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**An Examination of the Deaf Effect Response to Bad News Reporting in
Information Systems Projects**

BY

Michael John Cuellar

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
2008

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ACCEPTANCE

This dissertation was prepared under the direction of the candidate'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 Doctor in Philosophy in Business Administration in the Robinson College of Business of Georgia State University.

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Dr. H. Jeff Smith

ABSTRACT

An Examination of the Deaf Effect Response to Bad News Reporting in Information Systems Project

By

Michael John Cuellar

04/01/2009

Committee Chair: Dr. Mark Keil

Major Department: Computer Information Systems

Information systems project management has historically been a problematic area. One of the reasons for this has been the issue of escalation where resources continue to be committed to a failing course of action. While many causes of escalation have been proposed, this dissertation investigates one possible cause: that the project manager may not hear, ignores or overrules a report of bad news to continue a failing course of action: the Deaf Effect response to bad news reporting. This effect has not been previously studied within the information systems literature. In this dissertation, the Deaf Effect is examined through a series of three laboratory experiments and a case study. It finds that in a conducive environment, where the bad news reporter is not seen as credible, and the risk of project failure is seen as low, decision makers tend to view the report of bad news as irrelevant and thus ignore or overrule the report of bad news and continue the current course of action. Role Prescription of the bad news reporter, illusion of control and a perception of a highly politicized environment are factors that also increase the occurrence of the Deaf Effect.

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1 INTRODUCTION

1.1 MOTIVATION

Information systems (IS) project management has historically been a problematic area. IS projects frequently fail and are notorious for going significantly over budget and falling behind schedule. The Standish Group, a Massachusetts-based consulting organization, reports that while software productivity has improved over the past 12 years, software “value” is still only 59 cents per dollar spent. Nineteen percent (19%) of projects still fail outright and 46% have cost or time overruns or don’t meet the customer’s needs (Rubenstein 2007). In some cases, mismanagement of software projects means that they escalate out of control, continuing to absorb valuable resources without ever delivering benefits to the organizations that undertake them (Keil 1995). A survey sponsored by the Information Systems Audit and Control Association (ISACA) found that 30–40% of all software projects undergo some degree of project escalation (Keil and Mann 1997).

This escalation of commitment to a failing course of action is a well-known phenomenon in software project management and considerable work has been done to gain a better understanding of why executives continue to commit resources in the face of negative signals about the status of projects (Depledge 2003; Keil 1995; Keil and Flatto 1999; Keil, Tan, Wei, Saarinen, Tuunainen and Wassenaar 2000b; Ross and Staw 1993; Staw 1976; Staw 1981). While many explanations have been explored, recent work has focused on the communication failures that occur within organizations and how these may contribute to the escalation of commitment. A small, but growing number of studies have examined the so-called “Mum Effect” (Keil and Robey 1999; Keil and Robey 2001), or the reluctance to report bad news. In addition, Keil and Robey (1999, 2001) coined the term “Deaf Effect” suggesting that executives’ refusal to hear bad news might also promote escalation. That is, for reasons that are not well understood, executives may (consciously or unconsciously) ignore bad news even when those who report to them are bold enough to transmit the message. In those cases, it is important to know why senior management did not heed those who warned them that the project was in danger of failing.

Incidences of projects in which the Deaf Effect has occurred are numerous and involve serious failures. Perhaps the most notorious is that of the Challenger Disaster (Hauptman and Iwaki 1990) in which a group of engineers attempted to signal to their management that there would be failure of space shuttle solid rocket boosters if the shuttle launched at a low temperature. Their objections were ignored resulting in the destruction of the Challenger and the deaths of seven astronauts. In the management literature, Wissema (2002) records 14 cases of failure to attend to signals of impending failure which resulted in failures of executive succession and appointment, product development, acquisitions, diversification, internationalization and other actions. In the information systems literature, Keil and Robey(2001) documented three instances in which auditors attempting to report troubled projects encountered the Deaf Effect. In another prominent failure, the UK Child Support Agency (CSA) spent 456 million GBP to develop an enterprise support system which they deployed despite 40 audits of which 28 identified serious concerns and which had at implementation 52 known critical defects (Computer.Business.Review 2006). The defects in the system resulted in creation of over 600 workarounds (ZDNet.co.uk 2006), an increase in complaints from clients of 50% (McCue 2004) and 36,000 cases being “stuck” in the system and requiring manual processing outside of the system (ZDNet.co.uk 2006). The chairman of the Public

