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Preventing Runaway IT Projects: Protecting Auditors from Entrapment

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Abstract

More and more often, accounting professionals are being included on information systems project teams in an oversight role. One aspect of this role is to determine when a project is too dysfunctional to be continued. This study examined whether the accounting education received by students is adequate in this area through the use of an innovative research approach (conjoint analysis) that examines the decision to continue as if it was a consumer purchasing decision. The results show that accounting majors are often entrapped into continuing projects for reasons other than what is best for the organization.

Keywords: Escalation behavior, runaway projects, project management, auditors

Introduction

The problem of "runaway projects" within the arena of Information Systems has become unbearably high according to past research. Two surveys conducted by KMPG revealed that in 1988, 30-35% of their large clients said they had one or more runaway projects. In 1991, this percentage increased to 65% with over 50% of the respondents considering this to be normal (Cringely 1994). Runaway projects are typically defined as those that dramatically exceed their time and/or budget targets without producing an acceptable system.

Given the increased likelihood that auditors will either be included as members of information systems development teams or will be given oversight responsibilities for development projects, it becomes critical for us to train them to recognize runaway projects when they occur.

Early researchers made the assumption that runaway projects are just large failures and that project management problems were thought to be the primary cause of runaways. (Ex: Spangler and May (1992)). A new perspective on runaways comes from several other researchers who have examined runaways as examples of a phenomenon called *escalation behavior*. Escalation Behavior is when an ongoing project has signs of failure but is still pursued by allocating additional resources to it. Under this perspective, runaway projects are failing projects in which individuals become entrapped into continuing.

Early studies of escalation behavior were very simplistic because they tended to use experiments that focused on just one or two variables. The only cross-sectional survey in the literature on escalated information systems (IT) projects, Keil, Mann and Rai (2000) determined that multiple factors explain why a single project escalates. The study presented in this paper extends this research by examining the mechanism by which a decision-maker, when faced with a set of factors that might be entrapping will assess the situation in order to decide whether to continue a project or not.

This paper reports on the results of a pilot study with auditing students that specifically investigated how each individual cognitively analyzes the performance of a troubled project and its surrounding context when deciding whether to continue. The results provide an impetuous for improving training of auditing professionals in this important oversight issue and justifies the use of a larger study in the practitioner community.

The study was designed using a consumer metaphor as a theoretical foundation when examining individual escalation behavior decisions. Our perspective is based on the idea that choosing to continue a failing project is like a customer buying a product.

Product purchases are influenced by many factors that interact in complex ways in each consumer's mind. The purchaser examines product characteristics, the context under which it is sold (ex: advertising, store display) and the impact on their lives (ex: usefulness, status issues). In the same way, escalation decisions are also affected by many factors that interact in complex ways. Researchers have shown that decision-makers are influenced by project characteristics, the context surrounding the project and the impact of continuation or discontinuation on their lives. Both consumers buying a product and decision-maker continuing a failing project have to make sense of this complexity before taking action. Therefore, the basic hypothesis for this study is: *Escalation decisions are similar to consumer purchasing decisions.*

Theoretical Model and Research Questions

Approach-Avoidance theory (Lewin 1935) is a good mechanism for use in explaining escalation because it captures the essence of complex situations that tend to create conflict in the mind of a decision-maker. Approach-Avoidance was on of three types of conflict that Lewin suggested as causing stress. The other two were approach-approach and avoidance-avoidance. Approach situations are those that have positive attributes which make them attractive. Avoidance situations are the opposite in that they have attributes that make us want to avoid them. In an approach-avoidance situation, there are aspects that attract us and attributes that repel us. This creates conflict. The decision-maker must weight the positive and negative attributes in order to decide which is stronger -- the need to approach or the need to avoid. Approach-avoidance has been used in many fields including consumer behavior and conflict management.

