging decision makers to thoroughly examine the alternatives.

Decisional guidance is the selected de-escalation strategy for this study. The term decisional guidance was proposed by Silver (1990) in the context of decision support systems. Decisional guidance is used to guide information system users to make a better decision given a number of decision alternatives. Analogous to the decision regarding whether or not to escalate the commitment,

decisional guidance is expected to direct decision makers toward normative decisions. Further, in contrast to the study by Keil et al. (1995) in which alternatives are explicitly stated, decision makers in this study are instructed and encouraged to creatively think of alternative courses of actions.

The presence of decisional guidance is hypothesized to reduce the escalation behavior in both individuals and groups. However, based on limited theoretical support, comparing escalating behavior between individuals and groups will be investigated using an exploratory approach. Therefore, the sixth hypothesis states that

H6a: On average, individuals without decisional guidance will exhibit more escalation behavior than individuals receiving decisional guidance.

H6b: On average, groups without decisional guidance will exhibit more escalation behavior than groups receiving decisional guidance.

Research Method

A laboratory experiment is the selected research methodology for this study. Subjects' participation was voluntary and they were informed only that the experiment was about business decision-making. A decision scenario taken from Keil, et al. (1995) was modified to reflect two levels of sunk costs (SC; low at 25 percent of the budget vs. high at 75 percent), two levels of project completion (CMPLT; low at 25 percent vs. high at 75 percent), and two modes of decisional guidance (GUIDE; presence vs. absence of an additional paragraph at the end of the case describing normative decision making).² In addition, the experiment was divided into two phases to account for the two levels of decision unit (UNIT; individual vs. group). The experimental design results in 16 experimental treatments (eight for each phase).

Subjects in the first phase were 474 individual business students who assumed the role of the president of a small software company. Each student received an instrument randomly assigned to one of the eight treatments. They were asked to read the case scenario and response to the attached questionnaire. The second phase consisted of 427 students forming into 111 groups with the median of four people in each group. Each group was asked to assume the role of a group of executives responsible for the development of the project. They received one instrument set and provided a group response after a 10-minute discussion. The second phase was scheduled between two to four weeks after the first one. The average age of the subjects was 22 years. Subjects had approximately two years of working experience. Demographic information for the subjects is summarized in Table 1.

After reading the case, subjects were asked to decide whether or not to continue the project. The dependent variable is the percentage probability that the participant, assuming the role of either a president or a group of executives, will continue with the project (0% = definitely would not continue; 100% = definitely would continue). The controlled variable is a perception of success indicating the subject's belief regarding the outcome of the project (OUTCOME; 0 = Fail; 10 = Success). As suggested by Heath (1995) and by Moon (2001), this variable plays a significant role in examining the escalating behavior beyond that affected by project successfulness.³

²The dichotomous variables (low/high level of the manipulated variables) were chosen in this study since results from Keil et al. (1995) showed an upward trend (e.g., positively linear relationships) between dependent and independent variables. Using non-dichotomous variables not only dramatically increases the number of subjects required to achieve a desired level of statistical power, but also provides similar information to a study using dichotomous variables.

³Psychological, social, and organizational factors are also found to influence the escalation of commitment (Staw and Ross 1989). In the current study, the selected research method (i.e., laboratory experiment) provides partial controls for such factors. For example, psychological factors are found to have significant impacts when the situations are described differently (e.g., positive vs. negative framing). The case in this study was identically described with only variations in the manipulated variables; therefore, psychological impact seems to be significantly minimized.

Table 1. Demographic Information

	Phase 1	Phase 2
N	474 students	111 groups (427 students)
Class	Junior 29% Senior 69% Other 1%	Junior 13% Senior 63% Mixed 24%
Gender	Male 60% Female 40%	Male 55% Female 45%

Results

ANCOVA is the primary statistical technique as subject's perception regarding the project successfulness (OUTCOME) serves as a covariate. Manipulation and preliminary analyses were conducted by comparing related mean scores. Both parametric (two-tailed *t*-test) and nonparametric (Wilcoxon Rank Sum test) statistical procedures were utilized yielding highly consistent outcomes and, as a result, only *t*-test results are reported.

One objective of the study is to investigate the effect of two project factors and a decision guide on escalation behavior. Therefore, data was separately analyzed for individual and group levels with three independent variables, i.e. previous investment (SUNKCOST or SC), project completion (CMPLT), and decision guide (GUIDE). A full ANCOVA model comparing all of the variables between individual and group treatment (UNIT) is also conducted and the results are discussed.

