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*Computer Information Systems*  
*Robinson College of Business*  
*Georgia State University*  
*35 Broad Street, Atlanta, Georgia, 30303*

The director of this dissertation is:

*Dr. Mark Keil*  
*Computer Information Systems*  
*Robinson College of Business*  
*Georgia State University*  
*35 Broad Street, Atlanta, Georgia, 30303*

***An Investigation of the Relationships between Goals and Software Project Escalation:  
Insights from Goal Setting and Goal Orientation Theories***

BY

*Jong Seok Lee*

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctor of Philosophy

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY  
ROBINSON COLLEGE OF BUSINESS  
2013

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## ACCEPTANCE

This dissertation was prepared under the direction of the Jong Seok Lee's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctoral of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

H. Fenwick Huss, Dean

## DISSERTATION COMMITTEE

Dr. Mark Keil (Chair)

Dr. Arun Rai

Dr. Detmar Straub

Dr. Kin Fai Ellick Wong (Hong Kong University of Science and Technology)

***An Investigation of the Relationships between Goals and Software Project Escalation:  
Insights from Goal Setting and Goal Orientation Theories***

BY

*Jong Seok Lee*

4/12/2013

Committee Chair: Dr. Mark Keil

Major Academic Unit: Computer Information Systems

Abstract

Escalation of commitment is manifested as a behavior in which an individual resists withdrawing from a failing course of action despite negative feedback, and it is an enduring problem that occurs in a variety of situations, including R&D investment decisions and software project overruns. To date, a variety of theoretical explanations have been offered as to what causes escalation of commitment, including personal responsibility, the sunk cost effect, and the completion effect. Nonetheless, what is missing in our understanding is the role that goals can play in escalation situations. This represents a significant gap in escalation research, as goals are a fundamental element driving many human behaviors. Further, escalation researchers recently suggested that escalation behavior can be understood as an activity that is directed by goals. Therefore, this dissertation aims to generate insights regarding the impact of goals on escalation of commitment by drawing on goal setting and goal orientation theories. This dissertation consists of four essays each of which involves one or more studies.

## ACKNOWLEDGEMENTS

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Quite frankly, there are not many things that I will miss about being a PhD student, but I will certainly miss the people that I interacted with at GSU. As I am writing this note, I miss them already. It reminds me of the following quote from the book 'The Catcher in the Rye' – "Don't ever tell anybody anything. If you do, you start missing everybody."

Last but not least, I thank my family, including my parents, brother, and sister-in-law for their unconditional love. They are the reason I exist!



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## **Chapter 1 Introduction**

### **Motivation**

Escalation of commitment is a phenomenon in which an individual continues to invest additional resources into a previously chosen course of action that is failing. Since the mid-70's, escalation of commitment has been studied in a variety of settings, including bank loans (Staw, Barsade, & Koput, 1997), corporate bidding wars (Bazerman, 1999), hiring and promotion decisions (Schoorman, 1988), and warfare (Brafman & Brafman, 2008). In the information technology (IT) arena, "runaway systems" that seem to take the life of their own, often resulting in significant budget and schedule overruns have been examined from the perspective of escalation of commitment (Keil, 1995; Keil, Mann, & Rai, 2000a).

IT projects are notorious for falling behind schedule and going significantly over budget. Based on a global survey in which 1,471 IT projects were examined, Flyvbjerg & Budzier (2011) found that one in six of the projects experienced significant challenges with an average cost-overrun of 200 percent and an average schedule-overrun of 70 percent. Recently, the Government Accountability Office (GAO) investigated IT investments in the U.S. Federal government sector, and found that together nearly a dozen mismanaged IT projects will cost taxpayers a total of \$3 billion in budget-overruns. In response, a group of U.S. senators introduced the Information Technology Investment Management Act of 2011 to monitor and control the federal government's spending of \$80 billion on IT portfolio, and to terminate or redirect troubled projects. Prior research suggests that many IT projects exhibit the characteristics of escalation of commitment in which people continue to invest valuable resources into a failing course of action despite negative feedback.



Beginning with the initial study by Staw (1976), researchers have investigated a variety of factors that influence a decision of whether or not to continue a previously chosen course of action that is seemingly failing. Most notable factors include personal responsibility for initiating a course of action (Staw, 1976), the amount of investments already made in a previous course of action (Arkes & Blumer, 1985; Teger, 1980), and the extent to which a troubled project is close to completion (Conlon & Parks, 1987). While these factors offer some insight into why individuals continue to invest valuable resources into a failing course of action, Fox & Hoffman (2002) suggest an alternative perspective that may lend additional insight: namely, that escalation behavior can be understood as an activity that is directed by goals. In a similar vein, Conlon and Garland (1993) suggest that the project completion effect on escalation of commitment represents a goal substitution process in which a goal changes from an “economic one” to “completing whatever project has been started” (p. 403) as a project comes near completion. In other words, the project completion effect in escalation situations is driven by “well-known psychological processes whereby motivation to achieve a goal increases as an individual gets closer to that goal” (p. 403).

In fact, goals are an integral element in most human activities (Gollwitzer, 1996, 1999). Nonetheless, to date there has been only one empirical study that investigated how motivation to achieve a goal influences escalation of commitment; Kernan and Lord (1989) found that a discrepancy between an explicit goal (a goal expressed in a precise figure, e.g., a 10% increase in ROI) and specific feedback about current performance (e.g., an 8% increase in ROI) has a curvilinear relationship with escalation of commitment. Specifically, Kernan and Lord (1989) found that individuals become more willing to invest additional resources into a failing course of action when a discrepancy increases from small to moderate (e.g., 2% short of reaching a goal to

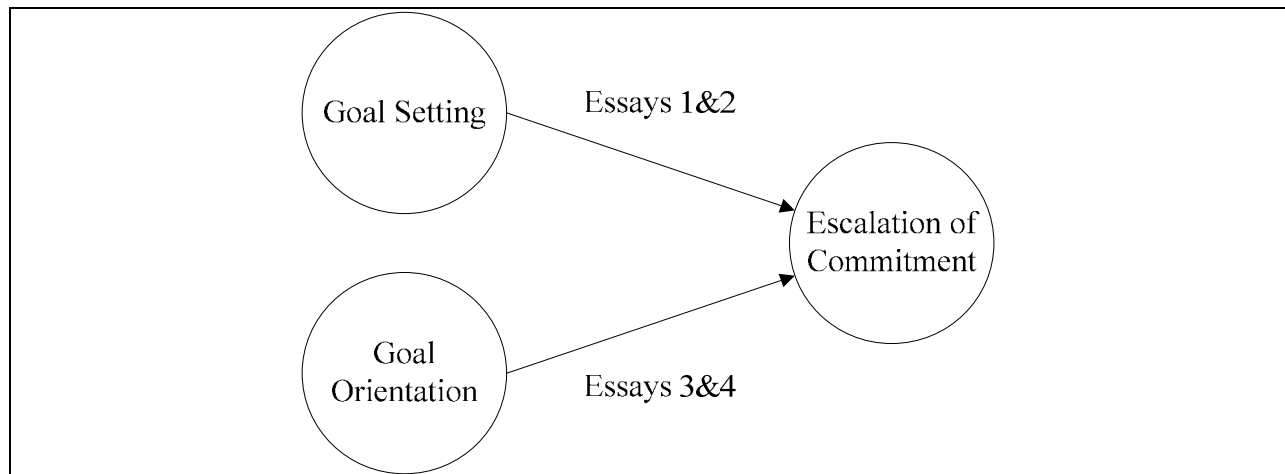
5% short of reaching a goal), but they become less willing to invest additional resources into a failing course of action when the discrepancy becomes large (e.g., 10% short of reaching a goal). While Kernan and Lord's (1989) results are very intriguing, one significant limitation is that their study does not shed any light on the underlying mechanism(s) governing the relationships between goals and escalation of commitment. In interpreting their results, Kernan and Lord (1989) draw upon control theory which posits that individuals monitor and control the goal-feedback discrepancy, but I suggest that there may be alternative theoretical explanations for their results (e.g., goal setting theory). Thus, more research is clearly warranted to investigate the relationships between goals and escalation of commitment; especially from the perspective of goal-related theories.

In this dissertation, I adopt a goal perspective to investigate escalation of commitment. Specifically, I draw from two of the most influential goal-related theories: goal setting theory (Locke, Shaw, Saari, & Latham, 1981) and goal orientation theory (Dweck & Elliott, 1983). In the remainder of this chapter, I present a general overview of this dissertation, discuss the relevant literatures, and present a brief introduction of four studies included in this dissertation.

### **Overview of Dissertation**

This dissertation follows the multi-paper model and consists of four separate essays that investigate the relationships between goals and escalation of commitment. Each essay involves one or more studies (each consisting of one or more laboratory experiments). Laboratory experiments were selected as the methodology of choice because they allowed me to create highly controlled settings in which the presumed cause-effect relationships could be examined without interference from other factors. Specifically, in each study I manipulate independent variables (i.e., a variety of aspects of goals) and examine their effects on escalation decisions.

Studies in Essay 1 are based on a simple task that involves identifying the letter ‘a’ in a small passage of text, whereas Studies in Essays 2–4 are based on a role-playing scenario that involves an IT project. In terms of theories, Studies in Essays 1 & 2 draw from goal setting theory, and Studies in Essays 3 & 4 draw from goal orientation theory (Figure 1-1).



**Figure 1-1 Conceptual Model for the Dissertation**

### **Relevant Literatures**

#### **Escalation of Commitment**

Despite advances in IT project management practices, successful completion of IT projects remains challenging. IT projects are often strategically important and require significant investments of both capital and labor; for instance, based on a global survey in which 1,471 IT projects were examined, Flyvbjerg & Budzier (2011) reported that the average cost of the IT projects was \$167 million and the largest cost was \$33 billion. As a consequence, failed IT projects can cause significant damages to organizations (Flyvbjerg & Budzier, 2011).

Signs that things are going awry (i.e., negative feedback) often become known to decision makers long before an IT project gets into serious trouble. However, in many situations decision makers continue to invest additional resources into troubled projects. For instance, in a recent survey it was found that 67 percent of companies failed to terminate, or redirect

unsuccessful IT projects (Meskendahl, Jonas, Kock, & Gemüden, 2011). Unsuccessful IT projects that continue to attract valuable organizational resources have been classified as “runaway” systems, and examined from the perspective of escalation of commitment (Keil, 1995; Keil et al., 2000a; Newman & Sabherwal, 1996). Further, Keil et al. (2000a) found that IT projects that experience escalation tend to perform worse in terms of project cost and schedule overruns compared to IT projects that do not experience escalation.

In the escalation literature, a variety of factors that influence a decision of whether or not to continue a failing course of action have been found. For instance, an individual who is personally responsible for initiating a course of action tends to become overly committed to this course of action despite negative feedback (Staw, 1976). In addition, there exists a linear relationship between sunk cost and escalation of commitment; the more resources that have been invested, the more an individual is willing to continue this course of action despite negative feedback (Arkes & Blumer, 1985; Garland, 1990). While these factors offer some explanation as to why an individual can become overly committed to a failing course of action, they ignore what may be an important key to understanding the escalation phenomenon, namely the relationships between goals and escalation behavior. A goal perspective is an appropriate lens to study escalation of commitment, because goals are what drive most human activities in achievement settings (Elliott & Dweck, 1988; Gollwitzer, 1996, 1999). Staw (1997) classified a variety of factors that influence escalation of commitment into four categories: project, psychological, social, and organizational; however, he did not provide any indication of how goals might affect escalation of commitment.

In the escalation literature, a few explanations have been offered as to how a goal can influence escalation decision: goal incongruency (Harrison & Harrell, 1993) and goal proximity

(Brockner, Shaw, & Rubin, 1979). Goal incongruity refers to goal conflict that occurs between principle and agent, and goal proximity refers to how close an individual is from reaching a goal; however, neither of these concepts provides an adequate explanation of how motivation to achieve a goal may influence escalation behavior. Thus, I suggest that further research is warranted to enhance our understanding of the escalation phenomenon from a goal perspective. In order to achieve this, I draw on two theoretical perspectives relating to goals; goal setting and goal orientation.

### **Goal Setting**

For several decades, researchers have consistently found goal setting to be an effective strategy to induce effort and improve task performance in a variety of situations, and goal setting theory is considered to be one of the most influential theories in management (Locke & Latham, 2009). Goal setting theory suggests that a specific challenging goal compared with a vague easy goal leads to better task performance (Locke & Latham, 2006). Three elements of a goal that have been found to influence task performance are: goal difficulty, goal specificity, and goal type (self-set vs. assigned). Specifically, a more difficult goal induces greater effort and leads to higher level of task performance compared with an easy goal (Locke & Latham, 2006); a specific goal leads to a smaller variability of performance than a vague goal (Latham & Locke, 1991); and a self-set goal (i.e., being asked to set a goal or take part in setting a goal) as opposed to an assigned goal encourages self-regulation activities, thus leading to better task performance (Erez & Kanfer, 1983).

Despite the benefits commonly associated with goal setting, Ordóñez et al. (2009) suggest that goal setting may also induce negative side effects. For instance, motivation to achieve a goal can lead individuals to make risky decisions, or to engage in unethical behaviors

(Ordóñez et al., 2009). Based on this, Ordóñez et al. (2009) suggested that more empirical research is warranted to investigate potential negative effects that can result from goal setting. I suggest that motivation to achieve a goal may lead individuals to continue a previously chosen course of action despite negative feedback, and that identifying the relationship between goal setting and escalation of commitment can make meaningful contributions to the recent scholarly discussion that has emerged concerning potential negative consequences of goal setting.

### **Goal Orientation**

Along with goal setting theory, goal orientation theory is considered to be one of the most influential motivation theories (DeShon & Gillespie, 2005). Goal orientation theory posits that individuals have different goal orientations which influence their conception of what can be accomplished in achievement situations (Dweck, 1986), and goal orientation has been found to influence a variety of behavioral response patterns in achievement settings (Dweck & Leggett, 1988; Elliott & Dweck, 1988), including feedback seeking (VandeWalle & Cummings, 1997), and performance adaptability (Kozlowski et al., 2001).

Goal orientation is believed to be a dispositional trait, but it can also appear as a situational trait in certain tasks (Button, Mathieu, & Zajac, 1996). Prior goal orientation research has shown that goal orientation can be manipulated through task instructions regarding beliefs about one's ability in achievement situations (Elliott & Dweck, 1988), and these beliefs about one's ability lead to adoption of two distinct types of goal orientation: learning and performance goal orientations (Brett & VandeWalle, 1999; Dweck, 1986). More specifically, individuals who view their ability as malleable (i.e., ability can be improved through effort) tend to adopt a learning goal orientation, whereas individuals who view their ability as fixed (i.e., ability cannot be improved through effort) tend to adopt a performance goal orientation (Brett & VandeWalle,

1999). A learning goal orientation involves improving one's ability by mastering challenging tasks, whereas a performance goal orientation involves demonstrating one's ability by producing a positive performance-related outcome, or avoiding a negative performance-related outcome.

While a two-dimensional conceptualization of goal orientation is widely accepted in the goal orientation literature, several researchers have suggested that there are two sub-dimensions underlying performance goal orientation: performance-proving and performance-avoiding goal orientation (Brett & VandeWalle, 1999; Elliot & Harackiewicz, 1996; VandeWalle, 1997). A proving goal orientation concerns "demonstrating one's competence and the gaining of favorable judgments from others", whereas an avoiding goal orientation concerns "avoiding negation of one's competence and the avoiding of negative judgments from others" (VandeWalle, 1997, p. 1000).

Goal orientation research has shown that different goal orientations induce different behavioral characteristics in organizational settings (Brett & VandeWalle, 1999; VandeWalle, Brown, Cron, & Slocum, 1999). To date, however, there have been no empirical studies that investigate how individuals' goal orientation influences escalation of commitment.

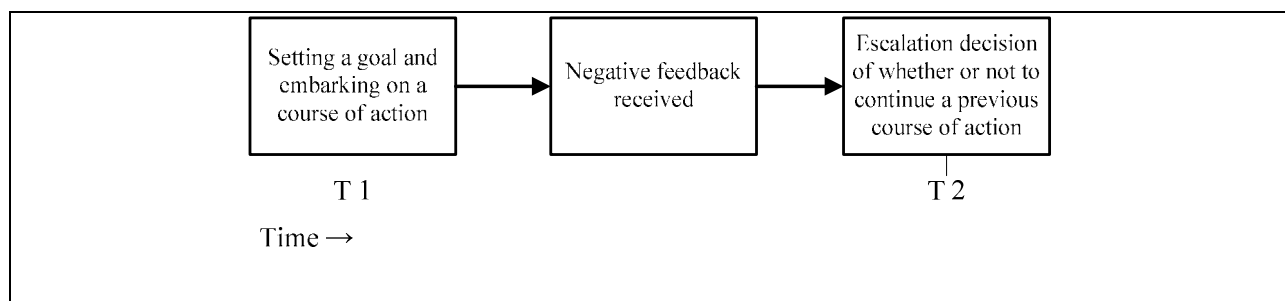
### **Overview of Four Essays**

In this section, I present a brief introduction and the research model for each of the four essays. All four essays draw upon two goal-related theories (goal setting and goal orientation) to enhance our understanding of escalation of commitment and focus on individual decision-making. Essay 1 focuses on two elements of goal setting (goal difficulty and goal source) and investigates the effect of initial goal setting on escalation decisions. Essay 2 investigates how initial budget and schedule goals influence the decision of whether or not to continue a troubled IT project. In Essay 2, two aspects of goal setting (goal difficulty and goal specificity) are

investigated in relation to escalation. Essay 3 investigates the effect of goal orientation (learning and performance) on escalation of commitment in a troubled IT. Lastly, Essay 4 investigates performance goal orientation (proving- and avoiding-performance goal orientation) as a mediating mechanism to understand the relationship between performance appraisal and IT project escalation.

### Essay One

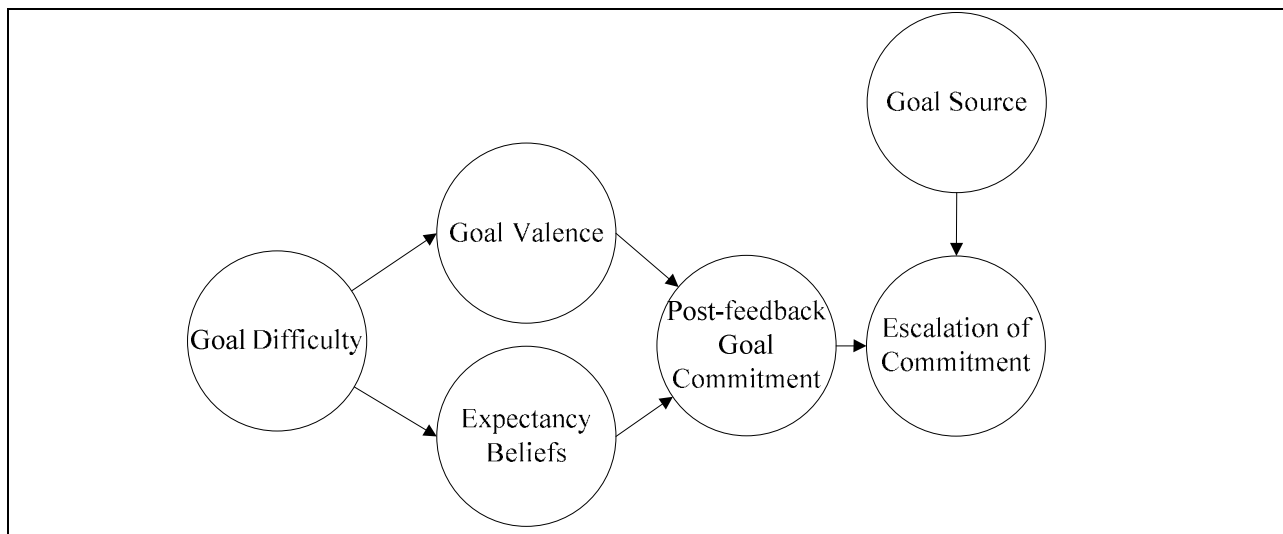
Essay 1 involves a series of five laboratory experiments with student subjects, and investigates the initial decision that involves goal setting in most escalation situations, and its effect on the subsequent decision of whether or not to continue a previously chosen course of action that is failing. Most human actions involve two distinct phases: (1) a “goal intention phase”, and (2) an “implementation intention” phase (Gollwitzer, 1996, 1999). More specifically, when initiating a certain purposeful action or task people first define goals to achieve (i.e., an end), and then determine a course of action to achieve the goals (i.e., means). In a similar vein, I conceptualize escalation situations as involving the followings: (1) a decision maker sets a goal to achieve (an end) and embarks on a particular course of action (a means), (2) subsequently, the decision maker receives negative feedback regarding the attainment of desired results, and (3) the decision maker commits additional resources into the previously chosen course of action that is failing (the previously chosen means) (Figure 1-2).



**Figure 1-2 Temporal Sequence of Escalation of Commitment**



The objective of Essay 1 is to draw new insights regarding the relationship of the initial goal setting (T1) with the subsequent escalation decision (T2), using two elements of goal setting: goal difficulty, and goal source. Specifically, I investigate a wide range of goal difficulty and three types of goal source (self-set, assigned, and inherited) with respect to their effects on escalation of commitment. In addition, I also investigate the mediating mechanisms (goal valence and expectancy beliefs) through which goal difficulty influences escalation of commitment. The research model for Essay 1 is shown in Figure 1-3.



**Figure 1-3 Research Model (Essay 1)**

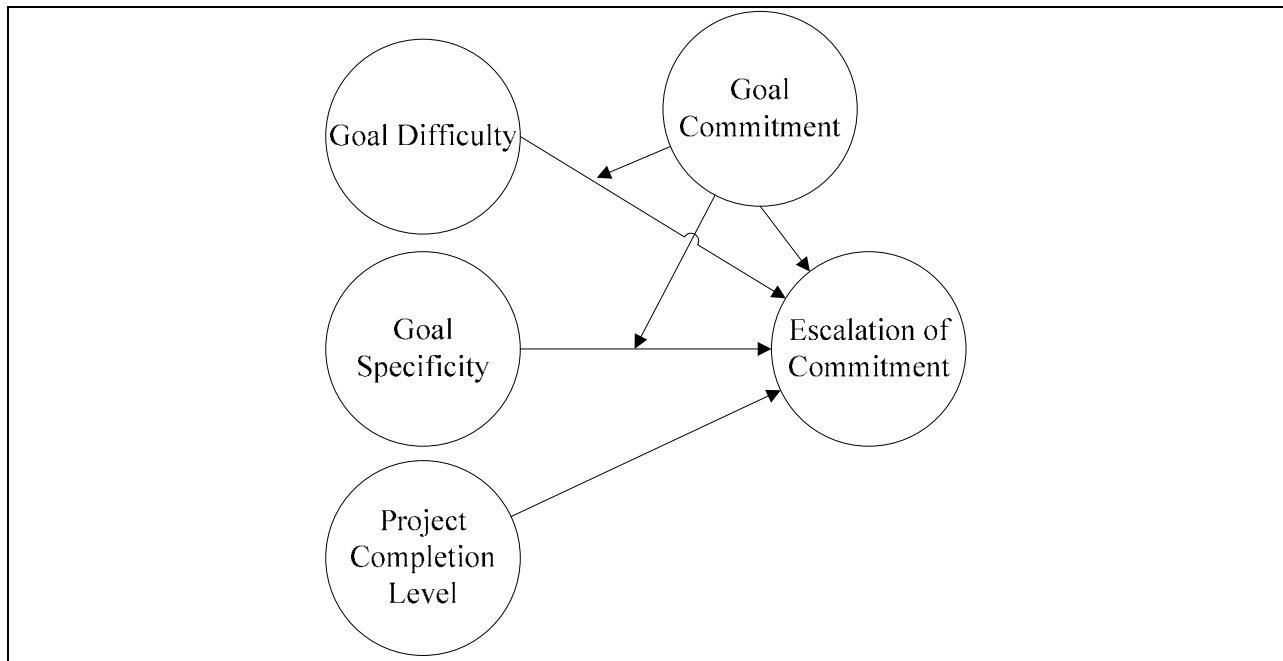
## **Essay Two**

Essay 2 involves a laboratory experiment with IT professionals. One key aspect of initiating an IT project involves setting a goal for budget and schedule. However, given any particular scope, budget and schedule goals may differ in terms of their difficulty and specificity. For example, a very aggressive budget and schedule goal (i.e., a difficult goal), or an ample budget and schedule goal (i.e., an easy goal) can be set for a project. Similarly, precise figures for the budget and schedule for a project (i.e., a specific goal), or ambiguous terms for the budget and schedule for a project (i.e., a vague goal) can be set. While budget and schedule goals set at

the beginning of a project can vary in terms of difficulty and specificity, the effect of difficulty and specificity of budget and schedule goals on IT project escalation remains unknown.

Therefore, the objectives of Essay 2 are to investigate the relationships between difficulty and specificity of budget and schedules goals on IT project escalation. In investigating these relationships, I develop two sets of competing hypotheses drawing from goal setting theory, and the literatures concerning the sunk cost effect and mental budgeting.

In addition, I also investigate the effect of project completion level on IT project escalation. The project completion effect is considered a cognitive bias in which individuals become more willing to continue a troubled project, as the project is near completion. I investigate if the project completion effect has an influence on escalation of commitment above and beyond the effect of motivational factors (goals). Lastly, I also investigate the interaction effects of initial commitment to budget and schedule goals with goal difficulty and goal specificity. The research model for Essay 2 is shown in Figure 1-4.



**Figure 1-4 Research Model (Essay 2)**

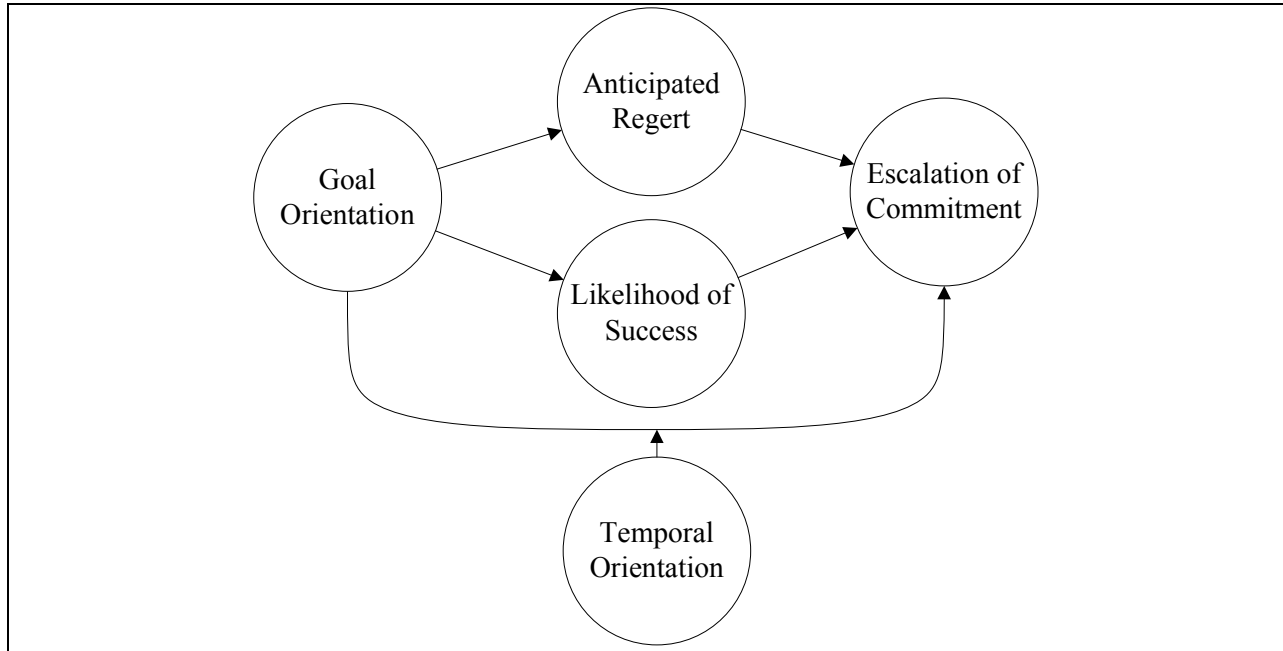
### **Essay Three**

Essay 3 involves a series of two laboratory experiments with student subjects and investigates the relationship between goal orientation (learning and performance) and escalation of commitment. Prior escalation research found that individuals are capable of both looking back and looking forward, and that both retrospective (e.g., sunk cost) and prospective factors (e.g., project completion level) can influence escalation behavior (Moon, 2001). Further, Conlon and Garland (1993) suggested that the force behind prospective thinking in escalation situations is achievement motivation. Escalation of commitment has not, however, been studied from an achievement motivation theory perspective, and this represents an important gap in escalation research. Goal orientation theory is one of the most influential achievement motivation theories (Elliott & Dweck, 1988), and it has the potential to yield important insights into how and why individuals look forward in escalation situations.

I suggest that a learning orientation is inherently prospective, as learning-oriented individuals focus on improving their ability through a future course of action and this prospective thinking may lead individuals to view continuing a failing course of action as an opportunity to achieve learning, hence causing escalation of commitment to occur. However, I also suggest that the prospective thinking that is normally associated with a learning goal orientation may be limited when individuals are instructed to focus on past events (i.e., past orientation). Thus, it is important to investigate the effect of temporal orientation (past or future orientation) (Holman & Silver, 1998; Zimbardo & Boyd, 1999) as a moderator for the relationship between goal orientation and escalation of commitment. Lastly, I also investigate the mediating mechanism underlying the effect of goal orientation on escalation of commitment. Specifically, I investigate two prospective factors (anticipated regret and perceived likelihood of success) as potential

mediating mechanisms through which goal orientation influences escalation of commitment.

The research model for Essay 3 is shown in Figure 1-5.



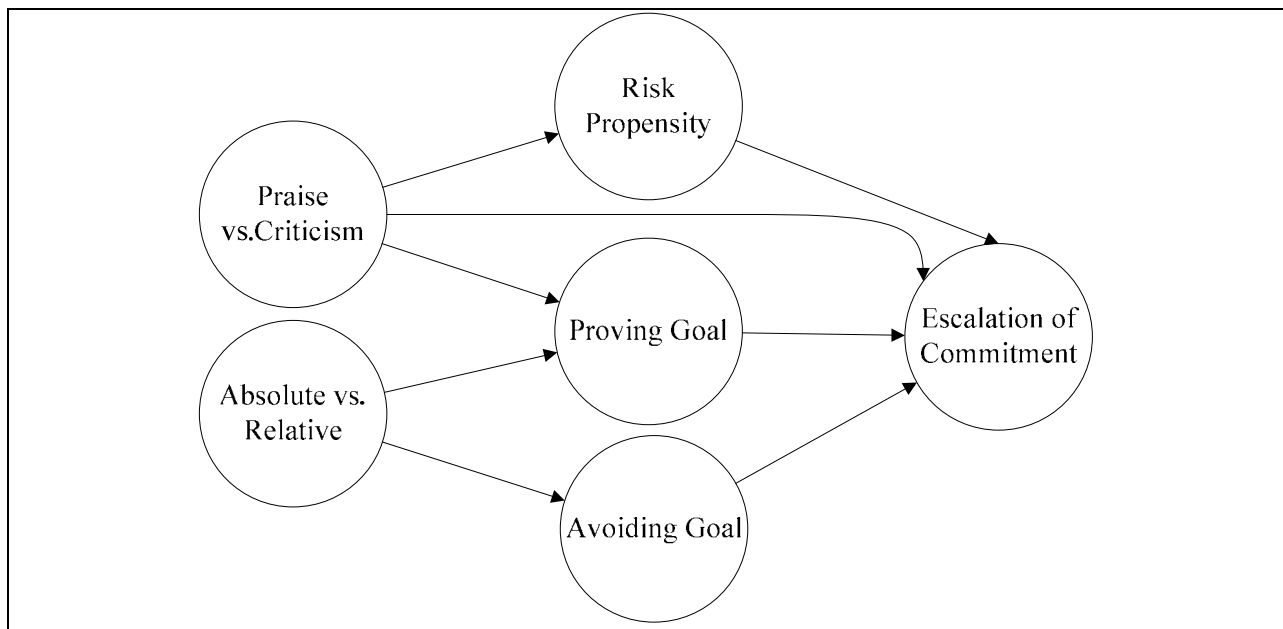
**Figure 1-5 Research Model (Essay 3)**

#### **Essay Four**

Essay 4 involves a laboratory experiment with student subjects, and investigates the influence of performance appraisal on escalation of commitment, as mediated by performance goal orientation. One overlooked area in escalation research is the inter-personal relationship between a subordinate (e.g., a project member) and his/her supervisor (e.g., a project manager), and its influence on escalation behavior. Specifically, I suggest that performance appraisals are an important part of building inter-personal relationships between project members and a project lead, and this may have a significant influence on personal goal development (e.g., goal orientation).

Essay four investigates the mediating role of two sub-dimensions of performance goal orientation (proving and avoiding goal orientations), on the relationship between performance

appraisal and a decision of whether or not to continue a troubled project. Specifically, I investigate two performance appraisal practices (praise vs. criticism based appraisals and absolute vs. relative rating appraisals) on escalation behavior. This essay also investigates how praise vs. criticism based appraisals influence project members' willingness to take risk (risk propensity), and how this, in turn, influences escalation decisions. The research model for Essay 4 is shown in Figure 1-6.



**Figure 1-6 Research Model (Essay 4)**

Table 1-1 provides the definitions for the constructs used in this dissertation.

	Construct	Definition	References
	Escalation of commitment <sup>++</sup>	An individual's continued commitment in the face of negative information about prior resource allocations coupled with "uncertainty surrounding the likelihood of goal attainment"	(Brockner, 1992)
Essay 1	Goal difficulty <sup>+</sup>	The degree to which a goal is difficult to achieve.	(Locke, Chah, Lustgarten, & Lustgarten, 1989)
	Goal source <sup>+</sup>	Where goals originate, i.e., in terms of whether an individual	(Erez & Kanfer, 1983; Latham, Erez, &

		voluntarily sets his or her own goal, is assigned a goal, or is asked to inherit a goal that a predecessor failed to attain.	Locke, 1988)
	Goal Valence <sup>++</sup>	Anticipated satisfaction or attractiveness of outcome.	(Dachler & Mobley, 1973; Garland, 1985; Mento, Locke, & Klein, 1992; Yukl & Latham, 1978)
	Expectancy Beliefs <sup>++</sup>	The degree to which individuals believe that effort will lead to a performance level required to attain the goal.	(Klein, 1991; Locke & Latham, 2002; Reinharth & Wahba, 1975)
Essay 2	Goal difficulty <sup>+</sup>	The degree to which a goal is difficult to achieve.	(Locke et al., 1989)
	Goal specificity <sup>+</sup>	The degree to which a project goal is described in a specific manner such that interpretive leeway is reduced from less specific goals (e.g., do your best) to more specific goals (e.g., increase your performance exactly by 10%)	(Locke et al., 1989)
	Project completion level <sup>+</sup>	The degree to which a project is near completion (e.g., 10%, or 90%)	(Garland & Conlon, 1998)
	Goal commitment <sup>++</sup>	The degree to which individuals are determined to achieve their goal even in the presence of obstacles or challenges.	(Latham & Locke, 1991)
Essay 3	Goal orientation <sup>+</sup>	An individual's orientation in achievement situations. Two major classes of goal orientation are known: learning goal orientation in which an individual focuses on learning, and performance goal orientation in which an individual focuses on the outcome of a task	(Dweck, 1986; VandeWalle et al., 1999)
	Temporal orientation <sup>+</sup>	An individual's cognitive emphasis anchored to one of the three time domains (i.e., past, present, or future) in specific situations.	(Holman & Silver, 1998; Zimbardo & Boyd, 1999)

	Anticipated regret <sup>++</sup>	A prospective type of regret that individuals experience by imagining how they will feel in response to a future event after they make a certain decision.	(Simonson, 1992; Zeelenberg, 1999)
	Perceived likelihood of success <sup>++</sup>	Perceived likelihood that continuing a failing course of action will lead to a positive outcome.	(Heath, 1995)
Essay 4	Praise vs. criticism based appraisals <sup>+</sup>	Conducting a performance appraisal primarily based on support or criticism regarding a subordinate's past performance.	(Cederblom, 1982)
	Absolute vs. relative rating appraisals <sup>+</sup>	Conducting performance appraisal interviews based on the absolute standing of a subordinate (i.e., furnishing performance feedback that is independent of others' performance) or the relative standing of a subordinate (i.e., furnishing feedback that is relative to that of others).	(Moore & Klein, 2008)
	Proving performance goal orientation <sup>++</sup>	Performance goal orientation that concerns "demonstrating one's competence and the gaining of favorable judgments from others"	(VandeWalle, 1997, p. 1000)
	Avoiding performance goal orientation <sup>++</sup>	Performance goal orientation that concerns "avoiding negation of one's competence and the avoiding of negative judgments from others"	(VandeWalle, 1997, p. 1000)
	Risk propensity <sup>++</sup>	An individual's preference to take or avoid risk in uncertain situations	(Sitkin & Pablo, 1992)
<sup>+</sup> Experimentally manipulated variables <sup>++</sup> Reflectively measured variables			

**Table 1-1 Construct Definitions**

### **Data Analyses**

A variety of statistical analysis techniques are used in this dissertation. The Analysis of Variance (ANOVA) is a simple, yet powerful technique to test the effect of various treatments on

a dependent variable in an experimental study (Tybout et al., 2001). Thus, various ANOVA-related techniques are used as a primary analysis technique for Study 1. Further, in Study 1, covariance-based SEM is used for the measurement model test, and the non-linear mediation analysis method suggested by Hayes & Preacher (2010) is used for the mediation test. The data analysis of Study 2 is primarily based on hierarchical regression with interaction terms. In Study 3, the data analysis is based on ANOVA-related techniques and the mediation analysis method suggested by Preacher & Hayes (2008). Lastly, Study 4 involves several structural paths between independent variables and a dependent variable; thus, the data analysis is based on a technique that allows structural path analysis (i.e., Partial Least Squares) and the mediation analysis method suggested by Preacher & Hayes (2008).

### **Contributions**

This dissertation contributes to existing knowledge in several respects. From a theoretical standpoint, it represents the first attempt to integrate two goal-related theories with escalation research. Thus, the dissertation provides strong empirical evidence that goals can indeed play a significant role in escalation of commitment across a variety of different task contexts (including IT and non-IT). More specifically, it enhances our understanding of how the difficulty and sources of initial goals influence the decision of whether or not to continue a failing course of action. Further, for IT project management this dissertation yields interesting insights into how the difficulty and specificity of initial budget and schedule goals can influence the decision of whether or not to continue a troubled IT project.

In addition, the dissertation provides new insight regarding how learning goal orientation invokes prospective thinking in escalation situations, and the moderating role that temporal orientation plays in shaping the relationship between goal orientation and escalation of



commitment. Lastly, it provides new insights regarding the role that performance goal orientation plays in mediating the relationship between performance appraisal and project escalation.