According to the Approach-Avoidance Theory perspective on escalated projects, Rubin and Brockner (1975), the factors that influence continuation decisions are of two types: Factors that encourage persistence, and factors that discourage it. In this study, these factors became our theoretical constructs. Specifically, the Approach-Avoidance perspective focuses on:

a) Factors related to cost of withdrawal. (Encourages persistence)
b) Factors related to reward for success. (Encourages persistence)
c) Factors related to completion proximity. (Encourages persistence)
d) Factors related to cost of persistence. (Encourages discontinuation)
e) Ambiguity about a project's future (Encourages persistence)

If escalation decisions are similar to product purchasing decisions then the logical research questions should be similar to those asked in Marketing. For example, marketers want to know what characteristics of a product, attract a consumer. In escalation research this translates to:

> What characteristics of failing projects are most likely to encourage or discourage decision-maker to persist?

Marketers also wish to determine whether the market includes different types of consumers with different buying preferences. The corresponding research question for this study would be:

> Can decision-makers be segmented into people with different escalationprofiles?

If this research is successful at answering these two research questions, it will benefit both practice and research. It will help practitioners to identify and prevent escalation behavior and it will help research by explaining the complex phenomenon of escalation behavior in richer way.

Model Operationalization

Figure 1 shows the set of constructs we were working with and their relationships to escalation. To carry out this research project, each of the Approach-Avoidance constructs was subdivided into one or two variables, each of which has been studied within escalation theory research. We specifically tried to include several different factors that relate to how the decision-maker is viewed by others so as to determine which has more influence (ex: looking like a failure, success or a fool). We also had several factors that related to the project itself (importance of the project, proximity to goal, sunk cost, visibility of completion, confidence in turn around, opportunity cost). Creating a high and a low value for use in a hybrid experimental/cross-sectional survey method further operationalized each variable. Each of the constructs, their variables and high/low levels are explained herein.

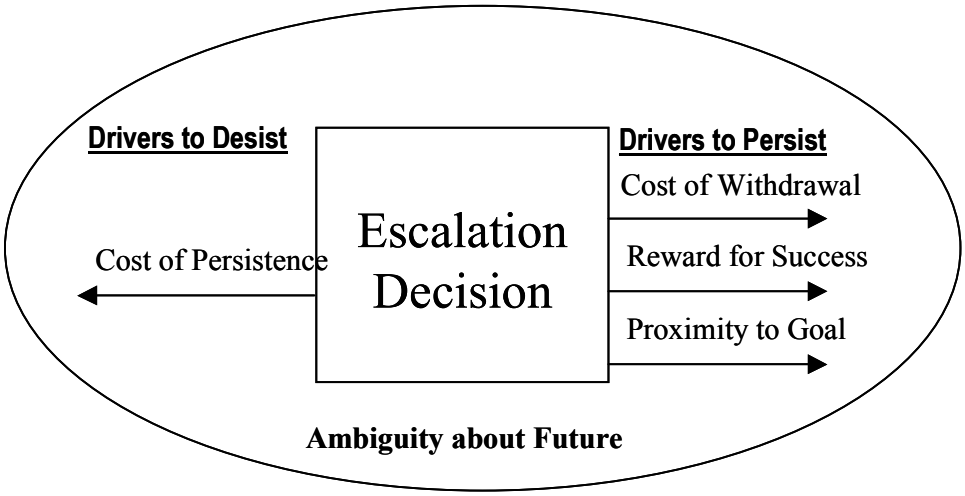

Figure 1. Basic Approach-Avoidance Escalation Model

Cost of Persistence (a driver to desist): When an individual continues a troubled endeavor, he or she may either feel foolish or may feel that others will view the decision as foolish. Our study included a variable that captures the latter: image as a fool (Treger, 1980). The second variable that was hypothesized to be driver to desist was the opportunity cost that is incurred when spending funds to turn the project around rather than a different project, Northcraft and Neale (1986).