Manipulation Checks

Table 2 presents mean scores for the manipulation check questions with corresponding *p*-values. Low and high treatments for both sunk cost and project completion were set at 25 percent and 75 percent of the budgeted cost, respectively. Both individual and group subjects were asked to indicate the level of amount spent to date relative to the budget (i.e., sunk cost) and the level of the project completion by choosing from one of the five choices, 0 percent, 25 percent, 50 percent, 75 percent, 100 percent. Individual subjects' responses to manipulation checks indicated the low and high level of sunk cost (project completion) of 28.92 percent (29.89 percent) and 71.73 percent (69.96 percent), respectively (*p*-value < .001). Similarly, group subjects indicated the low and high level of sunk cost (project completion) of 25.00 percent (25.00 percent) and 75.45 percent (71.43 percent), respectively (*p*-value < .001).

Regarding the decision guide, subjects were required to indicate whether or not the case provided a decision guide on a scale of 0 to 10 where 0, 5, and 10 were labeled no, not sure, and yes, respectively. Individual subjects whose case included (or did not include) the decision guide reported an average score of 5.48 (4.92) with *p*-value = .036. However, group subjects whose case included (or did not include) the decision guide reported an average score of 4.98 (4.45) with *p*-value = .370.

Table 2. Manipulation Check Results

Independent Variable	Phase 1 (Individual)			Phase 2 (Group)		
	Mean		<i>p</i> -value	Mean		<i>p</i> -value
	Low/No	High/Yes		Low/No	High/Yes	
Sunk Cost	28.92	71.73	<.001	25.00	75.45	<.001
Project Completion	29.89	69.96	<.001	25.00	71.43	<.001
Decision Guide	4.92	5.48	.036	4.45	4.98	.370

Notes:

1. For both sunk cost and project completion, Low and High treatment are anchored at 25%, and 75%, respectively. Subjects choose one answer of the 0%, 25%, 50%, 75%, and 100%.
2. For the decision guide, Subjects indicate on a scale of 0-10 of how like the case provide the decision guide where 0 = No, 5 = Not sure, and 10 = Yes.

One explanation for the unfavorable manipulation results from group treatment regarding decision guide is that group members tend to share information in order to make a final decision. Because, during phase 1, half of the subjects were assigned to the experimental treatments with the decision guide, they may have been reminded of the normative decision strategy. If they also participated in phase 2, they may share the information regarding the previously seen decision guide with their group members and, as a result, subjects may consider the decision guide information coming from the group members rather than the case. This potential group dynamic has a significant impact on the manipulation check regarding the decision guide in which subjects were uncertain about whether or not the case actually provided the decision guide. The effect of information sharing among group members on escalation behavior will be further examined.

Preliminary Analysis

A preliminary analysis of the result is conducted by comparing the mean of the percentage probability that the participants will continue with the project. Table 3 summarizes the results along with the sample size, mean, and standard deviation.

Results from Table 3 reveal two interesting patterns regarding escalation behavior. First, both individual and group subjects escalate their commitment when the project completion is high but de-escalate when the completion is low. Second, except for the low sunk cost with high completion treatment, individuals receiving no decision guide tend to escalate their investment more than those receiving decision guide. For group treatment, however, results are in the opposite direction. When working in groups, subjects indicate lower escalation behavior without the decision guide. These results imply potential interactions among variables and therefore data is further analyzed using ANCOVA in the next section.

Table 3. Preliminary Analysis

Sunk Cost	% Project Completion	Decision Guide	Phase 1 (Individual)			Phase 2 (Group)			<i>p</i> -value
			N	Mean	SD	N	Mean	SD	
High	High	Yes	59	64.92	20.79	14	77.14	18.58	.048
		No	60	68.33	23.66	14	63.57	23.07	.498
	Low	Yes	60	44.67	26.77	14	37.14	32.68	.367
		No	59	53.31	24.52	13	23.08	18.43	<.001
Low	High	Yes	60	54.17	24.38	14	67.14	25.25	.079
		No	59	52.54	23.53	14	63.57	37.75	.169
	Low	Yes	60	48.33	26.69	14	57.86	24.55	.227
		No	57	55.26	24.72	14	56.43	31.04	.881

Note: Dependent variable: Percent to continue

ANCOVA

ANCOVA results are summarized in Table 4. Subject's perception regarding outcome of the project serves as a covariate (OUTCOME) and the results are significant at all levels of analysis. This confirms the importance of the perception of project successfulness as a control variable to study escalation behavior as suggested by Heath (1995) and by Moon (2001).