## **Chapter 2 The Impact of Initial Goals on Escalation of Commitment: A Goal Setting Theory Perspective<sup>1</sup>**

### **Abstract**

Escalation of commitment to a failing course of action is a management problem that occurs across a wide range of decision contexts. In this research, we address an important theoretical gap by examining relationships between initial goal setting and escalation of commitment. Through a series of five experiments, we found that more difficult goals lead individuals to continue a failing course of action and that this relationship is mediated by goal valence and expectancy beliefs. The relationship between goal difficulty and escalation is non-linear, however, meaning that the effect of goal difficulty on escalation can become negative when goals are extremely difficult. Finally, we investigated the effect of goal source (self-set, assigned, and inherited goals) on escalation and found that individuals, who did not take part in initial goal setting and did not invest effort in pursuing the previous course of action, are less likely to fall into the escalation trap.

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<sup>1</sup> Lee, J. S., Keil, M., and Wong, K. F. W. "The Impact of Initial Goals on Escalation of Commitment: A Goal Setting Theory Perspective," Working paper, 2013. Note: a previous version of this paper was presented at the 2011 Academy of Management Meeting.

## Introduction

One of the greatest challenges that individuals often face is deciding whether or not to abandon a previously chosen course of action that has not produced a desired outcome. Indeed, it is well known that decision makers frequently become overly committed to a failing course of action, a phenomenon that has been labeled “escalation of commitment” (Staw, 1981, 1997). Escalation of commitment has been observed across a wide variety of contexts including: bank loans (Staw et al., 1997), corporate bidding wars (Bazerman, 1999), hiring and promotion decisions (Schoorman, 1988), warfare (Brafman & Brafman, 2008), software development projects (Keil, 1995; Keil et al., 2000a), and even NBA playing time (Staw & Hoang, 1995).

Due to its significant implications across a wide variety of contexts, escalation of commitment has attracted considerable research attention since the 1970s. Some of the more prominent factors that have been found to influence escalation of commitment include personal responsibility (Staw, 1976), sunk cost (Arkes & Blumer, 1985; Garland, 1990), and completion level (Conlon & Garland, 1993). While research on these and other factors have significantly enhanced our understanding, the existing literature remains silent on what we believe is an essential element of the escalation phenomenon, namely how initial goals shape escalation behavior. In this research, we show that examining escalation of commitment from a goal setting theory perspective provides fresh insights into the cognitive mechanisms underlying the relationship between initial goals and escalation behavior.

Most human actions involve two distinct phases: (1) a “goal intention phase”, and (2) an “implementation intention” phase (Gollwitzer, 1996, 1999). More specifically, when initiating a certain purposeful action or task people first define goals to achieve (i.e., an end), and then determine a course of action to achieve the goals (i.e., means). In a similar vein, escalation

situations typically begin with *an initial decision* to embark on a particular course of action (a means) with the aim of achieving a goal (an end), and this initial decision is followed by *a subsequent escalation decision* concerning whether or not to recommit to the previously chosen course of action that has not led to goal attainment or a desired outcome (Brockner, 1992).

Ironically, while escalation of commitment has on occasion been characterized as a goal pursuing activity (Brockner, 1992; Fox & Hoffman, 2002; Staw, 1981), there has been no systematic attempt to understand escalation behavior from a goal setting theory perspective. Moreover, prior escalation research has focused almost exclusively on factors that do not directly address the nature of initial goal setting in escalation situations; examples include personal responsibility (Staw, 1976), sunk cost (Arkes & Blumer, 1985), mental budgeting (Heath, 1995), risk and future reward (Wong & Kwong, 2008), and negative emotion reduction (Wong, Yik, & Kwong, 2006). Thus, very little is known about the relationship between the “goal intention” phase (i.e., initial goal setting) and the decision of whether or not to recommit to a previously chosen course of action that has failed to produce a desired outcome. We seek to address this theoretical gap in the literature by probing how initial goal setting influences escalation decisions, thereby gaining deeper insight into the cognitive mechanisms that influence escalation behavior. In order to accomplish this, we draw upon goal setting theory.

Goal setting theory is recognized as one of the most influential management theories (Locke & Latham, 1990, 2009), and integrating the goal setting perspective with escalation research holds the promise of enabling significant theoretical contributions for two reasons. First, the goal setting perspective provides an appropriate theoretical lens to investigate the cognitive mechanisms that explain how the difficulty of initial goals may influence escalation decisions. Second, it provides a theoretical lens to draw new insights on the relationship between sources of

initial goals (e.g., self-set and assigned goals) and escalation decisions. In this research, we examine empirically how the difficulty and source of an initial goal can influence an individual's willingness to escalate commitment to a previously chosen course of action. In sum, the objectives of our research are to investigate: 1) the relationship between goal difficulty and an escalation decision over a wide range of goal levels, 2) mediating mechanisms for the relationship between goal difficulty and an escalation decision, and 3) the effect of goal source on an escalation decision.

### **Escalation of Commitment**

Escalation of commitment has been studied from a variety of theoretical perspectives, including prospect theory (Whyte, 1986) and the sunk cost effect (Arkes & Blumer, 1985; Garland, 1990), agency theory (Harrison & Harrell, 1993), approach avoidance theory (Rubin & Brockner, 1975) and the completion effect (Conlon & Garland, 1993), and regret and negative affect aversion (Wong & Kwong, 2007). While these theories have significantly advanced our understanding of escalation of commitment, they have largely ignored the fact that the initial decision to embark on a course of action begins with a “goal intention” phase which involves setting a goal to be achieved.

While there are some studies that have alluded to the important role that goals can play in escalation of commitment, they have not focused on how initial goal setting influences escalation decisions. Instead, they have been grounded in agency theory or approach avoidance theory, rather than goal setting theory. For example, consistent with agency theory, prior research has shown that goal incongruency between principal and agent can promote escalation behavior when a condition of information asymmetry exists and the agent is able to conceal the true status of the task at hand (Harrison & Harrell, 1993; Kirby & Davis, 1998). In addition, consistent with

approach avoidance theory, prior research has indicated that goal proximity can influence escalation of commitment, presumably because an individual becomes more willing to invest additional resources as s/he comes closer to reaching a goal (Brockner et al., 1979). Conlon & Garland (1993) refer to this as the completion effect. They argue that the nature of the goal itself may change as a project nears completion; for example, the goal at the outset may have been an economic one, such as profit maximization but the goal can morph into simply completing the project at any cost (Conlon & Garland, 1993). If this is so, goal proximity promotes escalation by means of goal substitution which manifests itself not at the point at which an initial goal is set (i.e., goal intention phase), but rather, at the escalation decision stage.

In summary, while the concepts of goal incongruence and goal proximity have yielded important insights into escalation behavior, they do not provide a useful theoretical lens for understanding how initial goal setting influences escalation of commitment. For that, we must turn to goal setting theory. In a conceptual paper, Fox and Hoffman (2002) suggested escalation behavior can be viewed as a specific case of goal-directed activity. Since that time, one empirical study has found that assigning an extremely difficult goal can induce de-escalation of commitment (Lee, Keil, & Kasi, 2012a). To date, however, there has been no systematic investigation of the relationship between goal setting and escalation behavior and it is this theoretical gap that we seek to address.

## **Research Design: General Overview**

### **Preview of Studies**

In this paper, we report the findings of a series of five experiments in which the results of three initial experiments were used to design more refined subsequent experiments. Specifically, we conducted Study 1 to explore potential relationships between two aspects of goal setting (goal

difficulty and goal source) and escalation of commitment. The findings of Study 1 led us to propose a new type of goal source (i.e., inherited goal) and to conduct Study 2 in which the relationship between goal source and escalation of commitment was further explored. The findings of Study 1 also prompted us to conduct Study 3 in which the relationship between goal difficulty and escalation of commitment was explored over a much wider range of goal difficulty. On the basis of the findings of Studies 1, 2 & 3, which were more exploratory in nature, we then refined our experimental design, developed and tested a causal model that included mediating mechanisms for the relationship between goal difficulty and escalation of commitment (Study 4), and further probed the relationship between goal source and escalation (Study 5). Further, in Studies 4 & 5 we examined potential rival explanations for the relationships between goal setting and escalation of commitment. Taken together, the five experiments allowed us to replicate results using different decision settings, manipulations, and measures (Lykken, 1968; McNatt & Judge, 2004), thus adding to the robustness of our research and fulfilling the three key criteria for causality suggested by Cook & Campbell (1979): (1) co-variation between the presumed cause and effect, (2) temporal precedence of the cause over the effect, and (3) exclusion of alternative explanations for the presumed cause-effect relationship.

### **Experimental Design**

All five experiments consisted of 2 phases. In phase 1, participants were asked to set, or were assigned a goal, and then worked to attain the goal. In phase 2, participants who failed to attain their goals in phase 1 (or inherited a goal that had not been achieved in phase 1) were asked to make a decision regarding whether or not to continue to a previous course of action. The task chosen for our experiments was identifying the letter 'a' by circling each occurrence in a short passage of text from a business magazine article. This task was chosen for three reasons.

First, it is particularly challenging for an individual to identify all occurrences of a specific letter that is embedded in a meaningful passage of text as compared with a non-meaningful passage of text: a phenomenon known as the word inferiority effect (Healy & Drewnowski, 1983). Thus, a key benefit of choosing this type of task is that it allowed us to prevent losing a large fraction of participants in phase 1. Second, prior research has shown that people are engaged and care for their performance in this task (Kwong & Wong, In Press), thus allowing us to create an appropriate decision setting to examine escalation of commitment. In addition, we provided monetary rewards to the participants for attaining a goal. Thus, “psychological realism” was enhanced by engaging participants in a real task setting rather than a hypothetical setting, and by providing monetary incentives (Berkowitz & Donnerstein, 1982; Colquitt, 2008).

### **Study 1**

We conducted Study 1 to explore possible connections between two aspects of goal setting (goal difficulty and goal source) and escalation of commitment.

#### **Participants and Experimental Design**

We recruited 144 undergraduate students enrolled in an introductory business course at a large urban university in the southeastern United States (mean age = 21.05, s.d. = 4.42; 52% male, 48% female). In the experiment, two independent variables were manipulated: goal difficulty (easy and difficult) and goal source (self-set and assigned). Goal difficulty was manipulated by using an anchoring procedure. The anchoring effect is manifested as a cognitive bias that occurs when people make a decision that is influenced by a trivial fact or number to which they are exposed prior to the decision (Tversky & Kahneman, 1974). The use of anchors has been found to be an effective means of manipulating goal difficulty, with no effect on goal commitment associated with self-set goals (Hinsz, Kalnbach, & Lorentz, 1997). Goal source



was manipulated using a yoked design in which a pair of participants receive exactly the same treatment, but only one person in the pair is given an opportunity to exert control over the treatment (e.g., setting a goal) (Tybout et al., 2001). Within the escalation literature, there is precedent for using a yoked design (Wong et al., 2006), and this approach has the advantage of ensuring that a pair of participants receive a completely identical experience (in this case with respect to goal difficulty).

Subjects were randomly assigned to one of four treatment conditions in a 2 x 2 factorial design: self-set easy goal, self-set difficult goal, assigned easy goal, and assigned difficult goal. Prior research by Hinsz et al. (1997) has shown that an arbitrarily high anchor can be used as a strategy for establishing challenging self-set goals. Therefore, participants assigned to the self-set difficult goal group were given a high numeric anchor to induce the selection of a difficult goal. Participants in the self-set easy goal group were given a low numeric anchor to induce the selection of an easy goal. The yoked design enabled us to use the goals chosen by the participants in the self-set goal groups as the goals for participants in the corresponding assigned goal groups (Hollenbeck, Williams, & Klein, 1989). Each participant in the easy assigned goal group was yoked to a participant in the easy self-set goal group, and each participant in the difficult assigned goal group was yoked to a participant in the difficult self-set goal group. Thus, for each self-set goal participant, there was an assigned goal participant who was working with the exact same goal.

### **Decision Task, Procedure, and Measures**

The experiment consisted of 2 phases. In phase 1, the participants were given instructions pertaining to the task, goal, and reward rules, and then asked to set a goal or were assigned a goal. The participants were then given one minute to perform a task which involved

identifying the letter 'a' by circling each occurrence in a short text passage. The participants were instructed that they should spend the entire minute circling a's, and that they would be given time afterwards to count the number of a's they circled and to record their count. The passage of text had 291 words and contained 110 a's. The percent of a's that a participant set out to identify in the article constituted the goal.

In the self-set goal conditions, participants were given instructions that contained an anchor, and asked to set a goal as follows: "Set a goal for the percentage of 'a' letters in the passage that you think you can identify (by circling) in 1 minute, for example [10 / 90] %". The *10% anchor* was used for participants in the self-set *easy goal* group and the *90% anchor* was used for participants in the self-set *difficult goal* group (with 10% and 90% representing the anchors and not the actual goals selected by the participants). Participants were then asked to record their goal as follows by filling in the blank: "My goal is to be able to identify and circle \_\_\_\_\_% of the "a" letters in 1 minute." Participants in the assigned goal groups were then yoked to a participant in the corresponding self-set goal group.

Whether the goal was self-set or assigned, participants were informed that they would be rewarded for their performance based on their ability to attain the goal, and that the reward would be in direct proportion to the goal, provided that the goal was attained. They were also informed that there would be no additional reward for exceeding the goal. Rewards were set at the rate of 10 cents for every percent of a's identified in the passage of text. Before performing the task, participants were asked two questions pertaining to task specific self-efficacy (Whyte, Saks, & Hook, 1997) on a 7-point likert scale.

After performing the task, participants were asked to count and record the number of a's they identified, whereupon the administrator provided individual feedback on their phase 1

performance. As a first step in the feedback process, the administrator visually compared each individual's goal with the reported count to see whether the goal was attained. Participants who did not attain their goal were given this as feedback along with the exact percentage of a's in the passage they identified as a measure of their performance in phase 1. Participants who did not attain the goal in phase 1 were invited to participate in phase 2 of the experiment. Participants who attained their goal in phase 1 were given a monetary reward and dismissed from the experiment.

At the beginning of phase 2, participants were asked to answer two questions pertaining to perceived goal difficulty on a 7-point likert scale (see Appendix A for the actual measurement items used). After this short questionnaire, participants were informed that they would be given 2 more minutes and were asked to indicate what proportion of the 2 minutes they would choose to allocate between two tasks. The first task was to continue identifying a's with the aim of meeting the original goal. Participants were informed that if they chose this task, the progress they made in phase 1 would be accumulated across phase 1 and phase 2. The second task involved setting a new goal representing the percent of i's that a participant would try to identify in the same passage of text (any goal between 1-100% could be chosen), and working to attain the new goal. Participants could earn rewards under the same rules as in phase 1 for meeting either the original goal or their new goal. After allocating the time they planned to spend between the two tasks, however, participants were not asked to spend any additional time actually working on either task.

The dependent variable in our experiment was the percentage of time allocated in phase 2 to the original task. The allocation of resources has been used as dependent variable in many prior escalation studies (Conlon & Garland, 1993; Hantula & Bragger, 1999; Northcraft & Neale,

1986; Staw, 1976). Further, the experimental task and procedure were designed to be consistent with the escalation literature and contained the three characteristics that are normally associated with escalation situations: (a) embarking on a course of action with some goal in mind; (b) negative feedback that an individual is failing or has failed to attain the goal; and (c) an opportunity to invest additional resources to pursue a previous course of action (Staw, 1982).

## Results

**Manipulation check.** We first examined whether the use of anchors was effective in manipulating goal difficulty. A one-way ANOVA revealed that participants given a high anchor in the difficult goal group set significantly higher goals ( $M = 70.78$ ,  $SD = 20.72$ ) than did those given a low anchor in the easy goal group ( $M = 50.11$ ,  $SD = 24.07$ ), ( $F(1,69) = 15.05$ ,  $p < .01$ ,  $\eta^2_p = .18$ ). Thus, the anchoring approach was effective in manipulating goal difficulty. Further, the results of a two-way ANOVA indicated that goal difficulty had a significant positive effect on perceived goal difficulty ( $F(1,136) = 4.88$ ,  $p < .05$ ,  $\eta^2_p = .04$ ), and that goal source did not have a significant effect on perceived goal difficulty.

**Testing of Main Effects.** A yoked dyad of participants was used as our unit of analysis for testing of main effects. Four participants did not indicate their time allocation between the two tasks, and they were excluded from further analysis. Only those pairs in which neither participant (self-set or assigned) attained the goal were included in the analysis. This left us with 33 pairs for the difficult goal treatment and 25 pairs for the easy goal treatment. First, we compared the mean percentage of time allocated to the original task across the four treatment groups. In the self-set goal condition, participants with difficult goals allocated more time to the original task ( $M = 72.27$ ,  $SD = 32.36$ ) than did those with easy goals ( $M = 52.24$ ,  $SD = 34.55$ ).

In the assigned goal condition, participants with difficult goals also allocated more time to the original task ( $M = 65.55$ ,  $SD = 29.59$ ) than did those with easy goals ( $M = 51.20$ ,  $SD = 28.88$ ).

Tybout et al (2001) recommend that in a yoked design, variability between pairs be analyzed via a straightforward two-group matched test. Accordingly, we subjected the mean percentage of time allocated to the original task to a mixed-model ANOVA with interaction having a pair of two-group matched measures (goal source: self-set and assigned) and a between-subject factor (goal difficulty: difficult and easy). Only the main effect of goal difficulty on the mean percentage of time allocated to the original task was statistically significant ( $F(1,56) = 10.08$ ,  $p < .01$ ,  $\eta^2_p = .15$ ). The main effect of goal source was not significant, and there was no significant interaction between goal difficulty and goal source. In addition, we conducted a separate one-way ANCOVA on the unmatched dataset to test the main effect of goal difficulty on time allocation with two control variables (phase 1 performance and self-efficacy); phase 1 performance was included to control for the potential effect associated with a goal-performance discrepancy (Donovan & Williams, 2003) and self-efficacy was included as it has been found to be an important factor in goal-achievement situations (Bandura & Cervone, 1983; Phillips & Gully, 1997). The results indicated that the main effect of goal difficulty was significant ( $F(1,121) = 11.35$ ,  $p < .01$ ,  $\eta^2_p = .09$ ) even when controlling for these variables.

## Study 2

Motivated by the non-significant effect of goal source on escalation of commitment in Study 1, we designed Study 2 to further probe the effect of goal source on escalation of commitment. One key characteristic of Study 1 was that half of the participants received assigned goals in phase 1. Prior research has shown that previously assigned goals can influence subsequent decision making in a multiple-trial task (Locke, Frederick, & Bobko, 1984).

Therefore, the participants in Study 1 may have become committed to their assigned goals after working on the task in phase 1, thus weakening the effect of assigned goals and producing results similar to those obtained with self-set goals. Indeed, goal setting literature suggests that the element which distinguishes self-set goals from assigned goals is the extent to which individuals embrace a goal as their own (Latham, Winters, & Locke, 2006). When an individual accepts an assigned goal as his/her own goal, the distinct nature of an assigned goal disappears, and the assigned goal has the same effect as a self-set goal. Thus, we reasoned that the manner in which we manipulated assigned goals, coupled with the two-stage nature of the experiment, may have weakened the effect that would normally be associated with an assigned goal.

Upon further reflection, we concluded that there exists an additional type of goal in escalation situations, besides self-set goals and assigned goals. Escalation situations typically involve at least three distinct actions: initiating a course of action by setting some type of a goal, working on a chosen course of action with the aim of attaining the goal, and deciding whether or not to continue a failing course of action (Staw, 1982). Individuals with a self-set goal are involved in all three actions, whereas individuals with an assigned goal are typically involved in the latter two only. In addition to these two variations, an individual may be asked to take part only in making a decision of whether or not to continue the failing course of action. In such circumstances, the individual would be involved in *neither* initial goal setting *nor* pursuing the previous course of action. We call this type of goal source an inherited goal (Table 2-1).W

	Involvement in initial goal setting	Involvement in pursuing previous course of action	Involvement in decision to continue
Self-set goal	Yes	Yes	Yes
Assigned goal	<u>No</u>	Yes	Yes
Inherited goal	<u>No</u>	<u>No</u>	Yes

**Table 2-1 Three Types of Goal Source in Escalation Situations**

These three distinct goal sources allow us to theorize about the relationship between goal source and escalation of commitment. In the goal setting literature, goal source is known to influence task performance. More specifically, involvement in goal setting (i.e., self-set goals) is known to lead to a higher level of task performance than no involvement in goal setting (i.e., assigned goals) (Bandura, 1986; Deci, 1980; Erez & Kanfer, 1983). Still, the effectiveness of assigned goals can depend on how they are assigned and the degree to which individuals accept the assigned goal as their own (Erez & Kanfer, 1983; Latham et al., 1988; Latham & Locke, 1991). For instance, Latham et al. (1988) found that using a “tell and sell” style (i.e., providing a rationale along with an assigned goal) was just as effective as a self-set goal, whereas a simple “tell” style (i.e., without providing a rationale for an assigned goal) was not as effective as a self-set goal. Based on this, we posit that a goal that was set *and* failed to be attained by a predecessor (i.e., inherited goal) is less likely to be accepted by an individual, compared with either a self-set goal or an assigned goal that failed to be attained. Thus, we propose:

*Hypothesis 1.* Individuals with an inherited goal will be less willing to continue a previous chosen course of action despite negative feedback compared to individuals with either a self-set goal or an assigned goal.

## **Experimental Design**

We recruited 99 undergraduate students from the same business course at the same institution as in Study 1 (mean age = 22.31, s.d. = 6.14; 54% male, 46% female), but Study 2 was conducted in a different academic semester. Further, we excluded any student who re-enrolled in the course to make sure that no participant from Study 1 took part in Study 2. Participants were randomly assigned to one of three treatment groups: self-set goal, assigned goal, and inherited goal (conceptualized as a situation in which there was no participation in either goal setting or the previous course of action that did not lead to goal attainment as per

Table 2-1). For this study, we only examined difficult goals. A yoked design was used, in which the difficult goals chosen by participants in the self-set goal group were assigned to participants in the assigned goal group. The goals and phase 1 performance of the participants in the self-set goal group were assigned to participants in the inherited goal group. This ensured that each participant in the assigned goal group and the inherited goal group was working with the identical goal as the individual that s/he was yoked to in the self-set goal group.

### **Decision Task, Procedure, and Measures**

Study 2 involved the same task and measures from Study 1 for all three treatment groups; except that a higher anchor, “100%” (instead of 90%), was used for the self-set goal group to induce participants to choose very difficult goals in order to maximize the effect of goal difficulty (Erez, Gopher, & Arzi, 1990). Otherwise, the experimental procedure remained unchanged relative to Study 1 for the self-set goal group and the assigned goal group. Participants in the inherited goal group were informed that they had been brought in to replace another individual who had previously set a goal, but failed to attain the goal in phase 1. All three treatment groups received phase 2 instructions and reward rules that were the same as those used in Study 1.

### **Results**

**Testing of Main Effects.** A triad of 3 participants sharing the same goal (a participant in the self-set goal condition, a participant in the assigned goal condition, and a participant in the inherited goal condition) became our unit of analysis. A total of 4 participants attained their goals in phase 1, thus they were excluded from further analysis. Only those triads in which neither the participants in the self-set goal group nor those in assigned goal group attained the goal were included in the analysis. On this basis, 31 triads were retained for analysis. The mean



goal set by the participants in the self-set goal group was 74.00 ( $M = 74.00, SD = 19.88$ ).<sup>2</sup>

Because of the yoked design, the goals were the same in all three treatment groups. Once again, our dependent variable of interest was the mean percentage of time allocated to the original task. Participants in the self-set goal group allocated on average 71% of the 2 minutes to the original task ( $M = 71.35, SD = 29.44$ ), participants in the assigned goal group allocated on average 60% of the 2 minutes to the original task ( $M = 60.16, SD = 32.85$ ), and participants in the inherited goal group allocated on average 51% of the 2 minutes to the original task ( $M = 50.65, SD = 14.76$ ).

The effect of goal source was tested through repeated measures regression following the procedure delineated in Cohen & Cohen (1983), which focuses on testing the significance of incremental variance accounted by a repeated-measures factor using an  $F$ -statistic. We chose this analysis because our experiment involved a yoked design in which three individuals constituted a triad (self-set, assigned, and inherited), enabling repeated measure comparisons among goal source conditions with respect to escalation. This analysis allowed us to control for individual differences in a triad which would not have been possible using normal regression analysis. To perform the analysis, we followed a least-squares dummy variable approach (Jaccard & Wan, 1993; Sayrs, 1989) in which  $N - 1$  dummy-coded subject vectors were created (representing each of the participants) and entered in the first step of the regression to control for individual differences in a triad. First, in Model 1, the dummy vectors were entered into the regression to predict the mean percentage of time allocated to the original task (DV). Second, in Model 2, self-efficacy was entered into the regression to control for between-subject differences

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<sup>2</sup> This was slightly higher than the mean goal set by the participants in the difficult goal group in Study 1 ( $M = 70.78, SD = 20.72$ ) and may reflect the higher anchor that was used in Study 2 for the self-set goal treatment group (100% in Study 2 vs. 90% in Study 1).

in self-efficacy.<sup>3</sup> Third, in Model 3, goal source was entered into the regression. The  $F$ -change in Model 3 was found to be significant ( $\Delta F = 5.06, p < .01$ ), indicating that goal source had an effect on escalation controlling for both individual differences in a triad and self-efficacy. In addition, we conducted a repeated measures ANOVA with a post hoc analysis (Tukey HSD) to pinpoint significant differences between the three goal source groups. We found that the mean percentage of time allocated to the original task was significantly higher in the self-set goal group than in the inherited goal group ( $p < .01$ ). Differences between other group pairings were not found to be significant.

### **Study 3**

We designed Study 3 to investigate the boundary conditions concerning the effect of goal difficulty on escalation of commitment observed in Study 1 in which goal difficulty was manipulated at only two levels. Thus, in Study 3 we manipulated goal difficulty at 6 different levels in order to draw a more complete picture of the relationship between goal difficulty and escalation of commitment.

#### **Participants, Experimental Design, and Measures**

We recruited 207 undergraduate students in the same business course at the same institution as in the previous two studies (mean age = 22.48, s.d. = 5.97; 50% male, 50% female). Study 3 was conducted in the same academic semester as Study 2, but we recruited students from different sections of the course and excluded any student who re-enrolled in the course in order to ensure that no one took part in more than one study. The experimental design (decision task, procedure, and measures) was the same as Study 1, but only assigned goals were used and a total of 6 different levels of goal difficulty were examined (50%, 60%, 70%, 80%, 90%, and 100%).

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<sup>3</sup> Phase 1 performance was not included in this analysis as the participants in the inherited goal condition did not engage in phase 1.

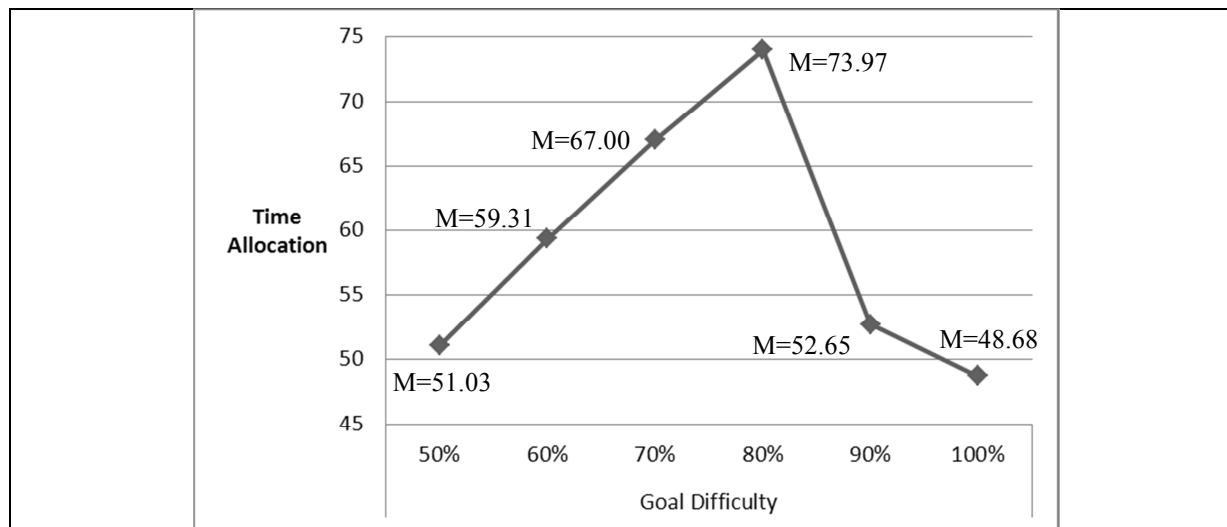
## Results

**Testing of Main Effects.** A total of 4 participants attained their goals in phase 1 and were excluded from further analysis. Table 2-2 shows the mean percentage of time allocated to the original task by goal difficulty.

Goal difficulty	50% (N=35)	Mean=51.03 / SD=32.06
	60% (N=29)	Mean=59.31 / SD=30.08
	70% (N=35)	Mean=67.00 / SD=35.40
	80% (N=34)	Mean=73.97 / SD=25.07
	90% (N=34)	Mean=52.65 / SD=37.60
	100% (N=34)	Mean=48.68 / SD=34.32

**Table 2-2 Mean Percentage of Time Allocated to the Original Task by Goal Difficulty**

We conducted a one-way ANCOVA to determine the effect of goal difficulty on time allocation while controlling for the performance-feedback discrepancy (a discrepancy between goals and phase 1 performance) and self-efficacy. The main effect of goal difficulty was found to be significant ( $F(5,191) = 3.1, p < .01, \eta^2_p = .08$ ) in the presence of these covariates. A post hoc test (Tukey HSD) showed that the mean percentage of time allocated to the original task was significantly higher in the 80% goal group than in either the 50% or the 100% goal groups ( $p < .05$ ). In addition, an ANCOVA with a quadratic term analysis was found to be significant ( $p < .01$ ), indicating that the relationship between goal difficulty and the mean time allocated to the original task is non-linear and takes the form of an inverted U-shape (as suggested by Figure 2-1).



**Figure 2-1 The Effect of Goal Difficulty on Time Allocation**

### **Discussion of Studies 1, 2, & 3**

The results of Studies 1, 2, & 3 provide meaningful insights regarding the relationships between goal setting and escalation of commitment. Specifically, the results of Study 1 suggest that goal difficulty positively influences escalation; individuals with a difficult goal tended to escalate their commitment to a greater degree than individuals with an easy goal. However, the results of Study 3 reveal important insights about the boundary condition that governs the relationship between goal difficulty and escalation. Our data suggest that as goal difficulty continues to increase, the linear relationship between goal difficulty and escalation begins to break down (perhaps at the point at which the goal is perceived to be unattainable). In fact, an extremely difficult goal decreases an individual’s willingness to continue a failing course of action, thus causing de-escalation to occur. Further, it is important to note that the effect of goal difficulty on escalation was found to be significant after controlling for phase 1 performance, suggesting that there is some cognitive mechanism inherent to goal difficulty itself – over and above a discrepancy induced by the performance level and the goal level. Thus, further

investigation is warranted regarding the mechanism(s) mediating the effect of goal difficulty on escalation of commitment.

In addition, the results of Study 2 provide new insight regarding the effect of goal source on escalation of commitment. The effect of goal source is highlighted by the fact that more time was allocated to the original task in the self-set goal group as compared with the inherited goal group. Further, a negative linear relationship was observed between the mean percentage of time allocated to the original task and goal source. Although the difference was only statistically significant between the self-set goal group and the inherited goal group, the linear pattern is interesting and underscores the fact that there exist three distinct types of goal source that appear to differ in terms of their relative effect on escalation decision. The differences we observed with respect to goal source are interesting because participants in all experimental groups were given goals with the exact same level of difficulty, the same negative feedback concerning goal attainment, and the opportunity to earn the exact same monetary reward.

#### **Motivation for Studies 4 & 5**

Based on the encouraging findings of Studies 1, 2, & 3, we refined our experimental design to strengthen it and rule out a possible confound and then proceeded to examine causal relationships as well as possible mechanisms that mediate the relationship between goal difficulty and escalation of commitment. In refining our experimental design, we modified the decision task, the reward scheme, and the measure used to assess escalation of commitment in order to create a robust setting that allowed us to replicate and extend the findings of Studies 1, 2, & 3.

One change introduced in the new experimental design was the level of investment made in phase 1. In our earlier experiments, the participants spent only one minute on a task before

making the time allocation decision in phase 2. While there are studies that have indicated that only a small amount of prior investment can lead to escalation of commitment (Brockner et al., 1979; O'Neill, 1986; Shubik, 1971), we decided to more than double the task duration (to 2.5 minutes) in phase 1 in order to create a greater investment of time and effort.

A second change involved the reward scheme. Previously, we used a reward scheme in which the reward level was proportionally set to match the goal level (i.e., 10 cents for 1% goal, 1 dollar for 10% goal, and so on). While this scheme represented a realistic situation in which a higher level of performance is awarded by a higher level of reward, it may have introduced a potential confound between goal difficulty and monetary incentive. Specifically, it is unclear whether the participants with a more difficult goal invested a larger amount of resources to attain the goal, or to simply to earn a higher level of reward. In order to address this potential confound, we decided to manipulate goal difficulty and the reward scheme independently.

A third change involved the measure used for escalation of commitment. In Studies 1-3, the percentage of time allocated to the original task was used as the measure for escalation of commitment. While the allocation of resources has been used as a measure for escalation of commitment in many prior escalation studies (Conlon & Garland, 1993; Hantula & Bragger, 1999; Northcraft & Neale, 1986; Staw, 1976), in the new experimental design we decided to employ an alternative measure which is also well-established in the escalation literature: namely, the willingness to continue a failing course of action (Garland, 1990; Garland, Sandefur, & Rogers, 1990; Moon, 2001). Lastly, and most importantly, we measured key constructs that were hypothesized to play a mediating role in the relationship between goal difficulty and escalation of commitment, and included additional control variables (i.e., personal responsibility).

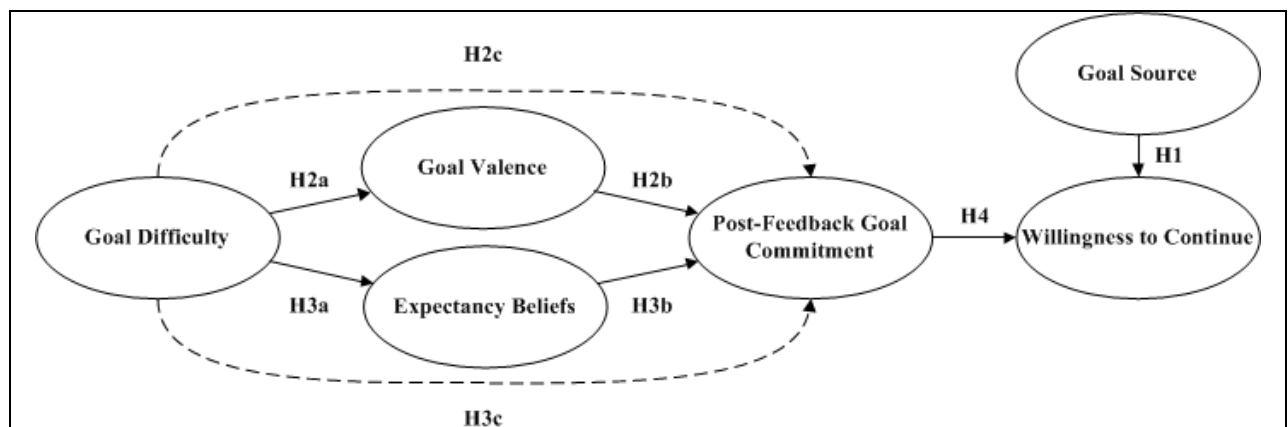
Table 2-3 summarizes the changes in our experimental design as we moved from Studies 1-3 to Studies 4 and 5.

	Studies 1, 2, & 3	Studies 4 & 5
Prior time commitment invested in phase 1	1 minute	2.5 minutes
Reward scheme	Proportionally set to match goal difficulty level (i.e., 10 cents for 1% goal, 1 dollar for 10% goal, and so on)	Manipulated in Study 4 independent of goal difficulty (proportional-rate vs. flat-rate reward) Flat-rate reward in Study 5
Measures for escalation of commitment	A percentage of 2 minutes allocated to the original task	Willingness to continue a failing course of action
Other variables measured	<u>Phase 1</u> Self-efficacy <u>Phase 2</u> Post-feedback goal difficulty	<u>Phase 1</u> Pre-feedback goal commitment* Pre-feedback goal difficulty* <u>Phase 2</u> Post-feedback goal difficulty Self-efficacy Post-feedback goal commitment* Goal valence* Expectancy beliefs* Personal responsibility*

\* New variables included in Studies 4 & 5

**Table 2-3 A Summary of Changes in Experimental Design**

Before we proceed further, we propose a general research model that depicts the causal relationships between goal setting and escalation of commitment (Figure 2-2).



**Figure 2-2 Research Model**

## Study 4

In Study 4, we propose and test the hypotheses concerning the relationship between goal difficulty and escalation of commitment.

### Goal Difficulty and Goal Valence

Prior goal setting studies have found that goal difficulty has a significant influence on valence and expectancy beliefs regarding goal attainment (Klein, 1991; Klein, Wesson, Hollenbeck, & Alge, 1999; Mento et al., 1992). Valence is defined as anticipated satisfaction or attractiveness of outcome, and prior goal setting studies have measured goal valence as the average anticipated satisfaction across a range of performance levels for a particular goal level (Dachler & Mobley, 1973; Garland, 1985; Mento et al., 1992; Yukl & Latham, 1978).

Expectancy beliefs regarding goal attainment can be defined as the degree to which individuals believe that effort will lead to a performance level required to attain the goal (Klein, 1991; Locke & Latham, 2002; Reinharth & Wahba, 1975). We suggest that these two constructs provide a solid theoretical foundation from which to draw new insights regarding the relationship between goal difficulty and escalation of commitment.

Goal difficulty has been found to be negatively associated with goal valence (Garland, 1985; Mento et al., 1992; Meyer & Gellatly, 1988), meaning that individuals with a difficult goal anticipate a lower level of satisfaction for any given performance level than individuals with an easy goal. This suggests that a goal functions as a norm for evaluating performance or outcome, and any performance level that falls short of the goal leads to a low satisfaction (Mento et al., 1992). While the average valence for a given performance level is lower for more difficult goals, the valence that is associated with *goal attainment* may be higher for more difficult goals.

Mento et al (1992) demonstrated that anticipated satisfaction was higher for a more difficult goal



than a less difficult goal at the performance level that leads to goal attainment<sup>4</sup>. Thus, while a difficult goal (e.g., brainstorming 20 ideas in a minute) may lead to a lower level of valence than an easy goal (e.g., brainstorming 10 ideas in a minute), for a given performance level (e.g., 10 ideas), the valence of *goal attainment* may be higher for the difficult goal than the easy goal. Thus, we posit that goal difficulty positively influences the valence associated with goal attainment (i.e., goal valence). However, this relationship may not necessarily be linear. In particular, too large a discrepancy between the performance level and the goal level may cause individuals to perceive goal attainment as being unattractive or unimportant (Hollenbeck & Williams, 1987; Taylor, Fisher, & Ilgen, 1984), suggesting that the positive effect of goal difficulty on goal valence may weaken or even become negative as goals become so difficult that they are perceived to be unattainable. Thus, we propose the following hypothesis:

*Hypothesis 2a.* Goal difficulty will have an inverted U-shaped curvilinear relationship with goal valence in escalation situations.

