A RETURN TO THE DYNAMICS OF ESCALATION AND WITHDRAWAL BEHAVIOR

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ABSTRACT

This paper reports the results of additional work on a model of *escalation* behavior since presentation of an early version of the model at the 1988 International Conference of the System Dynamics Society (Radzicki, Bowen, Kuller, and Guerrero, 1988). Here we propose that four variables: (1) the expected total benefits which will accrue if a project is completed; (2) the expected total costs which will be incurred if a project is completed; (3) the expected total benefits which will accrue only if a project is stopped; and, (4) the expected total costs which will be incurred only if a project is stopped; may be crucial to recommitment decisions in terms of a decision maker's perception of their interrelationships at any point in the evolution of a course of action.

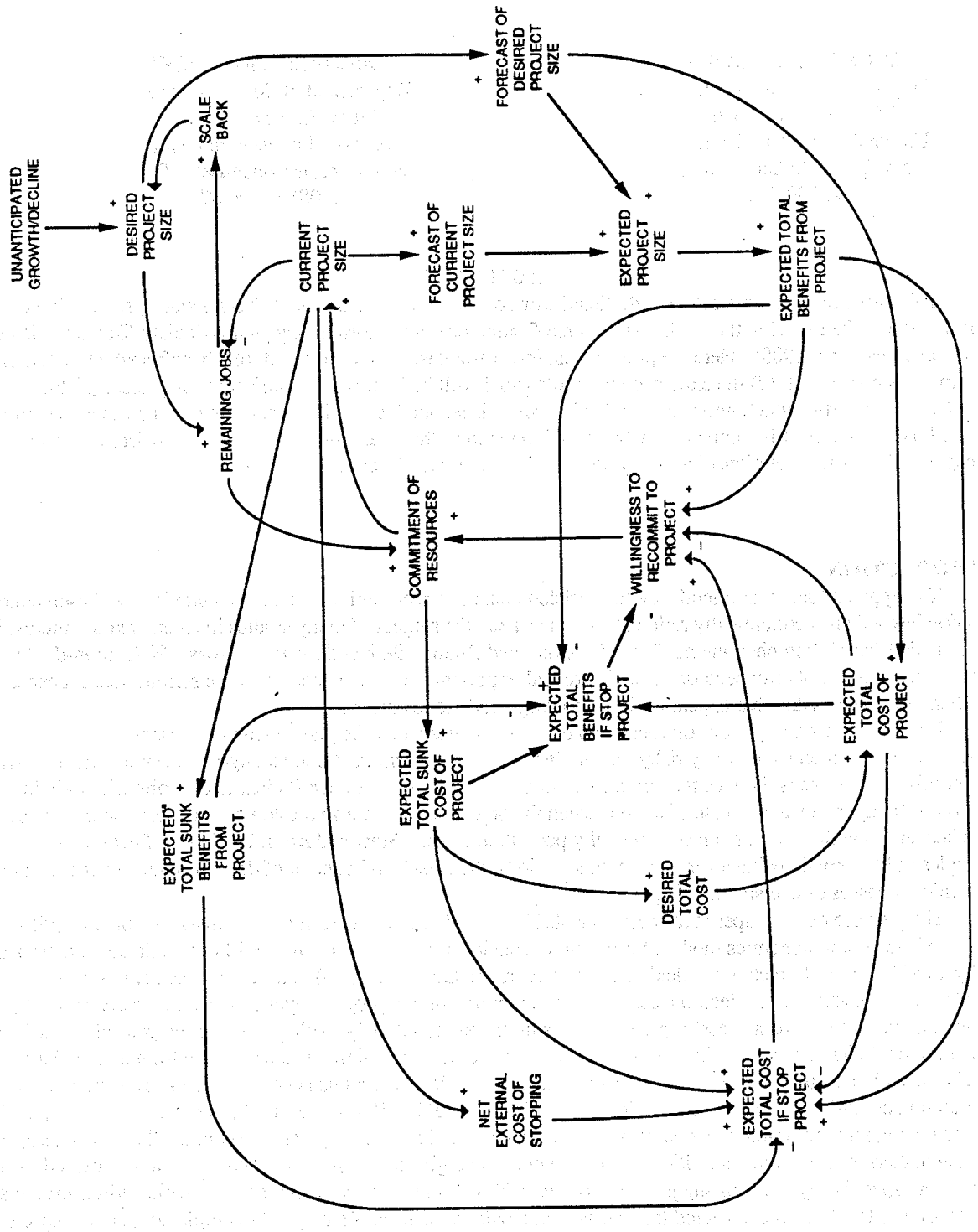
INTRODUCTION

The apparent behavioral tendency for decision makers to recommit resources to a previously chosen course of action beyond an "economically rational" point has been the subject of many studies in recent years. Interest in this so-called "escalation phenomenon" (see Brockner and Rubin, 1985; and Staw and Ross, 1987; for in-depth reviews) has grown not only because of its theoretical importance, but also because of the serious consequences that are often associated with what appears to be "throwing good money after bad."

Most of the scholarly work on escalation behavior suggests that the phenomenon represents an overcommitment, or an excessively risky recommitment, of some resource(s) to an ongoing course of action. At the core of this perspective is the idea that simple economic decision rules are insufficient to describe why individuals will so positively evaluate a course of action "when the objective facts are so bleak, nor why decision makers are so often hesitant to withdraw from an economically poor alternative." (Staw and Ross, 1987: 44) If economic principles fail to explain behavior in escalation situations, the behavioral content of decisions must override purely economic processes of decision making.

The purpose of this paper is to present an abridged version of the first of a set of insights from an updated version of the system dynamics model of escalation behavior first presented at the 1988 International Conference of the System Dynamics Society (Radzicki, Bowen, Kuller, and Guerrero, 1988); a model that can simulate the completion of a successful project, the escalation of commitment to a project beyond an economically rational point, and withdrawal from an unsuccessful project. The simulation model, only, perhaps, one of the possible models of recommitment behavior which might be built, is composed of a subset of the feedback loops from a much larger model (currently