Accounts committee referring to this project said, “Ignoring ample warnings, the DPW [Department for Works and Pensions], the CSA and IT contractor EDS introduced a large, complex IT system at the same time as restructuring the Agency. The new system . . . stumbled and now has enormous operational difficulties” (ZDNet.co.uk 2006). This disastrous system failure eventually resulted in the shutdown of the agency. Finally, the Denver International Airport baggage handling system is another example of where the Deaf Effect occurred. This new airport opened 16 months and \$2 billion over budget due to the failure of the automated baggage handling system development effort. During the development of this system, “[the baggage handling system development contractor] told them from the beginning that they were going to need at least one more year to get the system up and running but no one wanted to hear that” (Montealegre and Keil 2000,p.433). It wasn’t until the baggage system test failed completely that it was recognized that the system would not be available as planned (Montealegre and Keil 2000).

Failures involving the Deaf Effect thus represent a serious problem. Refusal to act on reports of bad news can result not only in loss of time and money but waste of resources and even in the failure of the organization. Thus it is important that the mechanisms that cause this effect be identified and conditions that predispose this effect to occur be identified so that practitioners can take action to insure that reports of bad news are attended to. To this point, the IS and management research disciplines have not devoted much effort to the study of this phenomenon.

The contribution of this dissertation is to provide the first systematic study of the Deaf Effect by developing and empirically testing an individual level model of how the Deaf Effect might occur and investigating a project status reporting system to identify organizational conditions that might inhibit or encourage the Deaf Effect. It is organized as follows: this chapter provides a summary of the background literature on the Deaf Effect.. Chapters 2 through 4 present the results of three laboratory experiments that develop and test the model. Chapter 5 reports the results of an exploratory case study of a state government project reporting system.

This chapter is organized as follows. First literature on project escalation and the Deaf Effect is reviewed to provide a historical and theoretical background to the study. Second, the Deaf Effect is defined and placed within that literature. It closes with descriptions of the four studies that comprise this dissertation.

1.2 REVIEW OF THE ESCALATION LITERATURE

In this section, I review the project escalation literature. Staw (1997) has provided a review of the literature up to that point in time. The discussion that follows summarizes that review and provides additional information from the literature subsequent to 1997.

Escalation has been defined as

“[a situation] where losses have been suffered, where there is an opportunity to persist or withdraw, and where the consequences of these actions are uncertain” (Staw 1997).

The general pattern of escalation that we see has been described by Staw (1997) as a tendency to become locked into escalation situations: to throw good money after bad. It is not a singular decision but rather a persistent course of action. This escalation course of action was found in a number of studies, e.g. Staw (1976), Teger (1980), Brockner and Rubin (1985), Arkes and Blumer (1985). However, it does not always occur.

Sometimes withdrawal occurs (McCain 1986). When there are alternatives that are clearly superior, or clear-cut financial information is available, withdrawal will occur (Bowen 1987; Northcraft and Neale 1986; Northcraft and Wolf 1984).

Escalation is not solely an IS related phenomenon. What makes it significant within the IS realm is the nature of information systems projects. Information systems are intangible objects and information systems projects are complex undertakings. Therefore the progress of an information systems development project is often not obvious upon inspection. This leads to considerable uncertainty as to the status of a project even to the participants. Additionally the nature of information systems development as a service leads to difficulties in understanding the nature of projects. The creation of a service arrangement, such as an IT development project, is a transaction that requires an exchange of information between the customer, and the service provider in order to define the service to be performed (Chesbrough and Spohrer 2006). This knowledge is likely to be tacit and difficult to transfer and even when the transfer has occurred it would be difficult for any one person to have a comprehensive understanding of a project. Thus different participants might have different conceptions of the goal of the project and thus different views of the progress toward reaching those goals. The intangibility of the product, the complexity of the activity and the service nature of the arrangement all make IS project governance especially challenging and subject to escalation.

Staw (1997) believes that escalation is a multi-determined outcome. That is it is not the result of a single causal factor but rather is the result of multiple forces operating at multiple levels of analysis. Individuals facing escalation situations do so in the face of social and/or organizational forces that surround them.