### **Goal Difficulty and Expectancy Beliefs**

In general, goal difficulty is negatively associated with expectancy beliefs (Locke & Latham, 2002). Expectancy beliefs are presumably lower for difficult goals, because difficult goals are harder to attain than easy goals (Locke & Latham, 2002). However, the relationship between goal difficulty and expectancy beliefs may not always be negative, particularly when individuals fail to attain a goal. When individuals fail to attain a goal, they may attribute their failure to other factors (e.g., I didn't try hard enough, or I was distracted), and still believe that they can attain their goal in another trial. This type of behavior may be explained through the lens of positive illusions (Taylor, 1989; Taylor & Brown, 1988). In the event of a setback or failure, people tend to develop overly positive beliefs about future outcomes if they can find

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<sup>4</sup> This difference was shown in descriptive statistics, but not statistically tested.

excuses for the poor performance (Armor & Taylor, 1998). We posit that such positive illusions may appear when individuals have failed to attain a goal that was thought to be easy. For example, an individual who perceives a goal to be easy may exert less effort than s/he otherwise would, thus resulting in a failure to attain the goal. In such an instance, the individual may attribute the failure to having underestimated the goal difficulty, and such an attribution may explain why an individual might be optimistic about goal attainment in a subsequent trial.

In addition, individuals experience an unpleasant surprise when their optimistic beliefs are challenged by an adverse event (e.g., a setback or failure). As a psychological coping strategy for dealing with such an adverse event, individuals may maintain or even strengthen optimistic beliefs in a new undertaking unless the adverse event strongly disconfirms their optimistic beliefs (Armor & Taylor, 1998). However, we posit that the positive effect of goal difficulty on expectancy beliefs may weaken or even become negative as goals become so difficult that they are perceived to be unattainable. Thus, we state the following hypothesis:

*Hypothesis 3a.* Goal difficulty will have an inverted U-shaped curvilinear relationship with expectancy beliefs in escalation situations.<sup>5</sup>

### **Goal Commitment**

Goal commitment is defined as the degree to which individuals are determined to achieve their goal even in the presence of obstacles or challenges (Latham & Locke, 1991). While most goal setting studies have conceptualized goal commitment as a moderator for the effect of goal difficulty on task performance, it can also be understood as a direct causal factor influencing task performance (Latham & Locke, 1991). For the same level of goal difficulty, individuals who are

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<sup>5</sup> Our experimental task was appropriate to test this hypothesis, because optimism has been found to be associated with word detection tasks (Segerstrom, 2001), which allowed us to create a setting that was conducive to exploring the relationship between goal difficulty and expectancy beliefs of goal attainment.

strongly committed to their goal perform better than individuals who are not as strongly committed to their goals (Klein, Wesson, Hollenbeck, Wright, & DeShon, 2001).

Both goal valence and expectancy beliefs have been found to be key predictors of goal commitment (Hollenbeck & Klein, 1987; Klein et al., 1999; Locke et al., 1981). We posited in Hypothesis 2a and Hypothesis 3a that the effect of goal difficulty on goal valence and expectancy beliefs manifests itself after individuals fail to attain a goal (i.e., after receiving negative feedback in escalation situations). Thus, from the perspective of temporal precedence we expect that goal valence and expectancy beliefs will positively influence post-feedback goal commitment in escalation situations.

*Hypothesis 2b.* A higher level of goal valence concerning a previously unattained goal will lead to a greater level of post-feedback goal commitment.

*Hypothesis 3b.* A higher level of expectancy beliefs of goal attainment concerning a previously unattained goal will lead to a greater level of post-feedback goal commitment. Our first four hypotheses suggest two mediating paths for the relationship between goal difficulty and post-feedback goal commitment.

Together, these four hypotheses predict that goal difficulty influences post-feedback goal commitment through goal valence (Hypothesis 2a & 2b) and expectancy beliefs of goal attainment (Hypothesis 3a & 3b). Thus, we propose the following mediation hypotheses.

*Hypothesis 2c.* Goal difficulty will have an inverted U-shaped curvilinear relationship with post-feedback goal commitment that is mediated by goal valence.

*Hypothesis 3c.* Goal difficulty will have an inverted U-shaped curvilinear relationship with post-feedback goal commitment that is mediated by expectancy beliefs.

In addition, consistent with Champion & Lord (1982) and Hollenbeck & Klein (1987), Kernan & Lord (1990) suggest that “goal commitment implies the extension of effort, over time, toward the attainment of a goal and emphasizes an unwillingness to reduce initial goals when confronted with performance-discrepant feedback” (p. 195). This suggests that negative

feedback in escalation situations may actually help in establishing commitment to a goal. Thus, we posit that post-feedback goal commitment positively influences individuals' willingness to continue a previous course of action in spite of negative feedback. On the basis of this, we propose:

*Hypothesis 4.* Post-feedback goal commitment positively influences an individual's willingness to continue a previous course of action despite negative feedback.

### **Participants and Experimental Design**

Participants in Study 4 were 185 undergraduate students from the same business course at the same institution as in the previous studies (mean age = 22.93, s.d. = 5.98; 57% male, 43% female), but Study 4 was conducted during a different academic semester. Further, we excluded any student who re-enrolled in the course to make sure that no participant from the previous studies took part in Study 4. The experiment involved a 2 (reward scheme: proportional-rate reward and flat-rate reward) x 3 (goal difficulty: 49%, 74%, and 99%) between-subjects factorial design. First, we manipulated the reward scheme as either proportional-rate reward (i.e., reward proportionally set to match the level of goal difficulty), or flat-rate reward (i.e., reward set at 5 dollars across all levels of goal difficulty). Second, we chose three goal levels to maximize the variance of goal difficulty based on the findings of Study 3. The least difficult goal was set at 49% so that the goal would not be so easy that a large portion of the participants could attain it in phase 1. Further, we chose 99% as opposed to 100% in Study 3, because 100% was deemed to be extremely difficult to attain. All experimental groups involved assigned goals.

### **Decision Task, Procedure, and Measures**

As before, the experiment consisted of 2 phases, and the experimental procedure remained unchanged relative to Study 3, except that in phase 2 participants had no option to switch to the counting 'i'. In phase 1, participants were given instructions pertaining to the task,

goal, and reward rules, and then were assigned a goal. The participants were informed that they would be given 2.5 minutes to perform a task. The same task from the previous studies was used, but we adopted a passage of text that was approximately 2.5 times longer to prevent losing a large number of subjects in phase 1 and to ensure that goal difficulty was comparable with the previous studies. The article used for the task had 582 words and contained 237 a's. As before, the percent of a's that a participant was assigned to identify in the article constituted the goal.

Before working on the task, participants were asked to answer two questions pertaining to goal commitment and two questions pertaining to perceived goal difficulty. Two participants attained their goal in phase 1, received the reward, and were dismissed from the experiment. The remaining participants who did not attain the goal in phase 1 were invited to take part in phase 2 of the experiment. After receiving feedback on their phase 1 performance, participants were asked to answer two questions pertaining to perceived goal difficulty. The participants were then informed that they would be given an additional 2.5 minutes to continue working on the previous task or they could choose to quit entirely, and were asked two questions relating to their willingness to continue working on the task. One question asked for a percentage probability of continuing the task from 0 to 100% (0 = absolutely no, 50 = neutral, 100 = absolutely yes) and the other question asked for a decision of whether or not to continue working on the task on a 10-point likert scale.

Following this, the participants were asked to answer questions pertaining to self-efficacy, post-feedback goal commitment, goal valence, expectancy beliefs of goal attainment, and personal responsibility (a complete list of measurement items and their sources are shown in Appendix A). The two measures used to assess the dependent variable were combined by re-

scaling the second measure of escalation of commitment from a 10-point scale to a 100-point scale and then creating a linear composite of the two measures.

## Results

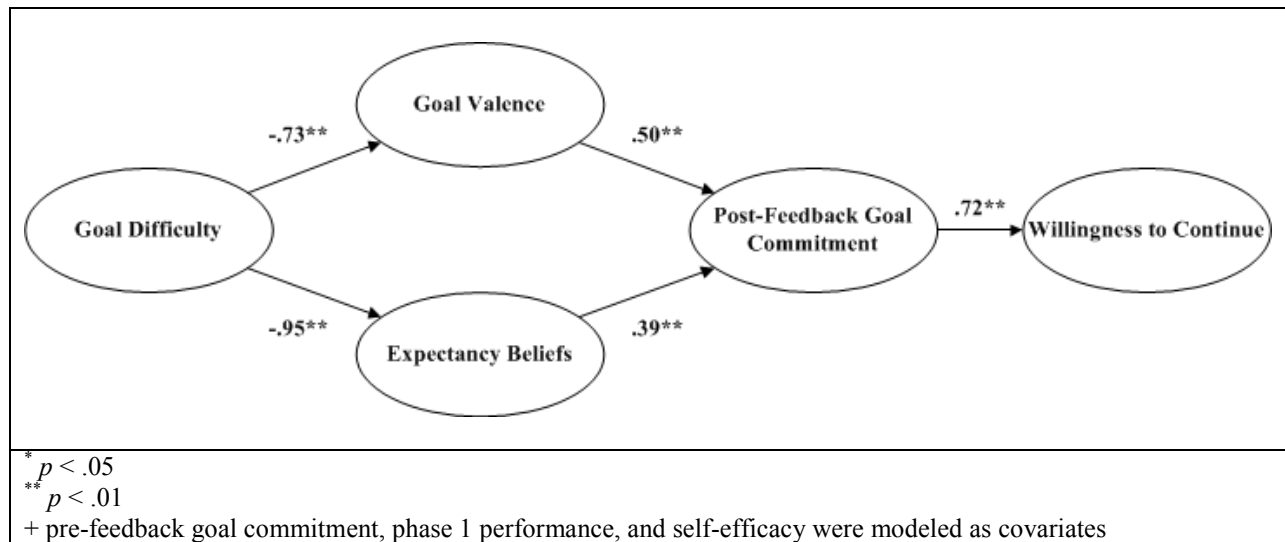
First, we examined the means, standard deviations, and inter-correlations among latent constructs (Table 2-4). Next, we examined the mean of the willingness to continue across the three goal difficulty groups. A similar pattern to that found in Study 3 was observed; the willingness to continue increased from the 49% goal ( $M = 65.11, SD = 31.39$ ) to the 74% goal ( $M = 80.20, SD = 21.64$ ), but there was an obvious drop as the goal difficulty further increased to 99% ( $M = 62.75, SD = 29.81$ ). A quadratic term of a one-way ANCOVA with the goal-feedback discrepancy (a discrepancy between goals and phase 1 performance and self-efficacy as covariates was significant ( $p < .01$ ), thus supporting an inverted U-shaped curvilinear relationship between goal difficulty and escalation of commitment, as observed in Study 3.

		1	2	3	4	5	6	7	8	9	10	M	SD	$\alpha$
1	Willingness to continue to pursue the unattained goal	-										69.35	28.85	.95
2	Pre-feedback goal commitment	.26**	-									5.89	1.40	.95
3	Pre-feedback goal difficulty	-.13	.04	-								4.07	1.67	.93
4	Perceived negative feedback	.22**	.25**	.07	-							6.33	1.00	.79
5	Post-feedback goal difficulty	.13	.18*	.21**	.48**	-						6.01	1.23	.92
6	Self-efficacy	.37	.10	-.26**	.12	.02	-					5.13	1.13	.73
7	Post-feedback goal commitment	.66**	.30**	-.16*	.25**	.09	.54**	-				5.24	1.43	.94
8	Goal valence	.66**	.34**	-.07	.26**	.17*	.45**	.71**	-			5.57	1.47	.94
9	Expectancy beliefs	.55**	.37**	-.17*	.21**	.03	.42**	.68**	.65**	-		5.17	1.42	.95
10	Personal responsibility	.27**	.30**	-.02	.20**	-.08	.25**	.51**	.39**	.60**	-	4.48	1.55	.84
<i>n</i> = 182 * $p < .05$ ** $p < .01$														

**Table 2-4 Means, Standard Deviations, and Inter-correlations among Latent Constructs**

**Measurement Model.** We assessed the measurement model of the latent variables using MPlus version 6 (www.statmodel.com). A confirmatory factor analysis (CFA) was conducted to assess the adequacy of the proposed relationships between the latent variables and their corresponding indicators. The analysis of our measurement model indicated a good fit to the data,  $\chi^2(125, N = 183) = 164.73, p < .01$ ; a standardized root-mean-square residual (SRMR) of .03; a comparative fit index (CFI) of .99; and a root-mean-square error of approximation (RMSEA) of .04. In addition, all the indicators loaded significantly onto their respective latent variables ( $p < .01$ ), and the standardized loadings ranged from .64 to .96.

**Structural Model.** After having established the adequacy of the measurement model, we proceeded with testing of the structural model that included the proposed causal paths (Figure 2-3). Fit indices for our structural model suggested that the model fit the data well,  $\chi^2(63, N = 183) = 117.27, p < .01$ ; a standardized root-mean-square residual (SRMR) of .04; a comparative fit index (CFI) of .97; and a root-mean-square error of approximation (RMSEA) of .07. Further, all proposed causal paths were significant ( $p < .01$ ) (see Figure 2-3).



**Figure 2-3 Structural Model with Standardized Path Estimates**

**Testing of the Hypotheses and the Mediation Paths.** We hypothesized the causal paths from goal difficulty to goal valence and expectancy beliefs of goal attainment to be an inverted U-shaped curvilinear relationship (Hypothesis 2a & 3a), and we did not specify the non-linear causal relationships in the analysis of our structural model. Thus, we conducted a separate analysis to examine these causal paths as non-linear relationships. First, we examined descriptive statistics of goal valence and expectancy beliefs of goal attainment at three levels of goal difficulty (Table 2-5). As expected, both goal valence and expectancy beliefs increased as goal difficulty increased from 49% to 74%, but there was a clear decrease in goal valence and expectancy when goal difficulty further increased from 74% to 99%. We then conducted two separate one-way ANOVAs to assess the effects of goal difficulty on goal valence and expectancy beliefs respectively. The results of these analyses suggested that goal difficulty had a significant main effect on goal valence ( $F(2,180) = 4.49, p < .05, \eta^2_p = .05$ ) and on expectancy beliefs ( $F(2,180) = 4.67, p < .05, \eta^2_p = .05$ ). Further, we also conducted two separate one-way ANOVAs in which we introduced a quadratic term for the main effect of goal difficulty on goal valence and for the main effect of goal difficulty on expectancy belief. Both were significant at the  $p < .01$  and  $p < .05$  level respectively. These results together provide support for inverted U-shaped curvilinear relationships between goal difficulty and goal valence (Hypothesis 2a) and between goal difficulty and expectancy beliefs (Hypothesis 3a).

		Goal Valence	Expectancy Beliefs
Goal difficulty	49%	N=61 / Mean=5.29 / SD=1.59	N=61 / Mean=5.24 / SD=1.24
	74%	N=61 / Mean=6.02 / SD=1.18	N=61 / Mean=5.52 / SD=1.18
	99%	N=61 / Mean=5.40 / SD=1.54	N=61 / Mean=4.75 / SD=1.50

**Table 2-5 The Effect of Goal Difficulty on Goal Valence and Expectancy Beliefs**

In addition, in our theorizing for Hypothesis 3a we posited that positive illusions may result when individuals have failed to attain a goal that was thought to be easy and that this



would drive the effect of goal difficulty on expectancy beliefs. In order to investigate this, we examined if the participants in fact underestimated their goal before working on the task in our experiment. To do this, we conducted a repeated-measures ANOVA with perceived goal difficulty as a within subject factor (pre- vs. post-feedback perceived goal difficulty). The results indicated that the participants perceived their goal to be easier before working on the task and receiving negative feedback ( $M = 4.06, SD = 1.67$ ), than they did after receiving negative feedback ( $M = 6.01, SD = 1.23$ ); and the difference was found to be statistically significant ( $F(1,182) = 200.26, p < .01, \eta^2_p = .52$ ). This suggests that our participants indeed underestimated the difficulty of the goal before working on the task.

Next, we proceeded to examine the effect of goal valence on post-feedback goal commitment (Hypothesis 2b), and the effect of expectancy beliefs on post-feedback goal commitment (Hypothesis 3b). We conducted a hierarchical regression analysis in which goal valence and expectancy were entered as predictors for post-feedback goal commitment. The results indicated that goal valence had a significant positive effect on post-feedback goal commitment ( $B = .456, p < .01$ ), and that expectancy beliefs had a significant positive effect on post-feedback goal commitment ( $B = .371, p < .01$ ); thus, providing support for Hypotheses 2b & 3b.

The preceding four hypotheses (Hypotheses 2a, 2b, 3a, & 3b) suggest two mediating paths for the relationship between goal difficulty and post-feedback goal commitment (Hypothesis 2c & 3c); thus, we proceeded to examine this mediation model with two mediators (X: goal difficulty, M: goal valence & expectancy belief, and Y: post-feedback goal commitment). First, we examined if goal valence and expectancy beliefs fully mediate the effect of goal difficulty on post-feedback goal commitment. We performed mediation testing

following the four steps suggested by Kenny, Kashy, & Bolger (1998). The results indicated that the effect of goal difficulty on post-feedback goal commitment is fully mediated by goal valence and expectancy beliefs (i.e., the effect of goal difficulty on post-feedback goal commitment was not significant after controlling for the mediators). Second, we proceeded to examine the significance of the indirect effects. We followed the bootstrapping method suggested by Hayes & Preacher (2010) for testing indirect effects in simple mediation models that include non-linear causal paths. This method uses a bootstrapping approach proposed by Shrout & Bolger (2002). We chose the bootstrapping approach over the Sobel test because of the unrealistic assumption of the Sobel test regarding the normality of the sampling distribution of the mediated effect (Preacher & Hayes, 2008).

When both causal paths in a mediation model (X-M-Y) are linear, the indirect effect of X on Y through M is constant across any value of X, however when a causal path is non-linear, the effect of X on Y through M changes depending on the specific value of X. Hayes & Preacher (2010) conceptualized this as *instantaneous indirect effect*, and suggest that indirect effects be estimated at three different representative values of X (e.g., one standard deviation below the mean, the mean, one standard deviation above the mean). Using this approach the significance of indirect effects can be evaluated based on whether or not zero is inside each confidence interval calculated using a bootstrapping approach.

We used the SPSS macro provided at Hayes' webpage ([www.afhayes.com](http://www.afhayes.com)) for our analysis. We conducted a non-linear simple mediation test for each hypothesized mediation path (i.e., each mediator). In these analyses, we included three control variables (pre-feedback goal commitment, phase 1 performance, and self-efficacy). Based on our hypotheses, we specified the causal path from X to M, and X to Y as quadratic, and the causal path from M to Y as linear

in both mediation tests. First, the results indicated that the indirect effect of goal difficulty on post-feedback goal commitment with goal valence as a mediator is statistically different from zero at low goal difficulty (-1 SD) and high goal difficulty (+1 SD) (Table 2-6). However, the indirect effect of goal difficulty on post-feedback goal commitment at the mean level was not significant. Further, the sign of the coefficient for the indirect effect was positive at low goal difficulty (.47), but negative at high goal difficulty (-.39), suggesting that the indirect effect of goal difficulty on post-feedback goal commitment is an inverted U-shaped function. Second, the results indicated that the indirect effect of goal difficulty on post-feedback goal commitment with expectancy beliefs as a mediator is statistically different from zero at mean goal difficulty and high goal difficulty (+1 SD). However, the indirect effect of goal difficulty on post-feedback goal commitment at low goal difficulty was not significant. Further, the coefficient at mean goal difficulty (-.12) was different from the one at high goal difficulty (-.42), suggesting that indirect effects of goal difficulty on post-feedback goal commitment are non-linear.

Variables	Bias Corrected Bootstrap 95% Confidence Interval for Instantaneous Indirect Effect			
		LowerCI	ab (indirect effect)	UpperCI
X = Goal difficulty M = Goal valence Y = Post-feedback goal commitment Covariates = Pre-feedback goal commitment, phase 1 performance, & Self-efficacy	-1 SD	.16	.47	.79
	Mean	-.08	.04	.17
	+1 SD	-.74	-.39	-.06
X = Goal difficulty M = Expectancy beliefs Y = Post-feedback goal commitment Covariates = Pre-feedback goal commitment, phase 1 performance, & Self-efficacy	-1 SD	-.11	.19	.52
	Mean	-.25	-.12	-.01
	+1 SD	-.83	-.42	-.09

**Table 2-6 Results of Testing of Non-linear Indirect Effect**

Lastly, we conducted a hierarchical regression analysis in order to test the effect of post-feedback goal commitment on the willingness to continue (Hypothesis 4). In Model 1, pre-feedback goal commitment, phase 1 performance, and self-efficacy were entered into the regression as controls. In Model 2, post-feedback goal commitment was added to the regression, and the results indicated that it had a significant positive effect on the willingness to continue ( $p < .01$ ) in the presence of the above controls; thus, supporting Hypothesis 4 (Table 2-7).

Variable	Model 1	Model 2
Pre-feedback goal commitment	.22**	.06
Phase 1 performance	.35**	.03
Self-efficacy	.00	.01
Post-feedback goal commitment		.63**
$\Delta R^2$	.19	.25
$\Delta F$	13.81**	79.75**
Overall model $R^2$	.19	.44
Adjusted $R^2$	.17	.43
Overall model $F$	13.81**	34.85**
$n = 182$ Dependent variable: the willingness to continue * $p < .05$ ** $p < .01$		

**Table 2-7 Regression Results for Testing of Hypothesis 4**

**Evaluating an Alternative Explanation.** While the previous analyses provide strong support for the causal relationship between goal difficulty and escalation, causality cannot be assured without eliminating alternative explanations for the presumed cause-effect relationship (Cook & Campbell, 1979). In Studies 1-3, we set the reward proportional to the goal difficulty level, thus raising the possibility of a confound between goal difficulty and reward scheme which may have influenced the results we obtained. In Study 4, we manipulated the reward scheme independently from goal difficulty as either a proportional-rate reward or a flat-rate reward (in which the reward was set at a fixed amount across all goal difficulty levels), allowing us to rule out this alternative explanation. To do this, we conducted a two-way ANOVA with goal difficulty and reward scheme as independent variables and the willingness to continue as the

dependent variable. The results indicated that reward scheme had neither a main effect ( $p = .97$ ) nor an interaction effect ( $p = .72$ ) with goal difficulty on the willingness to continue. This suggests that the difference observed in the willingness to continue was due to goal difficulty, not reward scheme; thus, ruling out the alternative explanation.

## **Discussion**

The results of Study 4 suggest that individuals with a more difficult goal are more willing to continue working on a failing course of action, but this positive relationship turns negative when the goal becomes extremely difficult. In Study 4, we also investigated two mediating mechanisms for the effect of goal difficulty on the willingness to continue. Our findings suggest that individuals become strongly committed to a more difficult goal because they anticipate a higher level of satisfaction of goal attainment (i.e., goal valence) for a more difficult goal (e.g., 79% goal). Further, individuals' level of commitment to a more difficult goal is influenced by a higher level of expectancy beliefs of goal attainment for a more difficult goal (79% goal) than a less difficult goal (49% goal). Ultimately, it is this commitment to a goal that leads to willingness to continue a failing course of action. However, we found that these positive relationships break down at the point at which the goal becomes extremely difficult (99% goal).

The findings of Study 4 also suggest that negative feedback regarding goal attainment affects goal commitment and thereby plays an important role in willingness to continue a failing course of action. This is evident in the fact that post-feedback goal commitment had a significant influence on individuals' willingness to continue. In addition, in Study 4 we were able to eliminate a potential alternative explanation for the relationship between goal difficulty and the willingness to continue by independently manipulating goal difficulty and reward scheme. The findings of Study 4 clearly show that whether the reward is proportionally set to

the goal level or set at a fixed rate across the goal levels does not have a significant influence on individuals' willingness to continue a failing course of action. Overall, the findings of Study 4 add greatly to the robustness of our research by successfully replicating the findings of the previous studies using a longer task duration, a different dependent variable measure, and ruling out a potential confound, while at the same time extending the earlier studies to illuminate underlying mediating mechanisms for the observed behavior.

### **Study 5**

With the encouraging findings of Study 4, we proceeded to re-examine the relationship between goal source and escalation of commitment using the refined experimental design employed in Study 4. The primary objective of Study 5 was to address a potential limitation of Study 2 which did not include what might be a key factor influencing the causal relationship between goal source and escalation: personal responsibility. One could argue that the effects observed in Study 2 were due to the fact that participants in the self-set goal group felt a greater personal responsibility for the initial goal than did participants in the inherited goal group. In order to rule out this alternative explanation for the effect of goal source, we wanted to control for personal responsibility. A secondary objective of Study 5 was to determine if the findings of Study 2 in which self-set goals were found to lead to a greater investment of the limited time resource to the original task, as compared to inherited goals, could be replicated using a longer decision task and a different measure of escalation.

#### **Participants, Experimental Design, and Procedure**

Participants in Study 5 were 109 undergraduate students from the same business course as in Study 4 (mean age = 21.88, s.d. = 4.76; 53% male, 47% female), but the participants were recruited from different sections of the course; thus, it was ensured that no participant from

Study 4 took part in Study 5. As in Study 2, goal source was manipulated using a yoked design: self-set, assigned, and inherited goal. The 100% anchor was used for participants in the self-set goal group in order to induce choosing a difficult goal. Key changes relative to the earlier experiment include longer task duration in phase 1, flat-rate reward, a different measure for escalation of commitment, and the inclusion of other variables (e.g., personal responsibility). Besides these changes, the experimental procedure remained unchanged relative to Study 2.

## Results

**Testing of Main Effects.** A triad of 3 participants sharing the same goal (a participant in the self-set goal condition, a participant in the assigned goal condition, and a participant in the inherited goal condition) became our unit of analysis. A total of 4 participants attained their goals in phase 1, and were thus excluded from further analysis. Only those triads in which neither the participants in the self-set goal group nor those in assigned goal group attained their goal were included in the analysis. On this basis, 30 triads were retained for analysis.

The mean goal set by the participants in the self-set goal group was 74.97 ( $SD = 20.40$ ). Our yoked design ensured that all three treatment groups had identical goals. As in Study 4, the dependent variable was the willingness to continue working on the previous task. Participants in the self-set goal group showed the greatest willingness to continue ( $M = 84.65$ ,  $SD = 22.89$ ), followed by those in the assigned goal group ( $M = 75.58$ ,  $SD = 23.92$ ), and those in the inherited goal group ( $M = 65.92$ ,  $SD = 30.28$ ). We conducted an ANCOVA with goal source as the independent variable, and personal responsibility, expectancy beliefs of goal attainment, goal valence, post-feedback goal commitment, and self-efficacy as control variables.<sup>6</sup> The results suggested a significant main effect of goal source on the willingness to continue ( $F(2,82) = 5.17$ ,

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<sup>6</sup> Phase 1 performance was not included in this analysis as the participants in the inherited goal condition did not engage in phase 1

$p < .01$ ,  $\eta^2_p = .11$ ). In contrast, personal responsibility, which was posited to be a potential alternative explanation, was found to have no significant effect on the dependent variable ( $p = .71$ ). A post hoc analysis (Tukey HSD) showed that willingness to continue was significantly higher in the self-set goal group than in the inherited goal group ( $p < .05$ ). Lastly, we conducted a repeated measures regression analysis with a least-squares dummy variable approach as before in Study 2. The incremental  $F$ -change introduced by goal source was found to be significant ( $\Delta F = 5.91$ ,  $p < .01$ ) after controlling for individual differences of participants and self-efficacy.

## **Discussion**

Consistent with the findings of Study 2, the findings of Study 5 suggest a negative linear relationship between goal source and escalation of commitment. Further, the findings of Study 5 suggest that the observed effect is not due to differing levels of personal responsibility induced by the different types of goal source. While individuals with a self-set goal may feel more responsible for their goal and action, this was not found to be a significant factor in predicting escalation behavior. While our manipulation of goal source was similar to the way in which personal responsibility was manipulated in prior escalation studies (e.g., Staw, 1976), our findings suggest that there is a cognitive effect introduced by the involvement in setting a goal, as opposed to merely inheriting a goal that someone else failed to achieve, and that differences we observe due to goal source are not the result of differences in perceived personal responsibility.

## **General Discussion**

In this research, we conceptualize escalation as consisting of two distinct phases: (1) goal setting, and (2) decision to escalate. Thus, we focused on an important, but overlooked aspect of the escalation phenomenon: that is, how does an initial goal influence the decision of whether or



not to continue a failing course of action. Drawing upon the goal setting theory perspective, our research underscores the strong connections which exist between the two decision phases in escalation situations, and the important role that goal setting plays, thus offering new insights into the escalation phenomenon.

In a series of five laboratory experiments, we found that goal setting can cause individuals to escalate their commitment to a previously chosen course of action that did not lead to goal attainment; particularly when goals are moderately difficult or self-set. We found that individuals continue to pursue a previously course of action because of the anticipated satisfaction or attractiveness of attaining a challenging goal, along with expectancy beliefs that they can attain the goal if given another opportunity. We demonstrated the relationships between goal setting and escalation of commitment using two different measures of escalation and two different reward schemes, thus adding to the robustness of our findings. Further, we investigated and ruled out alternative explanations, such as monetary incentives and personal responsibility for the causal relationships between goal setting and escalation of commitment. The findings of our research offer significant theoretical contributions to the literatures on escalation of commitment and goal setting.

### **Theoretical Implications**

Escalation of commitment is a common phenomenon that can adversely affect decision-making across a wide variety of contexts. While prior research has illuminated many important aspects of the escalation phenomenon, prior literature remains silent on what we believe is an essential element of the escalation phenomenon, namely how initial goals shape escalation behavior. In this research, we integrate a goal setting theory perspective to the study of escalation of commitment to shed new light on the relationship between initial goals and

escalation behavior. In so doing, we provide a fresh perspective on the escalation of commitment phenomenon. Specifically, we conceptualize escalation situations as consisting of two decisions: the initial decision that involves goal setting, and the escalation decision involving whether or not to continue pursuing that course of action in the face of negative feedback.

Our research contributes to the escalation literature in several important ways. Unlike much of the prior work in this area which has focused exclusively on the escalation decision, our study puts a spotlight on the relationship between the initial goal setting and the escalation decision of whether or not to re-commit to a failing course of action. Our findings provide several insights regarding the relationships between two core concepts of goal setting (goal difficulty and goal source) and escalation of commitment. First, our work represents the first empirical study to systematically investigate the relationship between goal difficulty and escalation over a wide range of goal difficulty. While there is one previous study (Lee et al., 2012a) that reported de-escalation as a result of an extremely difficult goal, our study provides a more nuanced perspective on the relationship between goal difficulty and escalation behavior. Specifically, our results provide new insight by demonstrating that the relationship between goal difficulty and escalation takes the form of an inverted U-shape.

Our most significant findings concern the underlying mechanisms through which goal difficulty influences escalation behavior. Specifically, our research suggests the presence of a cognitive process by which individuals anticipate a high level of satisfaction for attaining a difficult goal and develop beliefs that further effort will lead to goal attainment of a difficult goal. These factors together explain why individuals become strongly committed to their unattained goal, and in the context of our experiments why individuals chose to escalate. This finding also contributes to the goal setting literature concerning the relationships that exist between goal

difficulty and goal valence and between goal difficulty and expectancy beliefs (Garland, 1985; Mento et al., 1992; Meyer & Gellatly, 1988). Specifically, we found that people anticipate a greater satisfaction for attaining a more difficult goal, and show a higher expectancy belief for a more difficult goal. However, these relationships are subject to a boundary condition, namely that goal difficulty positively influences goal valence and expectancy beliefs of goal attainment only up to the point at which goals become extremely difficult.

This research makes another important contribution to goal setting research by conceptualizing three distinct goal sources that can be associated with multiple trial tasks in general and with escalation situations in particular: self-set goals, assigned goals, and inherited goals. Past studies in the goal setting literature have investigated the difference between a self-set goal and an assigned goal and their relative effect on task performance and goal commitment (Erez et al., 1990; Latham & Locke, 1991; Locke et al., 1984). However, the effect of an inherited goal (i.e., no involvement in goal setting or the previous course of action) has not been discussed in the literature. Our research provides evidence that an inherited goal induces different behaviors as compared with a self-set goal and that escalation in this context is not simply the result of differences in the level of perceived personal responsibility.

Our research also provides evidence that goal setting can sometimes produce negative outcomes, such as escalation of commitment. While we acknowledge that goal setting is an effective tool in producing greater effort, we wish to draw attention to what may be a dark side of goal setting. In their seminal book, Locke & Latham (1984) pointed out several potential dangers of goal setting, such as excessive risk taking. More recently, some researchers have expressed renewed concerns about the potential negative side effects of goal setting (Ordóñez et al., 2009) and there is some empirical evidence that challenging goals can increase risk seeking

behavior in decision making tasks (Larrick, Heath, & Wu, 2009). Overall, our research provides additional evidence concerning the negative implications of goal setting, suggesting that under certain circumstances goal difficulty and goal source can engender escalation of commitment.

### **Limitations and Directions for Future Research**

As with any research, there are limitations that must be noted. One limitation concerns the issue of external validity. The experimental task in our studies involved identifying the occurrences of a particular letter in a small passage of text and does not correspond to the kinds of tasks that individuals might typically perform in organizations. Thus, the ability to generalize from our research to the organizational context is necessarily somewhat limited. While laboratory experiments have their limitations in terms of external validity, they are still quite useful for understanding decision making and they provide a high level of internal validity, allowing the experimenter to manipulate the key variables of interest while tightly controlling for extraneous factors (Colquitt, 2008). It is worth noting that the experimental task used in our studies allowed participants to become engaged in a task and provided them with a reward based on their performance, thus enhancing the psychological realism of our experiment (Berkowitz & Donnerstein, 1982). This approach has some advantages over the more typical role-playing experiment used in most escalation studies in which participants are asked to read a hypothetical scenario, project themselves into the role of a decision-maker, and answer questions about what their intentions or behaviors (Conlon & Garland, 1993; Staw, 1976; Wong & Kwong, 2007). Thus, in spite of the known limitations associated with experiments, we believe that our experimental approach was as robust as possible and that the results hold important implications

for research. Still, one direction for future research would be to determine the extent to which goal setting influences escalation of commitment in various field settings.

Another limitation is that our participants spent a relatively small amount of time on a task before making an additional commitment decision. Thus, their investment represents a small fraction of what might be typically experienced in field settings. However, a small investment should also limit the tendency to engage in escalation of commitment, thus reducing the chance of finding statistically significant effects. Thus, our experimental context can be said to provide a conservative test of our hypotheses. Moreover, there are other escalation studies that have investigated the escalation phenomenon in settings that involved only a small amount of prior investment, such as waiting for a bus (Brockner et al., 1979) or participating in a one-dollar auction (O'Neill, 1986; Shubik, 1971). Nevertheless, future studies should investigate the effects of higher levels of investment in a task.

## **Conclusions**

In conclusion, human actions rarely begin without goal setting; escalation situations are no exception. Thus, initial goals set at the beginning of a course of action can have significant implications with respect to individuals' decision of whether or not to continue a previous course of action that has not produced a desired outcome. Our research underscores the strong connections between initial goal setting and escalation behavior by drawing upon the goal setting theory; thus, offering new insights into the escalation phenomenon.

## Appendix 2-A

Construct	Measurement Items	Sources
Goal commitment (phase 1 & phase2)	<ol style="list-style-type: none"> <li>1. I am committed to meeting this goal</li> <li>2. I am willing to put in a great deal of effort to achieve this goal</li> </ol>	Adapted from Senko & Harackiewicz (2005)
Perceived goal difficulty (phase 1)	<ol style="list-style-type: none"> <li>1. I think this goal will be difficult to achieve</li> <li>2. I think meeting this goal will be difficult</li> </ol>	Adapted from Senko & Harackiewicz (2005)
Self-efficacy	<ol style="list-style-type: none"> <li>1. How would you describe your capability in identifying and circling 'a' letters?</li> <li>2. How confident are you in your ability to meet a challenging goal with respect to identifying and circling 'a' letters within a prescribed period of time?</li> </ol>	Adapted from Whyte (1997)
Perceived goal difficulty (phase 2)	<ol style="list-style-type: none"> <li>1. Based on the feedback received after phase 1, I believe that the goal was difficult to achieve</li> <li>2. Based on the feedback received after phase 1, meeting the goal was difficult</li> </ol>	Adapted from Senko & Harackiewicz (2005)
Goal valence	<ol style="list-style-type: none"> <li>1. I find trying to achieve this goal enjoyable</li> <li>2. I would feel satisfied if I achieved this goal</li> </ol>	Adapted from Mento et al. (1992) and Senko & Harackiewicz (2005)
Expectancy beliefs	<ol style="list-style-type: none"> <li>1. I believe that working on this task for additional 2.5 minutes will lead to goal attainment</li> <li>2. I believe that I will be able to meet this goal in phase 2 if I put in more effort</li> </ol>	Adapted from Hackman (1968)
Personal responsibility	<ol style="list-style-type: none"> <li>1. I would feel responsible if I failed to achieve this goal</li> <li>2. It is my responsibility to meet this goal</li> </ol>	Adapted from Caldwell & O'Reilly (1982)

## Appendix 2-B

### Actual instruments used in Experiments 1 & 3

**INSTRUCTIONS:** The task that follows is part of a study that examines human performance. The task involves reading a passage of text and **circling the occurrences of the letter “a” in both upper and lower case form**. You will be given a goal or asked to choose one for yourself. **The goal will correspond to the percent of a’s that you will identify in the passage of text.** You will be rewarded for your performance based on your ability to meet the goal. **Your reward will be in direct proportion to the percentage of total a’s identified, provided that you meet the goal, but there will be no additional for exceeding the goal.** Rewards will be set at the rate of 10 cents for every percent of a’s identified in the passage. In other words, if your goal is to identify 10% of the a’s in the passage, you will receive \$1 if you meet or exceed this goal. If, on the other hand, your goal is to identify 90% of the a’s in the passage, you will receive \$9 if you meet or exceed this goal. **If, however, you do not meet the goal, you will receive NOTHING, no matter how close you come to reaching it. There is no benefit to exceeding your goal, as there will be no additional monetary reward for exceeding the goal.** No rewards WILL be given for guessing (i.e., you must circle the a’s that you identify). Please read all instructions carefully and respond to the questions below before starting the task. Do NOT skip ahead.

+++Assigned goal version: difficult goal:+++

Your goal is to identify and circle x% of all ‘a’ letters in the article in 1 minute.

+++Assigned goal version: easy goal:+++

Your goal is to identify and circle y% of all ‘a’ letters in the article in 1 minute.

+++Self set goal: difficult goal:+++

Set a goal for the percentage of ‘a’ letters in the passage that you think you can identify (by circling) in 1 minute, for example 90%. Record your goal below:

My goal is to be able to identify and circle \_\_\_\_% of the “a” letters in 1 minute.

+++Self set goal: easy goal:+++

Set a goal for the percentage of ‘a’ letters in the passage that you think you can identify (by circling) in 1 minute, for example 10%. Record your goal below:

My goal is to be able to identify and circle \_\_\_\_% of the “a” letters in 1 minute.