Individual Escalation Behavior

Panel A of Table 4 presents the results from individual subjects (Phase 1). Contrary to the prediction, there is a significant interaction effect between sunk cost and project completion (p -value = .007). Therefore, hypotheses 1 and 2 are not supported. Hypothesis 6a predicting the effect of decision guide as a de-escalation strategy is also not supported. Although results are insignificant statistically (p -value = .235), they are in the predicted direction, i.e., individuals without a decision guide, on average, exhibit more escalation behavior than individuals receiving a decisional guide.

The interaction effect between sunk cost and project completion is further analyzed and the results are graphically shown in Figure 2. Figures 2a and 2b indicate the same pattern of the interaction effect, with and without decision guide, respectively. In

Table 4. ANCOVA Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Panel A: Phase 1 – Individual Treatment (Adjusted R Squared = .532)					
Corrected Model	164522.001	8	20565.250	68.166	.000
Intercept	9936.446	1	9936.446	32.936	.000
OUTCOME	138425.359	1	138425.359	458.827	.000
SUNKCOST (SC)	2544.483	1	2544.483	8.434	.004
CMPLT	850.372	1	850.372	2.819	.094
GUIDE	426.874	1	426.874	1.415	.235
SC * CMPLT	2207.547	1	2207.547	7.317	.007
SC * GUIDE	35.557	1	35.557	.118	.732
CMPLT * GUIDE	710.424	1	710.424	2.355	.126
SC * CMPLT * GUIDE	13.958	1	13.958	.046	.830
Panel B: Phase 2 – Group Treatment (Adjusted R Squared = .698)					
Corrected Model	75807.865	8	9475.983	32.822	.000
Intercept	422.699	1	422.699	1.464	.229
OUTCOME	47086.075	1	47086.075	163.094	.000
SUNKCOST (SC)	170.553	1	170.553	.591	.444
CMPLT	2288.702	1	2288.702	7.927	.006
GUIDE	79.254	1	79.254	.275	.601
SC * CMPLT	149.085	1	149.085	.516	.474
SC * GUIDE	1364.013	1	1364.013	4.725	.032
CMPLT * GUIDE	552.389	1	552.389	1.913	.170
SC * CMPLT * GUIDE	153.713	1	153.713	.532	.467

Note: Dependent variable: Percent to continue

particular, for the high project completion (solid lines), subjects tend to escalate more when sunk cost is high than when it is low (p -value = .011 and <.001, with and without decision guide, respectively). For the low project completion (dashed lines), on the other hand, the percentage probability to continue the project is not statistically different across the levels of sunk cost (p -value = .454 and .669, with and without decision guide, respectively).

The simple main effect, although not a primary concern here, is further analyzed and the result is presented in Figures 2c and 2d. For the low sunk cost (Figure 2c), whether or not subjects receive the decision guide, their patterns of escalation behavior are not statistically different (p -value = .214 and .545, with and without decision guide, respectively). These results are also robust across different levels of project completion in which subjects exhibit a relatively consistent level of escalation behavior (p -value = .148 and .712 for low and high completion, respectively). For the high sunk cost (Figure 2d), however, subjects significantly escalate their investment more when the level of completion is high than when it is low (p -value < .001 and = .001, with and without decision guide, respectively), regardless of the decision guide (p -value = .405 and = .069 for low and high completion, respectively).

Group Escalation Behavior

ANCOVA results from the group subjects are presented in Panel B of Table 4. There is an unexpected significant interaction effect between sunk cost and decision guide (p -value = .032). Therefore, hypotheses 3a and 4 are not supported. The simple main effect for project completion strongly supported hypothesis 3b (p -value = .006) predicting a positive relationship between higher level of project completion and escalation behavior. Regarding the decision guide, groups given a decision guide exhibited more escalation behavior than those without a guide. As a result, hypothesis 6b is not supported.