still being built) that is conceived as a simulation of what has been described as a prototypical case of escalating commitment, the recent World's Fair, EXPO 86, held at Vancouver, B.C., Canada. We will argue that, and show how, recommitment to a course of action can be a product of a project's evolving feedback structure, and, decision makers' sensemaking activities which both create and give meaning to the feedback that is received over time. More specifically, we will suggest how four variables: (1) the expected total benefits which will accrue if a project is completed; (2) the expected total costs which will be incurred if a project is completed; (3) the expected total benefits which will accrue only if a project is stopped; and, (4) the expected total costs which will be incurred only if a project is stopped; may be crucial to recommitment decisions in terms of a decision maker's perception of their interrelationships at any point in the evolution of a course of action. Further, with the aid of seven hypotheses, derived from the possible interactions of the four variables, we will also suggest how other previously identified escalation determinants might affect decisions to persist and withdraw. The paper concludes with some suggestions for profitable avenues of research.

FIGURE 1. Simplified Model of Recommitment Behavior



RESULTS OF THE MODELING PROCESS: FOUR KEY VARIABLES

Figure 1 is a summary drawing of the simulation model of recommitment behavior we have developed. While the model is made up of many variables and feedback loops, the results of the modeling process suggest that the dynamic relationships among four variables: (1) the *expected total benefits which will accrue if a project is completed*; (2) the *expected total costs which will be incurred if a project is completed*; (3) the *expected total benefits which will accrue if a project is stopped*; and, (4) the *expected total costs that will be incurred if a project is stopped*; are of primary importance to producing persistence or withdrawal. Complete formulas for these variables can be obtained by following the chain of definitions given in the complete code for the model (available from the authors). Each of the four variables is now discussed individually.

Expected total *benefits* which will accrue if a project is completed. This variable represents a decision maker's dynamic expectations about the total benefits that would accrue if a project is successfully completed. More specifically, these expectations refer to beliefs about the total value of the *tangible* (i.e., the financial value that can be "objectively" calculated using generally accepted frameworks) and *intangible* (i.e., the financial or other value that cannot be calculated using generally accepted frameworks) outcomes of a project[1] --both by themselves and as they interrelate.