**Please answer the following questions before beginning the task. Do NOT start the actual task until the instructor has indicated that you may do so.**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. Quite frankly, I don't care if I achieve this goal or not	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I am strongly committed to pursuing this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. It wouldn't take much to make me abandon this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I think this goal is a good deal to shoot for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I am willing to put in a great deal of effort to achieve this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very weak	Weak	Somewhat weak	Neither weak nor strong	Somewhat strong	Strong	Very strong
1. How would you describe your capability in identifying and circling 'a' letters?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very doubtful	Doubtful	Somewhat doubtful	Neutral	Somewhat confident	Confident	Very confident
2. How confident are you in your ability to meet a challenging goal with respect to identifying and circling 'a' letters within a prescribed period of time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Please look up at the instructor now so that s/he knows that you are ready to begin the task. Do NOT turn to the next page or start the actual task until the instructor has indicated that you may do so.**



**You now have 1 minute to identify and circle the number of a's (both upper and lower case) in the paragraph below.**

Twitter has modified the terms of service that govern the proper user of the microblogging and social-networking site to state unequivocally that messages posted belong to their authors and not to the company. "Twitter is allowed to 'use, copy, reproduce, process, adapt, modify, publish, transmit, display and distribute' your tweets because that's what we do. However, they are your tweets and they belong to you," wrote Twitter co-founder Biz Stone in a blog post Thursday announcing the modifications. There has been controversy over the question of who owns the messages, photos, videos and other material that people post to social media and social-networking sites like Twitter, Facebook, MySpace and YouTube. For example, Google and Facebook got into hot water when critics complained about what they perceived as terms of service that claimed ownership of the data end users store in Google Apps and Facebook profiles. The revised Twitter terms also state that end users allow Twitter to make posted messages available to external applications that use the Twitter API (application programming interface). However, Twitter is still hammering out a set of guidelines for developers on the proper use of the API. The API guidelines are still in draft form and require that developers identify the authors of "tweets," maintain the integrity of the text and obtain permission to send messages on end users' behalf or turn their message into a commercial product, like a poster. Twitter is also keeping mum on details about the display of advertising on the site, an issue of much discussion among pundits who follow the company and have raised questions about how it will generate advertising to sustain its business. Twitter welcomes feedback on its terms of service and will revise them as it deems necessary.

**In the space below, record the total number of "a's" you identified and circled:**

\_\_\_\_\_

**After you have recorded the number of a's circled, please take your paper to the instructor and s/he will give you feedback on your performance.**

## Phase 2

The second phase of the task is designed for those who did not achieve their goal in phase 1.

<b>Please answer the following question below</b>
---

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. The feedback that I received after phase 1 was a clear indication that I did not accomplish the goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Based on the feedback received after phase 1, I believe that the goal was difficult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Based on the feedback received after phase 1, the goal was more difficult to achieve than I expected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You now have the opportunity to work for **2 additional minutes**. You may allocate your time in any proportion you like between two tasks. As before, you will be rewarded based on your performance. **The first task is to continue identifying and circling a's with the aim of meeting your previous goal.** If you choose this task and the cumulative performance (across Phase 1 and Phase 2) meets or exceeds your previous goal, you will win the reward under the same rules as before. **The second task involves setting a new goal and identifying and circling the number of i's in the same passage of text.** If you are able to meet or exceed your new goal for this task, you will receive a **reward in direct proportion to the percentage of total i's identified** under the same rules as before (i.e., getting the rewards if you meet or exceed the goal or no rewards if you do not meet the goal). You need to decide how to allocate your 2 minutes across the two tasks in any proportion you like. If you can meet or exceed your goals on both tasks, you can receive two rewards.

Be aware that you have already put 1 minute worth of effort on the original task and have achieved some progress. This progress will have no value, unless you choose to build upon it and are able to achieve the goal in the coming opportunity (i.e., Phase 2). **If you achieve both goals you will receive rewards for both, but if you don't achieve a goal, you will earn NOTHING for that task, no matter how close you come toward reaching your goal.** Please indicate what percentage of the 2 minutes you would choose to work on the two tasks. The sum should add to 100%.

1. I would choose to spend \_\_\_ % of my time on the original task.

1-1. I believe that my Phase 1 goal is achievable is Phase 2 \_\_\_ YES \_\_\_ No

2. I would choose to spend \_\_\_% of my time on the new task. If you choose to spend any time on the new task, you must state your goal below:

My goal is to be able to identify and circle \_\_\_% of the "i" letters in the fraction of time allocated to this task.

Before beginning the phase 2 task(s), please complete the following background questions.

**Instructions:** Please provide the following information about yourself by filling in the blanks or checking the appropriate box.

1. What is your age? \_\_\_\_\_ years
2. What is your gender?  
Male  Female
3. How would you rate your own willingness to take risks as compared to others?  
Much less willing to take risks      Much more willing to take risks

There is no Phase 2. Please hand in your work, and then you are free to go. Thank you for participating!

## Appendix 2-C

### Actual instruments used in Experiment 2 (self-set and assigned)

**INSTRUCTIONS:** The task that follows is part of a study that examines human performance. The task involves reading a passage of text and **circling the occurrences of the letter “a” in both upper and lower case form**. You will be given a goal or asked to choose one for yourself. **The goal will correspond to the percent of a’s that you will identify in the passage of text.** You will be rewarded for your performance based on your ability to meet the goal. **Your reward will be in direct proportion to the percentage of total a’s identified, provided that you meet the goal, but there will be no additional reward for exceeding the goal.** Rewards will be set at the rate of 10 cents for every percent of a’s identified in the passage. In other words, if your goal is to identify 10% of the a’s in the passage, you will receive \$1 if you meet or exceed this goal. If, on the other hand, your goal is to identify 90% of the a’s in the passage, you will receive \$9 if you meet or exceed this goal. **If, however, you do not meet the goal, you will receive NOTHING, no matter how close you come to reaching it. There is no benefit to exceeding your goal, as there will be no additional monetary reward for exceeding the goal.** No rewards WILL be given for guessing (i.e., you must circle the a’s that you identify). Please read all instructions carefully and respond to the questions below before starting the task. Do NOT skip ahead.

Set a goal for the percentage of ‘a’ letters in the passage that you think you can identify (by circling) in 1 minute, for example 100%. Record your goal below:

My goal is to be able to identify and circle \_\_\_\_% of the “a” letters in 1 minute. +++ Self-set goal+++

Your goal is to identify and circle 30% of all ‘a’ letters in the article in 1 minute. +++Assigned goal+++

**Please answer the following questions before beginning the task. Do NOT start the actual task until the instructor has indicated that you may do so.**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. Quite frankly, I don't care if I achieve this goal or not	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I am strongly committed to pursuing this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. It wouldn't take much to make me abandon this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I think this goal is a good deal to shoot for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I am willing to put in a great deal of effort to achieve this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I think this goal is difficult to achieve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very weak	Weak	Somewhat weak	Neither weak nor strong	Somewhat strong	Strong	Very strong
1. How would you describe your capability in identifying and circling 'a' letters?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very doubtful	Doubtful	Somewhat doubtful	Neutral	Somewhat confident	Confident	Very confident
2. How confident are you in your ability to meet a challenging goal with respect to identifying and circling 'a' letters within a prescribed period of time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Please look up at the instructor now so that s/he knows that you are ready to begin the task. Do NOT turn to the next page or start the actual task until the instructor has indicated that you may do so.**

**You now have 1 minute to identify and circle the a's (both upper and lower case) in the paragraph below.**

Twitter has modified the terms of service that govern the proper user of the microblogging and social-networking site to state unequivocally that messages posted belong to their authors and not to the company. "Twitter is allowed to 'use, copy, reproduce, process, adapt, modify, publish, transmit, display and distribute' your tweets because that's what we do. However, they are your tweets and they belong to you," wrote Twitter co-founder Biz Stone in a blog post Thursday announcing the modifications. There has been controversy over the question of who owns the messages, photos, videos and other material that people post to social media and social-networking sites like Twitter, Facebook, MySpace and YouTube. For example, Google and Facebook got into hot water when critics complained about what they perceived as terms of service that claimed ownership of the data end users store in Google Apps and Facebook profiles. The revised Twitter terms also state that end users allow Twitter to make posted messages available to external applications that use the Twitter API (application programming interface). However, Twitter is still hammering out a set of guidelines for developers on the proper use of the API. The API guidelines are still in draft form and require that developers identify the authors of "tweets," maintain the integrity of the text and obtain permission to send messages on end users' behalf or turn their message into a commercial product, like a poster. Twitter is also keeping mum on details about the display of advertising on the site, an issue of much discussion among pundits who follow the company and have raised questions about how it will generate advertising to sustain its business. Twitter welcomes feedback on its terms of service and will revise them as it deems necessary.

**In the space below, record the total number of "a's" you identified and circled:**

\_\_\_\_\_

**After you have recorded the number of a's circled, please take your paper to the instructor and s/he will give you feedback on your performance.**

## Phase 2

The second phase of the task is designed for those who did not achieve their goal in phase 1.

<b>Please answer the following questions below</b>
--

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. The feedback that I received after phase 1 was a clear indication that I did not accomplish the goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Based on the feedback received after phase 1, I believe that the goal was difficult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Based on the feedback received after phase 1, the goal was more difficult to achieve than I expected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You now have the opportunity to work for **2 additional minutes**. You may allocate your time in any proportion you like between two tasks. As before, you will be rewarded based on your performance. **The first task is to continue identifying and circling a's with the aim of meeting your previous goal.** If you choose this task and the cumulative performance (across Phase 1 and Phase 2) meets or exceeds your previous goal, you will win the reward under the same rules as before. **The second task involves setting a new goal and identifying and circling the number of i's in the same passage of text.** If you are able to meet or exceed your new goal for this task, you will receive a **reward in direct proportion to the percentage of total i's identified** under the same rules as before (i.e., getting the rewards if you meet or exceed the goal or no rewards if you do not meet the goal). You need to decide how to allocate your 2 minutes across the two tasks in any proportion you like. If you can meet or exceed your goals on both tasks, you can receive two rewards.

Be aware that you have already put 1 minute worth of effort on the original task and have achieved some progress. This progress will have no value, unless you choose to build upon it and are able to achieve the goal in the coming opportunity (i.e., Phase 2). **If you achieve both goals you will receive rewards for both, but if you don't achieve a goal, you will earn NOTHING for that task, no matter how close you come toward reaching your goal.** Please indicate what percentage of the 2 minutes you would choose to work on the two tasks. The sum should add to 100%.

---

1. I would choose to spend \_\_\_ % of my time on the original task.

1-1. I believe that my Phase 1 goal is achievable in Phase 2 \_\_\_ YES \_\_\_ No

---

2. I would choose to spend \_\_\_% of my time on the new task. If you choose to spend any time on the new task, you must state your goal below:

My goal is to be able to identify and circle \_\_\_% of the "i" letters in the fraction of time allocated to this task.

---

Before beginning the phase 2 task(s), please complete the following background questions.

**Instructions:** Please provide the following information about yourself by filling in the blanks or checking the appropriate box.

1. What is your age? \_\_\_\_\_ years
2. What is your gender?  
Male  Female
3. How would you rate your own willingness to take risks as compared to others?  
Much less willing to take risks      Much more willing to take risks

There is no Phase 2. Please hand in your work, and then you are free to go. Thank you for participating!



## Appendix 2-D

### Actual instruments used in Experiment 2 (inherited)

**INSTRUCTIONS:** The task that follows is part of a study that examines human performance. The task involves reading a passage of text and **circling the occurrences of the letter “a” in both upper and lower case form. You have been brought in to replace another individual who had previously set a goal of identifying and circling 80% of all ‘a’ letters in 1 minute. You had nothing to do with the setting of his/her goal.** Your predecessor failed to achieve the 80% goal and was only able to identify 30% of all ‘a’ letters.

Now, you will be given **2 minutes** and **you may allocate your time in any proportion you like between two tasks. The first task is to continue identifying and circling a’s with the aim of meeting your predecessor’s goal.** If you choose this task and the cumulative performance (across yours and your predecessor’s) meets or exceeds the previous goal, you will win a reward in direct proportion to the percentage of total a’s identified, as explained in the award rules given below. **The second task involves setting a new goal and identifying and circling the number of i’s in the same passage of text.** If you are able to meet or exceed your new goal for this task, you will receive a **reward in direct proportion to the percentage of total i’s identified.** You need to decide how to allocate your 2 minutes across the two tasks in any proportion you like. If you can meet or exceed your goals on both tasks, you can receive two rewards.

Be aware that your predecessor had already put 1 minute worth of effort on the original task and had achieved some progress. This progress will have no value, unless you choose to build upon it and are able to achieve the goal in the coming opportunity. **If you achieve both goals you will receive rewards for both, but if you don’t achieve a goal, you will earn NOTHING for that task, no matter how close you come toward reaching your goal.**

#### **Award rules:**

**Your reward will be in direct proportion to the percentage of total a’s or i’s identified, provided that you meet the goal, but there will be no additional reward for exceeding the goal.** Rewards will be set at the rate of 10 cents for every percent of a’s or i’s identified in the passage. In other words, if your goal is to identify 10% of the a’s in the passage, you will receive \$1 if you meet or exceed this goal. If, on the other hand, your goal is to identify 90% of the a’s in the passage, you will receive \$9 if you meet or exceed this goal. **If, however, you do not meet the goal, you will receive NOTHING, no matter how close you come to reaching it.**

**Please answer the following questions pertaining to your PREDECESSOR's goal before beginning the task. Do NOT start the actual task until the instructor has indicated that you may do so.**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. Quite frankly, I don't care if I achieve this goal or not	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I am strongly committed to pursuing this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. It wouldn't take much to make me abandon this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I think this goal is a good deal to shoot for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I am willing to put in a great deal of effort to achieve this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I think this goal is difficult to achieve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very weak	Weak	Somewhat weak	Neither weak nor strong	Somewhat strong	Strong	Very strong
1. How would you describe your capability in identifying and circling 'a' letters?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very doubtful	Doubtful	Somewhat doubtful	Neutral	Somewhat confident	Confident	Very confident
2. How confident are you in your ability to meet a challenging goal with respect to identifying and circling 'a' letters within a prescribed period of time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate what percentage of the 2 minutes you would choose to work on the two tasks. The sum should add to 100%.

---

1. I would choose to spend \_\_\_ % of my time on the original task initiated by my predecessor.

1-1. I believe that the goal set by my predecessor is achievable in Phase 2 \_\_\_ YES \_\_\_ No

---

2. I would choose to spend \_\_\_% of my time on the new task. If you choose to spend any time on the new task, you must state your goal below:

My goal is to be able to identify and circle \_\_\_% of the “i” letters in the fraction of time allocated to this task.

---

Before beginning the phase 2 task(s), please complete the following background questions.

**Instructions:** Please provide the following information about yourself by filling in the blanks or checking the appropriate box.

1. What is your age? \_\_\_\_\_ years
2. What is your gender?  
Male  Female
3. How would you rate your own willingness to take risks as compared to others?  
Much less willing to take risks      Much more willing to take risks

There is no actual task. Please hand in your work, and then you are free to go. Thank you for participating!

## Appendix 2-E

### Actual instruments used in Experiment 4 (self-set and assigned)

**INSTRUCTIONS:** The task that follows is part of a study that examines human performance. The task involves reading a passage of text and **circling the occurrences of the letter “a” in both upper and lower case form in 2.5 minutes**. [You will be given a goal] [You will be asked to choose a goal for yourself]. **The goal will correspond to the percent of a’s that you will identify in the passage of text.** You will be rewarded for your performance based on your ability to meet the goal. **Proportional reward** Your reward will be in direct proportion to the percentage of total a’s identified, provided that you meet the goal, but there will be no additional reward for exceeding the goal. Rewards will be set at the rate of 10 cents for every percent of a’s identified in the passage. In other words, if your goal is to identify 10% of the a’s in the passage, you will receive \$1 if you meet or exceed this goal. If, on the other hand, your goal is to identify 90% of the a’s in the passage, you will receive \$9 if you meet or exceed this goal. **Flat reward** You will receive a \$5 reward if you meet or exceed your goal, but there will be no additional reward for exceeding the goal}. **If, however, you do not meet the goal, you will receive NOTHING, no matter how close you come to reaching it.** No rewards will be given for guessing (i.e., you must circle the a’s that you identify). Please read all instructions carefully and respond to the questions below before starting the task. Do NOT skip ahead.

[Self-set] My goal is to be able to identify and circle \_\_\_\_\_% of the “a” letters in 2.5 minutes, [for example 100%]

[Assigned] Your goal is to identify and circle XX % (yoked to self-set) of all ‘a’ letters in the article in 2.5 minutes.

**Please answer the following questions before beginning the task. Do NOT start the actual task until the instructor has indicated that you may do so.**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. I am committed to meeting this goal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I am willing to put in a great deal of effort to achieve this goal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I think this goal will be difficult to achieve.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I think meeting this goal will be hard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Please look up at the instructor now so that s/he knows that you are ready to begin the task. Do NOT turn to the next page or start the actual task until the instructor has indicated that you may do so.**

**The passage of text appears below.**

Democrats and Republicans are dug in like soldiers at Verdun over what to do about the sputtering U.S. economy. Exhausted by the political stalemate, they've been reduced to magical thinking, hoping that things will eventually get better by themselves. But time isn't on America's side. The country is suffering its highest average duration of unemployment since at least 1948. "The longer this goes on, the greater the danger that the cyclical downturn becomes structural. People and things that lie idle start to lose their productive value. Then you're into all sorts of troubles," says Karen Ward, senior global economist at HSBC Holdings (HBC) in London. It may finally be time for Americans to consider ideas from a place that they don't usually look to for inspiration: the rest of the planet. The U.S.'s economic predicament does present some unique dilemmas. The Obama Administration has already pushed hard on the levers that countries usually use to get out of a slump, to little discernible effect. Short-term interest rates are near zero and fiscal stimulus is aggressive, judging from a budget deficit of about 10 percent of gross domestic product. David Rosenberg, chief economist at Gluskin Sheff & Associates, a Toronto-based wealth-management firm, says of the U.S.: "We're basically in uncharted territory." Maybe so. But there are guideposts that can help point the way out. The U.S., after all, is not the first country to wrestle with how to restart growth despite budget deficits that constrain big-spending solutions. The challenge is how to apply lessons from other countries to shore up American weaknesses, without sacrificing the strengths that make the U.S., for all its troubles, the world's biggest economy. To prod the conversation forward, *Bloomberg Businessweek* scanned the world and found innovative economic ideas in countries as diverse as Germany, Brazil, Singapore, and Thailand that are applicable to America's mess. The focus was on short-term solutions, but since there aren't a whole lot of miracle fixes to be had, we also considered some longer-term reforms that create a better environment for years of sustainable growth. There's no guarantee that all of these ideas would work in an American context. But it's clear that some fresh, non-ideological thinking is needed. Says Dow Chemical (DOW) Chief Executive Officer Andrew N. Liveris, a Greek-Australian-American and author of the book *Make It in America: The Case for Re-Inventing the Economy*: "People in the U.S. confuse big government and small government as the only two models. What we need is smart government." By that he means government that puts business objectives ahead of politics. "Countries are competing like companies more and more," says Liveris, "In the U.S., we haven't caught up." Here are nine ideas from the rest of the world to get America back in the race. Germany has one of the lowest homeownership rates among wealthy nations—around 46 percent, vs. two-thirds in the U.S.—and also one of the most stable housing markets. Prices of owner-occupied housing in Germany are up 9 percent since 2003, according to the Association of German Pfandbrief Banks. What's the German formula? Housing is less vulnerable to booms and busts because only highly qualified buyers can get a mortgage. Down payments are usually at least 20 percent, often 40 percent. Mortgage interest is not tax-deductible, as it is in the U.S., which also discourages excessive leverage. Germans are justly proud of their Pfandbrief, an ultrasafe bond whose collateral is a set of standardized mortgages whose loan-to-value ratio can't exceed 60 percent.

**In the space below, record the total number of “a’s” you identified and circled:**

\_\_\_\_\_

**After you have recorded the number of a’s circled, please take your paper to the instructor and s/he will give you feedback on your performance.**

## Phase 2

The second phase of the task is designed for those who did not achieve their goal in phase 1.

**Please answer the following questions below**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
4. The feedback that I received after phase 1 was a clear indication that I did not meet the goal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Based on the feedback received after phase 1, I failed to reach the desired level of performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Based on the feedback received after phase 1, I believe that the goal was difficult to achieve.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Based on the feedback received after phase 1, meeting the goal was hard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You now have the opportunity to work for another **2.5 minutes**. **You may continue to identify and circle a's with the aim of meeting the previous goal.** If you choose to continue and your cumulative performance (across Phase 1 and Phase 2) meets or exceeds the previous goal, you will win the reward under the same rules as before.

Be aware that you have already put 2.5 minutes worth of effort on the task and have achieved some progress. This progress will have no value, unless you choose to build upon it and are able to achieve the goal in the coming opportunity (i.e., Phase 2). **If you achieve the previous goal, you will receive the reward, but if you don't achieve the previous goal, you will earn NOTHING for that task, no matter how close you come toward reaching the goal.** Please indicate your willingness to continue to pursue the previous goal below as a percentage probability from 0 to 100% (0 = absolutely no, 50 = neutral, 100 = absolutely yes).

A percentage probability from 0 to 100%  
**(0 = absolutely no, 50 = neutral, 100 = absolutely yes)**

I would like to continue identifying and circling a' with the aim of meeting the previous goal \_\_\_\_\_ %

Further, please indicate your final decision of whether or not to continue working this database project.

I would continue working on this task to achieve the previous goal:

Absolutely disagree	Strongly disagree	Disagree	Somewhat disagree	Slightly disagree	Slightly agree	Somewhat agree	Agree	Strongly agree	Absolutely agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Now before beginning the phase 2 task or exiting this experiment, please answer the following questions:

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. How would you describe your capability in identifying and circling 'a' letters?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. How confident are you in your ability to meet a challenging goal with respect to identifying and circling 'a' letters within a prescribed period of time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I am committed to meeting this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I am willing to put in a great deal of effort to achieve this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I would be happy if I attained the desired level of performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I would feel satisfied if I achieved this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I believe that working hard on this task in phase 2 will lead to goal attainment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I believe that by putting more effort in phase 2, I will be able to meet this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I would feel responsible if I failed to achieve this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. It is my responsibility to meet this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. What is your age?	_____ years						
12. What is your gender?	Male / Female						



## Appendix 2-F

### Actual instruments used in Experiment 4 (inherited)

**INSTRUCTIONS:** The task that follows is part of a study that examines human performance. The task involves reading a passage of text and **circling the occurrences of the letter “a” in both upper and lower case form. You have been brought in to replace another individual who had previously set a goal of identifying and circling XX% (yoked to self-set) of all ‘a’ letters in 2.5 minutes. You had nothing to do with the setting of his/her goal.** Your predecessor was only able to identify XX %, thus having failed to achieve the goal, XX% (yoked to self-set)

Now, you will be given **2.5 minutes to continue identifying and circling a’s with the aim of meeting your predecessor’s goal.** If you choose this task and the cumulative performance (across yours and your predecessor’s) meets or exceeds the previous goal, [you will win a reward in direct proportion to the percentage of total a’s identified, as explained in the award rules given below/you will receive a \$5 reward as explained in the award rules given below]. You need to decide whether or not you continue identifying and circling a’s with the aim of meeting your predecessor’s goal.

Be aware that your predecessor had already put 2.5 minutes worth of effort on the original task and had achieved some progress. This progress will have no value, unless you choose to build upon it and are able to achieve the goal in the coming opportunity (i.e., Phase 2). **If you achieve your predecessor’s goal, you will receive a reward, but if you don’t achieve the goal, you will earn NOTHING for that task, no matter how close you come toward reaching your predecessor’s goal.**

**Award rules:**

**[Your reward will be in direct proportion to the percentage of total a’s identified, provided that you meet the goal, but there will be no additional reward for exceeding the goal.** Rewards will be set at the rate of 10 cents for every percent of a’s identified in the passage. In other words, if your goal is to identify 10% of the a’s in the passage, you will receive \$1 if you meet or exceed this goal. If, on the other hand, your goal is to identify 90% of the a’s in the passage, you will receive \$9 if you meet or exceed this goal.] [You will receive a \$5 reward if you meet or exceed your goal, but there will be no additional reward for exceeding the goal.] **If, however, you do not meet the goal, you will receive NOTHING, no matter how close you come to reaching it.**

**Please answer the following questions pertaining to your PREDECESSOR’s goal before beginning the task. Do NOT start the actual task until the instructor has indicated that you may do so.**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. I think this goal will be difficult to achieve.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I think meeting this goal will be hard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate your willingness to continue to pursue the predecessor's goal below as a percentage probability from 0 to 100% (0 = absolutely no, 50 = neutral, 100 = absolutely yes).

A percentage probability from 0 to 100%  
(0 = absolutely no, 50 = neutral, 100 = absolutely yes)

I would like to continue identifying and circling 'a' with the aim of meeting the predecessor's goal \_\_\_\_\_ %

Further, please indicate your final decision of whether or not to continue working this database project.

I would continue working on this task to achieve the predecessor's goal:

Absolutely disagree	Strongly disagree	Disagree	Somewhat disagree	Slightly disagree	Slightly agree	Somewhat agree	Agree	Strongly agree	Absolutely agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Now before beginning the phase 2 task or exiting this experiment, please answer the following questions:

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. How would you describe your capability in identifying and circling 'a' letters?							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. How confident are you in your ability to meet a challenging goal with respect to identifying and circling 'a' letters within a prescribed period of time?							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I am committed to meeting this goal							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I am willing to put in a great deal of effort to achieve this goal							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I would be happy if I attained the desired level of performance							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I would feel satisfied if I achieved this goal							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I believe that working hard on this task in phase 2 will lead to goal attainment							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I believe that by putting more effort in phase 2, I will be able to meet this goal							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I would feel responsible if I failed to achieve this goal							
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. It is my responsibility to meet this goal

11. What is your age?

\_\_\_\_\_ years

12. What is your gender?

Male / Female

## Appendix 2-G

### Actual instruments used in Experiment 5

**INSTRUCTIONS:** The task that follows is part of a study that examines human performance. The task involves reading a passage of text and **circling the occurrences of the letter “a” in both upper and lower case form in 2.5 minutes**. You will be given a goal. **The goal will correspond to the percent of a’s that you will identify in the passage of text.** You will be rewarded for your performance based on your ability to meet the goal. **Your reward will be in direct proportion to the percentage of total a’s identified, provided that you meet the goal, but there will be no additional reward for exceeding the goal.** Rewards will be set at the rate of 10 cents for every percent of a’s identified in the passage. In other words, if your goal is to identify 10% of the a’s in the passage, you will receive \$1 if you meet or exceed this goal. If, on the other hand, your goal is to identify 90% of the a’s in the passage, you will receive \$9 if you meet or exceed this goal. **If, however, you do not meet the goal, you will receive NOTHING, no matter how close you come to reaching it.** No rewards will be given for guessing (i.e., you must circle the a’s that you identify). Please read all instructions carefully and respond to the questions below before starting the task. Do NOT skip ahead.

Your goal is to identify and circle [49/74/99] % of all ‘a’ letters in the article in 2.5 minutes.

**Please answer the following questions before beginning the task. Do NOT start the actual task until the instructor has indicated that you may do so.**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. I am committed to meeting this goal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I am willing to put in a great deal of effort to achieve this goal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I think this goal will be difficult to achieve.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I think meeting this goal will be hard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Please look up at the instructor now so that s/he knows that you are ready to begin the task. Do NOT turn to the next page or start the actual task until the instructor has indicated that you may do so.**

**The passage of text appears below.**

Democrats and Republicans are dug in like soldiers at Verdun over what to do about the sputtering U.S. economy. Exhausted by the political stalemate, they've been reduced to magical thinking, hoping that things will eventually get better by themselves. But time isn't on America's side. The country is suffering its highest average duration of unemployment since at least 1948. "The longer this goes on, the greater the danger that the cyclical downturn becomes structural. People and things that lie idle start to lose their productive value. Then you're into all sorts of troubles," says Karen Ward, senior global economist at HSBC Holdings (HBC) in London. It may finally be time for Americans to consider ideas from a place that they don't usually look to for inspiration: the rest of the planet. The U.S.'s economic predicament does present some unique dilemmas. The Obama Administration has already pushed hard on the levers that countries usually use to get out of a slump, to little discernible effect. Short-term interest rates are near zero and fiscal stimulus is aggressive, judging from a budget deficit of about 10 percent of gross domestic product. David Rosenberg, chief economist at Gluskin Sheff & Associates, a Toronto-based wealth-management firm, says of the U.S.: "We're basically in uncharted territory." Maybe so. But there are guideposts that can help point the way out. The U.S., after all, is not the first country to wrestle with how to restart growth despite budget deficits that constrain big-spending solutions. The challenge is how to apply lessons from other countries to shore up American weaknesses, without sacrificing the strengths that make the U.S., for all its troubles, the world's biggest economy. To prod the conversation forward, *Bloomberg Businessweek* scanned the world and found innovative economic ideas in countries as diverse as Germany, Brazil, Singapore, and Thailand that are applicable to America's mess. The focus was on short-term solutions, but since there aren't a whole lot of miracle fixes to be had, we also considered some longer-term reforms that create a better environment for years of sustainable growth. There's no guarantee that all of these ideas would work in an American context. But it's clear that some fresh, non-ideological thinking is needed. Says Dow Chemical (DOW) Chief Executive Officer Andrew N. Liveris, a Greek-Australian-American and author of the book *Make It in America: The Case for Re-Inventing the Economy*: "People in the U.S. confuse big government and small government as the only two models. What we need is smart government." By that he means government that puts business objectives ahead of politics. "Countries are competing like companies more and more," says Liveris, "In the U.S., we haven't caught up." Here are nine ideas from the rest of the world to get America back in the race. Germany has one of the lowest homeownership rates among wealthy nations—around 46 percent, vs. two-thirds in the U.S.—and also one of the most stable housing markets. Prices of owner-occupied housing in Germany are up 9 percent since 2003, according to the Association of German Pfandbrief Banks. What's the German formula? Housing is less vulnerable to booms and busts because only highly qualified buyers can get a mortgage. Down payments are usually at least 20 percent, often 40 percent. Mortgage interest is not tax-deductible, as it is in the U.S., which also discourages excessive leverage. Germans are justly proud of their Pfandbrief, an ultrasafe bond whose collateral is a set of standardized mortgages whose loan-to-value ratio can't exceed 60 percent.

**In the space below, record the total number of “a’s” you identified and circled:**

\_\_\_\_\_

**After you have recorded the number of a’s circled, please take your paper to the instructor and s/he will give you feedback on your performance.**

## Phase 2

The second phase of the task is designed for those who did not achieve their goal in phase 1.

**Please answer the following questions below**

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
3. The feedback that I received after phase 1 was a clear indication that I did not meet the goal.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Based on the feedback received after phase 1, I failed to reach the desired level of performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Based on the feedback received after phase 1, I believe that the goal was difficult to achieve.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Based on the feedback received after phase 1, meeting the goal was hard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

You now have the opportunity to work for another **2.5 minutes**. **You may continue to identify and circle a's with the aim of meeting the previous goal.** If you choose to continue and your cumulative performance (across Phase 1 and Phase 2) meets or exceeds the previous goal, you will win the reward under the same rules as before.

Be aware that you have already put 2.5 minutes worth of effort on the task and have achieved some progress. This progress will have no value, unless you choose to build upon it and are able to achieve the goal in the coming opportunity (i.e., Phase 2). **If you achieve the previous goal, you will receive the reward, but if you don't achieve the previous goal, you will earn NOTHING for that task, no matter how close you come toward reaching the goal.** Please indicate your willingness to continue to pursue the the goal below as a percentage probability from 0 to 100% (0 = absolutely no, 50 = neutral, 100 = absolutely yes).

A percentage probability from 0 to 100%  
**(0 = absolutely no, 50 = neutral, 100 = absolutely yes)**

I would like to continue identifying and circling a' with the aim of meeting the previous goal \_\_\_\_\_ %

Further, please indicate your final decision of whether or not to continue working this database project.

I would continue working on this task to achieve the previous goal:

Absolutely disagree	Strongly disagree	Disagree	Somewhat disagree	Slightly disagree	Slightly agree	Somewhat agree	Agree	Strongly agree	Absolutely agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Now before beginning the phase 2 task or exiting this experiment, please answer the following questions:

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
13. How would you describe your capability in identifying and circling 'a' letters?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. How confident are you in your ability to meet a challenging goal with respect to identifying and circling 'a' letters within a prescribed period of time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I am committed to meeting this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I am willing to put in a great deal of effort to achieve this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I would be happy if I attained the desired level of performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I would feel satisfied if I achieved this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I believe that working hard on this task in phase 2 will lead to goal attainment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I believe that by putting more effort in phase 2, I will be able to meet this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. I would feel responsible if I failed to achieve this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. It is my responsibility to meet this goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. What is your age?	_____ years						
24. What is your gender?	Male / Female						

## **Chapter 3 The Effect of an Initial Budget and Schedule Goal on Software Project Escalation<sup>7</sup>**

### **Abstract**

Software project escalation is a costly problem that leads to significant financial losses. Prior research suggests that setting a publicly announced limit on resources can make individuals less willing to escalate their commitment to a failing course of action. However, the relationship between initial budget and schedule goals and software project escalation remains unexplored. Drawing upon goal setting theory as well as sunk cost and mental budgeting perspectives, we explore the effect of goal difficulty and goal specificity on software project escalation. The findings from a laboratory experiment with 349 IT professionals suggest that both very difficult and very specific goals for budget and schedule can limit software project escalation. Further, the level of commitment to a budget and schedule goal directly affects software project escalation and also interacts with goal difficulty and goal specificity to affect software project escalation. This study makes a theoretical contribution to the existing body of knowledge on software project management by establishing a connection between goal setting theory and software project escalation. The study also contributes to practice by highlighting the potential negative consequences that can result from the nature of initial budget and schedule goals that are established at the outset of a project.

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<sup>7</sup> Lee, J. S., Keil, M., & Kasi, V. "The Effect of an Initial Budget and Schedule Goal on Software Project Escalation," *Journal of Management Information Systems*, 29(1): 53-78.



## Introduction

Recent reports show that companies continue to struggle with completing software projects successfully and that failures are not uncommon (Standish, 2010). Sometimes, failing software projects appear to take on a life of their own continuing to attract valuable resources despite the fact that they may never be delivered successfully, a phenomenon known as escalation of commitment (Garland, 1990; Keil, 1995; Keil, Mixon, Saarinen, & Tuunainen, 1994; Mähring & Keil, 2008; Staw, 1997). Prior research suggests that escalation of commitment is exhibited in a high fraction of software projects, i.e., 35-40% (Keil et al., 2000a). The frequency and severity of software project escalation has motivated researchers to identify and understand the factors that bind decision makers to a failing software project.

Prior escalation studies have found that decision makers are swayed by the amount of resources already invested (i.e., sunk cost effect) (Arkes & Blumer, 1985; Garland, 1990; Garland & Newport, 1991) and the proximity to completion (i.e., completion effect) (Conlon & Garland, 1993; Garland & Conlon, 1998; Moon, 2001). While sunk cost and completion effects tend to manifest themselves long after a project has been initiated, recent research suggests that the seeds of escalation can also be sown much earlier (Mähring & Keil, 2008). For instance, setting no limit at the outset on the amount of resources that will go into a project is more likely to cause escalation to occur compared with setting a limit (Heath, 1995; Keil & Robey, 1999; Tan & Yates, 2002). Further, Mähring & Keil (2008) suggest that a project that is initially framed as being “necessary and urgent” is more likely to experience escalation.

While prior studies have enhanced our understanding of how progress-related decision dilemmas (e.g., sunk costs and project completion level) and some early actions (e.g., framing the project and setting resource limits) influence escalation, little is known about how setting an initial goal

for budget and schedule influences software project escalation. While goal setting has received considerable attention in management, and is known to be an effective motivation tool for improving task performance in organizations (Locke & Latham, 1990), it has received very little attention in the escalation literature. This is surprising, because embarking on a particular course of action is usually associated with setting some type of a goal. In this paper, we aim to address this theoretical gap.

In the context of software project management, early decisions result in the articulation of goals with respect to budget, schedule, and scope (De Meyer, Loch, & Pich, 2002; Jurison, 1999). However, for a software project of any particular scope, budget and schedule goals may vary in terms of their difficulty and specificity. For example, meeting a very aggressive budget and schedule goal can be difficult, while meeting an ample budget and schedule goal can be easy. Similarly, setting precise figures for the budget and schedule (e.g., X dollars and Y months) communicates a specific goal, whereas asking the project manager to deliver the project as soon as possible with as little expenditure as needed communicates a vague goal. While budget and schedule goals established at the outset of a software project can vary tremendously in terms of difficulty and specificity, the effect of such differences on software project escalation remains unknown.

Further, while both cognitive and motivational factors can, in theory, influence escalation of commitment, prior work has tended to focus on largely on cognitive factors such as attitudes toward risk, selective retrieval of information from memory, maximizing vs. satisficing tendencies, and so forth (Bowen, 1987; Keil et al., 2000b; Northcraft & Neale, 1986; Staw, 1997; Whyte, 1986). While some researchers have argued that escalation can also be caused by motivational factors as such goal setting (Fox & Hoffman, 2002), there has been little empirical

work done to explore the impact of motivational factors on escalation. Thus, it is important to address this theoretical gap by empirically investigating whether the initial goal setting aspect of early decisions in software project management (i.e., establishing budget and schedule goals) influences subsequent behavior in terms of software project escalation.

This gap in our understanding is not only important from a theoretical perspective, but also from a practical perspective, as the setting of different targets for expected cost and launch date is a subject of some concern in the software project management literature (Boehm & Ross, 1989; De Meyer et al., 2002; Humphrey, 1988; Jurison, 1999). The tension, for example, that frequently exists between customers and developers regarding how to set a target for budget and schedule is well known; customers want an aggressive budget and schedule to insure the lowest possible cost and an early launch date, whereas developers want the opposite to provide themselves with ample resources and time to fully develop and polish the product before bringing it to market (Boehm & Ross, 1989; Deephouse, Mukhopadhyay, Goldenson, & Kellner, 1995).

One of the challenges in setting appropriate budget and schedule goals is the difficulty associated with generating accurate estimates of the work required to carry out a software project. While much effort has been put into developing better software project estimation models (Hu, Plant, & Hertz, 1998; Johnson, Moore, Dane, & Brwer, 2000; Jørgensen, 2004; Jørgensen & Shepperd, 2007), some would argue that the estimates will continue to be inaccurate due to the intangible nature of software (Armour, 2002; Brooks, 1995; Keil et al., 1994; Robey, Smith, & Vijayasarathy, 1993) and the tendency to make bold forecasts (Kahneman & Lovallo, 1993). This suggests that it may be unwise for practitioners anchor their decisions around initial budget

and schedule estimates that may be highly inaccurate. However, these estimates are often adopted as a reference point in judging whether a project is on or off-track.

The purpose of this study is to gain a better understanding of the impact that various initial budget and schedule goals may have on the decision to escalate commitment to a troubled software project. Specifically, we seek to understand how the difficulty and specificity of initial budget and schedule goals influence software project escalation. In order to achieve this objective, we draw upon goal setting theory, and conduct a scenario-based experiment with 349 IT managers from over 150 different companies. In addition to the theoretical perspective offered by goal setting theory, we critically examine and draw on the notions of mental budgeting and the sunk cost effect to provide additional perspective regarding the relationship between budget and schedule goals and software project escalation.