Cost of Withdrawal (a driver to persist): Two constructs that have been studied in the past can be considered to be costs related to pulling out of a project. The first is the degree to which the decision-maker will be considered a failure by others (Rubin et al. 1980, 247-266) and the second was sunk cost - - the amount of money spent on the project, Keil, Rai and Mann (2000).

Reward for Success (a driver to persist): Turning around a troubled project gives the decision-maker two strong benefits. He or she will be viewed as successful and may therefore gain status of even promotion. In addition, the organization will garner the benefits from the project that were envisioned when it began. Both of these variables have not been explicitly investigated but social cues related to success and reward were found to be important in two studies, Rubin and Brockner (1975); Brockner, Shaw, and Rubin (1979).

Proximity to Goal (a driver to persist): The completion effect was first examined by Conlon and Garland (1993). They found it to be a stronger driver to continue than sunk cost.

Ambiguity (driver to persist): Ambiguity is included in the Approach-Avoidance model because the most unstructured or ambiguous a situation appears to be, the more conflict there is between driving and restraining forces. In escalation situations, ambiguity has been shown to encourage persistence Rubin and Brockner (1975); (Brockner et al. 1982). The variables used in this study to represent ambiguity were the confidence that the project could be turned around and the visibility of project completion.

The next section describes the data collection methodology, presents the high and low level operationalizations of each variable and justifies the use of a marketing statistical technique for analyzing the data.

Methodology

An experimental data collection technique was used in a web-based survey form. First, the subject was given a case description that described a troubled project (See Appendix A). Following the case description, the subject was given several slightly different scenarios. Each scenario included every factor but the values of the factor varied across the scenarios. For example, in some scenarios completion effect was high and in others it was low. Figure 2 shows the two most extreme versions of the

scenarios. In the first scenario, all the variables are set so that persistence is encouraged (the drivers to persist were high and the drivers to stop were low). The second scenario has the opposite values for each item and so discourages continuation.

Figure 2a: All Factors Encourage Continuation

As an auditor hired by the city, you know that this project is considered to be very important to the city's future and the reputation of everyone involved for both the short term and the long term. At this point $15 million has already been spent of the $20 million budget and the project is 80% complete. Everyone can see how close they are to finishing and they are 80% sure that they can turn this project around. NO one is saying that the extra money they will need to turn the project around should be spent on other things.

The project members think that if they discontinue the project, people will consider them a failure. If they proceed with the project and it continues to fail, they will just put more effort into it. Plus, if they complete this project successfully, their boss will give them other important projects and possibly a promotion.

Figure 2b: All Factors Encourage Discontinuation

You know that this is just one of the many science-tourism projects that the city is sponsoring. At this point $5 million has been spent of the $20 million budget and the project is 20% complete but it is difficult to determine how close they are to continuing because the project is so complex. They are only 20% sure that they can turn this project around. Everybody is saying that the extra money would be better spent on other things.

The project members think that if they discontinue the project now, people will think they are heroes. If they proceed with the project and it continues to fail, they will feel like fools for sticking with it and if they finish the project successfully, their boss will see that they are competent.

Figure 2. Extreme Escalation Scenarios

Data analysis of the responses employed a statistical technique called conjoint analysis. This technique is often used in marketing to determine the characteristics of a product or services that are most important to customers, Green and Srinivasan (1990). In a typical consumer behavior study, each respondent is given a set of cards. Each card represents a product they could choose to buy or not (ex: laundry detergent). Each card has the same set of product characteristics (price, color of box, number of loads, biodegradability) but the values for each characteristic change from card to card. The respondents are either asked to rank the cards to indicate how willing they would be to buy the product. Conjoint analysis is a statistical technique that is used to analyze the responses to each card in order to develop a profile for a typical consumer and different segments of consumers. Consumer profiles created by conjoint can also be used to project whether consumers will buy a simulated product (one that had characteristics different from any of the cards evaluated by the respondents).