The expected benefits from completing a project can be financial and/or not financial. They might be tied to any formal goals that are established, and they could be either intended from a project's inception or unintended (i.e., becoming salient as a project evolves). New benefits can arise and old ones change as a project proceeds. For example, in the case of EXPO 86, additional private and federal governmental expenditures in the province (which meant infrastructure improvements to the City of Vancouver, a new domed stadium, a major trade and convention center, a monorail system, residual long term utility of buildings carefully designed and constructed for use during and after the fair, among other things), cash revenues from the operations of the fair (estimated at $491 million), and tax revenues from increased economic activity during the construction phase of the fair and afterwards (e.g., increased tourism), were all important tangible benefits that planners believed would accrue if the fair were held. The major intangible benefit that was believed would accrue from holding the fair was a psychological boost for British Columbians at a time when morale in the province was suffering badly.

As planning for the fair proceeded, the original goals associated with a relatively small fair were changed. With much greater than originally expected success in attracting exhibitors from around the world, and the recruitment of Mike Bartlett, a former theme park manager, first as general manager and then president of the EXPO Corporation, under whose guidance EXPO's planners learned to think "big and first-class, not small and cheap," the fair grew from a modest single theme (i.e., transportation) to a two theme (i.e., transportation and communications) event. The updated expected tangible benefits from a larger, theme park quality, world's fair were obtained in a (December, 1983) consultant's report that estimated that the larger EXPO would generate approximately $2.8 billion of economic activity in British Columbia, together with $400 million in additional federal tax revenues and $172 million in provincial tax revenues. The larger fair would also draw a larger, wider audience, and generate more repeat visits to the fair and the Vancouver area. Planners believed that this could only add to the intangible benefits that were hoped for.

Expected total *costs* which will be incurred if a project is completed. The counterpart to the benefits that are expected to accrue from a finished project are a decision maker's expectations about the total costs that would be incurred if a project is completed. As is the case with expected total benefits, these expectations refer to beliefs about the total value of the tangible and intangible costs of completing a project.

At EXPO 86, the initial formal projection for the tangible cost of the fair was $78 million. As the thinking changed and plans for the fair grew in size and scope, the final operating budget (delivered by the EXPO board as a preliminary report in October, 1983, and formally announced in January, 1985) estimated that a total of $802

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[1] This distinction differs somewhat from that offered by accountants, and is consistent with arguments that are used to support the distinction now being made by economists between "use-value" and "non-use value" (e.g., Stigler, 1990). Accountants do not report items such as a superior product, an outstanding reputation, or a favorable location (i.e., goodwill) unless its value is established "objectively" in a purchase transaction. Because our research on EXPO 86, however, indicates that intangible factors were an integral component of the decisions that were made to undertake and then persist with the fair, an acceptable simulation model must be able to consider these items. As will be discussed later, in our view, much of the difficulty in understanding recommitment to a course of action has its basis in questions about how these subjective values are measured and compared against quantifiable, *hard* data, and then, how these comparisons influence decisions.

million would be spent on the completed project (not including the additional $698 million that would be invested by participants) with an anticipated deficit (operating revenues minus operating costs) of $311 million.

The intangible costs of completing EXPO included the ill-will created by the physical displacement of individuals and businesses as the fair site was being cleared and built, the polarization and increased tensions between organized labor and the B.C. government, and many personal political costs to the members of the government. Premier Bennett, for example, had to "fight through" two elections after EXPO planning had begun, in both cases under circumstances where many in the electorate and media did not share his understanding of the fair as a priority for the province.

There were also the intangible political costs of proceeding with the fair despite the large operating loss that was projected. This is particularly true in light of the fact that the size of the loss was in large part the result of difficult marketing and public policy decisions. Decisions to keep the admission price of the fair low, to presell multiple-day and season passes at reduced rates, as well as the decision to start the EXPO 649 lottery to make up the resulting deficit, created not only a larger (tangible) financial loss but also large (intangible) political costs and risks for Mr. Bennett and his Social Credit party. These costs were an important part of the tug-of-war of opposing views that decision makers considered as they made those somewhat unpopular decisions for the purpose of increasing the number of visits (a critical component of which were repeat visits) to the fair.

Expected *benefits* which will accrue if a project is stopped. This variable represents a decision maker's dynamic expectations about the total benefits that would accrue if a project is stopped. More specifically, it can consist of the tangible and intangible benefits which have accrued up to the time of cancellation and those benefits likely to be realized in the future from those items (i.e, what we have termed sunk benefits), the costs that will not be incurred because of the cancellation (i.e., what we have termed opportunity benefits), as well as those benefits which will or can accrue only if the project is cancelled. One benefit in this general category that has been discussed in the escalation literature is a project's "salvage value" (Northcraft and Wolf, 1984; Staw and Ross, 1987).