Staw and Ross (1987; 1989) have developed a classification system for escalation causes. They divide these causes into different categories dealing with level of analysis. Keil (1995), and Newman and Sabherwal (1996), following Staw and Ross, sort causes of escalation into the same categories. The section that follows discusses the literature that falls into each category.

1.2.1 Project Determinants

These are objective features of a project that affect the financial value or utility of a course of action. These include the size of the goal or payoff (Rubin and Brockner 1975), level of costs required to achieve the goal (Brockner, Rubin and Lang 1981), the availability of alternatives (Northcraft and Neale 1986) salvage value (Northcraft and Wolf 1984), and the presence of lock-in conditions (a high cost of withdrawal, little salvage value and high up front expenses already incurred).

An additional project determinant is the presence of real options. A project has real options when the managers have the opportunity but not the obligation to adjust the future direction of the project in response to external or internal events. Escalation may occur as a response to real options embedded in a project. Managers may opt to continue because they value the options and thus increase the value of the project over that reported by a strict financial analysis. Second, they value strategic options such as the opportunity to pursue new strategic options rather than simple operational options more highly (Tiwana, Keil and Fichman 2006).

1.2.2 Psychological Determinants

Psychological determinants are elements of the decision maker's psychological makeup or responses to situations that might cause escalation. For example:

Optimism and illusion of control. These are biases that distort the evaluation of situations. Optimism leads the decision maker to overestimate the possibility of positive events occurring. For example, executives who view themselves as very competent tend to take more risks (Krueger and Dickson 1994). Illusion of control is held to underlie such optimism (Staw 1997). Illusion of control has been defined as an expectancy of a personal success probability inappropriately higher than the objective probability would warrant (Langer 1975). This belief may be based on their perception of their own competence or of their special skills. Langer and Roth (1975) found that success bred a belief in their skill in subjects while lack of success lead to the opposite conclusion. This illusion of control or skill leads to distortions in perception or expectations of the project. Keil, Depledge and Rai (2007) in a role playing experiment, found a significant inverse relationship between problem recognition and escalation and that selective perception and illusion of control were found to significantly affect both problem recognition and escalation.

Self-justification. Self-justification is one of the oldest explanations for escalation. The idea behind this concept is that once a decision is made the decision maker will not only distort information but change behaviors to rationalize their decision (Staw 1976). Personal responsibility is a key factor in this explanation. Without a sense of responsibility for the solution, there is no reason for self-justification (Whyte 1986)

Framing Effects. Prospect theory (Kahneman and Tversky 1982) suggests that people don't have the same risk preferences for positive and negative outcomes. When the decision is framed as a choice between positive outcomes, decision makers become risk averse. In the opposite case, they become risk-accepting attempting to eliminate the loss by taking a gamble on a better outcome. Whyte (1986) suggested that prospect theory provided an explanation for escalation in the absence of personal responsibility. Sharp and Salter (1997) found that the same framing effects occurred in both North American and Asian subjects.

Sunk Cost Effects. In this stream of literature, it is recognized that sunk costs, those costs expended that cannot be recovered, may trigger a psychological response for decision makers to attempt to recover past expenditures through further commitment of resources. Arkes and Blumer (1985) with further studies by Garland and colleagues (1990; 1991) found that sunk costs influence decision makers over time. This applied to both project continuation and resource allocation decisions.

However, later studies found that in project completion decisions, it might be that sunk costs are only effective when accompanied by substantial project completion. Conlon and Garland (1993) found that information about project completion influences allocation decisions to a far greater extent than does sunk costs. Keil, Truex and Mixon (1995), in a qualitative analysis of explanations for decisions made in a laboratory experiment, found that sunk cost was given as a rationale three times more than completion status. Boehne and Paese (2000) found a strong project completion effect. That is that as a project nears completion, the goal of completing the project overrides economic considerations and even accountability. They found no support for sunk cost effects on escalation and suggest that in a project context, previous sunk cost effects (Arkes and Blumer 1985; Garland 1990; Garland and Newport 1991) were a confound with the completion effect. Project completion was not a total explanation, as some of the subjects decided to kill the project based on failure to meet profitability goals. Moon (2001) also found that there is an interaction effect between sunk cost and level of completion. At high levels of completion, the effect of sunk cost approached an exponential curve as the level of completion increased. Humphrey, Moon, Conlon, and Hofmann (2004) in laboratory

experiment and an archival field study of the road construction industry found results that support the Moon study. As a task approached completion, task completion is rated as increasingly important and economic motives as less important. Keil, Mann and Rai (2000a) found that the completion effect was a better classifier of projects that escalated than models constructed from self-justification, prospect theory and agency theory.