In this study, our "product" was a troubled project and the consumer's "buying behavior" became whether the subject would continue ("buy") the project or not. The continuation decision, therefore, was captured using the following question after each scenario:

Would you continue to allocate resources (time, money) to this project?
Probably not 1 2 3 4 5 6 7 Probably

The conjoint technique is also important in the creation of the card set. A statistical technique takes the different variable along with their range of possible values and creates an orthogonal set of cards. That is, the cards represent all the values necessary to test for main effects but yet none of the cards is a linear combination with any other card. The technique is our study produced 12 cards for our nine variables each with a high and low value. The cards were then translated into scenarios using the phrases representing the high or low values shown in Figure 2. None of the cards produced by conjoint matched the values in the two extreme cases of Figure 2. As a consistency check, we asked the subjects to respond to each of the extreme scenarios as well as the 12 scenarios generated by the conjoint technique. During the data analysis, we asked the conjoint software to use each

individual's profile to determine how likely they would be to continue or discontinue the extreme scenarios. This way we could compare the subject's actual response to the response generated from his or her profile.

Students in upper-level undergraduate and MBA level auditing classes were our subjects. Filling out the survey was designated as a way to obtain extra credit in the course. Auditing students were used because if auditor training were meant to prepare students for an oversight role in organizations, student subjects would mirror their training. If students can be entrapped into continuing a failing project, then the results have direct implications for auditor training. Moreover, if auditors are more objective observers than other project participants are we could use the results to form a reliable baseline of typical escalation behavior.

Results

Overall, 58 people participated in the surveys in the Spring and Summer of 2001. Fifty-five percent of respondents were male. Most of the respondents were graduate students (55%) or seniors (40%). Only two subjects were juniors. The distribution of ages was pretty even across the categories (See Table 1). Most subjects had no accounting experience (76%), 15% had one year and 5% had over 10 years. This means the study truly addresses the ability of accounting programs to instill into students the feeling that they are protectors of the organization.

Demographics

Table 1. Distribution of Sample According to Age Group

Age Group	Frequency (%)
20-25	19(33%)
26-30	14(24%)
31-35	*6 (10%)*
Over35	18 (31%)
Missing	1 (2%)
Total	100%

Escalation as a Purchase Decision

Our proposition that individuals process escalation decision using a complex analysis of several factors was supported in that the respondents rated each scenario differently based on its unique circumstances. Table 2 shows the relevant statistics for each of the 14 scenarios. The first column of the table shows the degree to which the respondents tended to continue the project in each scenario (the higher the mean response, the more likely continuation would have occurred. From Table 2, we can see that some scenarios were more likely to encourage escalation than others were.

Impact of Escalation Factors on Continuation

Each scenario was given a calculated value that indicates the degree to which each scenario is likely to trigger a continuation response according to escalation theory; under the assumption that escalation factors are additive in nature (i.e. as the number of factors increases, the more escalation becomes likely). The values of this column range from one to two. All the factors in the first scenario encourage continuation, so the scenario has a value of two on the Inducement to Escalate scale. All the factors in the second scenario discourage discontinuation, so it has a value of one on the scale. The other scenarios have a mixture of drivers to continue and discontinue and so their values are between one and two.

According to the research model and the assumption that escalation factors are additive, we would expect continuation to increase when there are more escalation factors present (note: "present" means the driver to persist was at a high rather than a low level). Thus, as the Inducement to Persist increases, the degree of continuation should increase.

With auditors, however, the relationship should be in the opposite direction. Auditors should be more objective and would not be entrapped into continuing by the same factors as a person involved in or responsible for the project.

Table 2. Results for Likert Scale of Each Scenario

Scenario	Mean Response	Std. Dev	Inducement to Escalate
SC1	5.92	1.41	2.00
SC2	2.57	1.74	1.00
SC3	4.63	1.81	1.33
SC4	5.29	1.44	1.56
SC5	4.59	1.93	1.33
SC6	3.33	2.06	1.33
SC7	4.03	1.79	1.44
SC8	3.19	1.74	1.22
SC8	3.34	2.03	1.56
SC10	3.67	1.79	1.44
SC11	6.05	1.15	1.67
SC12	4.49	1.80	1.67
SC13	5.93	2.42	1.67
SC14	3.60	1.99	1.78

The Pearson Product Moment Correlation between the Inducement to Persist measure and the auditor's average response, however, gives evidence that the situation is a bit more complicated than what we would expect. The correlation indicated a negative relationship (.241) exists, but it was not statistically significant ($p<.204$). This result means that some of the scenarios did trigger an escalation response in auditing students.