In the case of EXPO, benefits from infrastructure improvements (e.g., sewers, roads), construction of the domed stadium and monorail, and the cleanup and renovation of the False Creek fair site, for example, all would have grown in value, and provided long term tangible benefits to the province and city of Vancouver, as work was completed--had the fair been cancelled before it opened. Also, the city and province would have received some intangible benefits from the exposure that the area received as exhibitors visited the site, and from the "good feelings" that were generated as many of the unemployed people of B.C. went back to work in preparation for the fair and the province began to recover from recessionary times. Beyond the case of EXPO, an example of benefits of this sort would be the expected value that would be created by terminating the operations of a firm and then selling off the assets. Recent business history is filled with examples of cases where companies were acquired and then liquidated, because the liquidation value of the firm was believed to be worth more than its value as an ongoing enterprise plus the costs that would be incurred only if the firm ceased doing business.

Expected *costs* which will be incurred if a project is stopped. The counterpart to the benefits that are expected to accrue from a terminated project are a decision maker's expectations about the total costs that would be incurred if a project is cancelled. Again, as above, these costs consist of any tangible and intangible costs which have been incurred up to the time of cancellation and those costs that decision makers believe will be incurred from those items (i.e, sunk costs), the benefits that will not be received because the project is cancelled (i.e., opportunity costs), as well as those costs which will only be incurred if the project is terminated before completion. Costs in this general category that have been discussed in the escalation literature are a project's "closing costs" (Northcraft and Wolf, 1984; Staw and Ross, 1987); and any additional costs resulting from economic and technical side-bets, institutionalization; and a loss of political support (Ross and Staw, 1986; Staw and Ross, 1987).

A clear statement (given below) of how these costs were considered in recommitment decisions at EXPO was made by Jim Pattison, the then Chairman of the governmental organization charged with putting on the fair--the EXPO 86 Corporation. The statement, taken from his autobiography (written after the fair), refers to his April, 1984, recommendation to Premier Bennett that EXPO be cancelled unless a settlement that ensured construction labor peace on the EXPO site was quickly accepted by the B.C. Building Trades Council: "If EXPO closed down on April 18, the write-off would be about $80 million, plus some lawsuits--compared to about $950 million if we tried to struggle through to the end of '85. I admitted that cancelling the exposition would be "an international embarrassment to the government and people of British Columbia" and damage the province's investment potential for years to come." (Pattison, 1987: 247)

RELATIONSHIPS AMONG THE VARIABLES

In order to propose a framework for understanding how recommitment behavior is affected by the four variables described above, their relationships need to be clearly specified. Quite simply, we have found that there are three interconnected sets of comparisons among those variables which are important to recommitment decisions. These are, the relationships between: (1) the benefits and costs of completing a project; (2) the benefits that would accrue and costs that would be incurred if a project is cancelled; and, (3) the net benefits/costs of completing a project as opposed to the net benefits/costs that would be realized if a project is cancelled.

The relationships between the variables within each of these three comparisons are equally important. Logically, there are three possible relationships between these variables. To illustrate this, for the first two of these cases, in (1) or (2) above, one side of the equation could be *greater than*, *less than*, or *equal to* the other (e.g., the benefits of completing a project could be greater than, equal to, or, less than the costs of completing a project). The same three relationships are also possible with the third condition (3). The only difference in this case is that the net values (i.e., the larger of benefits or costs minus the other) from equations (1) and (2) are compared. That is, the net benefits or costs of completing a project are *greater than*, *equal to*, or, *less than* the net benefits or costs realized if a project is cancelled.

Each of the three sets of comparisons thus, individually, define three possible relationships among the various benefits and costs associated with a course of action. Taken together, therefore, there are a total of 27 possible states of the world (3X3X3) that relate the different costs and benefits of persisting with or withdrawing from a course of action. These relationships (i.e., conditions) are shown in Table 1.

Analyses of the net values of these 27 conditions shown in Table 1 indicate that 10 of the 27 sets of relationships can be eliminated because they are each fallacious; that is, there are no conditions under which they can be true. For example, Condition 5 of Table 1 states that the net value of the benefits of completing a project (i.e., the benefits of completing a project minus the costs that will accrue if a project is completed), by definition some *positive* number, is equal to zero (i.e., the benefits accruing if a project is stopped minus an equal amount of costs incurred if a project is stopped).