Financial and Mental budgets. Financial and mental budgets (Heath 1995; Tan and Yates 2002) have also been found to have a de-escalating effect on monetary based decisions. People tend to set budgets for projects and resist exceeding them. Escalation was only likely to occur when there was no budget or expenses were difficult to track.

Perceived Risk and Risk Propensity. Perceived risk is shaped more by perceived downside potential than the actual probability of failure. An individual's willingness to pursue a risky project appears to be influenced more by risk perception than any innate propensity to take or avoid risks (Keil and Wallace 2000). Wong (2005) found that risk propensity had a direct effect on escalation and was only partially mediated by risk perception.

1.2.3 Social Determinants

Social elements are those elements of the environment in which the nature of social structures influence the decision process.

External Justification and Binding. Staw (1997) indicates that the social environment may affect decision makers behavior through a number of mechanisms. There may be social costs for withdrawal. By advocating the termination or redirection of the project, they may lose face or be viewed as incompetent. Similarly, the decision maker in seeking to demonstrate competence may decide to continue on with the project. A highly politicized environment may make terminating the project infeasible given the desire to maintain their position. Accountability to others can be as important as the need to internally rationalize their decision. Managers may hesitate to recognize losing projects when their external reputations are at risk and when information about a project's performance is not widely known. This indicates that commitment to a project is not an isolated affair (Staw 1997).

Leadership Norms. Leadership norms may influence a decision to continue a failing course of action. There may be social rewards for persistence on a project so as to turn a losing project into a winner. If being consistent and successful is strongly valued in the society or organization then persistence in the face of a losing project may be viewed as the appropriate behavior (Staw 1997).

Groupthink. Groupthink, when a group of people share opinions and assess situations in the same manner (Wissema 2002), is a social characteristic that could lead to escalation. Groupthink forms when a homogenous team is unchanged for a long period (Hambrick and Mason 1984; Wissema 2002). Groupthink tends to cause rigidity of response which is acceptable for routine problems but leads to difficulties when the decision making team encounters novel or ill-defined problems (Fillee, House and Kerr 1976; Janis 1972). Groupthink may also be exacerbated by the presence of "yes-men." Managers might surround themselves with those who agree with them. The "yes-men" filter out messages that disagree with the situation as perceived by the managers, thus preventing the message from reaching the decision makers with the consequence that bad news reports are not acted on (Dunbar and Goldberg 1978). This not only reinforces the groupthink, but also leads to a situation in which management perceives the situation much differently from those at a lower level in the organization.

1.2.4 Organizational Determinants

These determinants are aspects of the organization that influence the decision making process.

Institutional inertia. Organizations have imperfect sensory systems making them impervious to changes. They are therefore slow to respond to external stimuli. Missing cues as to failing projects may result in escalation. Similarly, political resistance to the idea of terminating or redirecting a project may result in escalation. Similarly an organization's identification with a product or project can make withdrawal unthinkable (Staw 1997).

Agency situations. Agency theory (Eisenhardt 1989) suggests that managers (principals) have imperfect information about the activities of project managers (agents). They are subject to the risks of adverse selection (a subordinate misrepresenting their capabilities for a position) and moral hazard (the subordinate shirking their responsibilities to the principal or acting in their own interests instead of those of the principal). Studies have shown that agency effects may cause escalation. Where adverse selection exists, managers who initiated a project and become associated with the results of that project will tend to continue that project. Information asymmetry and an incentive to shirk must exist for this to occur. (Harrison and Harrell 1993). Under conditions for moral hazard, IS practitioners tended to implement a system with quality problems. However, this is modified by ethical considerations: moral equity (what is right) and relativism (is the behavior acceptable in this ethical context) considerations (Tuttle, Harrell and Harrison 1997). Sharp and Salter (1997) found that agency theory had a strong explanatory capability in North American subjects, but not for Asian subjects.