One explanation for the non-significant correlation is that we can see that there is a general tendency to continue projects in that there was only one scenario that was under 3.0 on a 7 point scale (scenario #2).

Even more telling is that there were two scenarios that had higher mean responses than scenario #1 (the scenario where all the escalation factors were present). According to our theory, the first scenario should have the highest mean response because all the factors encourage persistence. In the table, however, there are two scenarios with higher Mean Responses, Scenario 11 and Scenario 13 (though only .01 higher).

In Scenario 11 (see Figure 3), all the factors are set to values that induce escalation except 1) the sunk cost was low, 2) it was hard to tell how close the project is to finishing and 3) the project members would feel like fools for continuing. It is possible that the 80% confidence of being able to turn the project around and the low sunk cost offset the potential of looking like a fool for sticking with the project.

> You know that this project is considered to be very important to the city's future and the reputation of everyone involved. At this point $5 million has been spent of the $20 million budget, the project is 80% complete but it is difficult to determine how close they are to finishing because the project around and no one is saying that the extra money it would take should be spent on other things.
>
> The project members think that if they discontinue the project now, people will consider them a failure. If they proceed with the project and it continues to fail, they will feel like fools for sticking with it. If they complete the project successfully, their boss will give then other important projects and possible a promotion.

Figure 3. Scenario 11

In Scenario 13 (see Figure 4), all the factors encourage escalation except 1) the project members will look like heroes if they stop, 2) low sunk cost and 3) the project members would not gain much from successfully turning the project around. It is possible that an auditor would balance the protect member opinions against the "others" that say there is nothing else better to spend the money on, so continuation doesn't look so bad.

You know that this project is considered to be very important to the city's future and the reputation of everyone involved. At this point $5 million has been spent of the $20 million budget, the project is 80% complete and everyone can see how close they are to finishing. They are 80% sure that they can turn this project around and no one is saying that the extra money it would take should be spent on other things.

The project members think that if they discontinue the project now, people will consider them heroes. If they proceed with the project and it continues to fail, they will just put more effort into it. If they complete the project successfully, their boss will see that they are competent.

Figure 4. Scenario 13

So, Table 2 gives evidence that continuation decisions are complicated and that auditing students are susceptible to entrapment. In the next two sections, we examine the role that each of the escalation factors play in auditor continuation.

Testing the Approach-Avoidance Model

The model presented earlier was based on Approach-Avoidance, which hypothesizes that some factors encourage persistence and others discourage it. The drivers to persist and desist have all been successfully validated in escalation research. Ambiguity was originally thought to encourage persistence, but empirical results have been mixed. Given that previous research consisted solely of experiments testing at most three factors, it seemed prudent to validate the model after having the subjects respond to scenarios with all the factors. To test the model, we turned to the factor utilities generated by the Conjoint Analysis technique.

Conjoint Analysis produces a profile for each person that enumerates the person's utility for each factor in the treatment. In marketing, if a utility is positive then the factor was a product characteristic that was attractive to the customer, a negative utility is something that repels and a zero utility means the factor either did not influence them at all or that the factor's attractiveness was completely balanced by its repulsiveness. In terms of escalation decisions, a positive utility is a driver to continue and a negative utility is a driver to stop. Table 3 shows how often each factor was given a positive, negative or zero response by our subject. It becomes our test to determine if auditing students behave as expected by the escalation model.

Table 3. Are the Factors Drivers to Continue or Stop?