Table 1 also shows that the remaining 17 conditions can describe recommitment situations. In 15 of these 17 cases, however, the condition is conceptually identical to more than one other condition. The remaining two conditions (#'s 6 and 22, Table 1) are unique.

The implication of this analysis is that each set of equivalent conditions can be combined, yielding five pooled conditions. The two conditions that are unique each forms the basis for its own hypothesis. The seven conditions that result are listed, rewritten in proposition format, and presented as formal hypotheses about recommitment behavior (Hypotheses A → G) in Table 2.

HYPOTHESES ABOUT RECOMMITMENT BEHAVIOR

The hypotheses listed in Table 2 were developed by assessing the pressure for persistence or withdrawal (i.e., decision force) indicated by the variables in each condition. For example, in the case of Hypothesis A, condition A is a distillation of condition numbers 1, 2, and 3 from Table 1. In terms of its simplified terminology, condition A is composed of the relationship between the *Net Benefit of Completing* a project and the *Net B/C of Stopping* a project (see Definitions, Table 2). If condition A describes the decision situation at any particular point in a project, because the decision force for the *Net Benefit of Completing* is persistence (if the expected benefits from completing a project are greater than the expected costs of completing a project, the sensible choice--considering only these two variables--would be to persist with the project), and this force is *greater than* the force exerted by the *Net B/C of Stopping* (i.e, the force from either the expected benefits or costs that would be accrued or incurred if a project is stopped), the prediction is that a sensible decision maker will persist with a project.

The logic for each of the other hypotheses is the same. In Hypotheses B, C, D, E, and F, from Table 2, for example, the predicted decisions about whether a decision maker will recommit to a course of action are also clear cut. Because in each case one decision force dominates the decision situation, the predictions are straightforward: in Hypothesis B, the decision force for persistence dominates the force for withdrawal; in Hypotheses C and D, decision forces for withdrawal dominate the force for persistence; in Hypothesis E, decision forces on both sides of the equation indicate withdrawal; and in Hypothesis F, both sides of the equation indicate persistence. Hypothesis G, however, comprised of conditions where neither decision force dominates, warrants further attention.

Hypotheses G is based on three conditions from Table 1 (#'s 4, 14, and 24) which contain a combination of equal and opposing forces. For example, Condition 4, Table 1, is composed of an equation in which the *Net Benefit of Completing* a project (decision force = persist) is equal to the *Net Benefit of Stopping* a project (decision force =

TABLE 1. Recommitment Situations: 27 Possible States of the World

	Conditions[a]	Analyses[b]	Decision Consequence
1.	(BC > CC) > (BS > CS)	(2 and 3)	Persistence: See Condition A, Table 2
2.	(BC > CC) > (BS = CS)	(1 and 3)	Persistence: See Condition A, Table 2
3.	(BC > CC) > (BS < CS)	(1 and 2)	Persistence: See Condition A, Table 2
4.	(BC > CC) = (BS > CS)	(14 and 24)	Persistence: See Condition G, Table 2
5.	(BC > CC) = (BS = CS)	*	
6.	(BC > CC) = (BS < CS)		Persistence: See Condition F, Table 2
7.	(BC > CC) < (BS > CS)	(16 and 25)	Withdrawal: See Condition C, Table 2
8.	(BC > CC) < (BS = CS)	*	
9.	(BC > CC) < (BS < CS)	(18 and 27)	Persistence: See Condition B, Table 2
10.	(BC = CC) > (BS > CS)	*	
11.	(BC = CC) > (BS = CS)	*	
12.	(BC = CC) > (BS < CS)	*	
13.	(BC = CC) = (BS > CS)	*	
14.	(BC = CC) = (BS = CS)	(4 and 24)	Persistence: See Condition G, Table 2
15.	(BC = CC) = (BS < CS)	*	
16.	(BC = CC) < (BS > CS)	(7 and 25)	Withdrawal: See Condition C, Table 2
17.	(BC = CC) < (BS = CS)	*	
18.	(BC = CC) < (BS < CS)	(9 and 27)	Persistence: See Condition B, Table 2
19.	(BC < CC) > (BS > CS)	(20 and 21)	Withdrawal: See Condition D, Table 2
20.	(BC < CC) > (BS = CS)	(19 and 21)	Withdrawal: See Condition D, Table 2
21.	(BC < CC) > (BS < CS)	(19 and 20)	Withdrawal: See Condition D, Table 2
22.	(BC < CC) = (BS > CS)		Withdrawal: See Condition E, Table 2
23.	(BC < CC) = (BS = CS)	*	
24.	(BC < CC) = (BS < CS)	(4 and 24)	Persistence: See Condition G, Table 2
25.	(BC < CC) < (BS > CS)	(7 and 16)	Withdrawal: See Condition C, Table 2
26.	(BC < CC) < (BS = CS)	*	
27.	(BC < CC) < (BS < CS)	(9 and 18)	Persistence: See Condition B, Table 2