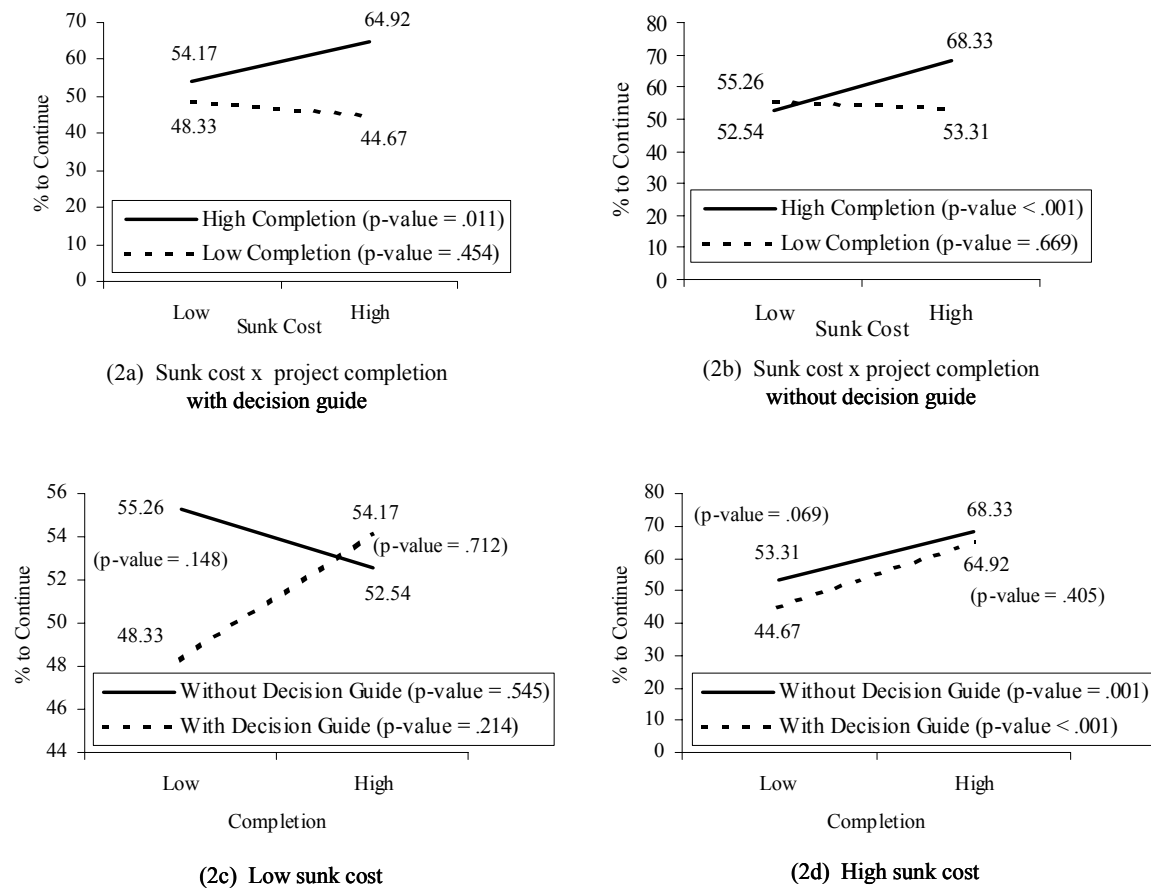


Figure 2. Individual Results (Phase 1)

Due to the unsuccessful manipulations of decision guidance in the group treatments, further investigations about the group escalation behavior and the comparison between individual and group escalation behavior (Hypothesis 5) will not be conducted. Instead, a new group of subjects will be needed for this part and the issue will be further discussed in the next section.

Discussion and Conclusion

This paper attempts to provide a more complete picture of individual and group escalating decisions. Regarding individual escalation behavior, the sunk cost and project completion interactions found in this study were highly consistent with the moderation model suggested by Moon (2001) where escalating decision was evident solely under the high project completion group. He argues that, grounded on entrapment literature, there are two requirements for a person to feel “entrapped” in the situation described by Brockner et al. (1981) and, as a result, to exhibit escalation behavior: (1) substantial previous investment and (2) psychological pressure. While both conditions are satisfied under the high project completion group, psychological pressure under the low completion treatment was not as strong as that in the high completion treatment, prohibiting the escalation behavior. Specifically, under the low project completion, “attempts not to appear wasteful (Arkes and Blumer 1985) are offset by the realization that higher expenditures contrasted with low completion may be associated with budget problems (Heath 1995) or with being behind schedule” (Moon, 2001, p. 108).