	Utility Frequencies			
Variable	**Positive**	**Negative**	**Zero**	**Stability**
Cost of Withdrawal				
Image as a Failure	25 (44%)	26 (46%)	6 (11%)	Volatile
Sunk Cost	12 (21%)	40 (70%)**	5 (9%)	Stable (-)
Reward for Success				
Image as a Success	29 (51%)*	19 (33%)	9 (16%)	Moderately Stable (+)
Project Importance	31 (54%)*	22 (39%)	4 (7%)	Moderately Stable (+)
Proximity go Goal				
Completion Percent	48 (84%)**	7 (12%)	2 (4%)	Stable +
Cost of Persistence				
Image as a Fool	22 (39%)	27 (47%)	8 (14%)	Volatile
Opportunity Cost	25 (44%)	25 (44%)	7 (12%)	Volatile
Ambiguity				
Visibility	32 (56%)*	18 (32%)	7 (12%)	Moderately Stable +
Confidence of Ability to Turnaround	43 (75%)**	11 (19%)	3 (5%)	Stable +

The first thing to notice in this table is that some of the items were highly volatile. That is, one factor may be a driver to continue for some people and a driver to stop for others. In terms of our model, the drivers to persist were supposed to be Cost of Withdrawal, Reward for Success and Proximity to Goal. According to Table 3, however, one of the Cost of Withdrawal construct was almost as likely to cause people to stop than it caused them to continue. Image as a Failure was a driver to continue for less

than half of the respondents. The other construct under Cost of Withdrawal was Sunk Cost and it was overwhelmingly a driver to stop.

Both constructs under Reward for Success somewhat supported the model in that over 50% of the subjects would be entrapped by Image as a Success (if project manager looked like a success for turning the project around) and Project Importance. On the other hand, a significant number of people were also induced to stop by these same factors.

Proximity to Goal fully supported the model in that 84% of subjects would continue if the project was close to completion.

Cost of Persistence was the single hypothesized driver to stop. According to Table 3, however, the items were either volatile or in the wrong direction. Image as a Fool was more negative than positive but in seven cases it had no impact on the decision to continue than to stop (more positive than negative).

Lastly, the results supported the hypothesis that Ambiguity encourages persistence. When Visibility was high (i.e. easy to see the end of the project), over 50% of the subjects would continue the project. When Confidences of Ability to Turn Project Around was high, 75% of subjects would continue the project.

From Table 3, it is clear that the Approach-Avoidance model does not predict all of the auditor's escalation behavior but it also demonstrates that some factors will encourage continuation (Image as a Success, Project Importance, Completion Percent, Visibility, Confidence), one factor will encourage deescalation (Sunk Cost) and other factors will influence some people to stop and others to continue (Image as a Fool and Opportunity Cost).

Which Factors Are Most Important?

The primary research question after testing the model was what characteristics of failing projects are most likely to encourage or discourage decision-maker to persist? We addressed this question by looking at the Relative Importance statistics of each respondent's profile. As said before, Conjoint Analysis evaluates the subject's reactions to each card (or scenario in this case) and calculates a utility score for each factor in the decision. When the utility for one factor is divided by the total utility for all factors, the result is a percentage the represents the relative importance of that factor to the individual. Table 4 compares the relative importance for all the factors.

Table 4. Relative Importance of Escalation Factors

Construct/Item	Average Relative Importance	Total for Construct
Cost of Withdrawal		
Image as a Failure	8%	
Sunk Cost	13%	Total: 21%
Reward for Success		
Image as a Success	7%	
Project Importance	9%	Total: 16%
Proximity to Goal		
Completion Percent	21%	Total: 21%
Cost of Persistence		
Image as a Fool	9%	
Opportunity Cost	7%	Total: 16%
Ambiguity		
Visibility of Completion	7%	
Confidence of Ability to Turnaround	18%	Total: 25%
Total	99%	99%

.If we only look at single factors, the Completion Percent has the strongest influence on the escalation decision for auditing students and we know from above that the Completion percent is a driver to continue for most of the respondents. If we look at

the relative importance of each construct (total for items within each construct), Ambiguity becomes the strongest driver to continue, Proximity to Goal is second and Reward for Success is third.