Notes:

[a] Conditions

BC = *Expected Total Benefits Which Will Accrue if a Project is Completed*
CC = *Expected Total Costs Which Will Be Incurred if a Project is Completed*
BS = *Expected Total Benefits Which Will Accrue if a Project is Stopped*
CS = *Expected Total Costs Which Will Be Incurred if a Project is Stopped*

[b] Analyses are based on the *net* values (i.e., the larger of benefits or costs minus the other) specified in the above conditions. See the Definitions given in Table 2.

#'s in parentheses identify those conditions that are conceptually identical to the condition.
* identifies the condition as *fallacious*. These cases are eliminated from further analysis.

TABLE 2. Seven Hypotheses about Recommitment Behavior

Conditions	Decision Consequence[a]
A. If *Net Benefit of Completing* > *Net B/C of Stopping*	Persistence {#'s 1, 2, and 3, Table 1}
B. If *Net Cost of Stopping* > *Net B/C of Completing*	Persistence {#'s 9, 18, and 27, Table 1}
C. If *Net Benefit of Stopping* > *Net B/C of Completing*	Withdrawal {#'s 7, 16, and 25, Table 1}
D. If *Net Cost of Completing* > *Net B/C of Stopping*	Withdrawal {#'s 19, 20, and 21, Table 1}
E. If *Net Cost of Completing* = *Net Benefit of Stopping*	Withdrawal {#22, Table 1}
F. If *Net Benefit of Completing* = *Net Cost of Stopping*	Persistence {#6, Table 1}
G. If *Force for Persistence* = *Force for Withdrawal*	Persistence {# 4, 14, and 24, Table 1}

Definitions and Decision Force:[b]

Definitions:	Force
1. *When* Benefits if Complete a Project > Costs if Complete a Project: Benefits if Complete a Project - Costs if Complete a Project = ***Net Benefit of Completing*** . .	Persistence
2. *When* Costs if Complete a Project > Benefits if Complete a Project: Costs if Complete a Project - Benefits if Complete a Project = ***Net Cost of Completing***	Withdrawal
3. *When* Benefits if Stop > Costs if Stop: Benefits if Stop - Costs if Stop = ***Net Benefit of Stopping***	Withdrawal
4. *When* Costs if Stop > Benefits if Stop: Costs if Stop - Benefits if Stop = ***Net Cost of Stopping***	Persistence

Additional Definitions:

5. ***Net B/C of Completing*** = the *net* value of Benefits or Costs if Project is Completed (i.e., Benefits - Costs, or, Costs - Benefits) subtracting the smaller from the larger value. The result will either be a positive number, or zero if these benefits and costs are equal.

6. ***Net B/C of Stopping*** = the *net* value of Benefits or Costs if a project is Stopped (i.e., Benefits - Costs, or, Costs - Benefits) subtracting the smaller from the larger value. The result will either be a positive number, or zero if these benefits and costs are equal.

Note:

[a] {#'s correspond to conditions specified in Table 1}
[b] Decision Force describes the sensible strategy in the decision situation.

withdraw). Similarly, Condition 24, Table 1, is composed of an equation in which the *Net Cost of Completing* a project (decision force = withdraw) is equal to the *Net Cost of Stopping* a project (decision force = persist). Condition 14, Table 1, on the other hand, is based on conditions where the opposing forces are equal to zero, thus canceling each other.