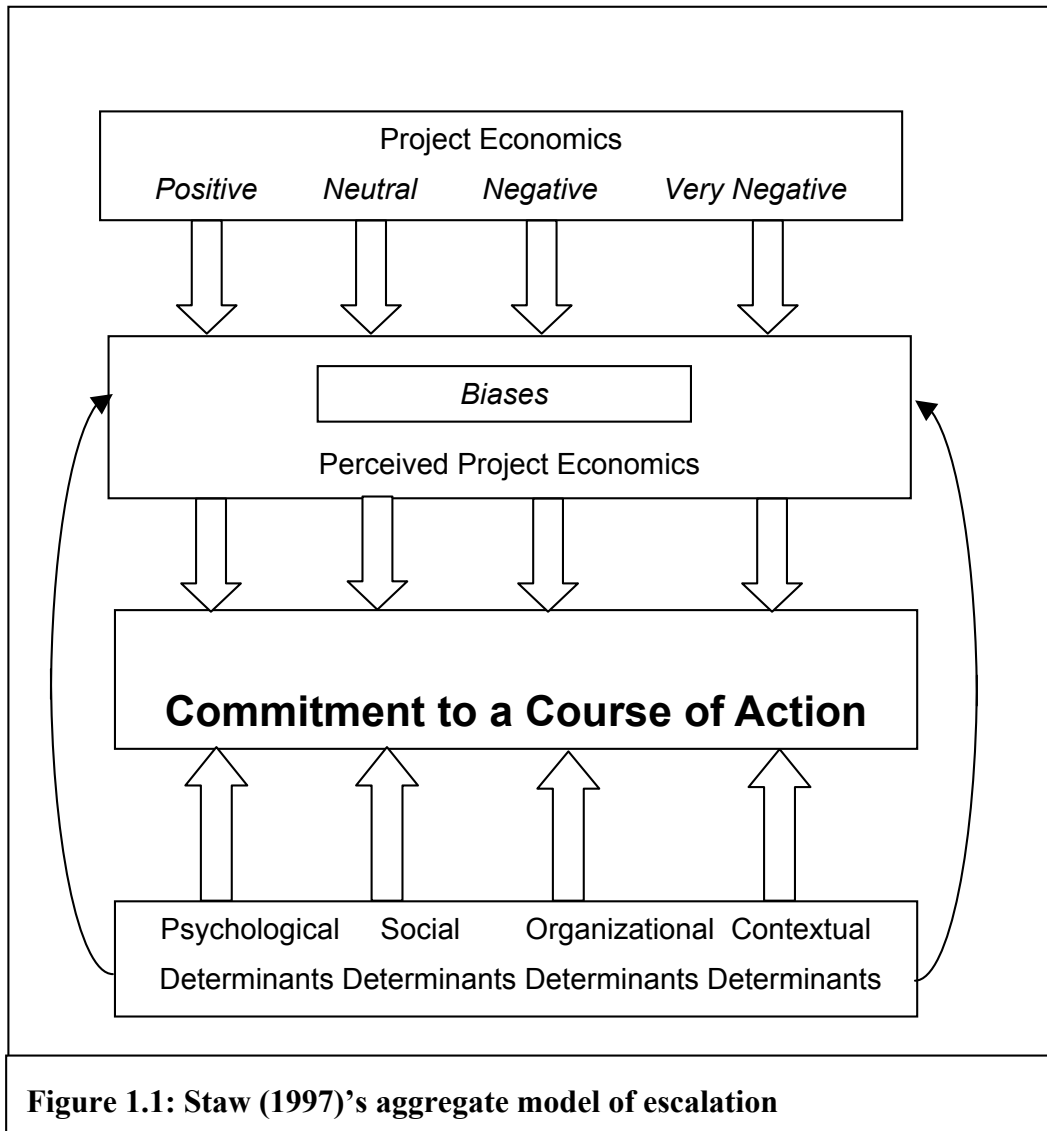
Organization Structure and Values. An unclear organizational structure or weak culture could also lead to escalation (Wissema 2002). Where there is an unclear division of responsibilities, signals indicating problems in a project can be missed as managers assume that others are attending to those signals. Alternately, one manager may be overwhelmed and ignore the signal or another may simply pass it on to that manager. Similarly, where there is a weak culture, the signal may be lost in wrangling over how to respond or who is to respond to the signal.