Given that the respondents were auditing students, we would expect that they would be less influenced by whether the project manager's image was affected by continuing the project. We therefore sliced the data another way by separating project factors from image factors. These results are shown in Figure 5. While it is true, that auditing students were more influenced by project factors (68%), it is striking to note how important image factors were (31%) to auditing students that are supposed to be protecting the organization, not the project manager.

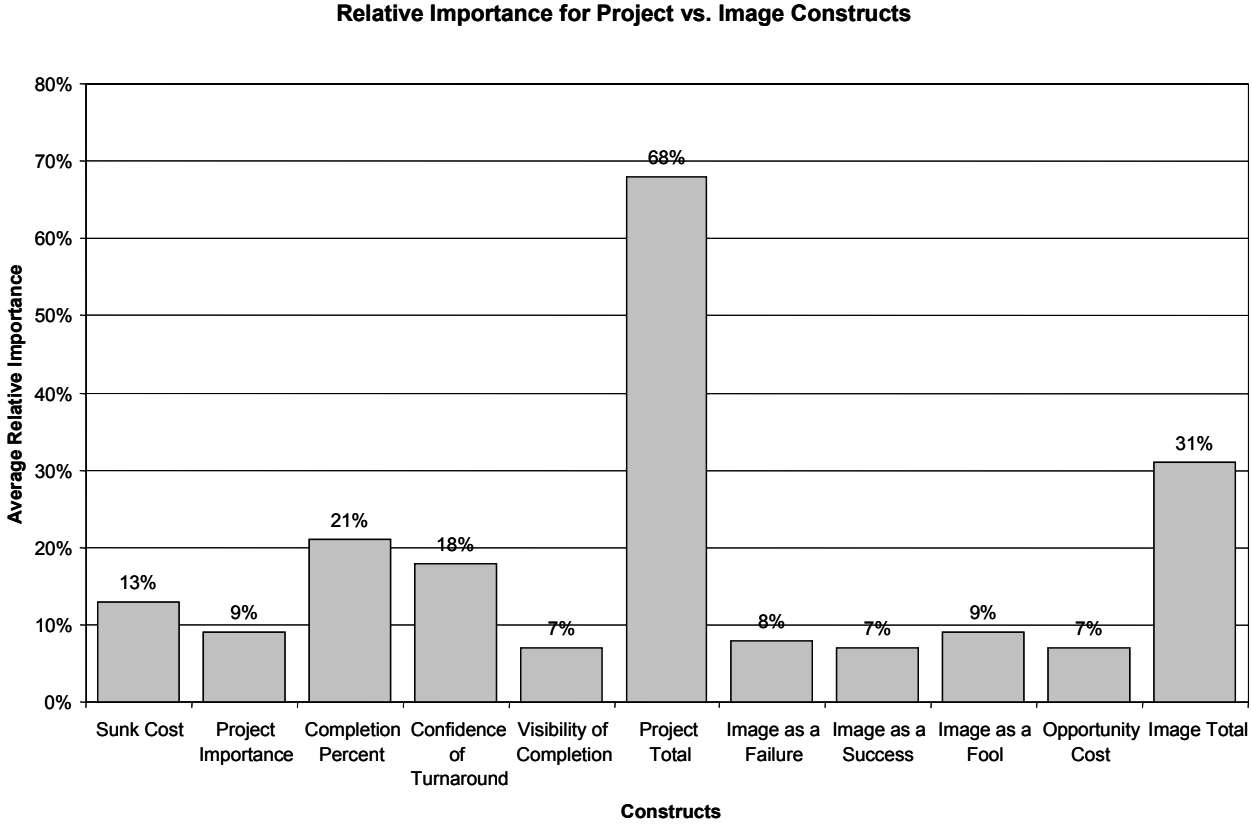

Figure 5. Project vs. Behavioral Relative Importance

Limitations and Future Research

One limitation of the conjoint methodology is that because subjects are reacting to complex scenarios, there is no way to validate the constructs using traditional Cronbach's Alphas, Correlations, Factor Analysis etc. The only measures collected are the likelihood that the respondent will continue the project given the scenario. The conjoint analysis statistical program in SPSS then calculates the degree to which each factor influenced the individual based on their responses to all the scenarios.