The remainder of the paper is organized as follows; first, we offer a brief overview of the relevant literature and the theoretical gap that our study addresses, followed by the research model that we seek to test. Next, we discuss the theoretical foundation behind the hypotheses depicted in our research model. Then, we describe the experiment conducted to test the hypotheses followed by the results that were obtained. Finally, we discuss the implications of our work for both research and practice.

### **Literature Review and Research Model**

Early escalation studies underscore the role of sunk costs in promoting escalation (Northcraft & Wolf, 1984; Teger, 1980); decision makers anchor their decision frame around past investments, and tend to “throw good money after bad” in order to turn around a failing course of action (Arkes & Blumer, 1985; Garland, 1990). While sunk costs should not affect the decision of whether or not to continue a failing course of action, prior escalation studies have

found that decision makers in escalation situation are more likely to continue a failing course of action when sunk costs are larger (Garland, 1990; Keil, Truex, & Mixon, 1995). Further, it has been found that the level of project completion in a progress-related task (e.g., a software development project) also influences escalation; individuals consider how close a project is to completion, and are more willing to continue a project when it is close to completion (e.g., 90% completed) as opposed to far from completion (e.g., 10% completed) (Conlon & Garland, 1993; Garland & Conlon, 1998; Keil et al., 1995; Moon, 2001). Therefore, we know that *after* a project is well underway (i.e. a significant amount of available funds have already been spent or the project is perceived to be near completion), sunk cost and completion effects can promote escalation. Little is known, however, about how budgets and schedules that are commonly set at the *beginning* of a project may influence subsequent escalation behavior.

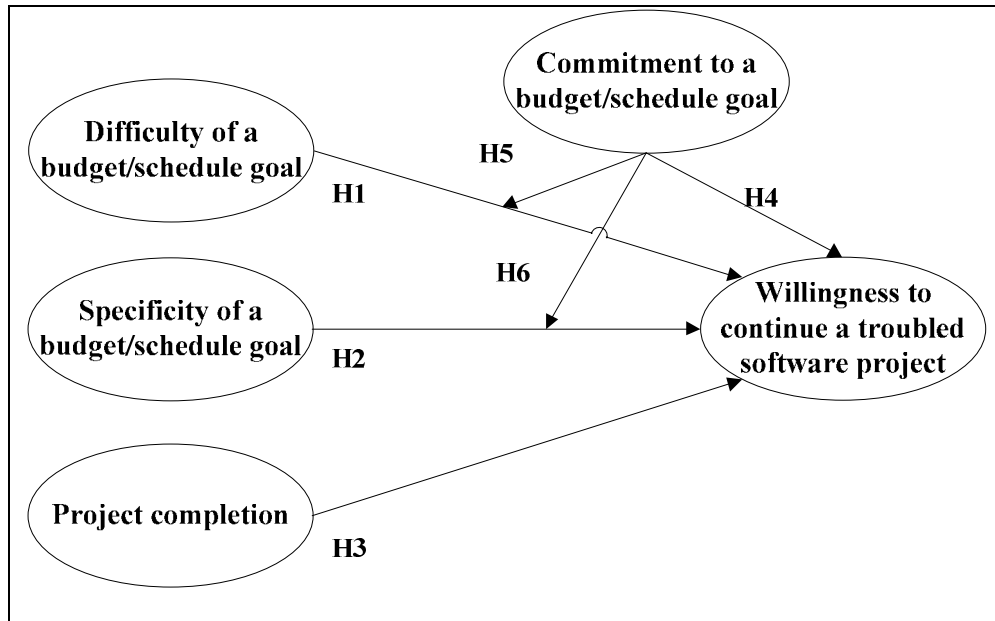
Prior research suggests that when a limit on resources is set and publicly announced, individuals become less willing to authorize additional funding beyond the limit for a failing course of action (Brockner et al., 1979). Mental budgeting theory provides an explanation for this type of behavior (Heath, 1995). Mental budgeting theory suggests that people allocate a certain amount of money to a particular course of action (e.g., setting a monthly expense for entertainment), and then resist exceeding this pre-determined budget (Thaler, 1990, 1999). Mental budgeting has been well documented in consumer behavior research (Thaler, 1985) and has been applied in the context of escalation research as well (Heath, 1995). Based on a series of experiments designed to test the notion of mental budgeting in the context of escalation, Heath (1995) concluded that escalation occurs when: (1) people do not set a budget, or (2) people cannot track expenses against the budget. Subsequent work by Tan & Yates (2002) indicates that the prospect of

exceeding a financial budget reduces an individual's willingness to make additional investments to a failing course of action.

Still, there is a significant gap in the literature concerning the influence that different *types* of initial budget and schedule goals can have on the subsequent decision to escalate. Budget and schedule goals that are set at the beginning of a project certainly have project management implications (Abdel-Hamid, Sengupta, & Swett, 1999; Wallace & Keil, 2004). For instance, the perceived success of a software project depends to a great extent on whether or not it is delivered within budget and on schedule (Lindberg, 1999). When significant additional costs are incurred that go beyond the budget, this clearly reduces the financial value, or net benefits, associated with the project. Schedule overruns can also have a negative impact, particularly when the software project is of strategic importance or is linked to a new product offering. New product development research has shown that success may depend on how quickly a product can be launched to the market (Cohen, Eliashberg, & Ho, 1996).

Based on work by Abdel-Hamid et al (1999), it is clear that different types of goals (e.g. cost/schedule vs. quality/schedule) can lead to different software project planning and resource allocation decisions. However, what is not yet known is the extent to which budget and schedule goals that vary in terms of their difficulty and specificity affect software project escalation. In this study, goal difficulty is defined as the degree to which a goal is difficult to achieve (i.e., an aggressive budget and schedule goal is more difficult compared with an ample budget and schedule goal) (Locke & Latham, 1990, 2002), and goal specificity is defined as the degree to which a goal is described in a specific manner (i.e., setting a precise figure for the budget and schedule is more specific compared with a vague "do your best" type statement) (Locke et al.,

1989; Locke & Latham, 1990). Before moving to the next section, we present our research model in Figure 3-1.



**Figure 3-1 Research Model**

In this study, we conceptualize budget and schedule as highly correlated variables and manipulate the two in tandem. While we recognize that there may be projects in which the schedule is aggressive (i.e., difficult) and the budget is ample (i.e., easy), and vice versa, in general, budget and schedule are highly correlated in software projects (i.e., a longer schedule requires a larger budget) (Boehm, Abts, & Chulani, 2000; Ravichandran & Rai, 1999). More importantly, there are known trade-offs among the three elements of the so-called triple constraint (scope, budget, and schedule) in project management (Abdel-Hamid, 1990a; Boehm & Ross, 1989; De Meyer et al., 2002; Jurison, 1999). These trade-offs may lead to varying degrees of goal difficulty (e.g., the difficulty of a tight schedule goal may vary depending on the scope and the amount of budget). Thus, in order to investigate the effect of difficult vs. easy goals on software project escalation we chose to simplify matters and control for possible trade-offs by

jointly manipulating budget and schedule for a particular level of scope. In other words, we chose not to manipulate budget and schedule independently.

### **Theory and Hypotheses**

In this section, we theorize about the effects of goal difficulty and goal specificity on software project escalation. In doing so, we draw upon goal setting theory as well as sunk cost and mental budgeting perspectives on escalation of commitment, leading us to propose rival explanations based on different theoretical perspectives. We then extend our theorizing to include the effects of project completion level (a cognitive factor) and goal commitment (a motivational factor), both of which goal-related factors that may also influence escalation behavior.

#### **Goal Difficulty**

##### ***Goal Setting Perspective***

Based on the goal setting literature, one of the key facets that differentiates one goal from another is goal difficulty (Locke et al., 1989; Locke & Latham, 1990). Goal difficulty is known to positively influence task performance; task performance increases as a goal becomes more difficult (Locke & Latham, 1990). However, Atkinson (1958) found that the relationship between goal difficulty and task performance is not necessarily a linear function. More specifically, when the limits of an individual's ability are reached, further increases in goal difficulty do not lead to the same proportional increase in task performance, and can even lead to decreased task performance (Erez & Zidon, 1984; Latham & Locke, 1991). The positive effect of goal difficulty on task performance is believed to arise from the perceived discrepancy between a present state and a state to be reached (i.e., a goal), which motivates an individual to engage in self-regulation activities to decrease the discrepancy and reach the desired state



(Bandura, 1977; Bandura & Cervone, 1983; Locke, 1991). However, when the perceived discrepancy is so large that the desired state is judged to be outside an individual's ability to reach, this has the effect of reducing motivation to exert greater effort to reach the desired state (Latham & Locke, 1991).

The large perceived discrepancy that is induced by a very difficult goal is similar in some ways to the large discrepancy that can be caused by strong negative feedback in escalation situations. Prior research on escalation suggests that if the negative feedback associated with a previously chosen course of action becomes sufficiently strong (or unambiguous), this will induce the perception that a troubled project may not yield the desired outcomes (i.e., a large discrepancy), leading to de-escalation. Strong negative feedback conveys information regarding the progress made up to a certain point (i.e., a present state) in reference to desired outcomes (i.e., a state to be reached), thus highlighting a large discrepancy that causes reduced motivation to continue a failing course of action. For instance, in a scenario-based oil exploration experiment, petroleum geologists became less willing to authorize additional funding to continue drilling as the number of dry wells increased (Garland et al., 1990). The increased number of dry wells in this experiment provided strong negative feedback indicating that there might not be any oil to be found at the chosen site (i.e., a large discrepancy between the present state and the state to be reached), eventually leading to withdrawal from the venture. Based on the above, we posit large discrepancies of this type (between the present state and the state to be reached) can not only be caused by strong negative feedback, but can also result from a goal that is too difficult. Thus, we posit that a very difficult goal for budget and schedule reduces a decision maker's willingness to continue a troubled software project.

*Hypothesis 1a.* A very difficult budget and schedule goal compared with a very easy budget and schedule goal reduces an individual's willingness to continue a troubled software project.

### ***Sunk Cost Perspective***

The sunk cost perspective provides an alternative point of view, suggesting that theoretically there should be no effect of budget/schedule goal difficulty on software project escalation, provided that the relative magnitude of sunk cost remains constant (i.e., a null effect hypothesis). While sunk costs (i.e., the amount of funds already invested in a previously chosen course of action) have been found to influence escalation of commitment (Garland, 1990; Keil et al., 1995; Northcraft & Wolf, 1984), in a study by Garland and Newport (1991), the relative magnitude of sunk costs rather than the absolute magnitude was found to influence the escalation decision. More specifically, while prior escalation studies found that larger sunk costs are more likely to lead to escalation of commitment, Garland and Newport (1991) suggest that when there is an initial budget for a particular course of action or a project, decision makers evaluate past investments (i.e., sunk cost) in ratio terms against this initial budget, and willingness to make additional investments is higher when the past investments represent a large proportion of the initial budget, as compared to when the past investments represent a small proportion of the initial budget. This suggests that as long as the same proportion of the initial budget and schedule has been expended (i.e., the same relative magnitude of sunk costs) at the point when the escalation decision is made, there will be no observable difference in escalation due to goal difficulty per se.

As an illustration, we may consider a situation that involves two hypothetical budget and schedule goals for a software development project: a difficult budget and schedule goal (e.g., \$10,000 and 10 months) and an easy budget and schedule goal (e.g., \$20,000 and 20 months).

Let us suppose that a decision maker received negative feedback that there was an unexpected and very serious technical problem with a software project, and was told that 90% of the initial budget and schedule had already been expended. This situation would generate a difference in the absolute magnitude of sunk cost for two hypothetical goals (i.e., \$9,000 and 9 months for the difficult goal and \$18,000 and 18 months for the easy goal), whereas the relative magnitude of sunk cost is the same for both goals (i.e., sunk cost represents 90% of both goals). Thus, the sunk cost perspective would suggest that the decision maker's willingness to continue this troubled project will be invariant across the two goals even though one goal is clearly more difficult than another. On the basis of this logic, we propose the following rival hypothesis:

*Hypothesis 1b.* There is no relationship between goal difficulty and an individual's willingness to continue a troubled software project when the relative size of the budget/schedule goals in relation to the total budget/schedule is held constant.

## **Goal Specificity**

### ***Goal Setting Perspective***

In goal setting theory, goal specificity is another central element along with goal difficulty. While it is widely accepted in the literature that difficult (but attainable) goals lead to better task performance, there is much less consensus on the effect of specific goals on task performance. While some researchers appear to operate under the assumption that more specific goals lead to better task performance, others suggest that goal setting theory does not make such an assertion about the effect of goal specificity on task performance (Locke et al., 1989). In fact, Locke et al (1989) found that goal specificity affects the variability of performance rather than the level of performance. In other words, specific goals lead to less variation in task performance, whereas vague goals lead to greater variation in task performance. Since specific goals provide clear and unambiguous guidance as to the perceived outcome that needs be achieved, this is believed to

produce little variation in task performance. Vague goals, in contrast, create room for ambiguity, thus allowing individuals to interpret goals in many different ways, leading to greater variation in task performance. Based on goal setting theory, we would not expect to observe a direct effect of goal specificity on task performance. Thus, we posit that a very specific goal for budget and schedule does not motivate a decision maker's willingness to continue working on a troubled software project, which gives rise to the following null effect hypothesis:

*Hypothesis 2a.* There is no relationship between goal specificity and an individual's willingness to continue a troubled software project.

### ***Mental Budgeting Perspective***

The mental budgeting perspective provides an alternative hypothesis to the null effect of goal specificity on software project escalation. Using a series of experiments, Heath (1995) investigated the relationship between mental budgeting and escalation. His results suggest that having the ability to track expenses against a predefined budget is critical in order for mental budgeting to be an effective means of limiting escalation. In other words, the effectiveness of mental budgeting in limiting escalation of commitment is diminished if the ongoing investment is hard to track or if the reference point is unclear, a point that becomes relevant in theorizing about the effect of goal specificity in the context of escalation of commitment. In the case of a specific budget and schedule goal, there is an exact amount of money that can be expended and a precise timeline for project completion. In contrast, a vague budget and schedule goal does not provide explicit guidance to the decision maker. Thus, a vague budget and schedule goal does not provide a clear reference point against which the prospect of making additional investments can be assessed or tracked. On the basis of this logic, we propose the following hypothesis:

*Hypothesis 2b.* A very specific budget and schedule goal compared with a very vague budget and schedule goal reduces an individual's willingness to continue a troubled software project.

## **Level of Project Completion and Goal Commitment**

Project completion level is a useful indicator in software development for assessing the progress level of a project and is often expressed as “percentage completed.” The level of project completion is clearly related to the concept of goal proximity and has been shown to be influential in prior research on escalation (Conlon & Garland, 1993; Keil et al., 2000a; Moon, 2001). Unless additional information is given about how close an individual is to reaching a goal, a high level of project completion (e.g., 90% completion) may be interpreted as a proximal goal (i.e., the goal may be perceived to be near at hand), whereas a low level of project completion (e.g., 10% completion) may be interpreted as a distal goal (i.e., the goal may be perceived to be far from reach). On this basis, we posit that in the absence of additional information about goal proximity, project completion level serves as a proxy for goal proximity and will positively influence a decision maker’s willingness to continue a troubled software project.

To date, the effect of project completion level on software project escalation has not been tested together with other goal-related motivational factors in the same study. To better understand the roles of motivational and cognitive factors in promoting software project escalation, both types of factors need to be investigated in a single study. More specifically, we suggest that project completion level (a cognitive factor) positively influences software project escalation above and beyond what is accounted for by the motivational factors of goal difficulty and goal specificity. Thus, we state the following hypothesis:

*Hypothesis 3.* A high project completion level compared with a low project completion level increases an individual’s willingness to continue a troubled software project above and beyond what is accounted for by the motivational factors of goal difficulty and goal specificity.

Goal commitment is a motivational factor that refers to an individual’s determination to achieve a goal (Hollenbeck & Klein, 1987; Locke, Latham, & Erez, 1988). In the goal setting

literature, goal commitment is known to increase performance for the following reasons: 1) goal commitment increases the effort an individual exerts toward achieving the goal, 2) goal commitment helps an individual to exert and maintain effort over time, and 3) goal commitment makes an individual unwilling to abandon a goal in the face of a challenge (Erez & Zidon, 1984; Klein et al., 1999; Locke & Latham, 1990). Thus, we posit that goal commitment positively influences a decision maker's willingness to continue working on a troubled software project.

*Hypothesis 4.* A higher commitment to a budget and schedule goal level compared with a lower goal commitment level increases an individual's willingness to continue a troubled software project.

Goal commitment has been identified as an important moderator of the effect of goal difficulty on task performance (Locke & Latham, 2002). More specifically, the relationship between goal difficulty and task performance is strengthened when there is a high level of goal commitment (Erez & Zidon, 1984; Klein et al., 1999; Locke & Latham, 2002). In the context of escalation of commitment, continuing a failing course of action is often perceived as the best or only way to accomplish a task. On the basis of this logic, we posit that if H1a is supported and there is a relationship between goal difficulty and escalation, then goal commitment will moderate this relationship. Specifically, we suggest that the relationship between goal difficulty and escalation will be stronger when there is a high level of goal commitment.

*Hypothesis 5.* The level of commitment to a budget and schedule goal moderates the relationship between goal difficulty and software project escalation such that the effect of goal difficulty on escalation is stronger when there is a higher level of goal commitment.

The mental budgeting perspective offers an interesting insight regarding how goal commitment may moderate the relationship between goal specificity and software project escalation if H2b is supported. Two key elements of mental budgeting are 1) setting an initial budget and 2) having the ability to track ongoing investments against this initial budget. Thus,

when the prospect of making an additional investment would exceed the initial budget, people become less willing to make this additional investment into a failing course of action. However, commitment to the initial budget may also be critical in the assessment process. For instance, if an individual is not committed to adhering to the initial budget, s/he may not track on-going investments against the initial budget. In fact, Heath (1995) suggests that for mental budgeting to work, attention should be given to ongoing investments in reference to a budget. Thus, the effect of mental budgeting on software project escalation may necessitate a decision maker's commitment to a budget and schedule goal (i.e., a reference point). Therefore, we posit that mental budgeting is more effective when a decision maker is more highly committed to a budget and schedule goal. Thus, we propose the following hypotheses.

*Hypothesis 6.* The level of commitment to a budget and schedule goal moderates the relationship between goal specificity and software project escalation such that the effect of goal specificity on software project escalation is stronger when there is a higher level of goal commitment.

## **Method**

### **Subjects and Experimental Design**

In order to test our hypotheses, a scenario-based laboratory experiment was conducted over the web, using actual IT professionals as our subjects. Initially, we contacted potential subjects in a number of companies individually through personal contacts. During this initial contact (via phone or email), we explained the context of the study in very general terms, the type of task that subjects would be asked to perform during the experiment, and the time commitment that would be involved, without providing any details regarding the experimental treatments or what we were actually studying. Using this process, we followed a snowball sampling approach in which those who agreed to participate in the study recruited additional

subjects from among their acquaintances. Snowball sampling is advantageous when it would be otherwise difficult to locate individuals of a specific population (e.g., IT professionals).

Using this approach, we were able to recruit 638 subjects who agreed in principle to participate in the study. These individuals were sent an email containing a link to the experimental materials. A total of 349 individuals participated in the experiment, representing a 54.7% response rate. Subjects who participated in the experiment worked for over 150 different companies, concentrated mainly in the U.S. and India. The top represented companies are shown in Table 3-1, and the demographics of the subjects are shown in Table 3-2. An independent sample t-test showed that there was no significant difference on the dependent variable between the subjects from the U.S. and those from India ( $t=-.902$ ), and Levene's test for homogeneity of variance showed that there was no significant difference in variance between the two groups ( $F=1.702$ ).

Company Name	Number of subjects
Tata Consultancy Services	24
Infosys Technologies	18
Wipro Technologies	15
Microsoft Corporation	10
Business Objects	10
Intel Corporation	7
IBM	6
Cisco Systems	6
Manhattan Associates	6
Nokia	5

**Table 3-1 Subjects by Company**



Sample size	349
Age	Average of 28.4 years
IT experience	Average of 5.3 years
Software development experience	Average of 5.1 years
Education	Doctoral degree: 9 Master's degree: 131 Bachelor's degree: 144 No response: 65

**Table 3-2 Demographics of the Subjects**

While snowball sampling is a non-probability sampling technique and representativeness of the sample is not guaranteed, we still assessed non-response bias by comparing the data from early and late response group. An analysis of variance showed no significant difference on the dependent variable ( $t=0.283$ ), and Levene's test showed no significant difference in variance between the two groups ( $F=1.665$ ).

Subjects were randomly assigned to one of eight treatment conditions in a 2 x 2 x 2 design in which goal difficulty, goal specificity, and project completion were manipulated as independent variables. Goal difficulty was manipulated as either very difficult (a \$60,000 budget and a 10 month schedule that was portrayed to be a very aggressive budget and schedule in relation to the scope of work to be accomplished) or relatively easy (a \$100,000 budget and a 20 month schedule that was portrayed to be an ample budget and schedule in relation to the scope of work to be accomplished). Consistent with prior studies in the goal setting literature, goal specificity was manipulated using either a quantitative goal (e.g., \$60,000 budget and a 10 month schedule) or a non-quantitative goal (as little budget and as short schedule as possible) (Locke et al., 1989). As explained earlier, we chose to manipulate budget and schedule in tandem as these two resources are often highly correlated in software projects (i.e., larger projects generally require both greater budgets and longer schedules) (Abdel-Hamid, 1990b;

Boehm et al., 2000). Moreover, our primary interest was to investigate the effect of difficult vs. easy goals on software project escalation rather than to tease out the separate effects that budget and schedule goals may have. Lastly, consistent with the prior studies on escalation (Garland & Conlon, 1998; Moon, 2001), project completion levels were manipulated as either high (90% completion level) or low (10% completion level).

### **Decision Task and Procedure**

Subjects were asked to carefully read a business scenario that involved the development of a Business Process Management Software (BPMS) product for external sale (the actual scenario used is shown in Appendix A), and to play the role of a software developer. The scenario consisted of 2 phases. In phase 1, general information about the project was provided, the manipulation of goal difficulty and goal specificity was introduced, and subjects were asked to answer the questions pertaining to goal commitment and respond to manipulation checks for goal difficulty and goal specificity. In phase 2, negative feedback about the project was introduced (an unexpected and very serious technical problem) and project completion level was manipulated. Subjects were then informed that the project was already over budget and behind schedule relative to where the project should be for the completion level. Lastly, the subjects were asked to answer questions pertaining to their willingness to continue the troubled software project as well as manipulation checks for project completion level.

### **Variables and Measures**

Independent variables in this experiment included the three manipulated variables (goal difficulty, goal specificity, and project completion level) and one measured variable (goal commitment). Five measurement items for goal commitment were adopted from Klein, Wesson, Hollenbeck, Wright, & DeShon (2001), and measured on a seven-point likert scale. The

dependent variable in this study was the willingness to continue a troubled software project. Two measurement items with an eight-point scale were used to assess the dependent variable. These measurement items were informed by previous escalation studies, but modified to incorporate the context of the experiment (Garland, 1990; Keil et al., 2000b). After making the decision of whether or not to continue a troubled software project, subjects were asked to describe the basis of their decision in an open-ended format. Measurement items are shown in Appendix B.

## Results

### Manipulation Checks and Descriptive Statistics

Two measurement items were used as a manipulation check for each manipulated variable. For goal difficulty and goal specificity, subjects were asked to answer on an eight-point scale the extent to which they felt that the goal was difficult or specific. The mean difference between the difficult goal ( $M = 6.48$ ) and easy goal ( $M = 3.66$ ) condition was significant and in the expected direction,  $F(1, 343) = 687.22, p < .001$ . The mean difference between the specific goal ( $M = 6.03$ ) and vague goal ( $M = 3.61$ ) condition was significant and in the expected direction,  $F(1, 343) = 505.11, p = < .001$ . For project completion level, subjects were asked to answer on an eight-point scale the extent to which they felt that the project was near completion. The mean difference between the high completion level ( $M = 5.89$ ) and low completion level ( $M = 3.12$ ) condition was significant and in the expected direction,  $F(1, 344) = 642.46, p < .001$ .

The means, standard deviations, and zero-order correlations of all variables are shown in Table 3-3. Consistent with our theorizing, escalation of commitment was significantly correlated with goal difficulty, goal specificity, project completion level, and goal commitment. Goal

difficulty was found to be significantly correlated with goal commitment, which is consistent with prior findings in the goal setting literature.

Variable	M	SD	1	2	3	4	5
1   Willingness to continue	5.75	1.74	-				
2   Goal difficulty <sup>a</sup>			<b>-.231**</b>	-			
3   Goal specificity <sup>a</sup>			<b>-.164**</b>	.054	-		
4   Project completion level <sup>a</sup>			<b>.107*</b>	.082	.042	-	
5   Goal commitment <sup>a</sup>	5.99	.84	<b>.149*</b>	<b>-.111*</b>	.006	.026	-

<sup>a</sup> Experimentally manipulated between-subjects variable  
 \*\*  $p < .01$   
 \*  $p < .05$

**Table 3-3 Means, Standard Deviations, and Zero-Order Correlations**

### Hypotheses Testing

Hierarchical regression analysis was conducted in order to test the hypotheses (See Table 3-4 for a summary of the results). Hierarchical regression analysis was chosen over other analysis techniques more common for experimental studies (e.g., ANOVA), because we hypothesized main effects of not only manipulated variables (goal difficulty, goal specificity, and project completion level), but a continuous variable (goal commitment). Further, Hypothesis 5 and 6 concerned interaction effects between manipulated variables and a continuous variable which cannot be tested with ANOVA. Lastly, we wanted to test for significant incremental changes in variance explained as we moved beyond main effects and explored hypothesized interaction effects. Goal commitment was mean centered before this analysis to lessen potential multi-collinearity between interaction terms and their component variables (Cohen, Cohen, West, & Aiken, 2003).

In Model 1, four independent variables (goal difficulty, goal specificity, project completion level, and goal commitment) were regressed on the willingness to continue a troubled software project. The results indicated that the difficult goal had a significant negative effect on

the willingness to continue a troubled software project,  $\beta = -.24$ ,  $t(311) = -4.38$ ,  $p < .001$ ; thus, supporting Hypothesis 1a. The results also showed that the specific goal had a significant negative effect on the willingness to continue a troubled software project,  $\beta = -.16$ ,  $t(311) = -2.92$ ,  $p = .004$ ; thus, supporting Hypothesis 2b. Further, a high project completion level (i.e., 90%) was found to positively influence the willingness to continue a troubled software project,  $\beta = .12$ ,  $t(311) = 2.23$ ,  $p = .027$ ; thus, supporting Hypothesis 3. Lastly, a higher level of commitment to a budget and schedule goal was found to increase the willingness to continue a troubled software project,  $\beta = .12$ ,  $t(311) = 2.26$ ,  $p = .025$ ; thus, supporting Hypothesis 4.

Having examined the main effects, each interaction term was added one at a time in Model 2 and Model 3. The results indicated that there was a significant interaction effect between goal difficulty and goal commitment,  $\beta = -.21$ ,  $t(310) = -2.52$ ,  $p = .012$  (Model 2), and between goal specificity and goal commitment,  $\beta = -.15$ ,  $t(309) = -1.97$ ,  $p = .050$  (Model 3); thus, supporting Hypothesis 5 and 6. Lastly, the results indicated that the final model explained a significant proportion of variance, adjusted  $R^2 = .13$ ,  $F(1, 309) = 8.64$ ,  $p < .001$ . In summary, the results supported Hypothesis 1a (goal setting perspective) and Hypothesis 2b (mental budgeting perspective) as well as Hypotheses 3, 4, 5, and 6. Explanation and discussion concerning the results are offered in the next section.

Variable	Model 1	Model 2	Model 3
<b>Main effects</b>			
Goal difficulty (H1)	-.24**	-.23**	-.24**
Goal specificity (H2)	-.16**	-.16**	-.16**
Project completion level (H3)	.12*	.11*	.12*
Goal commitment (H4)	.12*	.29**	.38**
<b>Interaction effects</b>			
Goal difficulty x Goal commitment (H5)		-.21*	-.20*
Goal specificity x Goal commitment (H6)			-.15*
$\Delta R^2$	.12	.02	.01
$\Delta F$	10.11**	6.36**	3.88**
Overall model $R^2$	.12	.13	.14
Adjusted $R^2$	.10	.12	.13
Overall model $F$	10.11**	9.50**	8.64**
<i>n</i> = 316 Dependent variable: the willingness to continue a troubled software project ** <i>p</i> < .01 * <i>p</i> < .05			

**Table 3-4 Regression Results for Hypotheses Testing**

## Discussion

### Theoretical Implications

This study makes a theoretical contribution to the existing body of knowledge on software project escalation. Specifically, the study offers new insights regarding how budget and schedule goals that are established at the outset of a project affect software project escalation. Previous research had already established that the level of project completion and the failure to establish mental budgets, or limits, on resource expenditures at the outset of a project can promote escalation (Conlon & Garland, 1993; Heath, 1995; Keil & Robey, 1999; Moon, 2001). However, the linkage between budget and schedule goals that are set at the beginning of a project and escalation behavior had not been previously explored. In order to address this gap in the literature, we applied two key elements of goal setting theory (i.e., goal difficulty and goal

specificity) (Locke & Latham, 1990) to the problem of software project escalation in order to investigate the impact of budget and schedule goals that are difficult versus easy and vague vs. specific. Using goal setting theory, complemented by mental budgeting, sunk cost, and completion perspectives, we developed and tested a research model and found that very difficult or specific budget and schedule goals reduce an individual's willingness to continue a troubled software project. Further, we found that both project completion level and goal commitment directly affect software project escalation. We also found that commitment to a budget and schedule goal moderates both the relationship between goal difficulty and escalation and the relationship between goal specificity and escalation.

One important finding from this study is that a very difficult budget and schedule goal (i.e., a very aggressive budget and schedule) is less likely to cause software project escalation to occur as compared with a very easy budget and schedule goal (i.e., an ample budget and schedule). While this finding is consistent with goal setting theory, which suggests that a very difficult goal leads to decreased motivation for a given task (Locke & Latham, 1984, 2002; Locke et al., 1981), it is counter-intuitive from the sunk cost perspective which suggests that the relative magnitude of sunk cost rather than the absolute magnitude causes escalation to occur (Garland & Newport, 1991). In our experiment, for each level of project completion, we controlled for the relative amount of sunk costs in the difficult and easy goal conditions, whereas the absolute amount of sunk costs were different across the two goal difficulty conditions. Comments provided by the subjects with respect to the basis for their escalation decision provide further support for the finding that very difficult goals can inhibit escalation (see Table 3-5).

Goal difficulty	Goal specificity	Project completion level
<p>“Considering the very difficult nature of your goal on this SoftBPM project (i.e., as little budget and as short schedule as possible)... I would strongly recommend to discontinue the project” (Subject A)</p>	<p>“...given very vague nature of the goal, being overbudget and behind schedule seems irrelevant. I would push to get the technical problems overcome” (Subject G)</p>	<p>“90% of the project is over, there is no way I am calling off this project. I would like my team to investigate on how to get this done quickly, invest a weekend or two in this and get the project running...” (Subject M)</p>
<p>“I would press to continue since the goals are very easy... if the budget and time frame were more strict I would have leaned towards not continuing with a project that has become problematic...” (Subject B)</p>	<p>“As it has no specific time frame to complete and lots of effort put in by the tech team, we can still afford to run the program in our background and try to work on removing the hitches involved and get the software developed” (Subject H)</p>	<p>“After completing a 90% of the project and spending above budget it is unwise to discontinue” (Subject N)</p>
<p>“Since the project is supposed to be easy but lucrative, I would bet on going ahead with the project. Also there are very few schedule and budget constraints and that would make me more comfortable in backing the project “(Subject C)</p>	<p>“Since Schedule and Budget were vague since beginning of the project the only limiting factor is the "unresolvable" technical glitch with the product/software development. The technical glitch can be overcome” (Subject I)</p>	<p>“Having completed the project up to 90%, I would definitely look at solving the technical problem” (Subject O)</p>
<p>“As much budget and schedule needed.....that’s all I need to know... I would go for it” (Subject D)</p>	<p>“Firstly, the timelines and budget are vague and are not a major problem. Also, the technical difficulty may prove to be impossible to solve, but is not guaranteed to be so. Till we really try, we cannot be sure...” (Subject J)</p>	<p>“Since the project is finished 90% and as we have already spent lot of time and money it's better to finish off the product” (Subject P)</p>
<p>“Due to technical difficulties &amp; low budget, it might not be worth to take risk of project continuation to prevent loss of</p>	<p>“Due to the vague schedule of the project it’s likely to see budget overruns, and mid-term resource losses. However on</p>	<p>“Project is completed 90% means we have an end product ready... technical issues at the last minute is the challenge we</p>



time & budget...” (Subject E)	completion the company is likely to gain access to a lucrative market in the long run. Therefore it’s in the interest of the company to continue...” (Subject K)	need to face to get this product working.” (Subject Q)
“Since there is no urgent schedule and budget limit for this... I would request some more time to finish it successfully and continue on project ...” (Subject F)	“...the client is very specific about time & money so it becomes a tough task come what may...” (Subject L)	“I feel it is better to quit... at 10% completion, the project is over budget and behind schedule. As further development occurs, more errors and problems will arise” (Subject R)

**Table 3-5 Sample Subjects Comments about the Basis for the Escalation Decision**

A second important finding which emerges from our work is that the specificity of a budget and schedule goal also has an influence on escalation; a specific budget and schedule goal is less likely to cause software project escalation to occur as compared with a vague budget and schedule goal. While the relation of goal specificity with escalation is not supported from the goal setting perspective, the mental budgeting perspective offers an explanation regarding how the escalation decision can be affected by the specificity of a budget and schedule goal.

In particular, a vague budget and schedule goal does not provide a clear indication of what is the reference point against which the prospect of making additional investments can be assessed (Heath, 1995; Tan & Yates, 2002). Due to the lack of a clear reference point, mental budgeting may not be as effective with vague goals as compared with specific goals. This is because vague budget and schedule goals violate one of the two conditions required for mental budgeting to be effective: (1) knowing what the budget limit is, and (2) having the ability to track expenses against it. In our manipulation for goal specificity, subjects in both conditions (specific and vague goal) were told that they were already behind schedule and over budget relative to where they should be for a particular completion level. In other words, all subjects were given

equivalent information about how much had been spent, thus satisfying condition (2) above. However, people with a vague goal have a vague indicator for the limit – violating condition (1), whereas people with a specific goal have a clear indicator for the limit – this is what makes mental budgeting work only in the specific goal condition.

Further, the vague goal offers leeway for different interpretations in terms of what the goal is (i.e., ‘as little as possible’ can be perceived differently by decision makers), whereas the leeway for different interpretations is minimal with the specific goal (e.g., a \$60,000 budget and a 10 month schedule). Table 3-5 provides a sampling of representative comments provided by subjects indicating how goal specificity may have influenced their escalation decisions.

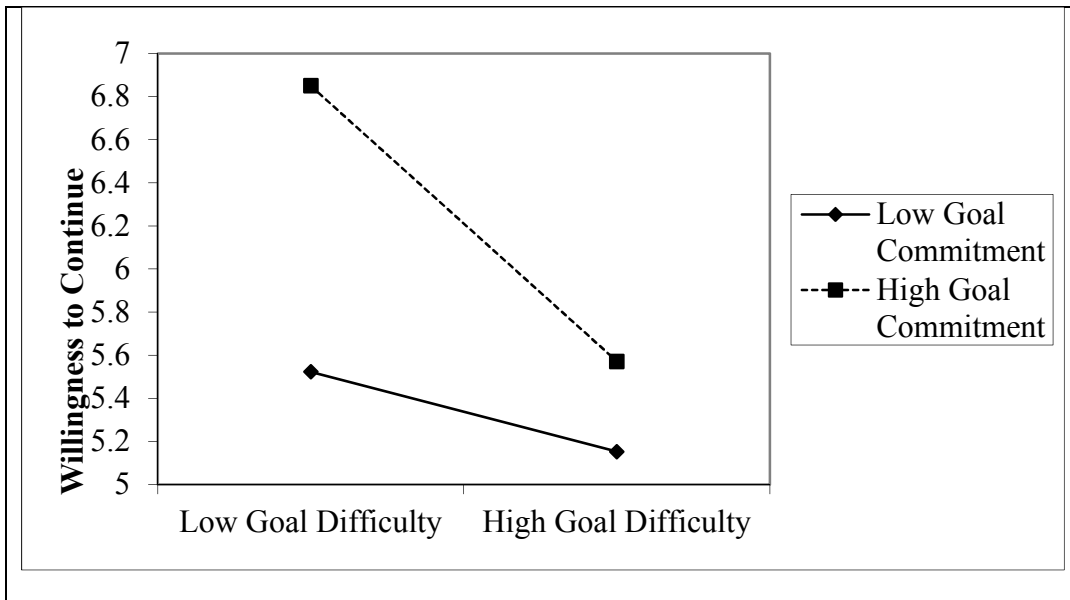
A third finding concerns the effect of project completion level on software project escalation.

We noted that there are two different types of factors that are known to influence software escalation project in the literature: motivational and cognitive factors. While the level of project completion, a cognitive factor, has been found to influence software project escalation in prior research (Keil, 1995; Keil et al., 2000a), it was not known whether its effect would still be significant after considering the variance in escalation that is accounted for by the motivational factors examined in this study (e.g., goal difficulty and goal specificity). The results of our regression analysis suggest that the level of project completion has a significant effect on software project escalation beyond what is accounted for by goal difficulty and goal specificity. This is consistent with, and provides empirical support for, the notion that both cognitive and motivational factors can influence escalation.

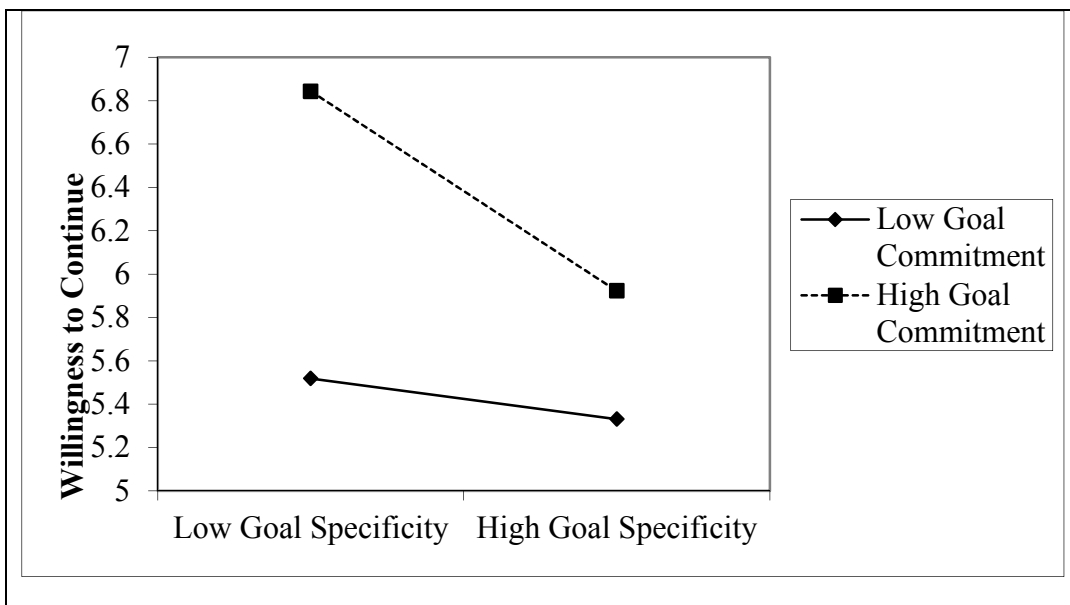
Fourth, the findings of this study offer an explanation regarding how the commitment to a budget and schedule goal influences software project escalation. Goal setting theory suggests that goal commitment helps maintain a high level of effort over time (persistence) and can make

an individual unwilling to abandon a goal (Hollenbeck & Klein, 1987; Klein et al., 1999; Klein et al., 2001; Locke et al., 1988). Consistent with this, a high level of goal commitment was found to lead to more escalation as compared with a low level of goal commitment.