Although the results regarding individual escalation behavior are consistent with those in the previous literature, this study could be recognized as a new contribution, as well as a triangulation for the research stream. Specifically, whereas Moon (2001) studied the escalation of commitment using the classic blank radar plane scenario introduced by Arkes and Blumer in 1985, the current study used the modified version of the Compusys Corporation (CONFIG project) case developed by Keil et al. in 1995.

The results concerning group escalation behavior found in this study also deserve further discussion as they are different and inconsistent with the individual findings. One possible explanation is the halo effect as a result of within-subject design for the decision unit. Whyte (1993) suggested that, in the context of escalation of commitment, group members “will be compelled to seek information from others in making their decision” (p. 435). In this study, each subject participated in the experiment twice with a two- to four-week gap between sessions, and they may have been assigned to a different treatment each time. Consequently, as also observed from the post-experiment discussion with the subjects, it is likely that, instead of ignoring the previous phase of the experiment, student subjects exhibited the halo effect in which individuals exchanged their information regarding the previous experiment and tried to figure out the “right” answer. Therefore, in order to provide a more meaningful interpretation of the findings, further investigation is needed with a completely different set of subjects.

This study is subject to several limitations. First, as discussed earlier, the internal validity regarding the group treatment is questionable due to the use of mixed factorial design, i.e., within-subject for the decision unit and between-subject for the others. Second, students did not turn in their responses before answering the manipulation check questions. Consequently, they had access to the scenario containing all of the information. Third, each variable was manipulated using only two levels (i.e., high/low for sunk cost and project completion, and yes/no for decision guide), prohibiting an analysis of a possible curvilinear relationship between sunk cost and project completion as suggested by Moon (2001). Finally, although consistent with several studies in the area (Keil et al. 2000b; Keil et al. 1995; Moon 2001), student subjects assuming the role of decision makers raises the question of external validity, i.e., generalizability of results to real-world problems.

Despite the large body of research regarding escalation behavior accumulated during the past two decades, this topic continues to receive consistent attention from researchers in various fields. Instead of examining each project factor (i.e., sunk cost and project completion) independently, these factors are manipulated jointly in this study. A decision guide is also tested as a de-escalation strategy providing satisfactory results for the individual level. The current study also compares the escalation behavior across decision units. However, because of several limitations, a comparison between individual and group escalating decisions, especially the effect of group dynamic and communication on group performance, needs further investigation.

References

- Arkes, H. R., and Blumer, C. “The Psychology of Sunk Cost,” *Organizational Behavior and Human Decision Processes* (35:1), 1985, pp. 124-140.
- Bateman, T. S. “The Escalation of Commitment in Sequential Decision-Making - Situational and Personal Moderators and Limiting Conditions,” *Decision Sciences* (17:1), 1986, pp. 33-49.
- Bazerman, M. H., Giuliano, T., and Appelman, A. “Escalation of Commitment in Individual and Group Decision-Making,” *Organizational Behavior and Human Performance* (33:2), 1984, pp. 141-152.
- Brockner, J. “The Escalation of Commitment to a Failing Course of Action: Toward Theoretical Progress,” *Academy of Management Review* (17:1), 1992, pp. 39-61.
- Brockner, J., Rubin, J. Z., and Lang, E. “Face-Saving and Entrapment,” *Journal of Experimental Social Psychology* (17:1), 1981, pp. 68-79.
- Brody, R. G., and Kaplan, S. E. “Escalation of Commitment among Internal Auditors,” *Auditing: A Journal of Practice and Theory* (15:1), 1996, pp. 1-15.
- Conlon, D. E. “Escalation in Decision-Making: The Tragedy of Taurus,” *Administrative Science Quarterly* (44:1), 1999, pp. 180-183.
- Conlon, D. E., and Garland, H. “The Role of Project Completion Information in Resource- Allocation Decisions,” *Academy of Management Journal* (36:2), 1993, pp. 402-413.
- Debondt, W. F. M., and Makhija, A. K. “Throwing Good Money after Bad: Nuclear-Power Plant Investment Decisions and the Relevance of Sunk Costs,” *Journal of Economic Behavior & Organization* (10:2), 1988, pp. 173-199.
- Heath, C. “Escalation and De-Escalation of Commitment in Response to Sunk Costs: The Role of Budgeting in Mental Accounting,” *Organizational Behavior and Human Decision Processes* (62:1), 1995, pp. 38-54.
- Hollar, D. W., Hattie, J., Goldman, B., and Lancaster, J. “Developing Assessment Procedures and Assessing Two Models of Escalation Behavior among Community College Administrators,” *Theory and Decision* (49:1), 2000, pp. 1-24.
- Janis, I. L. *Victims of Groupthink: A Psychological Study of Foreign Policy Decisions and Fiascoes*, Houghton Mifflin, Boston, 1972.
- Keil, M. “Pulling the Plug: Software Project Management and the Problem of Project Escalation,” *MIS Quarterly* (19:4), 1995, pp. 421-447.