The convenience sample of 58 undergraduate accounting majors in auditing classes is a major weakness of the study, but it is acceptable for a pilot study that is highly exploratory. The sample was capable of testing the methodology, determining whether escalation decisions are similar to consumer purchasing, that different scenarios evoke different responses and that a single escalation factor can both encourage and discourage continuation in different individuals.

Given the success of this study, the next stage will be to use the same methodology to study practitioners in the obvious fields of traditional and IT auditors. Larger sample sizes would allow comparisons across professions and demographics, such as

gender, experience. The research case used in this study could also be extended to information technology professionals, engineers, scientists and public administrators as well.

Conclusions

The results clearly demonstrated that the Conjoint Analysis data collection technique can be useful for examining complex decisions such as continuation of a troubled project. Just as important was the ability of Conjoint Analysis to test the complex Approach-Avoidance model and to give us information on which factors seemed to be more influential. Some parts of the model were validated but others were not, at least for auditing students.

There were some surprising findings given that our subjects were auditing students. We found that auditing students were indeed induced to escalate by some of our scenarios and that they are influenced more than we would like by irrelevant issues such as the image of the project manager and the degree to which the project is complete. On the other hand, they were strongly influenced by ambiguity, which of all our factors is the only construct that should be considered as important.

The results reported herein are very important from a pedagogical perspective. These results demonstrate that auditing students need to be better trained when making decisions concerning troubled projects. First, it is important to alert auditing students that Runaway projects are a behavioral phenomenon where people become entrapped by irrelevant issues. Second, each of the escalation factors should be discussed so that students can create a policy for whether to include this in their decision or not. Students should also be asked to develop policies that might either prevent the escalation factor from occurring or changing how it impacts continuation decisions. It is hoped that by talking these issues out, we can prevent escalation when it occurs and avoid runaway projects.

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Appendix A. Case Description

Zoo Exhibition for Chimpanzees

Raleigh Durham City civic leaders want put up Zoo Exhibition for Chimpanzees that combines science and tourism. The exhibit would have automated environment controls and cognitive learning exercises for the chimps designed by local scientists. Their idea was to create a new high-tech facility intended to have chimpanzees learn to communication (ex: use sign language: gestures, and facial expressions). This will seek to involve a cross-section of experts from the field of science, such as, psychologists who will come up with methods necessary for the learning process which may include videos, keyboards, interactive games, and other state-of-the-art displays that show symbols of tangible items (ex: fruits). The facility would also have a glass-walled amphitheater that faces the exhibit so tourists could watch the scientists at work. Everyone (city politicians, media, and general public) overwhelmingly supports the project. Even People for the Ethical Treatment of Animals likes it because the chimps are being challenged and they will be unaware of their being watched. The project will also involve several other specialists. Information System experts will formulate an interface that will allow the chimps to use the automated exercises and possibly translate for them into human speech. Engineers will be hired to build the new high-tech facility for the learning exercises, while architects and artisans will undertake the design of the exhibit and the amphitheater. Public Administrators will handle the funding and supervision of the project. To monitor all of these participants will be auditors from the city managers office. You are one of the auditors.

The city raised $20 million for this project (40% local funds, 30% from the state, 30% from federal government) and at first things were going well. Recently, however, the project has had some major setbacks. There have been numerous conflicts and miscommunications between the experts from different disciplines and there have been many problems with unionized construction workers. Some participants are starting to grumble that this project may never be successfully completed.