Each of these three conditions define situations where decision makers have no preference about persistence or withdrawal. In order to predict whether persistence or withdrawal will occur in these conditions, it is necessary to systematically consider the following situation. If a decision maker is trying to determine whether to persist with an ongoing course of action, and if the opposing forces for continuance or withdrawal are equal, a decision maker, by definition, will not/cannot make a decision until the balance in the equation is upset either in the direction of going ahead with the project or terminating the project. Because such "doing nothing" implies the passage of time until expectations about the various costs and benefits can change enough to upset the balance of forces, in the conditions included in Hypothesis G, therefore, the inability to make a decision means persistence with the current course.

ESCALATION AND WITHDRAWAL BEHAVIOR

The behavior that has been labeled the escalation phenomenon has been defined as the tendency for individuals to throw good money after bad, or to persist beyond an economically rational point (Staw and Ross, 1987). Traditionally this point of economic rationality has been defined in the escalation literature as that point where the costs of completing a project exceed the benefits of completing that project. An example of the use of this criterion is Ross and Staw's (1986: 280; see also Staw and Ross, 1987) description of EXPO 86 as a prototypical escalation case, in which they argue that EXPO is a clear-cut case of escalation because the fair began as a "$78 million project with virtually no deficit" and "became a $1.5 billion project with an official projected deficit of $311 million."

Given the total range of recommitment possibilities outlined as hypotheses above, the traditional escalation criterion is met in only one of the hypotheses (i.e., Hypothesis B) listed in Table 2. There, the conditions that comprise the hypothesis describe cases where persistence will occur because the initial economic rationality of the project has been made irrelevant by the fact that the *Net Cost of Stopping* has become greater than either the benefits or costs of completing the project. Based on this, our expectation is that what many have described as "throwing good money after bad" can only occur in those conditions; conditions which perhaps correspond to those by which decision makers for EXPO 86 had become locked-in to the fair by the summer of 1985. As described by Staw and Ross (quoting a headline in the Toronto Globe and Mail; 1987: 68), by this point EXPO had become "as Costly to Kill as to Save." These same conditions were also described by Premier Bennett as he discussed the point of no return in the planning of EXPO: "There's a point where you can't stop. Once we made the decision on the construction to proceed, that was it. ... Once you've started to build, it's too late, you're starting to get very hard dollars into it. Then your loss could be just as great by not proceeding." (Personal interview with the authors, May, 1988)

A similar expectation can be generated for withdrawal behavior. Traditional notions of economic rationality hold that withdrawal from a course of action will not occur if the benefits of completing a project are greater than the costs of completing the project. Our Hypotheses D and E, in Table 2, are consistent with this view. Hypothesis C, from Table 2, however, suggests that withdrawal will occur when the benefits that will accrue if a project is terminated are greater than the net benefits or costs of completing a project. As briefly alluded to earlier, there are numerous examples of this type of activity in current business behavior. Such cases include situations where organizations liquidate the assets of an acquired company for more money than that company could be sold for as an ongoing enterprise.

DISCUSSION

The framework we present is important to the general literature of organizational behavior because it can establish a clear set of expectations about whether a decision maker will recommit to a course of action. Within the more specific context of the escalation literature, the decision making perspective given here contrasts somewhat with previous research on escalating commitment; research which has tended to focus on information processing errors which can override an objective situation (e.g., economic variables) that indicates withdrawal, thus creating overcommitments. In addition to going beyond the simple rules for economic decision making that are usually applied in analyses of escalating situations, the results of this research suggest that the behavioral and economic aspects of decision making in recommitment situations are inseparable components of the decision process. By this

we mean that to understand decision making in escalation situations it is necessary to eliminate the conceptual difference between the "objective" and "subjective" factors of decisions. This is because each of the four benefit and cost variables associated with recommitment decision making have important tangible and intangible components: part of each variable is reasonably objective, while the other part is essentially subjective. These factors are influential in decision making as they are expectations about future conditions whose relationships are featured in the hypotheses we propose.