Finally, the commitment to a budget and schedule goal was found to moderate both the relationship between goal difficulty and escalation and the relationship between goal specificity and escalation. These findings indicate that setting a difficult goal for budget and schedule has a more significant effect on escalation when a decision maker's goal commitment is higher (see Figure 3-2). In other words, individuals who are strongly committed to their budget and schedule goals are more strongly affected by goal difficulty as compared with people who are less strongly committed to their goals. This finding is consistent with the goal setting literature in which the effect of goal difficulty has been found to be stronger when there is a higher level of goal commitment (Hollenbeck & Klein, 1987; Klein et al., 1999). In addition, the findings of this study demonstrate that setting a specific goal for budget and schedule has a more significant effect on escalation when a decision maker's goal commitment is higher (see Figure 3-3). This finding supports the notion that mental budgeting will be most effective as a deterrent to escalation when the decision maker has a specific goal for budget and schedule and s/he is highly committed to that goal.



**Figure 3-2 Moderation Model Showing the Interaction Effects of Goal Difficulty and Goal Commitment on the Willingness to Continue a Troubled Software Project**



**Figure 3-3 Moderation Model Showing the Interaction Effects of Goal Specificity and Goal Commitment on the Willingness to Continue a Troubled Software Project**

### Practical Implications

Our findings also offer practical implications regarding how budget and schedule goals can influence software project escalation. While decision makers seek to balance between three elements of the project management triangle (i.e., budget, scope, and schedule) when

establishing initial goals for software projects (Boehm & Ross, 1989; De Meyer et al., 2002; Jurison, 1999), our study suggests that they need to be aware of potential consequences that can result from the nature of initial budget and schedule goals. More specifically, decision makers are less likely to escalate commitment to failing projects when an aggressive budget and schedule goal has been established at the outset of the project. Further, setting a specific budget and schedule goal provides a clear reference point for decision making and is therefore also likely to reduce software project escalation. To this end, considerable research has been conducted on software project estimation and there are a variety of techniques that have been developed over the years (Jørgensen, 2004; Jørgensen & Shepperd, 2007). While many would argue that initial time and cost estimations are only guesses at best (Armour, 2002; Atkinson, 1999), and that problems can occur when managers anchor prematurely on an estimate that has high uncertainty associated with it, our study suggests that establishing specific budget and schedule targets at an early stage can have practical value in terms of reducing the potential for software project escalation.

Another practical implication of this study concerns a decision maker's commitment to a budget and schedule goal. Decision makers may become highly committed to a budget and schedule goal in part because there is almost always some pressure from customers to release software applications within expected cost and schedule targets. However, it is worth noting that a high level of commitment to a budget and schedule goal may be detrimental in terms of its effect on escalation. While prior studies have noted the importance of setting a target for budget and schedule with respect to project performance (Boehm & Ross, 1989; De Meyer et al., 2002), it is important to use such targets as guideposts, and to avoid becoming overly committed to achieving these goals.

## **Limitations and Directions for Future Research**

As with any research, this study is not without limitations. One limitation of our study is that we were only able to examine two levels of goal difficulty. In seeking to maximize variance, we chose very difficult and very easy goals for budget and schedule and we conceptualized a difficult budget and schedule goal as having a tight budget and an aggressive schedule. However, some may argue that a project with a difficult goal (i.e., a tight budget and an aggressive schedule) elicits more focus and attention, and thus this goal may be “easier” to achieve in some respects than a project with an easy goal (i.e., an ample budget and a generous schedule) that generates no urgency on the part of project participants. Indeed, this would be consistent with goal setting research which has found that people generally perform better with a difficult goal than with an easy goal (i.e., difficult goals lead to better task performance) (Locke & Latham, 1990, 2002). Further research is therefore needed in order to explore the effect of goal difficulty on escalation more fully.

Another limitation of our study is that we relied on self-reported intentions as an indicator for escalation of commitment. Prior research has suggested that behavioral intentions do not necessarily equate to actions (Morrison, 1979; Morwitz & Fitzsimons, 2004; Wu & Wang, 2005). One particular issue concerning using intention to measure escalation of commitment is that escalation can be driven by both cognitive and motivational factors and there may be some instances in which spur of the moment decisions are made based on information processing errors rather than motivational factors, rendering intentions moot. However, in many situations, there are explicit go-or-stop decision points that force decision makers to reflect and formulate intentions with respect to escalation. In fact, prior field studies on software project escalation suggest that the intention of whether or not to continue a troubled software projects is openly

discussed among team members (Keil, 1995; Mähring & Keil, 2008). Still, further research is warranted to determine the extent to which intentions drive behaviors in various field settings involving escalation.

Another direction for future research would be to focus on other goal-related constructs. While this study investigated three goal related constructs in relation to software project escalation (goal difficulty, goal specificity, and goal commitment), there is a need for further research to investigate how other goal-related constructs such as goal orientation influence escalation behavior (Button et al., 1996; Dweck, 2000; Dweck & Leggett, 1988). Lastly, this study manipulated goal difficulty and goal specificity at only two levels respectively; thus, another direction for future research may involve investigating a wide range of goal difficulty/specificity with respect to their effects on software project escalation.

### **Conclusion**

In this study, we have proposed that budget and schedule goals for software projects vary in terms of their difficulty and specificity. Drawing on goal setting, we found that setting a very difficult goal for budget and schedule (i.e., an aggressive budget and schedule) can help limit software project escalation. Further, we found that the mental budgeting perspective appears to explain how goal specificity may influence software project escalation; setting a specific goal for budget and schedule helps decision makers to limit escalation of commitment to a troubled software project by providing a clear reference point against which further investments can be assessed. We also found that the level of commitment to a budget and schedule goal has a direct influence on software project escalation; a high level of goal commitment makes individuals more willing to continue investing in a troubled project. Lastly, our findings suggest that goal commitment moderates the relationship between goal setting and escalation, such that difficult

and specific goals have the strongest effect on escalation when goal commitment is highest and the weakest effect when goal commitment is lowest. Taken together, the findings from this study suggest that initial budget and schedule goals and commitment to these goals can have a significant impact on software project escalation.



## Appendix 3-A

### Experiment Scenario

**Instructions:** the business case that follows is part of a study that examines business decision-making. Please take a few minutes to read over the case and to answer the questionnaire that follows. Read the material and complete the questions in the order in which they are presented – Do Not skip ahead. There are no right or wrong questions.

#### SoftBiz Software Corporation (A)

You are a lead software developer of SoftBiz, a company that specializes in developing software products. You are assigned to a promising and lucrative project aimed at developing a business process management software product for external sale. This development effort is named SoftBPM and will appeal to companies that are experiencing significant costs due to inefficiently managed business processes. SoftBPM enables efficient management of business processes.

Your goal is to deliver this completed fully functional, software product. The budget and schedule for the project are very [specific/vague]. You have [**a \$60,000 budget and a 10 month schedule/a \$100,000 and a 20 month schedule/as little budget and as short schedule as possible/as much as budget and schedule as needed**] to complete the project. This is a very [difficult/easy] goal considering other projects you and your company have undertaken in the past. SoftBPM project is very important for your career prospects within the company.

#### Case (B)

At this point, your project is [10%/90%] complete and you are already behind schedule and over budget relative to where you should be for this completion level. Moreover, it has come to your attention that there is an unexpected and very serious technical problem with SoftBPM that will need to be overcome in order to complete the project successfully. Your technical people have informed you that it may be impossible to solve the project. Now your company is faced with the decision of whether or not to continue with the SoftBPM project. You are required to make a recommendation to your upper management regarding this. Considering the very [difficult/easy] and very [specific/vague] nature of your goal on this SoftBPM project (i.e., [**a \$60,000 budget and a 10 month schedule/a \$100,000 and a 20 month schedule/as little budget and as short schedule as possible/as much as budget and schedule as needed**])...

### Appendix 3-B

<b>Measurement Items</b>	
<b>Escalation of commitment (DV)</b>	<ol style="list-style-type: none"><li>1. To what degree do you lean towards discontinuing or continuing the project</li><li>2. How strongly will you recommend to discontinue or continue the project</li></ol>
<b>Goal commitment (IV)</b>	<ol style="list-style-type: none"><li>1. Quite frankly, I don't care if I achieve this goal or not</li><li>2. I am strongly committed to pursuing this goal</li><li>3. It wouldn't take much to make me abandon this goal</li><li>4. I think this goal is a good deal to shoot for</li><li>5. I am willing to put in a great deal of effort to achieve this goal</li></ol>

## **Chapter 4 Achievement Motivation in Escalation of Commitment: A Perspective of Goal Orientation and Temporal Orientation Theories<sup>8</sup>**

### **Abstract**

Escalation of commitment is a phenomenon whereby individuals continue allocating resources to a previously chosen course of action that has failed to produce the desired outcome. A recent line of escalation research has highlighted the effect of prospective factors on escalation of commitment (e.g., project completion levels and anticipated regret). However, to date no theoretical explanation has been offered as to why and how individuals look forward in escalation situations. Drawing from the most influential motivation theory (goal orientation theory), we found that individuals look forward to achieve a certain goal (e.g., learning) in escalation situations, and this motivates individuals to continue a failing course of action. Specifically, we found that individuals who adopt a learning goal orientation are more willing to continue a failing course of action due to the motivation to achieve learning by mastering challenges associated with an escalation situation, as compared with individuals who adopt a performance goal orientation. Further, we reasoned that the effect of goal orientation on escalation of commitment is associated with inherent prospective thinking in goal orientation. In support of this supposition, we found that two prospective factors (anticipated regret and perceived likelihood of success) mediate the relationship between goal orientation and escalation of commitment. However, we also found that the prospective thinking inherent in goal orientation becomes less salient when individuals are in the past-oriented state.

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<sup>8</sup> Lee, J. S., Keil, M., and Wong, K. F. W. "Achievement Motivation in Escalation of Commitment: A Perspective of Goal Orientation and Temporal Orientation Theories," Working paper, 2013. Note: a previous version of this paper was presented at the 2012 Academy of Management Meeting.

## Introduction

It is common to witness individuals continuing to allocate additional resources to a previously chosen course of action that has failed to produce the desired outcome. Many individuals have succumbed to this phenomenon which is known as escalation of commitment to a failing course of action (Garland 1990; Staw 1976; Staw 1981); examples include students (O'Neill 1986; Shubik 1971), business professionals (Bazerman 1999; Schoorman 1988), software developers (Keil 1995), and even political leaders (Sheehan and Kenworthy 1971). Prior research has shown that the consequences of escalation of commitment can be quite negative, sometimes resulting in large financial losses (Keil 1995; Ross and Staw 1986; Ross and Staw 1993) or even the loss of peoples' lives (Roberto 2002; Sheehan and Kenworthy 1971).

Early research on escalation and the sunk cost effect found that in spite of negative feedback, people become willing to allocate additional resources to a previously chosen course of action when a large amount of resources have already been expended (Arkes and Blumer 1985; Garland 1990). However, researchers have since suggested that these studies confounded sunk costs with completion levels in progress-related decision tasks (Conlon and Garland 1993; Garland and Conlon 1998). More specifically, in prior escalation studies sunk costs were manipulated as a percentage of the initial budget that had been expended (e.g., 10% or 90%), and this was implicitly or explicitly associated with the level of project completion (e.g., 10% complete, or 90% complete). Based on this observation, Conlon & Garland (1993) conducted two experiments and found a significant effect of project completion level on escalation, but no significant effect of sunk cost on escalation. Later, Moon (2001) suggested that individuals are capable of looking forward and looking backward in escalation situations, and found that both sunk costs and project completion levels have significant effects on escalation.

While the above-mentioned studies by Conlon & Garland (1993) and Moon (2001) highlighted the impact of prospective thinking in escalation of commitment situations, neither study offered a theoretical explanation as to why and how individuals look forward in escalation situations. Conlon and Garland (1993) suggested that the force driving the completion effect in escalation situations is achievement motivation. More specifically, they posited that when a project is perceived to be near completion, a form of goal substitution occurs whereby the original goal (e.g., profit maximization) is replaced by the goal of “completing whatever project has been started” (p. 403). Thus, the project completion effect is associated with “well-known psychological processes whereby motivation to achieve a goal increases as an individual gets closer to that goal” (p. 403). To date, however, escalation of commitment has not been studied from an achievement motivation perspective, and this represents an important theoretical gap. To address this gap, in this research we draw on one of the most influential and frequently-studied achievement motivation theories (i.e., goal orientation theory) (DeShon and Gillespie 2005; Dweck and Elliott 1983; Elliott and Dweck 1988) in order to empirically investigate the role of achievement motivation in escalation of commitment.

Goal orientation theory (Dweck and Elliott 1983) suggests that individuals have different beliefs about their ability in achievement situations, and these beliefs lead to two distinct types of goal orientation. The key aspect of goal orientation that is pertinent to escalation of commitment is that goal orientation captures both the retrospective and prospective thinking that is associated with the temporal dimension. For example, in an achievement situation, some individuals have a learning goal orientation, believing that their ability can be improved through effort; thus, they focus prospectively on improving their ability by mastering a challenging task (i.e., learning goal orientation). In contrast, other individuals have a performance goal orientation, believing that

their ability is fixed and cannot be improved; thus, they focus on demonstrating their current ability by attempting to produce a positive outcome or avoid a negative outcome (Dweck and Elliott 1983; Nicholls 1984a). The performance goal orientation is inherently retrospective, as individuals focus on demonstrating an ability that has already been established.

These two distinct goal orientations allow us to theorize how achievement motivation may influence escalation behavior. Specifically, we suggest that individuals who are instructed to focus on improving their ability by mastering challenging tasks (i.e., learning goal orientation), may focus on achieving learning by continuing a failing course of action. In contrast, individuals who are instructed to focus on demonstrating their current ability (i.e., performance goal orientation) are less likely to escalate their commitment to a failing course of action.

Furthermore, the effect of learning goal orientation on escalation may depend on an individual's temporal orientation. Temporal orientation refers to whether an individual's cognitive emphasis is anchored in the past, present, or future, and can vary depending upon the situation (Holman and Silver 1998; Zimbardo and Boyd 1999). We suggest that the effect of learning goal orientation on escalation of commitment is driven by prospective thinking. However, when individuals are instructed to focus on the past, this will induce them to focus on a previous course of action, and such retrospective thinking will tend to weaken the effect of learning goal orientation on escalation of commitment. Therefore, we suggest that temporal orientation must also be considered in order to develop a more nuanced theoretical understanding of the relationship between goal orientation and escalation.

Lastly, if it is indeed the prospective thinking inherent in motivation for learning that drives the effect of learning goal orientation, there may be prospective factors that mediate the effect of learning goal orientation on escalation. Prior escalation research has shown that two

prospective factors anticipated regret – (Wong and Kwong 2007) and likelihood of success (Heath 1995) – can have significant effects on escalation behavior. In this research, we investigate the mediating effects of these two prospective factors on the relationship between learning goal orientation and escalation.

In summary, this research addresses three important theoretical gaps in the literature on escalation of commitment by investigating: (1) how achievement motivation for learning (i.e., learning goal orientation) influences the decision of whether or not to continue a failing course of action, (2) the role of temporal orientation in moderating the relationship between learning goal orientation and escalation of commitment, and (3) the role of prospective thinking in mediating the effect of learning goal orientation on escalation of commitment.

### **Escalation of Commitment**

Escalation of commitment has attracted considerable research attention since the 1970s and has been observed in a wide variety of contexts including: bank loans (Staw et al. 1997), corporate bidding wars (Bazerman 1999), hiring and promotion decisions (Schoorman 1988), software development projects (Keil 1995; Keil et al. 2000), and warfare (Brafman and Brafman 2008). To date, several theoretical explanations have been offered to explain escalation, and sunk cost, personal responsibility, and project completion level are among the most notable factors that cause individuals to become overly committed to a failing course of action (Sleesman et al. 2012). For example, in his seminal study, Staw (1976) found that individuals who authorized the initial funding for a course of action are likely to allocate additional resources to it when things go awry, simply due to personal responsibility for having chosen the course of action in the first place. Further, escalation researchers have found that individuals tend to

“throw good money after bad” (Garland 1990) in order not to appear wasteful in escalation situations (i.e., sunk cost effect) (Arkes and Blumer 1985).

Much of the prior research on escalation, including the studies mentioned above, have had a retrospective focus on the factors that promote escalation (Conlon and Garland 1993; Garland and Conlon 1998; Moon 2001) – e.g., personal responsibility for initiating a course of action, or prior investments made into a previous course of action. More recently, several researchers have begun to investigate the relationships between prospective thinking and escalation of commitment. Most notably, Conlon & Garland (1993) found that individuals evaluate how close a project is to completion and become more willing to continue a failing course of action when it is near completion (i.e., the project completion effect). Further, Moon (2001) manipulated project completion levels independently of sunk costs, and found a significant effect of project completion levels on escalation. The impact of prospective thinking on escalation of commitment was further highlighted in a study by Wong and Kwong (2007), who found that individuals anticipate future outcomes in escalation situations and are willing to continue a failing course of action when the possibility of future regret about withdrawal is high (i.e., anticipated regret).

While these previous studies have highlighted the role of prospective thinking in escalation of commitment, to date no theoretical explanation has been offered with respect to why and how individuals look forward in escalation situations. Conlon and Garland (1993) suggested that it is achievement motivation (e.g., completing what has already been started) that drives prospective thinking in escalation of commitment situations, but this has never been empirically examined from an achievement motivation theory perspective.



## Goal Orientation

Goal orientation theory is one of the most influential achievement motivation theories, and suggests that individuals conceive different goals in achievement situations (Dweck and Elliott 1983). Goal orientation can be generally understood as an individual's conception of goals in achievement situations (Dweck and Elliott 1983), and has been found to influence the cognitive and behavioral response patterns of individuals (Dweck and Leggett 1988; Elliott and Dweck 1988) in areas such as feedback seeking (VandeWalle and Cummings 1997; VandeWalle et al. 2002), sales performance (VandeWalle et al. 1999), goal setting (Phillips and Gully 1996), and performance adaptability (Kozlowski et al. 2001).

One core aspect of goal orientation has to do with implicit theories of ability (i.e., an individual's beliefs about his or her ability) (Dweck 1996; Dweck 1999; Dweck and Leggett 1988). Based on such theories, prior research has identified two major conceptions of goals in achievement situations: learning goal orientation and performance goal orientation (Button et al. 1996; Dweck 1989; Dweck and Elliott 1983; Heyman and Dweck 1992; Nicholls 1984a). Beliefs about ability lead to adoption of two distinct goal orientations (Brett and VandeWalle 1999; Dweck 1986). More specifically, individuals who view their ability as malleable (i.e., ability can be improved through effort) tend to adopt a learning goal orientation, whereas individuals who view their ability as fixed (i.e., ability cannot be improved through effort) tend to adopt a performance goal orientation (Brett and VandeWalle 1999). Prior research has shown that individuals' goal orientation can be manipulated through task instructions, so as to create a perception that task-related skills or ability either can or cannot be improved through effort (Elliott and Dweck 1988; Mangos and Steele-Johnson 2001; Martocchio 1994; Nicholls 1984a).

These two distinctive goal orientations have been found to induce different perceptual and behavioral patterns in achievement situations. Specifically, individuals who adopt a learning goal orientation focus on developing their competence by mastering challenging tasks, thus they tend to maintain high effort under difficult conditions, be open to new opportunities, and escalate effort when needed (Diener and Dweck 1978; Diener and Dweck 1980; Dweck 1986; Nicholls 1984b; VandeWalle et al. 2001). Those who have a learning goal orientation tend to be more future oriented and are likely to embrace courses of action that represent learning opportunities. Thus, when presented with negative feedback, instead of focusing on how much they have already learned, they are likely to view the negative feedback as an opportunity for further learning. In contrast, individuals who adopt a performance goal orientation focus on demonstrating and validating the competence they have already acquired, thus they tend to avoid or withdraw from difficult tasks (Diener and Dweck 1978; Diener and Dweck 1980; Dweck 1986; Nicholls 1984b; VandeWalle et al. 2001).

Elliott and Dweck (1988) suggest that “the focus of individuals who pursue learning goals (whether they believe their ability to be high or low) is on improving ability over time, not on proving current ability” (p. 6). Thus, in escalation situations we posit that individuals who adopt a learning goal orientation (as opposed to a performance goal orientation) will be more willing to continue a failing course of action in order to improve their ability over time by mastering the challenges associated with turning around a failing course of action. Based on this, we propose the following hypothesis:

*Hypothesis 1.* Individuals who adopt a learning goal orientation will have a greater willingness to continue a failing course of action as compared to individuals who adopt a performance goal orientation.

It is important to note one assumption underlying Hypothesis 1; that is, certain individuals are driven toward escalation in order to attain a learning goal that is associated with pursuing a particular course of action. This assumption is consistent with goal orientation theory which can be considered inherently forward-looking and also comports with the general philosophical assertion that the future is a dominant factor in human consciousness (Heidegger 1962; Minkowski 1970). To deepen our theorizing, we propose two additional prospective factors (anticipated regret and perceived likelihood of success) as mediators for the relationship between goal orientation and escalation of commitment. We discuss each below.

### **The Mediating Role of Anticipated Regret and Perceived Likelihood of Success**

Anticipated regret is a prospective type of regret that individuals experience by imagining how they will feel in response to a future event after they make a certain decision (Simonson 1992; Zeelenberg 1999). For instance, a customer may experience a high level of anticipated regret by imagining that the price of a car s/he recently purchased is later reduced by fifty percent. In escalation situations, we posited that individuals with a learning orientation will focus on improving their ability by mastering the challenges associated with turning around a failing course of action. Therefore, when individuals who adopt a learning goal orientation imagine a negative future event in an escalation situation (e.g., an eventual failure) associated with the decision to proceed, they may experience a low level of anticipated regret, because despite the eventual failure they will still have accrued some learning value by virtue of having worked on a challenging problem. In contrast, when individuals who adopt a performance goal orientation imagine a negative future event (e.g., an eventual failure) associated with the decision to proceed, they may experience a high level of anticipated regret, because such an outcome will adversely affect their ability to demonstrate and validate their ability.

With respect to the relationship between anticipated regret and escalation of commitment, prior research has shown that when individuals have a higher level of anticipated regret about *withdrawal* from a failing course of action, they are *more* likely to escalate their commitment (Wong and Kwong 2007). Here, we theorize that individuals, who experience a higher level of anticipated regret about *continuing* a failing course of action, will become *less* likely to escalate their commitment.

With respect to the perceived likelihood of success, individuals who adopt a learning goal orientation believe their ability can be improved through effort (Brett and VandeWalle 1999; Dweck 1986) and will therefore tend to believe that they can overcome challenges by improving their own ability. In contrast, individuals who adopt a performance goal orientation lack such positive beliefs about their own ability and as a result tend to lack confidence when it comes to accomplishing challenging tasks (Brett and VandeWalle 1999; Dweck 1986). Further, VandeWalle (1996) found that a learning goal orientation is positively associated with optimism, whereas a performance goal orientation is negatively associated with optimism. Based on these prior research findings, we posit that individuals who adopt a learning goal orientation will exhibit a higher level of perceived likelihood of success as compared with individuals who adopt a performance goal orientation. Further, we posit that the perceived likelihood of success will have a positive effect on escalation of commitment, as it has been found to be a key predictor for escalation of commitment (Heath 1995; Moon 2001). On the basis of the above logic, we suggest the following two mediation hypotheses:

*Hypothesis 2.* Anticipated regret about continuing a failing course of action mediates the effect of goal orientation on escalation of commitment.

*Hypothesis 3.* Perceived likelihood of success mediates the effect of goal orientation on escalation of commitment.

Previously, in theorizing the relationship between goal orientation and escalation of commitment (Hypothesis 1), we suggested that individuals who adopt a learning goal orientation (as opposed to a performance goal orientation) will be more willing to continue a failing course of action; their learning motivation will, in effect, cause them to want to master the challenges associated with turning around a failing course of action. However, we suggest that a shift in temporal orientation may limit the effect of learning goal orientation in escalation situations. Specifically, goal orientation is inherently prospective, and captures only the prospective thinking of escalation of commitment. Therefore, its effect on escalation may change when individuals are in the retrospective state. Indeed, temporal orientation theory suggests that people situationally focus on different time domains (i.e., past or future) (Zimbardo, 1994). In the following section, we theorize the effects of goal orientation on escalation across the retrospective domain (past orientation), and the prospective domain (future orientation).

### **The Moderating Role of Temporal Orientation**

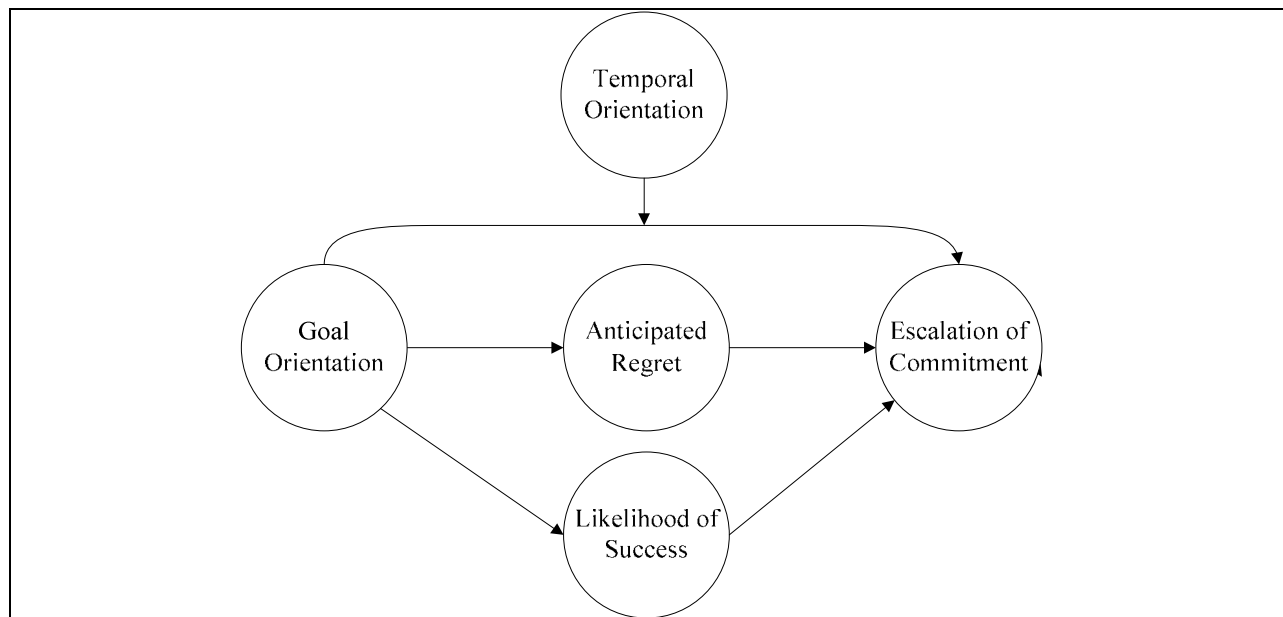
Psychologists have long suggested that human perceptions of time are key foundations of human cognitive process and behaviors (James 1890; Kelly 1955; Lewin 1942). There has been ample empirical evidence that temporal perceptions have significant influence on human behavior and decision making (Fraisse 1963; Karniol and Ross 1996; Zimbardo 1994), such as academic achievement (De Volder and Lens 1982), coping with traumatic events (Holman and Silver 1998), psychological adjustment (Melges 1990; Rappaport et al. 1985), and risk taking (Strickland et al. 1966). One construct that has been frequently discussed in the literature on perceptions of time is temporal orientation (De Volder 1979; Nuttin 1985). Temporal orientation is conceptualized as an individual's cognitive emphasis anchored to one of the three time domains (i.e., past, present, or future) in specific situations (Holman and Silver 1998; Zimbardo

and Boyd 1999). A temporal orientation toward a particular time domain is posited to have strong effects on human cognition and behavior (Zimbardo 1994). Here, we consider two dimensions of temporal orientation (past vs. future) and theorize about how they may moderate the relationship between goal orientation and escalation of commitment.

While Hypothesis 1 suggests that learning goal orientation will positively influence escalation of commitment, this effect may become weakened as the temporal orientation shifts from the future to the past. When the temporal focus is on the past, individuals who adopt a learning goal orientation may evaluate a previously course of action that did not produce a positive outcome and conclude that some learning has already been achieved. Thus, they may have less motivation for escalating their commitment for the sake of learning. In a similar vein, Molden & Hui (2011) found that activating individuals' broad motivations for growth and promotion helps reduce concerns with prior loss; thus, increasing perceptions of alternatives and promoting de-escalation. Based on this, we propose the following hypothesis:

*Hypothesis 4.* Temporal orientation negatively influences the relationship between goal orientation and escalation of commitment such that the effect of goal orientation on escalation of commitment is weakened as temporal orientation shifts from the future to the past.

Before we proceed to the next section, we present our overall research model that summarizes the causal relationships posited in Hypotheses 1-4.



**Figure 4-1 Research Model**

### **Method**

In order to test our hypotheses, we conducted two laboratory experiments using a scenario-based approach that has been widely used both in prior escalation studies (Conlon and Garland 1993; Garland 1990; Moon 2001; Staw 1976; Wong and Kwong 2006) and in prior goal orientation studies (Elliott and Dweck 1988; Mangos and Steele-Johnson 2001; Steele-Johnson et al. 2000). We chose this method in order to create a highly controlled setting that would allow us to examine the proposed causal relationships between goal orientation and escalation of commitment. Each experiment involved different escalation scenarios. In Study 1, we investigated the initial connection between goal orientation and escalation of commitment (Hypothesis 1). In Study 2, we further probed the relationship between goal orientation and escalation in a different escalation situation (Hypothesis 1), and also investigated two mediating factors (Hypotheses 2 & 3) and a moderating factor (Hypothesis 4) for the effect of goal orientation on escalation of commitment.

## Study 1

### Participants and Design

Seventy undergraduate students enrolled in an introductory information systems course at a large urban university in the southeastern U.S. participated in Study 1. Participants were randomly assigned to one of two treatment conditions in a 1 x 2 design in which goal orientation (learning and performance) was manipulated. In both treatments, we specified a decision control environment that was decentralized. Decision control is conceptualized as an important decision right in organizations, and includes approval of organizational activities and monitoring of task performance (Fama and Jensen 1983). In performing organizational tasks, an agent may be given substantial decision control, or the principal may retain substantial decision control. Depending on the degree of decision control given to an agent, two classes of decision controls emerge: centralized and decentralized (Tiwana 2009). We posited that the motivation for learning may be weakened under centralized decision control; thus, in order to maximize the learning motivation, we fixed the control type as decentralized. Specifically, participants were told that they had complete control over decisions regarding the project and that their actions were *not* monitored by management. The experiment was conducted during class time in a controlled environment. Participants were instructed to read a scenario in which they were assigned the role of a software developer for an on-line bank, and then respond to a series of questions.

### Decision task, Procedure, and Measures

The decision scenario involved the development of a software application for mobile phones (see Appendix A for the actual scenario). First, the participants were given task instructions and goal orientation was manipulated. Goal orientation was manipulated through



beliefs about ability, consistent with the manipulation used by prior goal orientation research based on implicit theories of ability (Elliott and Dweck 1988; Mangos and Steele-Johnson 2001; Martocchio 1994; Nicholls 1984a)<sup>9</sup>. Specifically, in the learning goal orientation condition, the task instructions were designed to create the belief that software development ability is changeable and easy to improve through effort. In the performance goal orientation condition, the task instructions were designed to create the belief that software development ability is stable and difficult to improve through effort.

Following the manipulations, the participants were given negative feedback regarding the software application (i.e., unforeseen technical glitches), and told that it would be difficult to complete the software application. Next, the participants were asked to indicate their willingness to continue this troubled project on a 7-point scale (Garland 1990; Moon 2001; Wong and Kwong 2007). They were also asked to answer two questions pertaining to self-efficacy (Whyte et al. 1997), which was used as a control variable in our study. Self-efficacy has been found to be highly relevant to escalation of commitment (Whyte et al. 1997), and we deemed it was important to control for it, since our design involved manipulating individuals' beliefs about their ability.

## **Results**

**Manipulation Checks.** A manipulation check was conducted for goal orientation. The participants were asked to answer two questions pertaining to goal orientation as a manipulation check (VandeWalle et al. 2001) (these items were combined by taking a linear average). Based on a one-way analysis of variance (ANOVA), the mean difference between the learning ( $M =$

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<sup>9</sup> Prior goal orientation research shows that manipulating one's beliefs about ability leads to adoption of different goal orientations (Elliott & Dweck, 1988; Mangos & Steele-Johnson, 2001; Martocchio, 1994; Nicholls, 1984a).

6.08,  $SD = .87$ ) and performance ( $M = 2.34$ ,  $SD = 1.49$ ) goal orientation was significant and in the expected direction,  $F(1,68) = 166.59$ ,  $p < .01$ ,  $\eta^2_p = .71$ .

**Hypothesis Testing.** In order to test Hypothesis 1, an analysis of covariance (ANCOVA) was conducted with goal orientation as an independent variable, self-efficacy as a control variable, and willingness to continue a failing course of action as a dependent variable. The results indicated that participants in the learning goal orientation group ( $M = 5.66$ ,  $SD = 1.07$ ) had a greater willingness to continue a failing course of action than did participants in the performance goal orientation group ( $M = 3.82$ ,  $SD = 1.49$ ), and this difference was statistically significant ( $F(1,67) = 24.81$ ,  $p < .01$ ,  $\eta^2_p = .20$ ) after controlling for self-efficacy; thus supporting Hypothesis 1.

## **Discussion**

Study 1 provides empirical evidence that goal orientation influences an individual's decision of whether or not to continue a failing course of action. Specifically, our results indicate that individuals who adopt a learning goal orientation are more willing to continue a failing course of action as compared to individuals who adopt a performance goal orientation. These results suggest that achievement motivation leads individuals to look forward and continue a failing course of action because they perceive a learning value associated with doing so.

With the encouraging findings of Study 1, we proceeded to further investigate the relationship between goal orientation and escalation, and to test Hypotheses 2, 3, & 4. One underlying assumption regarding the effect of goal orientation found in Study 1 is that individuals who adopt a learning goal orientation inherently look forward in escalation situations and that this positively influences their escalation decision. If it is the prospective thinking inherent in a learning goal orientation that leads to escalation of commitment, probing some

future-related mediating mechanisms will allow us to develop a more nuanced understanding of the causal relationship between goal orientation and escalation of commitment.

In addition, if it is indeed prospective thinking that drives the effect of learning goal orientation on escalation; a shift in an individual's temporal focus may have significant implications for the relationship between goal orientation and escalation of commitment. In fact, a focus on a particular temporal domain (e.g., past or future) has been well recognized as an important factor influencing human cognition and decision making (Ancona et al. 2001; Holman and Silver 1998; Zimbardo and Boyd 1999). Further, different time perspectives have also been recognized as an important factor in escalation research (Garland 1990; Moon 2001; Wong and Kwong 2007). Thus, it is important to investigate temporal orientation as a potential moderator for the effect of goal orientation on escalation of commitment observed in Study 1. Study 2 was undertaken in order to investigate this idea by having individuals explicitly focus on either a past temporal domain or a future temporal domain.

To achieve these objectives, Study 2 involved a laboratory experiment to investigate the moderating effect of temporal orientation, as well as two future-related factors (i.e., anticipated regret and perceived likelihood of success) that may mediate the relationship between goal orientation and escalation of commitment.

## **Study 2**

### **Participants and Design**

One hundred thirty undergraduate students enrolled in an introductory information systems course at a large urban university in the southeastern U.S. participated in Study 2. Study 2 was conducted in a different academic semester from Study 1; thus, it was ensured that no participant from Study 1 took part in Study 2. Participants were randomly assigned to one of

four treatment conditions in a 2 x 2 factorial design in which goal orientation (learning and performance) and temporal orientation (past and future) were manipulated independently. The experiment was conducted during class time in a controlled environment. Participants were instructed to read a scenario in which they were told they were a member of the Business Student Association at their university and had initiated a database development project for the association. As before, the scenario was followed by a brief set of questions.

### **Decision task, Procedure, and Measures**

The decision context for Study 2 was based on a funding proposal application scenario that has been used in previous escalation studies (Wong 2005; Wong and Kwong 2007). We adapted the scenario to create a decision context that would be realistic for our participants (i.e., university students). The decision scenario involved applying for project funding to support developing a database system for a student organization at a university. Participants were told that they had already spent considerable time and effort developing a database system, but that additional funding would be needed in order to complete the project. Negative feedback was introduced into the scenario by an Information Systems professor indicating that the quality of the project was not good enough to obtain funding from the Student Technology Fund (see Appendix B for the actual scenario).

Next, manipulations for goal orientation and temporal orientation were introduced. First, goal orientation was manipulated through beliefs about ability regarding the database project (consistent with the manipulation in Study 1) (Elliott and Dweck 1988; Mangos and Steele-Johnson 2001; Martocchio 1994; Nicholls 1984a). Second, the manipulation of temporal orientation was informed by the procedure used by Krishnamurthy & Sujana (1999) in which inducing thoughts relating to past or future was found to induce a past or future orientation. In

our experiment, the participants were asked to identify and write down the things that they may have gained or lost *thus far* (past orientation), or that they may gain or lose *in the future* (future orientation) with respect to working on the project. Following these manipulations, participants were asked to indicate their willingness to continue working on the project proposal as a percentage probability from 0 to 100% (0 = absolutely no, 50 = neutral, 100 = absolutely yes). Further, they were asked to indicate their final decision of whether or not to continue working on the project proposal on a 10-point likert scale. After they made the escalation decision, participants were asked to answer two questions each pertaining to self-efficacy (Whyte et al. 1997), perceived likelihood of success (Heath 1995; Moon 2001), and anticipated regret (Wong and Kwong 2007) on 7-point likert scales.