- Keil, M., Mann, J., and Rai, A. "Why Software Projects Escalate: An Empirical Analysis and Test of Four Theoretical Models," *MIS Quarterly* (24:4), 2000a, pp. 631-664.
- Keil, M., Tan, B. C. Y., Wei, K. K., Saarinen, T., Tuunainen, V., and Wassenaar, A. "A Cross-Cultural Study on Escalation of Commitment Behavior in Software Projects," *MIS Quarterly* (24:2), 2000b, pp. 299-325.
- Keil, M., Truex, D. P., and Mixon, R. "The Effects of Sunk Cost and Project Completion on Information Technology Project Escalation," *IEEE Transactions on Engineering Management* (42:4), 1995, pp. 372-381.
- Montealegre, R., and Keil, M. "De-Escalating Information Technology Projects: Lessons from the Denver International Airport," *MIS Quarterly* (24:3), 2000, pp. 417-447.
- Moon, H. "Looking Forward and Looking Back: Integrating Completion and Sunk-Cost Effects Within an Escalation-of-Commitment Progress Decision," *Journal of Applied Psychology* (86:1), 2001, pp. 104-113.
- Newman, M., and Sabherwal, R. "Determinants of Commitment to Information Systems Development: A Longitudinal Investigation," *MIS Quarterly* (20:1), 1996, pp. 23-54.
- Schoorman, F. D., and Holahan, P. J. "Psychological Antecedents of Escalation Behavior: Effects of Choice, Responsibility, and Decision Consequences," *Journal of Applied Psychology* (81:6), 1996, pp. 786-794.
- Seibert, S. E., and Goltz, S. M. "Comparison of Allocations by Individuals and Interacting Groups in an Escalation of Commitment Situation," *Journal of Applied Social Psychology* (31:1), 2001, pp. 134-156.
- Silver, M. S. "Decision Support Systems: Directed and Nondirected Change," *Information Systems Research* (1:1), 1990, pp. 47-70.
- Simonson, I., and Staw, B. M. "Deescalation Strategies: A Comparison of Techniques for Reducing Commitment to Losing Courses of Action," *Journal of Applied Psychology* (77:4), 1992, pp. 419-426.
- Staw, B. M. "Knee-Deep in the Big Muddy: A Study of Escalating Commitment to a Chosen Course of Action," *Organizational Behavior and Human Performance* (16), 1976, pp. 27-44.
- Staw, B. M., Barsade, S. G., and Koput, K. W. "Escalation at the Credit Window: A Longitudinal Study of Bank Executives' Recognition and Write-Off of Problem Loans," *Journal of Applied Psychology* (82:1), 1997, pp. 130-142.
- Staw, B. M., and Fox, F. V. "Escalation: The Determinants of Commitment to a Chosen Course of Action," *Human Relations* (30:5), 1977, pp. 431-450.
- Staw, B. M., and Ross, J. "Understanding Behavior in Escalation Situations," *Science* (246), 1989, pp. 216-246.
- Street, M. D., and Anthony, W. P. "A Conceptual Framework Establishing the Relationship between Groupthink and Escalating Commitment Behavior," *Small Group Research* (28:2), 1997, pp. 267-293.
- Tan, H. T., and Yates, J. F. "Sunk Cost Effects - the Influences of Instruction and Future Return Estimates," *Organizational Behavior and Human Decision Processes* (63:3), 1995, pp. 311-319.
- Vinokur, A. "Review and Theoretical Analysis of the Effects of Group Processes Upon Individual and Group Decisions Involving Risk," *Psychological Bulletin* (76), 1971, pp. 234-250.
- Whyte, G. "Escalating Commitment in Individual and Group Decision-Making : A Prospect-Theory Approach," *Organizational Behavior and Human Decision Processes* (54:3), 1993, pp. 430-455.