1.2.5 Contextual Determinants

Finally, Staw (1997) indicates that extra organizational influences may cause escalation. For example, in the case of the Shoreham nuclear reactor project, there was external pressure from the Federal Department of Energy and various pro-nuclear groups for continuance of the project against the effects of anti-nuclear activist groups (Ross and Staw 1993).

1.3 MODELS OF ESCALATION

Four different attempts have been made at creating a model to describe escalation. The first, was a temporal model of escalation described in Ross and Staw (1986). It was a stage model in which there were three stages to escalation: 1) Beginning the course of action; 2) Receiving questionable or negative results and 3) Receiving highly negative results. In each phase psychological and social forces were described as holding the decision makers in place in the current course of action. This model did not receive much empirical support (Staw 1997) and Staw (1997) proposed an alternative “aggregate” model (figure 1.1).



Staw's model portrays commitment to a course of action as the result of behavioral variables interacting with perceived project economics. The behavioral variables in addition to directly affecting the commitment to a course of action also influence how the

decision maker sees the project economics. Commitment is held to be the balancing of forces between negative economic data and the behavior variables. The key assumption is that “the behavioral forces must match or exceed the strength of any negative economic data in order to hold [decision makers] in a failing course of action” (Staw 1997, p. 209).

In an unpublished conference article, Royer (2002) proposed an eight phase process-oriented model of both escalation and de-escalation based on two case studies. Royer’s model includes four escalation phases: (i) blindly going on, (ii) relentlessness, (iii) diagnosis, and (iv) verification.