## Results

**Manipulation Checks.** Manipulation checks were conducted for both goal orientation and temporal orientation after participants made the escalation decision. The participants were asked to answer two questions each pertaining to goal orientation and temporal orientation. The individual measurement items for each construct were combined by taking a linear average. In a one-way ANOVA, the mean difference between the learning ( $M = 5.88$ ,  $SD = 1.11$ ) and performance ( $M = 4.02$ ,  $SD = 1.86$ ) goal orientation was statistically significant and in the expected direction,  $F(1,128) = 48.47$ ,  $p < .01$ ,  $\eta^2_p = .28$ . Based on a separate one-way ANOVA, the mean difference between past ( $M = 3.51$ ,  $SD = 1.07$ ) and future ( $M = 4.95$ ,  $SD = 1.17$ ) temporal orientation was also statistically significant and in the expected direction,  $F(1,128) = 54.34$ ,  $p < .01$ ,  $\eta^2_p = .30$ .

**Descriptive Statistics and Reliability Test.** First, we examined the means, standard deviations, and inter-correlations among latent constructs (Table 1). Significant correlations

were found between goal orientation and anticipated regret, likelihood of success, and willingness to continue. Anticipated regret also correlated significantly with likelihood of success and willingness to continue, and there was a significant correlation between likelihood of success and willingness to continue. Self-efficacy, which was measured as a control variable, correlated very highly with perceived likelihood of success; thus it was excluded in this analysis and hereafter due to the potential multi-collinearity issue. Lastly, we examined Cronbach's alphas for each construct and found that they were all higher than .83. These results together provided support for the adequacy of our measurement model.

		1	2	3	4	5	M	SD	$\alpha$
1	Goal orientation <sup>+</sup>	-					.50	.50	–
2	Temporal orientation <sup>+</sup>	.02	-				.50	.50	–
3	Anticipated regret	.22*	-.04	-			4.53	1.88	.83
4	Likelihood of success	-.25**	.05	-.40**	-		5.22	1.67	.95
5	Willingness to continue	-.37**	.02	-.47**	.67**	-	68.65	24.87	.94

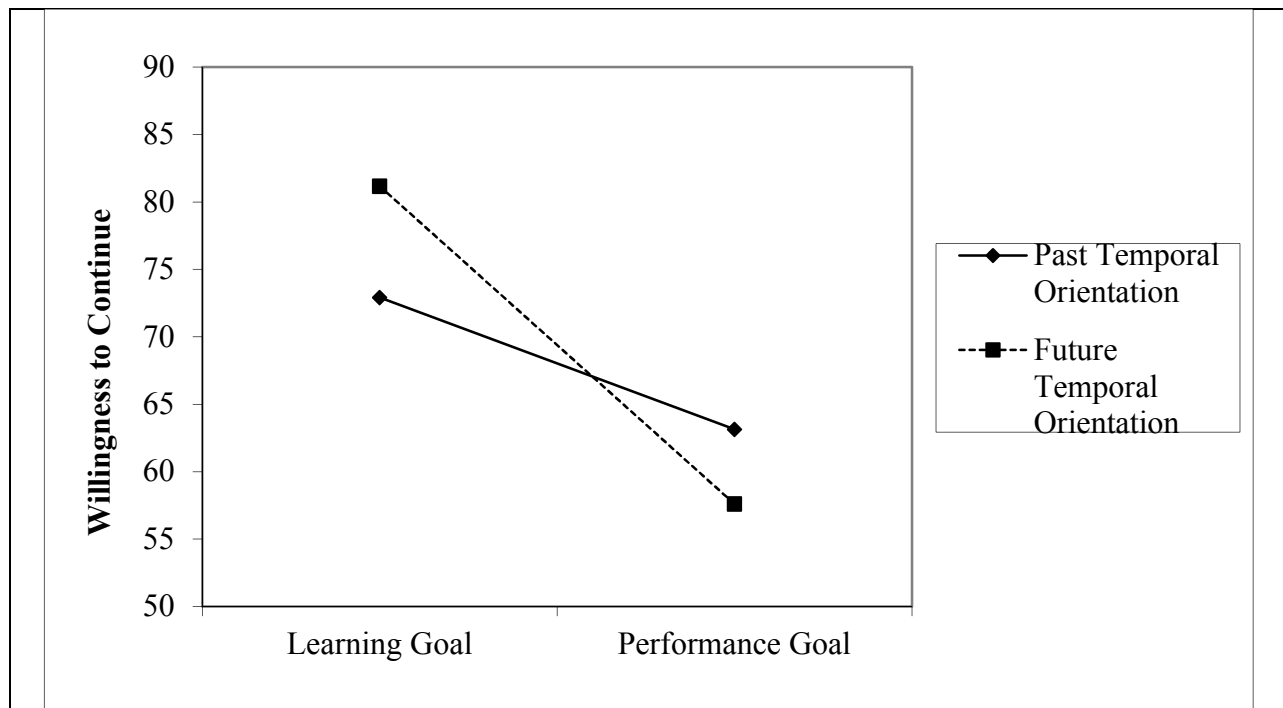
$n = 130$   
\*  $p < .05$   
\*\*  $p < .01$   
<sup>+</sup> Experimentally manipulated variables

**Table 4-1 Means, Standard Deviations, and Inter-correlations among Constructs**

**Hypothesis Testing.** First, we examined the hypothesized main effect between goal orientation and temporal orientation (Hypothesis 1) and the interaction effect between goal orientation and temporal orientation (Hypothesis 4). An ANCOVA was conducted with goal orientation and temporal orientation as independent variables, anticipated regret, perceived likelihood of success, as covariates, and willingness to continue a failing course of action as the dependent variable. The results indicated a significant main effect of goal orientation,  $F(1,124) = 5.34, p < .05, \eta^2_p = .04$ ; participants in the learning goal orientation group ( $M = 76.98, SD = 20.41$ ) showed a greater willingness to continue a failing course of action than did participants in

the performance goal orientation group ( $M = 60.33$ ,  $SD = 26.27$ ). These results were consistent with those obtained in Study 1 and lend further support for our findings regarding the influence of goal orientation on escalation (i.e., H1), as the same pattern of results was replicated in a second experiment using a different experimental scenario. Furthermore, a significant interaction effect between goal orientation and temporal orientation was found,  $F(1,124) = 10.94$ ,  $p < .01$ ,  $\eta^2_p = .08$ , thus supporting Hypothesis 4.

Following the procedures proposed by Aiken & West (1991), we plotted the interaction effects between goal orientation and temporal orientation (Figure 2), and examined the significance of each simple slope. It was found that the difference between learning goal orientation and performance goal orientation in the past orientation condition was marginally significant ( $p < .10$ ), whereas the difference between learning goal orientation and performance goal orientation in the future orientation condition was highly significant ( $p < .01$ ). This result suggests that the effect of goal orientation is weakened as the temporal orientation shifts from the future to the past.



**Figure 4-2 Simple Slopes for Escalation of Commitment**

Having established support for the interaction effect between goal orientation and temporal orientation, we proceeded to test our two proposed mediation paths: Hypothesis 2 (goal orientation → anticipated regret → escalation of commitment) & Hypothesis 3 (goal orientation → perceived likelihood of success → escalation of commitment). We followed the three-step bootstrapping approach recommended by Shrout & Bolger (2002) and Preacher & Hayes (2008). Bootstrapping is a statistical method based on random re-sampling with replacement from the data set (see Shrout & Bolger (2002) for a more detailed discussion). We chose the bootstrapping approach for testing of indirect effects over Sobel's (1982) test, because of the unrealistic assumption of the Sobel test regarding the normality of the sampling distribution of the mediated effect. For our analysis, we followed the guidelines for a multiple mediator model suggested by Preacher & Hayes (2008) and the SPSS macro provided at Hayes' webpage ([www.afhayes.com](http://www.afhayes.com)).



We conducted a multiple mediation test with a 5000 resamples. The results indicated that goal orientation had a significant effect on escalation of commitment after controlling for the two mediators (see Table 2), thus suggesting partial mediation. Further, the indirect effect of each mediation path ( $\alpha\beta$ ) was found to be significant; the confidence interval for each indirect effect did not include zero, indicating the indirect effects were significantly different from zero (see Table 3). Overall, the mediation model explained slightly over half of the observed variance in escalation of commitment (adjusted  $R^2 = .51$ ). The results of our analysis provide strong evidence for our two hypothesized mediating paths between goal orientation and escalation of commitment, thus supporting Hypotheses 2 & 3.

		Coefficient	SE
Step 1: independent variable predicting mediator	goal orientation – anticipated regret	0.83*	0.32
	goal orientation – likelihood of success	- 0.84**	0.28
Step 2: mediator predicting dependent variable	anticipated regret – escalation	- 2.85**	0.90
	likelihood of success – escalation	8.23**	1.02
Step 3: independent variable predicting dependent variable after controlling for mediator(s)	goal orientation – escalation (covariates: anticipated regret & likelihood of success)	- 7.38*	3.19
N = 130 * $p < .05$ . ** $p < .01$ .			

**Table 4-2 Mediation Testing**

	Bias Corrected Bootstrap 95% Confidence Interval for Instantaneous Indirect Effect		
	$\alpha\beta$ (indirect effect)	Lower	Upper
Anticipated Regret	- 2.32	- 6.26	- 0.46
Likelihood of success	- 7.04	- 13.61	- 2.11
TOTAL	- 9.36	- 15.85	- 3.61

**Table 4-3 Mediation of the Effect of Goal Orientation on Escalation of Commitment through Anticipated Regret and Perceived Likelihood of Success**

## **Discussion**

Study 2 offers valuable insights that complement and extend the findings of Study 1. First, the results suggest that the effect of goal orientation on escalation of commitment is moderated by temporal orientation. When an individual's temporal focus is on the future, a learning goal orientation ( $M = 81.17, SD = 16.48$ ) leads to a greater willingness to continue than a performance goal orientation ( $M = 57.60, SD = 25.34$ ). However, when an individual's temporal focus is on the past, the difference in the willingness to continue between learning goal orientation ( $M = 72.91, SD = 23.13$ ) and performance goal orientation is not as pronounced ( $M = 63.14, SD = 27.32$ ). In other words, the relationship between goal orientation and escalation is weakened as an individual's temporal orientation shifts from the future to the past. This finding is consistent with our supposition that when individuals with a learning goal orientation focus on their past course of action, they perceive that some learning value has already been realized and this reduces their willingness to escalate further – presumably due to a decreased motivation for learning. The results of Study 2 further suggest that the effect of goal orientation on escalation of commitment is mediated by two future-related factors: anticipated regret and perceived likelihood of success. This supports our supposition that it is the prospective thinking inherent in goal orientation that explains the effect of goal orientation on escalation of commitment.

### **General Discussion**

Prior escalation research has found that individuals are capable of looking back and looking forward in escalation situations (Moon 2001) and that there are connections between certain prospective factors (e.g., project completion levels and anticipated regret) and escalation of commitment. However, to date no theoretical explanation has been offered as to why and how individuals look forward in escalation situations and this represents an important gap in the

literature. Conlon & Garland (1993) noted that achievement motivation (e.g., completing what has been started) may drive prospective thinking in escalation situations. Based on this, we drew from the most influential achievement motivation theory (goal orientation theory), and empirically investigated the impact of achievement motivation in escalation of commitment.

Through a series of two laboratory experiments, we found that individuals who adopt a learning goal orientation are more willing to continue a failing course of action, as compared with individuals who adopt a performance orientation. Further, we reasoned that the effect of goal orientation on escalation of commitment is associated with the inherent prospective thinking that stems from a learning goal orientation. In support of this supposition, we found two prospective factors mediating the relationship between goal orientation and escalation of commitment. However, we also found that the effect of goal orientation on escalation is weakened when individuals are instructed to focus on the past rather than on the future.

### **Theoretical Implications**

Despite its significant influence on individuals' behavioral patterns in achievement settings (Brett and VandeWalle 1999; Button et al. 1996; Dweck 1989; Dweck and Leggett 1988), goal orientation has been completely ignored in prior escalation research. This represents a significant theoretical gap, because achievement motivation may be an important factor for understanding why individuals look forward in escalation situations. Our research offers the first empirical evidence indicating that individuals look forward in order to achieve a certain goal (e.g., learning) in escalation situations, and this motivates individuals to continue a failing course of action.

Further, our research underscores the role of prospective factors mediating the effect of goal orientation on escalation of commitment. Specifically, individuals who adopt a learning

goal orientation anticipate a low level of regret about a potential negative outcome that can result from continuing a failing course of action. This suggests that a learning goal orientation produces an achievement motivation that places value on the learning outcomes that will result from trying to turn around a troubled project, even if the project itself should ultimately fail. This is consistent with prior escalation research which suggested that a goal in escalation situations may not be an “economic one” (Conlon and Garland 1993), but rather it may be completing whatever project has been started or per our research achieving learning.

Another prospective factor that was found to mediate the effect of goal orientation on escalation is the perceived likelihood of success. Individuals who adopt a learning goal orientation perceive that a failing course of action can be turned around by putting in more effort. This result suggests that individuals with a learning goal orientation may be more confident that they will be able to turn around a failing course of action due to beliefs about their ability. Specifically, individuals who adopt a learning goal orientation may believe that their ability can be improved by working through challenging situations and that they can overcome challenges with their improved ability (Brett and VandeWalle 1999; Dweck 1986). This is consistent with prior goal orientation research which found that a learning goal orientation is associated with optimism and positive beliefs about outcome (VandeWalle 1996).

While our findings suggest that a learning goal orientation is prospective in nature and that this promotes escalation of commitment, we also found that when individuals are instructed to focus on the past rather than the future, their motivation for learning may become weakened. Presumably, when a previously chosen course of action does not lead to a positive outcome, individuals with a learning goal orientation who are primed to focus on the past perceive that some learning value has already been obtained, and this seems to attenuate their willingness to

continue a failing course of action. This finding further underscores the importance of temporal thinking in understanding the escalation phenomenon (Moon 2001; Wong and Kwong 2007). In addition, this adds to the de-escalation literature which has found that motivation for growth tends to attenuate loss aversion in escalation situation (Molden and Hui 2011).

Lastly, our research contributes to goal orientation research by incorporating a temporal orientation perspective. Prior goal orientation research has conceptualized goal orientation as having two broad classes (i.e., learning and performance)<sup>10</sup>, and investigated the effects of learning vs. performance goal orientation on a variety of individual behaviors (Button et al. 1996; Dweck 1989; Dweck and Leggett 1988; Heyman and Dweck 1992). However, our research shows that the effects of goal orientation may change depending on which temporal domain individuals focus on. We therefore suggest that goal orientation researchers embrace temporal orientation as a potential moderator for the effects of goal orientation in achievement settings. Further research is warranted to synthesize the knowledge of temporal orientation with the literature on goal orientation; by doing so, it may even lead to developing four classes of goal orientation based on learning vs. performance goal orientation and future vs. past temporal orientation.

### **Practical Implications**

Despite its significant influence on individuals' behavioral patterns in achievement settings (Brett and VandeWalle 1999; Button et al. 1996; Dweck 1989; Dweck and Leggett 1988), goal orientation has been completely ignored in prior escalation research. This represents a significant theoretical gap, because achievement motivation may be an important factor for understanding why individuals look forward in escalation situations. Our research offers the first

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<sup>10</sup> We acknowledge that some previous goal orientation studies conceptualized goal orientation as having three classes: learning, performance-proving, and performance-avoiding goal (VandeWalle & Cummings, 1997).

empirical evidence indicating that individuals look forward in order to achieve a certain goal (e.g., learning) in escalation situations, and this motivates individuals to continue a failing course of action.

Further, our research underscores the role of prospective factors mediating the effect of goal orientation on escalation of commitment. Specifically, individuals who adopt a learning goal orientation anticipate a low level of regret about a potential negative outcome that can result from continuing a failing course of action. This suggests that a learning goal orientation produces an achievement motivation that places value on the learning outcomes that will result from trying to turn around a troubled project, even if the project itself should ultimately fail. This is consistent with prior escalation research which suggested that a goal in escalation situations may not be an “economic one” (Conlon and Garland 1993), but rather it may be completing whatever project has been started or per our research achieving learning.

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## Limitations and Future Research

Our research has a few limitations that may suggest directions for future research. First, in both of our studies goal orientation was manipulated through participants' beliefs about ability (Elliott and Dweck 1988; Mangos and Steele-Johnson 2001; Martocchio 1994; Nicholls 1984a). This allowed us to create a controlled setting in which to investigate the causal relationships between goal orientation and escalation of commitment. However, there exist different definitional approaches to goal orientation (DeShon and Gillespie 2005), including goal orientation as a personal dispositional characteristic rather than a situational characteristic (VandeWalle and Cummings 1997). While there is ample evidence that an individual's goal orientation can change in different situations (i.e., quasi-trait) (Button et al. 1996; Elliot and Church 1997) and many goal orientation studies have manipulated goal orientation (Elliott and Dweck 1988; Mangos and Steele-Johnson 2001; Martocchio 1994; Nicholls 1984a), we suggest that further research is warranted to investigate the role of *dispositional* goal orientation in escalation situations.

Second, the use of scenario-based experiments limits our ability to generalize the findings of this research to natural settings. Nonetheless, in the escalation literature the findings reported from scenario-based experiments have been consistent with the findings reported from field studies (Staw et al. 1995; Staw and Hoang 1995). Further, the scenarios used in our research were tailored to fit the backgrounds of participants (i.e., university students), and we believe this addresses the limitation concerning the use of scenario-based experiments with student subjects to some extent. Nonetheless, one direction for future research is to determine the extent to which the relationships we documented are consistent with the behavior that occurs in actual field settings.



Lastly, in our studies, goal orientation was conceptualized as having either a learning or performance orientation. However, some goal orientation researchers suggest that a performance goal orientation can be further decomposed into two distinct dimensions (i.e., performance-prove and performance-avoid goal orientation) (Brett and VandeWalle 1999; Dweck 1986). Therefore, we suggest that further research is warranted to investigate the effects of performance-prove vs. performance-avoid goal orientation on escalation of commitment.

### **Conclusion**

In this research, we found that learning-oriented individuals tend to become more strongly committed to a previously chosen course of action that is failing as compared to performance-oriented individuals. Further, this effect is mediated through two future-related factors (anticipated regret and perceived likelihood of success); learning-oriented individuals experience a lower-level of anticipated regret about potential negative outcomes that may result from continuing a failing course of action, and perceive a failing course of action as being more likely to be successful. We also identified temporal orientation as an important moderator for the effects of goal orientation on escalation of commitment.

## Appendix 4-A

### Materials Used in Study 1

You are a software developer for On-Line Bank, a full service bank that is completely web-based. Six months ago you initiated a project to develop a software application that would allow customers to use their mobile phones to make payments at any retail location by simply waving the phone instead of swiping a debit card.

[Learning goal] You believe that your software development ability is changeable and easy to improve through effort. In other words, you expect that you can become more competent through practice. Working on this project provides an opportunity to learn and to improve your own software development ability.

[Performance goal] You believe that your software development ability is stable and difficult to improve through effort. In other words, you do not expect that you can become more competent through practice. Your performance on projects like this one reflects your own underlying software development ability.

At On-Line Bank, decision control is highly de-centralized. In other words, you have complete control over every decision regarding this project and do not need to seek approval from upper management. Moreover, management does not monitor your actions, nor do they establish rewards and penalties for project outcomes.

To date, you have failed to deliver the software application, due to unforeseen technical glitches. Furthermore, you feel that it will be difficult to complete the software application with your current level of ability.

## Appendix 4-B

### Materials Used in Study 2

You are a member of the Business Student Association at your university. Six months ago, you initiated a database project for this student association with a plan to apply for the Student Technology Fund sponsored by the Division of Student Affairs. This database project when successfully completed is expected to replace the old excel spreadsheets and help manage a large amount of student data more efficiently. However, it is critical that you obtain funding in order to cover the costs for database implementation (e.g., purchasing database management software, a server computer, etc). In other words, without the funding, it will be impossible to complete the project (i.e., impossible to implement the database). To date, you have spent considerable time and effort on the project, including requirements analysis, database modeling, database design, and meetings with students.

The Division of Student Affairs will accept database project funding applications on an ongoing basis over the next six months, and evaluates all projects on a 10-point scale, with 1 representing *poor*, 5 representing *average*, and 10 representing *excellent*. Recently, the Division of Student Affairs announced that database projects that are rated 6 or higher will be funded, and that all database projects will be evaluated based on the quality of requirements analysis, database design, and development and implementation plans. In order to obtain an objective assessment of your database project, you contacted a professor in Information Systems who has previously served on the Student Technology Fund grant review committee. After reviewing your database project, the professor noted many technical problems and concluded that your project would most likely be rated a 4 in its current form, which definitely would NOT be enough to obtain the funding. Moreover, he indicated that it would be unlikely that the problems with the project could be successfully addressed within the next six months.

The decision you need to make now is whether to continue working on your database project in the hope that you can improve the quality of your database project (i.e., you can eventually obtain a 6 or higher score on your database project), and apply for the funding some time in the next six months, or to abandon the project. Before making the decision, you have decided to reflect on your database ability.

[Learning goal] You believe that your database ability is changeable and easy to improve through effort. In other words, you believe that you can become more competent through practice. Working on this project provides an opportunity to learn and to improve your own database ability.

[Performance goal] You believe that your database ability is stable and difficult to improve through effort. In other words, you do not believe that you can become more competent through practice. Your performance on projects like this one reflects your own underlying database ability.

[Past Orientation] Please spend a few minutes to identify and write down below the things that you may have gained or lost thus far while working on this project in relation to your database ability.

[Future Orientation] Please spend a few minutes to identify and write down below the things that you may gain or lose in the future if you decide to continue working on this project in relation to your database ability.

## Appendix 4-C

### Measurement Items Used

Constructs	Measures	References
Self-efficacy	<ol style="list-style-type: none"><li>1. I believe that I can improve the quality of this database project, and obtain the funding for this project eventually</li><li>2. I am confident that I will be able to get a 6 or higher score on this project.</li></ol>	(Whyte et al., 1997)
Likelihood of success	<ol style="list-style-type: none"><li>1. I think that the quality of this project will be improved enough to receive the funding.</li><li>2. I think that this project will be likely to be rated a 6 or higher.</li></ol>	(Heath, 1995)
Anticipated regret	<ol style="list-style-type: none"><li>1. I would regret if I continued working on this database project but failed to get a 6 or higher score on the project</li><li>2. I would be disappointed if I continued working on this database project, but failed to improve the quality of the project enough to obtain the funding</li></ol>	(Wong & Kwong, 2007)

## **Chapter 5 The Influence of Performance Appraisal on Escalation of Commitment in IT Projects<sup>11</sup>**

### **Abstract**

Escalation of commitment is a management problem that can cause significant cost and schedule overruns on IT projects. While prior escalation studies have identified and reported several factors that promote escalation of commitment, what is relatively overlooked in escalation research is how the inter-personal relationship between a subordinate (e.g., a project member) and his/her supervisor (e.g., a project manager) may influence the subordinate's decision of whether or not to continue a troubled task in an IT project. In this research, we suggest that performance appraisals can have an important influence on the inter-personal relationship between a supervisor and a subordinate and on individual goal development, and we investigate the influence of performance appraisal on escalation of commitment. Drawing upon goal orientation theory, we found that a criticism-based appraisal interview leads to a greater willingness to continue a troubled task as compared to a praise-based appraisal interview, and this relationship is partially mediated by risk propensity and proving goal orientation. In addition, we found that appraisals involving a relative rating lead to a greater willingness to continue a troubled task as compared to appraisals involving an absolute rating, and this relationship is fully mediated by proving and avoiding goal orientation.

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<sup>11</sup> Lee, J. S., Keil, M., and Givens, P. S. "The Influence of Performance Appraisal on Escalation of Commitment in IT Projects," Working paper, 2013.

## Introduction

Based on a recent global survey, in which 1,471 IT projects were examined, Flyvbjerg & Budzier (2011) reported that 20 percent of IT projects experience significant challenges. Of particular note is that a majority of IT project problems (54 percent) are associated with project management (Gulla, 2011). Signs that things are going awry often arrive long before an IT project goes completely out-of-control, yet according to a recent survey 67 percent of companies failed to terminate, or redirect unsuccessful IT projects (Meskendahl et al., 2011) instead continuing to escalate their commitment to a failing course of action (Keil, 1995; Keil et al., 2000a; Newman & Sabherwal, 1996).

Many studies have investigated the factors that cause escalation of commitment in IT projects which include sunk cost (Keil et al., 2000a; Newman & Sabherwal, 1996), personal responsibility (Keil, 1995), emotional attachment to the project (Keil, 1995), risk perception (Keil et al., 2000b), and illusion of control (Keil, Depledge, & Rai, 2007). While these studies have significantly advanced our understanding of the escalation phenomenon, little is known about how the inter-personal relationship between a subordinate (e.g., a project member) and his/her supervisor (e.g., a project manager) may influence the subordinate's escalation of commitment. Furthermore, prior work on IT project escalation has focused on the project as a whole, but from a project management perspective, projects are comprised of work packages and specific tasks that must be accomplished and that a delay in completing a single critical path task will adversely affect the project's schedule. In this research we view escalation from a more granular perspective (i.e., the level of the individual task).

Most IT projects are sufficiently large and complex that they require multiple individuals, each assigned to work on various tasks in order to complete the overall project. When an

individual encounters a setback on a specific task that threatens the completion or quality of the overall project, s/he must decide whether to continue working on the task in the hope of completing it successfully or to choose a different course of action such as asking someone for assistance. In this research, we investigate why individuals continue to work on a troubled task in an IT project, focusing on the inter-personal relationship between subordinates (e.g., project members) and their superior (e.g., project manager). In order to achieve this objective, we turn to the literature concerning performance appraisal.

Performance appraisal is an important organizational practice that is used to evaluate the job performance of individual employees (Levy & Williams, 2004; Murphy & Cleveland, 1995). Performance appraisal has been found to influence a variety of employees' behaviors and attitudes (Feldman, 1981), including job performance (Pearce, Stevenson, & Perry, 1985), job satisfaction (Nathan, Mohrman Jr., & Milliman, 1991), and trust in management (Mayer, Davis, & James, 1999). The performance appraisal interview is regarded as an integral part of the appraisal process in which the subordinate and the supervisor meet to discuss the subordinate's performance (Cederblom, 1982). The performance appraisal interview can play a key role in shaping the inter-personal relationship between subordinates and their supervisor (Cederblom, 1982). Further, performance appraisal interviews have been found to have a significant influence on individual goal development (Cederblom, 1982; Cummings & Schwab, 1978). Based on this, we posit that performance appraisals may have significant implications regarding individuals' goal orientation (conception of goals to achieve in achievement situations), and this provides an appropriate theoretical lens (i.e., goal orientation theory) to investigate the relationship between performance appraisal and escalation of commitment.

In this research, we investigate the following: (1) the impact of praise vs. criticism based appraisals on escalation, (2) the impact of absolute vs. relative rating appraisals on escalation, and (3) the cognitive process (i.e., mediators) underlying the effects of performance appraisals on escalation of commitment.

### **Escalation of Commitment**

Escalation of commitment involves investing additional resources into a previously chosen course of action despite negative feedback that it may not result in positive outcomes (Brockner, 1992). Escalation of commitment is a management problem that has been observed in a variety of business contexts; examples include bank loans (Staw et al., 1997), corporate bidding wars (Bazerman, 1999), and hiring and promotion decisions (Schoorman, 1988). IT projects have been found to be particularly prone to escalation of commitment (Keil et al., 2000a); it is common to witness troubled IT projects that appear to take on a life of their own, continuing to attract valuable organizational resources without much chance that they will be completed successfully. Prior research has shown that in many cases escalation of commitment leads to negative consequences, such as large financial losses (Keil, 1995).

A number of different explanations have been offered for the escalation of commitment phenomenon. For instance, individuals may fall into the escalation trap due to previous investments made (sunk cost effect) (Garland, 1990), or individuals may escalate simply to finish what they began (completion effect) (Conlon & Garland, 1993; Moon, 2001). From an agency theory perspective, individuals may be more willing to escalate when they are able to conceal the true status of the task at hand from a supervisor (i.e., information asymmetry), and when there is a personal motivation to continue a failing course of action (i.e., goal incongruence) (Harrison & Harrell, 1993). While the agency theory perspective begins to get at the relationship between



subordinates and supervisors, its focus is limited to information asymmetry and goal incongruence as opposed to how performance appraisal feedback may affect escalation.

In this research, we posit that the inter-personal relationship between subordinates and their supervisor plays an important role in the escalation behavior of subordinates. Specifically, we focus on the performance appraisal interview as not only shaping the relationship between subordinates and their supervisors but also their goal oriented behaviors. Performance appraisal interviews are typically conducted to discuss past performance of individuals as well as to set future goals (Cederblom, 1982; Cummings & Schwab, 1978). Further, it has been found that performance feedback plays an important role in shaping individuals' goal orientation (VandeWalle et al., 2001; VandeWalle & Cummings, 1997). Based on this, we posit that performance appraisals can sway individuals' goal orientation in a specific way, and subsequently influence individuals' escalation decision.

### **Theoretical Background and Hypotheses**

The concept of goal orientation was originally developed in the educational psychology and child development literature (Ames, 1992; Dweck, 1989). Since the 1990s however, goal orientation has been brought into management research, and linked to many human behaviors in organizational settings such as sales performance (VandeWalle et al., 1999), goal setting (Phillips & Gully, 1997) and performance adaptability (Kozlowski et al., 2001). Early research on goal orientation suggested that in achievement situations individuals tend to exhibit either a learning goal orientation or a performance goal orientation (Dweck, 1986; Dweck & Leggett, 1988; Elliott & Dweck, 1988). Generally, individuals who adopt a learning goal orientation tend to focus on mastering their competency by improving their ability through challenging situations, whereas individuals who adopt a performance goal orientation tend to focus on demonstrating

their competence by seeking favorable judgments and avoiding negative judgments (Dweck & Leggett, 1988).

While this conceptualization of goal orientation became well accepted in the goal orientation literature, several researchers have since suggested that performance goal orientation can be further categorized into performance-proving and performance-avoiding goal orientation (Brett & VandeWalle, 1999; Elliot & Harackiewicz, 1996; VandeWalle, 1997). A proving goal orientation concerns “demonstrating one's competence and the gaining of favorable judgments from others”, whereas an avoiding goal orientation concerns “avoiding negation of one's competence and the avoiding of negative judgments from others” (VandeWalle, 1997, p. 1000).

One core aspect of performance goal orientation is individuals' belief about ability. Individuals who adopt a performance goal tend to believe that ability is a fixed attribute and therefore difficult to improve (Dweck, 1986). Further, when an individual adopts a proving goal, there is a tendency to demonstrate competency not by polishing his/her skills, but rather by attempting to look better than others (Brett & VandeWalle, 1999). In this process, individuals with a proving goal orientation use the performance of other individuals as a reference point to assess and demonstrate their competency (Butler, 1993; Farr, Hoffmann, & Ringenbach, 1993). In contrast, avoiding goal orientation is known to be associated with defensive behavior (Button et al., 1996), and has been found to be positively related with test anxiety (Middleton & Midgley, 1997) and fear of negative evaluation from others (VandeWalle, 1997).

The distinction between proving and avoiding goal orientation allow us to theorize how performance appraisal interviews may influence individuals' goal orientation in the IT project context. In performance appraisal interviews, supervisors may provide either support or criticism regarding a subordinate's past performance (Cederblom, 1982). Providing support in

the form of praise during a performance appraisal interview has been found to lead to positive outcomes (Burke, Weitzel, & Weir, 1978), such as a high level of satisfaction with the appraisal process (Nemeroff & Cosentino, 1979). In contrast, subordinates tend to react negatively to criticism received from their supervisors, resulting in a low level of satisfaction with the appraisal process (Greller, 1978). Further, criticism can be perceived as a threat by subordinates and can even lead to poor performance (Kay, Meyer, & French, 1965). In escalation situations, we posit that individuals who receive criticism during a performance appraisal interview may take the criticism as a threat. In response to this perceived threat, they may become motivated to complete a troubled task. Further, criticism may motivate individuals to demonstrate their competency and prove their supervisor wrong; thus, leading to a proving goal orientation. Individuals with a high proving goal orientation may feel compelled to demonstrate their competency by successfully completing a troubled task. Based on this, we propose one main effect and one mediation hypothesis as follow:

*Hypothesis 1.* Criticism-based appraisal leads to a greater willingness to continue a troubled task in an IT project than praise-based appraisal.

*Hypothesis 2.* Criticism-based appraisal leads to a greater willingness to continue a troubled task in an IT project than praise-based appraisal, and this effect is mediated by proving goal orientation.

In addition, criticism may have a positive effect on individuals' risk taking behavior in escalation situations (i.e., risk propensity). Risk propensity refers to an individual's preference to take or avoid risk in uncertain situations (Sitkin & Pablo, 1992), and we posit that individuals who receive criticism during performance appraisal interview may become more willing to take risk in an escalation situation. Further, risk propensity has been found be an important predictor of escalation behavior (Keil et al., 2000b; Wong, 2005); individuals who are more risk taking are

more likely to continue a failing course of action. Based on this, we propose the following mediation hypothesis:

*Hypothesis 3.* Criticism-based appraisal leads to a greater willingness to continue a troubled task in IT project than praise-based appraisal, and this effect is mediated by risk propensity.

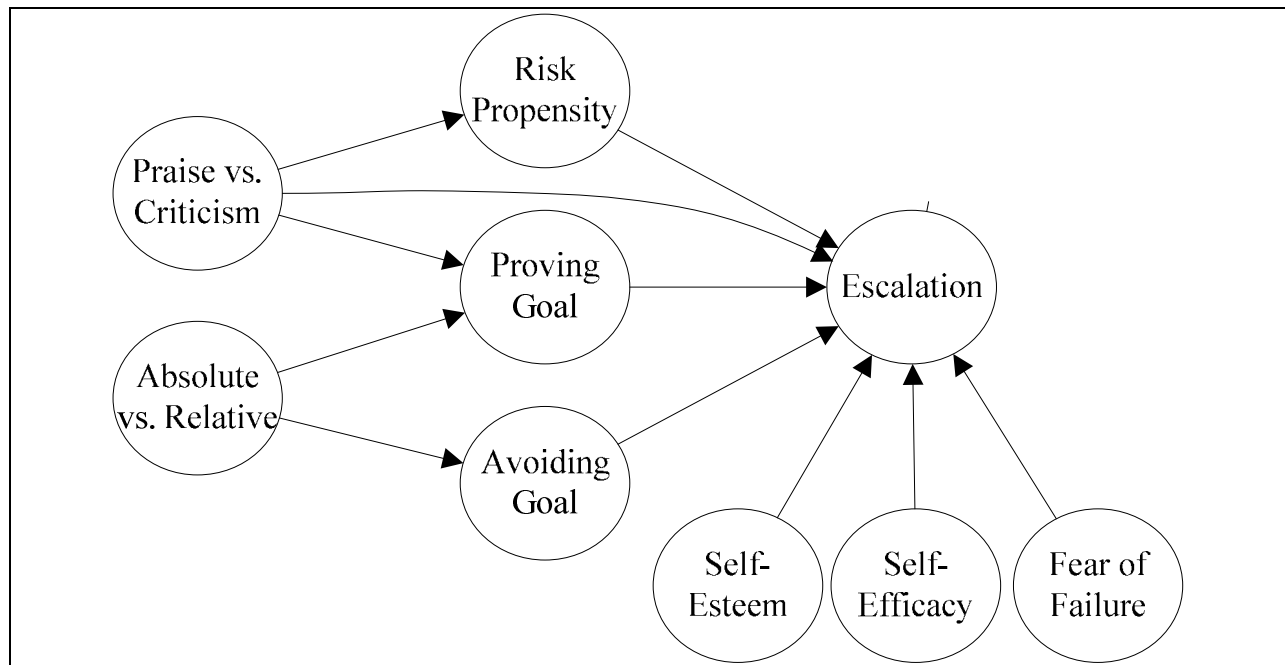
In conducting performance appraisal interviews, a supervisor can provide rating feedback to a subordinate in absolute terms (i.e., by furnishing performance feedback that is independent of others' performance) or in relative terms (i.e., by furnishing feedback that is relative to that of others) (Moore & Klein, 2008). The appraisal rating system (absolute vs. relative rating appraisal) has been found to have a significant influence on employees' satisfaction with performance and self-evaluation (Moore & Klein, 2008). With respect to its relation with goal orientation, we suggest that when an individual gets evaluated based on his or her standing against his or her colleagues, s/he may become motivated to demonstrate his or her competency in reference to others, and become less defensive due to inevitable competition with peers introduced by the relative rating system. Based on this, we posit that a relative rating appraisal tends to lead to more of a proving goal orientation and less of an avoiding goal orientation.

In addition, we theorize that individuals with a proving goal orientation will be more inclined escalate their commitment to a troubled task in an IT project in order to prove their ability, whereas individuals with an avoiding goal orientation will be less inclined to do so for fear of potential negative consequences that might result. In summary, we propose the following two mediation hypotheses for the relationship between absolute vs. relative rating appraisal and escalation of commitment:

*Hypothesis 4.* Relative rating appraisal leads to a greater willingness to continue a troubled task in an IT project than absolute rating appraisal, and this effect is mediated by proving goal orientation.

*Hypothesis 5.* Relative rating appraisal leads to a greater willingness to continue a troubled task in IT project than absolute rating appraisal, and this effect is mediated by avoiding goal orientation.

Figure 5-1 shows our research model summarizing the hypothesized relationships between performance appraisal and escalation of commitment and includes three control variables: self-esteem, self-efficacy, and fear of failure. Self-esteem was included in our model as it may be influenced by praise- vs. criticism-based appraisal and self-efficacy was included as it has been found to be an important predictor of escalation (Whyte et al., 1997). Lastly, fear of failure was included as it has been found to be associated with escalation (Malhotra, 2010).



**Figure 5-1 Research Model**

### **Method**

In order to test the hypothesized relationships between performance appraisal and escalation of commitment, we conducted a laboratory experiment, adopting a scenario-based approach that has been widely used in many prior escalation studies (Conlon & Garland, 1993;

Garland, 1990; Moon, 2001; Wong & Kwong, 2006). This method is particularly useful for creating a highly controlled setting that allows examining causal relationships.

### **Experimental Design and Participants**

The experiment involved a 2 x 2 factorial design in which praise- vs. criticism-based appraisal and absolute vs. relative rating appraisal were manipulated independently. One hundred thirty-one undergraduate students enrolled in upper-level information systems courses (junior and senior level) at a large urban university in the southeastern U.S. participated in the experiment. Participants were randomly assigned to one of four treatment conditions. The experiment was conducted during class time in a controlled environment. Participants were informed that this was a scenario-based experiment involving decision making, and instructed to read a scenario in which they were asked to play the role of an intern developer for a large retailer of consumer electronics, and then respond to a series of questions.

The decision scenario was tailored to be consistent with the typical escalation situation in which negative feedback is introduced regarding a previous course of action, and individuals are given an opportunity to continue the previous course of action that is failing (Brockner, 1992). In addition, the scenario used in our experiment was customized to fit the backgrounds of our participants (i.e., university students taking upper level information systems courses who might be likely to hold internships such as the one depicted in the scenario).