Because the formation of expectations is considered a sensemaking/learning activity (Cyert and March, 1963; Sterman, 1987), however, ties between our perspective on how the expected benefits and costs in our model are valued and the what has been learned from the escalation literature are straightforward. An illustration of this is dissonance reduction mechanisms (e.g., self-justification), which are important psychological factors in the escalation literature. Specifically, research on justification processes in escalation situations has generally found that decision makers who are responsible for negative results may seek to justify prior decisions (i.e., to turn the negative situation around so that the earlier decisions will appear to have been correct) by increasing commitment to the poorly performing course of action. In terms of our analysis, such self-justification processes would operate by affecting a decision maker's expectations about a project's benefits and costs. This might be particularly true for the intangible, thus more subjective, components of the various benefits and costs included in our model. For example, our analysis concurs with Staw and Ross who note "responsibility for losses and the ego implications of failure will increase the perceived costs of withdrawal." (1987: 51)

One implication of this argument, however, is that discussing escalation commitment using language such as: "Information processing errors may foster belief persistence when administrators interpret ambiguous data in positive ways or when they treat negative data as somewhat irrelevant" (Ross and Staw, 1986: 294), may be misleading. This view is also supported by research suggesting that the data with which decision makers work are subject to multiple interpretations (Weick, 1979); interpretations that are possible, Weick argues, not because sensemakers are necessarily stupid or malevolent, but because of "intact reinforced schema and an equivocal object." (1979: 157) Therefore, because interpretations of new data are necessarily based on assumptions from prior learning (e.g., a behavioral anchor: Tversky and Kahneman, 1974), it is not yet clear whether the existence of information processing errors is necessary to explain escalation behavior.

In addition, the analysis in this paper suggests the possibility that when decision makers treat negative data as irrelevant, as Ross and Staw have suggested in the quotation above, the so-called negative data *may actually be* irrelevant to the decision maker. In terms of the seven hypotheses we offer, it is the relative strengths and interrelationships between the various expectations that result in persistence or withdrawal. This implies that the receipt of any new feedback may not be strong enough to alter the dominance created by a particular combination of decision forces in a situation. For example, in the case of EXPO 86, (negative) feedback that operating costs would exceed operating revenues by $311 million was a potentially large political problem, but an irrelevant recommitment issue to decision makers who believed that the total (tangible and intangible) benefits from a successful fair would far exceed that amount and the rest of the project's total costs.

In proposing throughout this paper that decision makers compare the various tangible and intangible benefits and costs in order to make recommitment decisions, we are not, however, arguing that the decision process is necessarily an exercise in rational calculus. That is not to say that it could not be, but because of the difficulties that exist in estimating/measuring intangibles, and the decision norms that have developed as a result of those difficulties (e.g., accountants are trained to ignore *soft* data), our sense is that decisions are rarely so calculated. In our research on EXPO 86 we observed that decision makers believed that they had no way of accurately estimating intangible factors. Despite this, the intangible costs and benefits of the fair were integral components of the decision making process. In the words of former B.C. provincial Premier Bennett about plans for EXPO:

> *I was thinking in terms that there was going to be tremendous residual benefits that will build year after year... It just made common sense to me that given the access to these people and information of what we could see, that there were going to be benefits. We would get increased investment. I never tried to, in my own mind, tried to say what would be there. I wasn't, first of all, I didn't have the time nor am I competent to do that type of research...*
> *We went through some grim times, and some tough cost-cutting times, and I guess the best benefit was that we were ready because we were coming out of the recession and we were ready for a mood change. And it gave us the mood change. I mean, people got confidence back. You can't put a price on that.*
> *Approximately 3 million people got their confidence back and felt good about their province. (Personal*

interview with the authors, May, 1988)

Our view is thus that, in practice, the comparisons described in the conditions that make up the seven hypotheses about recommitment behavior we have presented are most often informal and unsystematic. Again, this does not suggest that this process cannot be formal and systematic. Rather, the results of this research suggest that, while there may be formal comparisons between tangible costs and benefits in structured decision processes, the intangible forces that are a part of every decision may not be formally attended to. The practical problem, for both decision makers and the researchers who would attempt to examine our hypotheses, is, of course, "how do you measure and compare the relative values of intangible factors? While there have been recent attempts to systematically measure such "unmeasurables," (e.g., the work of real estate researchers Michael Robbins and the late James Graaskamp to value the scenic and natural beauty of wilderness lands) there are no widely accepted procedures for doing so at this time. Before beginning to address such issues, however, we may need to understand much more about how subjective factors (including *personal values* such as ethical considerations) are measured and compared against quantifiable, hard data, and then, how these comparisons influence decision making in recommitment situations.

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