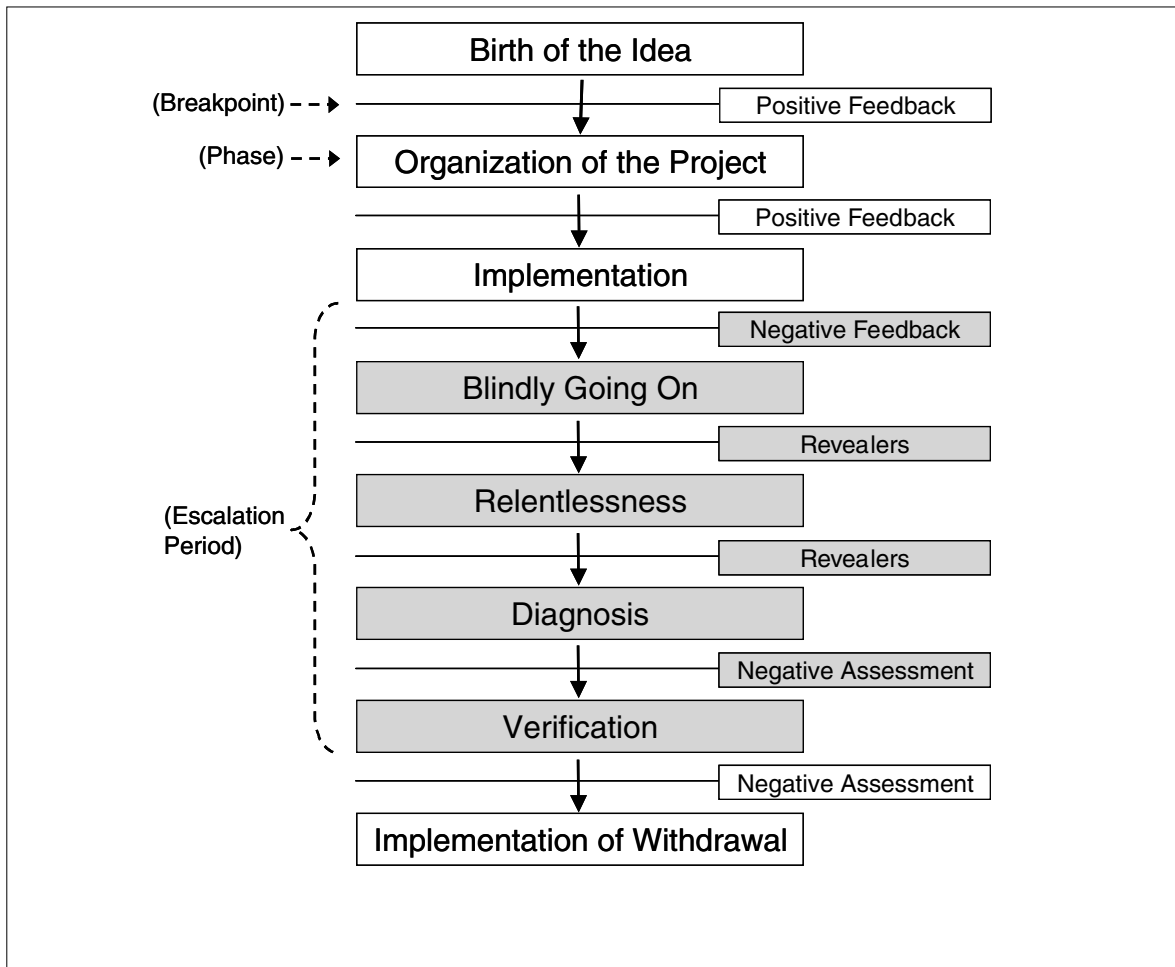


Figure 1.2: Royer’s (2002) Escalation Process Model from Mahring and Keil (2008).

Royer based her model on the concept of collective belief. Her model accounts for the rise of collective belief in a project, its persistence through bad news and then provides for the de-escalation of the project. Escalation is held to arise when the collective belief in the success of a project persists through negative feedback. Factors that account for this persistence include groupthink and cognitive biases. Only when the collective belief is broken down through the presence of revealers or entrance of actors outside the collective who don’t hold to the belief challenging the groupthink will escalation occur.

Mahring and Keil (2008) proposed a process model of escalation (figure 1.3). In this model, they argue that an escalating project begins with the framing of the project