### **Decision Task, Procedure, and Measures**

The decision scenario involved the development of an e-commerce system for a large retailer (the actual scenario is shown in Appendix A). First, participants were given task instructions and the background information of the project. Next, the manipulations of absolute vs. relative rating appraisal were introduced. These were adapted based on the manipulations

used by Moore & Klein (2008). In the absolute rating appraisal condition participants were told that their performance would be evaluated based on an absolute rating that is independent of the performance of other interns. In the relative rating appraisal condition, the participants were told that their performance would be evaluated based on a relative ranking of their performance in comparison to the performance of other interns. Next, the manipulations of praise- vs. criticism - based appraisal were introduced. These were informed by the discussion in Cederblom (1982). In the praise-based appraisal condition, participants were told that during a quarterly performance appraisal meeting their boss (the project manager) went out of his way to praise their performance. In the criticism-based appraisal condition, participants were told that their boss (the project manager) went out of his way to criticize their performance.

Following the manipulations, negative feedback regarding the most recent assignment (developing a number of database queries) was introduced. Specifically, participants were told that they had discovered several errors in the database queries and suddenly realized that they had completely misunderstood what needed to be done. Further, they were told that if they attempted to fix the problem on their own there was a 75% chance that they would be the cause of a delay in the overall project.

After reading the scenario, the participants were asked to answer two questions concerning their willingness to continue working on the troubled task (Garland, 1990; Keil et al., 2000b). Next, they were asked to answer six questions each concerning proving goal orientation and avoiding goal orientation (Elliot & Church, 1997; Wang & Takeuchi, 2007), and two questions concerning risk propensity (Sitkin & Weingart, 1995). Next, the participants were asked to answer a question concerning self-esteem (Robins, Hendin, & Trzesniewski, 2001), two questions concerning self-efficacy (Whyte et al., 1997), and two questions concerning fear of

failure (Houston & Kelly, 1987). Appendix B shows the complete list of measurement items used in our experiment. All questions were measured on a 7-point likert scale.

## **Results**

### **Manipulation Checks**

After making the escalation decision, the participants were asked to answer one question each pertaining to praise- vs. criticism-based appraisal and absolute vs. relative rating appraisal (manipulation checks). In a one-way ANOVA, the mean difference between the praise-based ( $M = 2.77$ ,  $SD = 1.56$ ) and absolute-based ( $M = 5.25$ ,  $SD = 1.39$ ) appraisal was statistically significant and in the expected direction,  $F(1,129) = 93.30$ ,  $p < .01$ ,  $\eta^2_p = .42$ . In a separate one-way ANOVA, the mean difference between the absolute-based ( $M = 3.07$ ,  $SD = 1.87$ ) and relative-based ( $M = 5.61$ ,  $SD = 1.35$ ) appraisal was also statistically significant and in the expected direction,  $F(1,129) = 78.23$ ,  $p < .01$ ,  $\eta^2_p = .39$ .

### **Measurement Model Assessment**

All constructs were modeled as reflective and we assessed our measurement model using the Partial Least Squares (PLS) approach as implemented in SmartPLS 2.0 (Ringle, Wende, & Will, 2005). First, we assessed the convergent validity of our measurement model by examining standardized loadings, reliability, and average variance extracted (AVE) of all constructs included in our model (Table 5-1). Chin (1998) recommends standardized loadings of .707 or higher in order to demonstrate that the shared variance between each item and its associated construct is greater than the error variance. The results of our analysis indicated that the loadings of all items exceeded this threshold. Next, we examined Cronbach's alpha, composite reliability, and average variance extracted (AVE) in order to assess the internal consistency for each block of measures. While there are no absolute threshold values for Cronbach's alpha and composite



reliability, Straub, Boudreau, & Gefen (2004) recommend that values of Cronbach’s alpha above .70 are desirable for confirmatory research, and values as low as .60 are acceptable for exploratory research. The results of our analysis suggested that all but risk propensity exceeded .70, and the value of risk propensity still exceeded .60.

As for composite reliability, values exceeding .80 provide exemplary evidence of reliability (Bearden, Netemeyer, & Mobley, 1993; Yi & Davis, 2003). The results of our analysis suggested that all constructs exceeded .80. AVE indicates the amount of variance captured by a construct from its indicators relative to the amount of variance from measurement error (Fornell & Larcker, 1981) and Chin (1998) suggests that values of .50 or higher are acceptable. The results of our analysis indicated that all of our constructs had AVE values greater than .60, suggesting that 60% or more variance of the constructs was accounted for by their indicators. Overall these analyses provided strong evidence of the convergent validity of our measurement model.

Second, we assessed the discriminant validity of our measurement model by examining the cross loadings between items and constructs (Table 5-2). Our analysis suggested that each construct had higher loadings with its corresponding indicators than those with other indicators. Further, no high cross-loadings were found.

Variable	Item	Standardized Loading	Cronbach’s Alpha	Composite Reliability	Average Variance Extracted
Proving goal orientation	prove1	.861	.938	.951	.765
	prove2	.925			
	prove3	.867			
	prove4	.871			
	prove5	.923			
	prove6	.794			
Avoiding goal orientation <sup>1</sup>	avoid1	.721	.775	.864	.682
	avoid2	.894			

	avoid3	.852			
Risk propensity	risk1	.930	.642	.838	.724
	risk2	.763			
Escalation	esc1	.925	.829	.921	.854
	esc2	.924			
Self-efficacy	eff1	.946	.883	.945	.896
	eff2	.947			
Fear of failure	fear1	.724	.730	.850	.743
	fear2	.981			

<sup>1</sup> Avoiding goal orientation originally had 6 items, but items 4,5,6 were excluded due to low item loadings in this analysis. Because this construct was modeled reflectively and measurement items for reflective construct are interchangeable and highly correlated, dropping these measurement items was judged not to significantly reduce content validity.

<sup>+</sup> Dummy codes were used for two manipulated variables (absolute vs. relative and praise vs. criticism), thus the statistics of these variables are not shown in this table.

<sup>++</sup> Self-esteem was measured using a single-item measure. Thus it cannot be assessed for reliability and is not shown in this table.

**Table 5-1 Item Loadings and Reliability of Constructs**

Variable	Item	1	2	3	4	5	6
Proving goal orientation	prove1	<b>.860</b>	-.144	.229	.436	.247	.127
	prove2	<b>.925</b>	-.141	.284	.511	.366	.072
	prove3	<b>.867</b>	-.149	.155	.456	.372	-.019
	prove4	<b>.871</b>	-.048	.214	.419	.284	.098
	prove5	<b>.923</b>	-.136	.314	.481	.345	.077
	prove6	<b>.793</b>	-.023	.187	.450	.352	.214
Avoiding goal orientation	avoid1	-.015	<b>.720</b>	-.036	-.119	.022	.470
	avoid2	-.137	<b>.894</b>	-.088	-.189	-.116	.409
	avoid3	-.128	<b>.851</b>	-.066	-.262	-.097	.339
Risk propensity	risk1	.286	-.085	<b>.930</b>	.520	.330	.094
	risk2	.134	-.040	<b>.762</b>	.267	.225	.199
Escalation	esc1	.461	-.168	.490	<b>.924</b>	.368	.043
	esc2	.513	-.286	.421	<b>.923</b>	.440	.004
Self-efficacy	eff1	.387	-.090	.316	.412	<b>.945</b>	.035
	eff2	.328	-.079	.320	.416	<b>.946</b>	.004
Fear of failure	fear1	.055	.507	.126	.008	.003	<b>.724</b>
	fear2	.111	.415	.144	.028	.023	<b>.980</b>

**Table 5-2 Loadings and Cross-Loadings**

We also compared the AVE of each construct with the shared variance between all possible pairs of other constructs in order to ensure that the values of AVE exceed the square of the correlations among the constructs (Chin, 1998). As shown in Table 5-3, the value of AVE for each latent variable was higher than its squared correlations with other latent variables. This

indicated that each construct shared more variance with its respective indicators than with a different block of indicators of other constructs. Overall these analyses provided strong evidence of the discriminant validity of our measurement model.

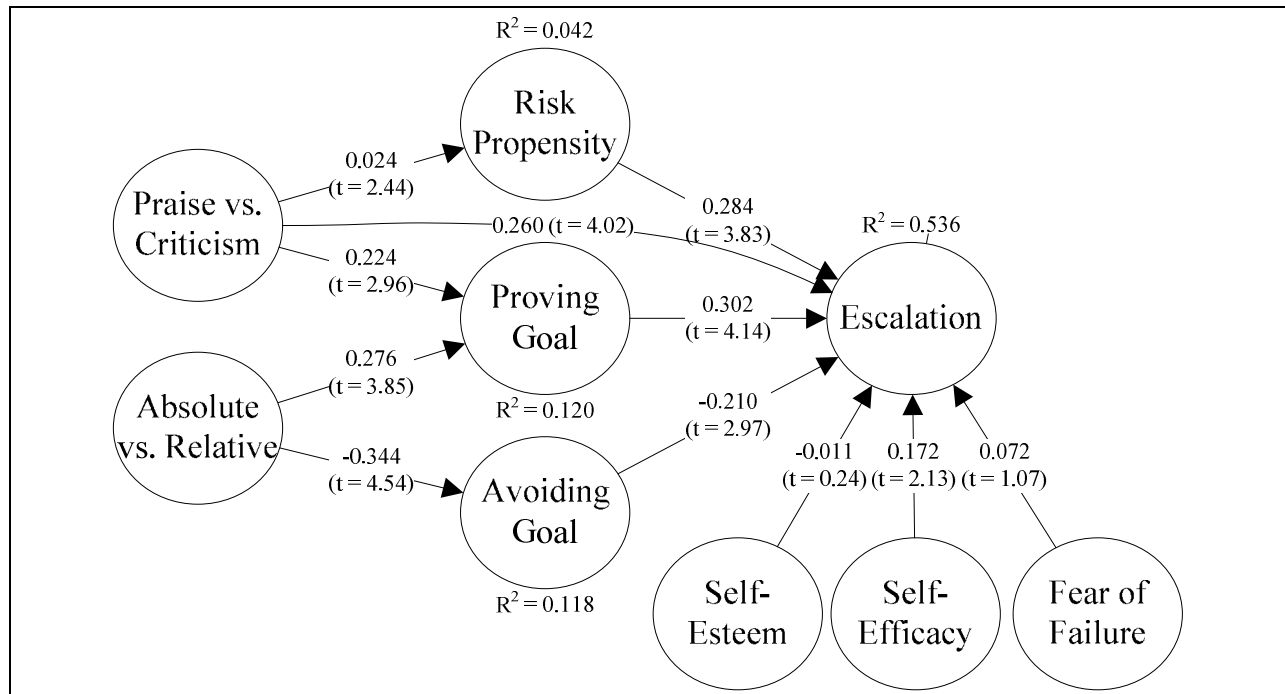
	Variable	AVE	1	2	3	4	5	6
1	Proving goal orientation	.765	–	-.118	.246	.524	.371	.093
2	Avoiding goal orientation <sup>1</sup>	.682	-.118	–	.009	-.240	-.064	.563
3	Risk propensity	.724	.246	.009	–	.463	.325	.158
4	Escalation	.854	.524	-.240	.463	–	.438	.021
5	Self-efficacy	.896	.371	-.064	.325	.438	–	.014
6	Fear of failure	.743	.093	.563	.158	.021	.014	–

**Table 5-3 Comparison of Average Variances Extracted (AVEs) with Squares of Correlations between Constructs**

### Structure Model Assessment

Having established the adequacy of our measurement model, we proceeded to test our structural model (Figure 5-1). In our analysis, manipulated variables (praise vs. criticism & absolute vs. relative) were included as categorical variables being coded as 0 (praise and absolute) or 1 (criticism and relative) in our structural model (Lohmoeller, 1989; Vinzi, Chin, Henseler, & Wang, 2009). First, we computed path coefficients of each structural path in our research model. All path coefficients were in the expected directions (Figure 5-2). Further, we examined the  $R^2$  of the dependent variable (escalation of commitment) to evaluate the overall explanatory power of our structural model. The  $R^2$  value of the dependent variable was .54, meaning that our model explains 54% of the variance in escalation of commitment. We also examined  $R^2$  values of the mediating factors in our structural model. The  $R^2$  value for “risk propensity”, “proving goal orientation”, and “avoiding goal orientation” were 0.04, 0.12, and 0.12, respectively.

Next, we used the bootstrapping method with 5000 resamples in order to obtain t-values for each path and assess the significance of each path. Generally acceptable t-values for path significance testing (two-tailed) are 1.96 and 2.58 at the significance levels of 0.05 and 0.01. All the structural paths in our research model showed t-statistics greater than 1.96 (except for self-esteem and fear of failure which were modeled as control variables), indicating that they are significant at the 0.05 level. Overall, the results of the structural model analysis provided strong support for our research model.



**Figure 5-2 Structural Model Test Results**

### Assessment of the Predictive Relevance of the Structural Model

In addition to assessing the magnitude of the  $R^2$  as a criterion for evaluating explanatory power of our structural model, we conducted the Stone-Geisser test of predictive relevance. The Stone-Geisser test ( $Q^2$ ) can be used to assess the overall model fit (Geisser, 1975; Stone, 1974). In PLS, the result of this test can be used as a fit indicator, as PLS does not provide assessment of goodness of fit (Ruiz, Gremler, Washburn, & Carrion, 2010). Further, this test is considered

appropriate in PLS analysis, as it does not require assumptions regarding the distribution of residuals (Ruiz et al., 2010). We computed  $Q^2$  test statistics using “blindfolding” implemented in SmartPLS 2.0. A blindfolding procedure omits a part of the data for a particular block of indicators during parameter estimations and then attempts to estimate the omitted part using the estimated parameters (see Ruiz et al. (2010) for a more detailed explanation).  $Q^2$  is used to assess how well observed values are reconstructed by the model and its parameter estimates (Chin, 1998).  $Q^2 > 0$  indicates that the model has predictive relevance whereas  $Q^2 < 0$  indicates a lack of predictive relevance (Ruiz et al., 2010). In our analysis, we obtained a  $Q^2$  value of 0.46 for our model, thus suggesting a strong predictive relevance of our structural model. Lastly, we calculated a global criterion of goodness of fit (i.e., GoF index) in order to assess the goodness of fit of our structural model<sup>12</sup>. The criteria for evaluating GoF are  $GoF_{small}=0.1$ ,  $GoF_{medium}=0.25$ , and  $GoF_{large}=0.36$ . We obtained a GoF value of .38, suggesting that our structural model had a large goodness of fit.

### **Testing of Mediating Paths and Hypotheses**

Our research model entailed one main effect hypothesis (Hypothesis 1) and four mediation hypotheses (Hypotheses 2-5). In order to test these hypotheses, we conducted mediation tests following the bootstrapping approach suggested by Shrout & Bolger (2002). We chose this approach over the mediation test approach suggested by Baron & Kenny (1986) for the following reasons: 1) it does not require unrealistic assumptions regarding the normality of sample data, and 2) it allows testing a mediation model that involves multiple mediators. For our analysis, we used the SPSS macro developed by Preacher & Hayes (2008).

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<sup>12</sup> We used the following formula to calculate GoF index:  $GoF = \sqrt{Communitality * R^2}$

Shrout & Bolger (2002) recommends a three-step mediation analysis, which involves running three bootstrapping-based regressions: Step 1) the independent variable (X) predicting the mediator (M), Step 2) the mediator (M) predicting the dependent variable (Y), and Step 3) both the independent variable (X) and the mediator (M) predicting the dependent variable (Y). A mediation relationship can be established when significant coefficients are shown in the first two regression equations. Further, partial mediation is indicated when the coefficient of the independent variable in the third regression equation is significant, whereas full mediation is indicated when the coefficient of the independent variable is not significant in the third equation. We conducted two independent mediation analyses: 1) for the relationship between praise- vs. criticism-based appraisal and escalation, with both risk propensity and proving goal orientation as mediators, and 2) for the relationship between absolute vs. relative rating appraisal and escalation, with both proving and avoiding goal orientation as mediators. We used a 5000 resample in both analyses, and three variables were entered as control variables (self-esteem, self-efficacy, and fear of failure).

The results of the first mediation analysis (the effect of praise vs. criticism on escalation) indicated significant coefficients in all three regression equations, suggesting partial mediation. In other words, praise vs. criticism has a significant effect on escalation after controlling for risk propensity and proving goal, thus providing support for Hypothesis 1 (Table 5-4). Next, we examined the bias corrected 95% confidence intervals in order to assess the significance of the indirect effects. The indirect effects of each mediation path ( $\alpha\beta$ ) (through risk propensity and through proving goal) were found to be significant; the confidence interval for each indirect effect did not include zero, suggesting that the indirect effect was significantly different from zero (see Table 5-5); this provided support for Hypotheses 2 & 3. In the second mediation

analysis, we found significant coefficients only in the first two regression equations, but not in the third equation, suggesting a full mediation. Further, the confidence interval for each indirect effect (proving goal and avoiding goal) did not include zero, indicating the indirect effects were significantly different from zero, thus providing support for Hypotheses 4 & 5.

<b>The effect of praise vs. criticism on escalation</b>		Coefficient	SE
Step 1	praise vs. criticism → risk propensity	<b>.47<sup>*</sup></b>	.22
	praise vs. criticism → proving goal	<b>.49<sup>*</sup></b>	.23
Step 2	risk propensity → escalation	<b>.35<sup>**</sup></b>	.09
	proving goal → escalation	<b>.42<sup>**</sup></b>	.09
Step 3	praise vs. criticism → escalation	<b>.89<sup>**</sup></b>	.24
<b>The effect of absolute vs. relative on escalation</b>		Coefficient	SE
Step 1	absolute vs. relative → proving goal	<b>.54<sup>*</sup></b>	.23
	absolute vs. relative → avoiding goal	<b>-.94<sup>**</sup></b>	.20
Step 2	proving goal → escalation	<b>.48<sup>**</sup></b>	.10
	avoiding goal → escalation	<b>-.24<sup>*</sup></b>	.03
Step 3	absolute vs. relative → escalation	.16	.28
N = 130 <sup>*</sup> $p < .05$ <sup>**</sup> $p < .01$ Note: Step 1: independent variable predicting mediator Step 2: mediator predicting dependent variable Step 3: independent variable predicting dependent variable after controlling for mediator(s)			

**Table 5-4 Mediation Test Results**

	$\alpha\beta$ (indirect effect)	BC 95% CI <sup>+</sup>	
		Lower	Upper
<b>The effect of praise vs. criticism on escalation</b>			
Risk propensity	.1668	.0212	.4107
Proving goal	.2109	.0187	.4883
Total	.3777	.0923	.7205
<b>The effect of absolute vs. relative on escalation</b>			
Proving goal	.2575	.0442	.5709
Avoiding goal	.2253	.0356	.5220
Total	.4827	.1755	.8964

<sup>+</sup> Bias corrected 95% confidence intervals

**Table 5-5 Indirect Effects and Confidence Intervals**

### Discussion

In this research, we investigated an unexplored, but important area in escalation research: namely, the relationships between performance appraisal and escalation of commitment in IT projects. Performance appraisal is an important organizational practice that is widely used (Levy & Williams, 2004; Murphy & Cleveland, 1995) and performance evaluation of project team members is also regarded as an important IT project management activity. The performance appraisal interview plays an important role in shaping the inter-personal relationship between a subordinate and his/her supervisor and can influence individual goal development (Cederblom, 1982; Cummings & Schwab, 1978). Our research provides new insights regarding how performance appraisal can influence an individual's decision of whether or not to continue a troubled task in an IT project. Drawing upon goal orientation theory, we investigated the impact of two popular performance appraisal practices (praise- vs. criticism-based appraisal and absolute vs. relative rating appraisal) on individuals' escalation of commitment at the IT project task level.

In this research, we found that a criticism-based appraisal leads to a greater willingness to continue a troubled task than a praise-based appraisal, and that this relationship is partially



mediated by risk propensity and proving goal orientation. In addition, we found that a relative rating appraisal leads to a greater willingness to continue a troubled task than an absolute rating appraisal, and that this relationship is fully mediated by proving and avoiding goal orientation.

### **Theoretical Implications**

Our research offers several contributions to the literatures concerning escalation of commitment, performance appraisal, and goal orientation. Most notably, it is the first study to establish a connection between performance appraisal and escalation of commitment. The key benefit of integrating these two literatures lies in enhancing our understanding of the escalation phenomenon from the inter-personal relationship perspective. While agency theory has been brought into escalation research (Harrison & Harrell, 1993), it focuses on information asymmetry and goal incongruence that may exist between the agent and the principal, rather than the inter-personal relationship between a subordinate and his/her supervisor and how the manner in which performance feedback is communicated affects the subordinate's behavior.

Second, while goal orientation has been studied in achievement situations (Dweck, 1986), and has been found to influence a variety of human behaviors (DeShon & Gillespie, 2005), its connection with escalation behavior has not been widely investigated. Indeed, we know of only one such paper by Lee, Keil, & Wong (2012b) in which a learning goal orientation was found to lead to a greater willingness to continue a failing course of action than a performance goal orientation. In our research however, we focused on two sub-dimensions of performance goal orientation (proving and avoiding goal orientation), and found that the proving dimension of performance goal orientation can cause escalation to occur.

Third, while a variety of effects have been found to be associated with performance appraisal – e.g., job performance (Pearce et al., 1985) & job satisfaction (Nathan et al., 1991),

and performance appraisal has been found to have a significant influence on an individual's goal development (Cederblom, 1982; Cummings & Schwab, 1978), its relationship with goal orientation have not been previously explored. Our study provides the first empirical evidence regarding how performance appraisal can influence individuals' goal orientation.

Lastly, goal orientation researchers have begun to call for more research that investigates the distinct effects that are associated with proving vs. avoiding goal orientation (Brett & VandeWalle, 1999; Elliot & Harackiewicz, 1996; VandeWalle, 1997). To this end, our research contributes to goal orientation research by demonstrating that a proving goal orientation can lead to a stronger commitment to a failing course of action than an avoiding goal orientation. In addition, feedback on performance has been found to have a significant effect on individuals' goal orientation (VandeWalle et al., 2001; VandeWalle & Cummings, 1997), and our findings contribute to this stream of research by identifying performance appraisal as antecedents of goal orientation.

### **Practical Implications**

Despite advances in IT project management practices, IT projects are still notorious for being late or over-budget. Signs that a project is in trouble sometimes arrive early, but decision makers find it very challenging to terminate the troubled project before it gets into serious trouble, and they often end up investing additional resources into the troubled project. While previous research has examined escalation at the overall project level, our research examines escalation at the task level, which is a much more granular approach. We believe that this distinction is important for the very practical reason that as project managers know, projects do not become cases of escalation all at once – they get there one day and one task at a time. By focusing on escalation at the task level, we highlight that that project delay can be traced to the

individual developer level. An individual developer may continue to work on a troubled task that might be on the critical path, and this can cause a significant delay or harm to the overall project. Our research suggests that project managers should look for signs of escalation at the task level.

Furthermore, our research suggests that project managers should be mindful when it comes to conducting performance appraisal interviews with project members, as the approach used may have unintended consequences regarding individuals' commitment to a troubled task. Specifically, criticism-based appraisal or relative rating appraisal has a greater tendency to cause task-level escalation and can therefore pose a risk to the overall project (as project members become overly committed to a troubled task). When developers are working on troubled tasks that can potentially cause harm to the overall project, it would be wiser to rely on praise-based appraisal or absolute rating appraisal in order to minimize any task level escalation of commitment.

### **Limitations and Directions for Future Research**

As with any research, our study is not without limitations. First, as an initial step to establish the connection between performance appraisal and escalation of commitment, we adopted the scenario-based laboratory experiment approach, which has been widely used in many previous escalation studies (Conlon & Garland, 1993; Keil et al., 2000b; Staw, 1976; Wong & Kwong, 2008). The artificially-created decision setting in our experiment was designed to achieve high internal validity but was not designed to include all of the complexities of actual work settings, thus placing a limit on our ability to generalize our findings. However, it should be noted that the goal of research lies in generalizing a “particular set of results to some broader theory” (Yin, 2009, p. 43). Our experiment provided a highly controlled setting which allowed

us to examine causal relationships between performance appraisal and the escalation phenomenon; thus the findings of our experiment offer several meaningful contributions to the theories concerning escalation of commitment, performance appraisal, and goal orientation. In addition, Swieringa and Weick (1982) argue that the laboratory experiment is an excellent venue for building “good theory”, and suggest that it is theory rather than findings that is generalizable to the field setting. In other words, “there is nothing more practical than a good theory” (Lewin, 1952, p. 169).

Second, in our experiment we engaged university students in a decision task concerning an IT project. While there has been some debate regarding the use of student subjects in business research (see, for example, Cunningham, Anderson, & Murphy (1974) and Remus (1986) for a more detailed discussion), two distinctive types of external validity should be considered when evaluating the appropriateness of using student subjects: “effect application” and “theory application” (Calder, Phillips, & Tybout, 1981). Specifically, ‘effect application’ research aims to generalize insights that are directly applicable in real world settings, whereas ‘theory application’ research aims to advance scientific theory and enhance our understanding of phenomena observed in the real world. For ‘theory application’ research, using student subjects serves the purpose of advancing our understanding of real work phenomena (Calder et al., 1981; Calder, Phillips, & Tybout, 1982; Calder & Tybout, 1999) – in our case, understanding the escalation phenomenon. In addition, our experiment was highly de-contextualized and subjects did not need to have in-depth knowledge of software technology or project management; in other words, only basic knowledge was required for subjects to interpret our manipulations (performance appraisal) and understand the project context (e.g., database queries and e-commerce system). Thus, while the subjects in our experiment were university students, the

scenario was customized to depict a situation that they could reasonably project themselves into. Moreover, since these were students majoring in Information Systems taking upper level courses, we have good reason to believe they possessed the background to interpret and process our experimental scenario.

Lastly, we manipulated praise- vs. criticism-based appraisal in a simple way in order to maximize its effects and to control for potential confounding factors. However, a previous performance appraisal study found that negative effects associated with criticism tend to disappear when criticism is offered on a specific behavior and along with possible remedies for improvement (Miner, 1975). Thus, one direction for future research is to investigate how the relationships between praise- vs. criticism- based appraisal and escalation change when criticism is offered in different ways.

### **Conclusion**

Escalation of commitment is a management problem that negatively affects IT projects, causing a delay in project schedule and budget or sometimes project failure. Through a laboratory experiment, we found strong evidence for how performance appraisal may influence individuals' decision of whether or not to continue a troubled task in an IT project. Our findings suggest that individuals are more likely to escalate their commitment to a troubled task when: (1) they receive criticism-based as opposed to praise-based appraisal and (2) a relative rating appraisal is used to convey performance feedback as opposed to an absolute rating appraisal. We also found that proving goal orientation and avoiding goal orientation, as well as risk propensity, play important mediating roles in the relationships between performance appraisal and task level escalation.

## Appendix 5-A

### Scenario and Manipulations

Three months ago, you were hired as a student intern in the information technology (IT) department at Electro Lions, a large retailer of consumer electronics. You were one of six student interns hired to work on a new IT project at Electro Lions. The project, if successfully completed, is expected to deliver a lucrative e-commerce system. You have already completed several assignments related to the project, and for your current assignment your boss (the project manager) asked you to develop a number of database queries that would allow users to search for information within the system.

[Absolute]

At the beginning of your internship, you were told that each intern assigned to this project would be evaluated based on an absolute rating that is independent of the performance of other interns. Further, you were told that there would be quarterly performance appraisal meetings with your boss. Your hope is to land a full-time job with this company following your internship.

[Relative]

At the beginning of your internship, you were told that each intern assigned to this project would be evaluated based on a relative ranking of his or her performance in comparison to the performance of other interns. Further, you were told that there would be quarterly performance appraisal meetings with your boss. Your hope is to land a full-time job with this company following your internship.

A week ago, you had your first performance appraisal meeting.

[Absolute/Praise] Your boss was very pleased with your performance on the previous assignments related to the project. During the appraisal he went out of his way to praise your performance without any reference to how your performance compared to that of the other interns.

[Absolute/Criticism] Your boss was very critical of your performance on the previous assignments related to the project. During the appraisal he went out of his way to criticize your performance without any reference to how your performance compared to that of the other interns.

[Comparative/Praise] Your boss was very pleased with your performance on the previous assignments related to the project. During the appraisal, he went out of his way to praise your performance showing how your performance compared to the other interns.

[Comparative/Criticism] Your boss was very critical of your performance on the previous assignments related to the project. During the appraisal, he went out of his way to criticize your performance showing how your performance compared to the other interns.

Today, in reviewing your queries for the current assignment you discovered several errors and suddenly realized that you had completely misunderstood what needed to be done. Given the tight timeline for your deliverable, if you attempt to fix the problem on your own there is a 75% chance that you will be the cause of a delay in the overall project and that this will jeopardize any chance you have for converting the internship into a permanent job offer.

Now you are faced with a decision of whether to continue to work on this assignment with the goal of fixing your queries in a timely manner, or to contact your boss and ask for his help to fix the queries for you. Now, please indicate your decision of whether or not to continue to work on this assignment or to ask your boss to fix the queries for you.

## Appendix 5-B

### Constructs and Measurement Items

Construct	Measurement Items		Sources
Escalation	esc1	I would continue to work on fixing the queries on my own.	(Garland, 1990; Keil et al., 2000b)
	esc2	I would choose to work on this assignment on my own with the goal of fixing the queries in a timely manner.	
Proving goal	prove1	It is important to me to show to my boss that I am better than the other interns.	(Elliot & Church, 1997; Wang & Takeuchi, 2007)
	prove2	My goal is to get a better performance evaluation than the other interns.	
	prove3	I am striving to prove my ability to my boss relative to the other interns.	
	prove4	I am motivated by the thought of proving my ability to my boss by outperforming the other interns.	
	prove5	It is important to me to get a better performance evaluation from my boss compared to the other interns.	
	prove6	I want to do well on this internship project to show my ability to my boss and others.	
Avoiding goal	avoid1	The thought of getting a bad evaluation from my boss concerns me.	(Elliot & Church, 1997; Wang & Takeuchi, 2007)
	avoid2	I worry about the possibility of getting a bad performance evaluation from my boss.	
	avoid3	My fear of performing poorly on this internship project is what motivates me.	
	avoid4	I want to avoid doing poorly in this internship project.	
	avoid5	I'm afraid that if I do poorly on the assignments in this	

		internship project, my boss might not think I'm very competent.	
	avoid6	I wish I could avoid having to be evaluated on my internship performance.	
Risk propensity	risk1	I choose a risky alternative which could have a major impact on my future employment opportunity.	(Sitkin & Weingart, 1995)
	risk2	I choose an action that has the potential to backfire.	
Self-esteem	esteem1	I feel that I would be able to do things as well as most other interns working on the project.	(Robins et al., 2001)
Self-efficacy	eff1	I believe that I could fix my queries in a timely manner.	(Whyte et al., 1997)
	eff2	I am confident that I would be able to turn around this situation and finish the assignment in a timely manner.	
Fear of failure	fear1	I am worried that my future employment opportunities will depend on how I perform on this assignment.	(Houston & Kelly, 1987)
	fear1	I am worried that my performance on this assignment could negatively affect my ability to get a full time job with the company.	



## Chapter 6 Conclusion

Escalation of commitment is a costly problem that has been observed in a variety of settings, including bank loans (Staw et al., 1997), corporate bidding wars (Bazerman, 1999), hiring and promotion decisions (Schoorman, 1988), warfare (Brafman & Brafman, 2008), and IT projects (Keil, 1995; Keil et al., 2000a). While several explanations have been offered as to what causes individuals to continue a failing course of action, prior research has largely ignored an element that is integral to understanding escalation behavior: namely, goals. My dissertation addresses this theoretical gap by draw on goal setting and goal orientation theories. This was accomplished by focusing on three elements that are central to goal setting theory (goal difficulty, goal specific, and goal source), and investigating their effects on escalation of commitment (Essays 1 & 2). Further, I investigated the role of individuals' goal orientations (learning, performance-proving, and performance avoiding goal orientations) in shaping escalation behavior (Essays 3&4). Through four essays that each involved one or more studies (laboratory experiments), my dissertation provides strong empirical evidence that goals can indeed play a significant role in escalation of commitment across a variety of different task contexts (including IT and non-IT) – a summary of the major findings of each essay is shown in Table 6-1. In remainder of this chapter, I discuss the contributions of my dissertation to research and practice, limitations, and directions for future research.

Essay 1	<ul style="list-style-type: none"><li>• Goal difficulty has a curvilinear relationship with escalation of commitment, and this effect is significant above and beyond the goal-feedback discrepancy, suggesting that there is a goal-related psychological mechanism governing this relationship.</li><li>• Goal difficulty influences goal valence and expectancy beliefs which subsequently shape individuals' commitment to their goals following negative feedback; ultimately, it is commitment to goals that leads to recommitment to a failing course of action.</li><li>• Self-set goals compared with inherited goals lead to a greater willingness to</li></ul>
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	continue a failing course of action.
Essay 2	<ul style="list-style-type: none"> <li>• An extremely difficult budget and schedule goal has a negative effect on willingness to continue a troubled project, and this effect is significant above and beyond the sunk cost effect (experimentally controlled), and the project completion effect (statistically controlled).</li> <li>• A specific budget and schedule goal has a negative effect on willingness to continue a troubled project, and this effect can be explained from the mental budgeting perspective, rather than the goal setting theory perspective.</li> <li>• Initial commitment to a budget and schedule goal has a positive effect and interaction effects with goal difficulty and goal specificity on willingness to continue a troubled project.</li> </ul>
Essay 3	<ul style="list-style-type: none"> <li>• A learning goal orientation leads to a greater willingness to continue a failing course of action compared to a performance goal orientation, and this relationship is mediated by anticipated regret and perceived likelihood of success.</li> <li>• Temporal orientation moderates the relationship between goal orientation and escalation of commitment, such that the effect of goal orientation on escalation of commitment is weakened as temporal orientation shifts from the future to the past.</li> </ul>
Essay 4	<ul style="list-style-type: none"> <li>• Criticism-based appraisal leads to a greater willingness to continue a troubled task in an IT project than praise-based appraisal, and this effect is mediated by proving goal orientation and risk propensity.</li> <li>• Relative rating appraisal leads to a greater willingness to continue a troubled task in an IT project than absolute rating appraisal, and this effect is mediated by proving goal orientation and avoiding goal orientation.</li> </ul>

**Table 6-1 A Summary of the Major Findings**

### **Contributions to Research**

#### **Goal Setting and Escalation of Commitment**

One key contribution of this dissertation lies in establishing the connections between initial goal setting and escalation of commitment. Generally, escalation of commitment is known to involve at least two distinct temporal phases: 1) initiating a course of action with some goal in mind (T1), and 2) deciding whether or not to continue a previous course of action despite negative feedback (T2). This dissertation represents the first set of empirical studies designed to investigate systematically various aspects of initial goals (T1) and their effects on escalation decisions that occur at a later point in time (T2). Specifically, the findings of this dissertation

suggest that initial goals set at the beginning of a course of action can vary in terms of their difficulty, specificity, and sources, and this can, in turn, set the stage for escalation behavior.

Further, this dissertation makes another important contribution by conceptualizing three distinct goal sources that can be associated with escalation situations: self-set goals, assigned goals, and inherited goals. Prior goal setting research found that goals can be either self-set, or assigned. However, focusing on the distinct temporal phases (T1 & T2) associated with escalation situations this dissertation conceptualizes a third and new type of goal source: inherited goals (i.e., a goal that was set and which failed to be attained by a predecessor in T1, and is inherited by another individual in T2). In addition, this dissertation critically examined alternative perspectives regarding the relationships between initial goal setting and escalation of commitment: including the sunk cost perspective for the relationship between goal difficulty and escalation, the mental budgeting perspective for the relationship between goal specificity and escalation, and the personal responsibility perspective for the relationship between goal source and escalation. This allowed me to provide a more nuanced and complete understanding of how initial goals influence escalation of commitment.

### **Goal Orientation and Escalation of Commitment**

This dissertation makes a significant contribution to escalation research by demonstrating that individuals look forward to achieve a certain goal (e.g., learning) in escalation situations and this motivates individuals to continue a failing course of action. Prior escalation has alluded to the role of prospective thinking (i.e., looking forward) in escalation of commitment (e.g., project completion levels and anticipated regret), and this dissertation represents the first empirical investigation into why and how individuals look forward in escalation situations. Further, this research integrates temporal orientation in theorizing and examining the relationships between

goal orientation and escalation of commitment; thus providing a more nuanced understanding of how temporal thinking, which is inherent in goal orientation, influences escalation decisions. Another contribution of this dissertation lies in establishing the connections between performance appraisal and escalation of commitment. With the exception of agency theory, escalation of commitment has not been examined from the perspective of inter-personal interactions between the agent and the principal. This dissertation suggests that performance appraisal is an important element in establishing inter-personal relationships between a project team member and his or her supervisor, and can thus have a significant influence on individuals' performance goal orientations and subsequently escalation decisions.

### **Contributions to Practice**

Goal setting and learning goal orientation are generally viewed as effective managerial tactics that induce greater effort and produce higher levels of task performance (DeShon & Gillespie, 2005). However, this dissertation underscores potential side effects that are associated with goal setting and learning goal orientation, namely becoming overly committed to a failing course of action. Indeed, Ordóñez, et al. (2009) suggest that goal setting “may cause systematic problems in organizations due to narrowed focus, increased risk taking, unethical behavior, inhibited learning, decreased cooperation, and decreased intrinsic motivation” (p. 14). In a similar vein, DeShon and Gillespie (2005) suggest that while it is generally believed that a learning goal orientation results in positive outcomes, there is a lack of empirical research supporting this. In this regard, my dissertation underscores the fact that goal setting may sometimes produce unintended consequences, and that challenging goals or learning goal orientations do not always lead to positive outcomes. Thus, I suggest that managers should not

treat goal setting or goal orientation as an all-purpose remedy for employee motivation, and instead use goal setting and goal orientation with caution.

### **Limitations**

Like any other research, this dissertation is not without limitations. My dissertation is based on laboratory experiments, and this may limit my ability to generalize the findings of this dissertation to organizational settings. While laboratory experiments are strong in terms of testing causal relationships in a highly controlled setting (internal validity), they may not effectively replicate the complexities of real organizational settings (external validity). As a result, this dissertation necessarily trades off internal validity for external validity to some extent. Nevertheless, my dissertation is strong in terms of analytic (not statistical) generalization, and I believe that the findings of this dissertation can be meaningfully generalized to a broad body of theories; including goal setting theory, goal orientation theory, and escalation of commitment.

### **Directions for Future Research**

Future research on escalation of commitment should consider strategies and tactics that decision makers can use to break over-commitment to a failing course of action – i.e., induce de-escalation of commitment. One avenue for de-escalation research would be to adopt a goal perspective. Specifically, while initial goals can set the stage for escalation behavior, I suggest that their effects can be attenuated by allowing individuals to revise the initial goals. For example, while individuals may become locked into a failing course of action due to difficult goals that are set at the beginning of a course of action, the escalation trap can be avoided if individuals are given opportunities to revise these initial goals. In fact, prior goal setting research found that individuals can adapt and revise their goals in a more realistic manner when they have access to performance feedback (Donovan & Williams, 2003).

Another avenue for future research is to investigate how learning-oriented organizations vs. performance-oriented organizations influence IT project escalation. While goal orientation is conceptualized at the individual level in this dissertation, organization culture may imbue organizations with similar types of goal orientations. Especially, many IT organizations or companies encourage innovation and learning, thus they may be indeed highly learning-oriented. Therefore, it may be fruitful to conceptualize goal orientation at the organizational level, and investigate the effects on employees' escalation of commitment behavior.

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