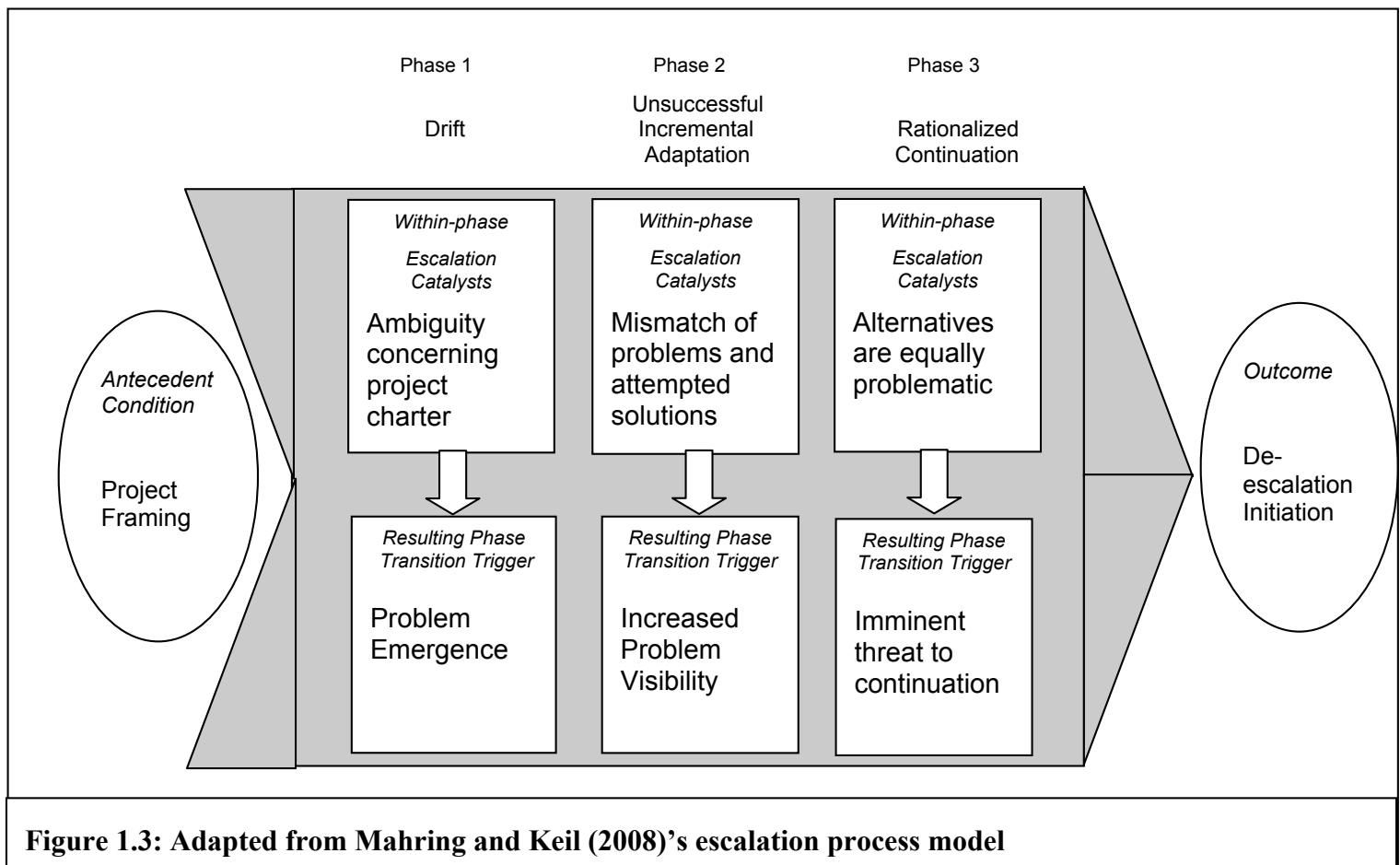


Figure 1.3: Adapted from Mahring and Keil (2008)'s escalation process model

which they describe as being ambiguous. This allows the project to drift until conflicts concerning goal and direction arise signaling problems in the project. Solutions are attempted without a change in direction but the solutions attempted don't match the problems resulting in increasing problem visibility. This results in a movement to the third stage in which the problems and problem continuation are rationalized. This continues until the rationalizations lose their credibility at which point de-escalation is enacted.

1.4 DE-ESCALATION STUDIES

Staw (1997) does not include de-escalation studies within his classification scheme. De-escalation studies have investigated how projects have or can be de-escalated. These studies are of interest to this dissertation since the Deaf Effect can be considered a failure to de-escalate. Knowing the conditions under which de-escalation occurs may be enlightening to the study of why de-escalation does not occur.

Simonson and Staw (1992) found that a) making negative outcomes less threatening, b) setting minimum target levels that if not reached result in change of policy and c) evaluating decision makers on process rather than outcome were most effective in making decision makers more responsible to available evidence.

Montealegre and Keil (2000) found de-escalation is a gradual process vs. a sudden event. It is not random but a patterned sequence of events. De-escalation is a dynamic process that is simultaneously constricted by actions in the antecedent episode, yet capable of constructing new patterns of commitment to alternative courses of action. De-escalation is a four phase process – 1) problem recognition; 2) re-examination of previous course of action; 3) search for alternative solutions; 4) implementing an exit strategy. Phase 1 requires a clear understanding that there is a problem. There needs to be unambiguous signs of issues or external events that trigger a general reassessment of resource allocation and allow de-escalation to occur. The Deaf Effect would prevent any of these steps from being taken.

McNamara, Moon and Bromiley (2002) found that increased monitoring of decision makers and changing decision makers attenuated escalation in commercial lending decisions. However, this had second order effects in decision makers avoiding recognition of the problem in order to avoid increased scrutiny or loss of control of the account.

Heng, Tan and Wei (2003) found that in conditions of low sunk cost, superiors or peers who assisted in shouldering blame or providing assurance facilitated de-escalation of commitment to a course of action, However, in case of high sunk cost none of these options were effective.

Pan, Pan and Flynn (2004; Pan, Pan, Newman and Flynn 2006) investigated how a manager de-escalated commitment and turned around a government e-procurement project. In this project, the Deaf Effect occurred because the project manager was looking at the sunk cost already in the project. The project steering committee was unwilling to de-escalate the project because they feared reporting their problems to the cabinet deputy responsible for the area and additionally were unwilling to disappoint everybody involved in the project. Pan, et al. identified that the manager used the techniques of behavior disconfirmation, continuous commitment, provision of psychological safety, development of new attitudes and behaviors, and the alignment and integration of the new attitudes and behaviors to turn around the project. They subsequently recast these findings into an evaluation model of escalation and de-escalation in IS projects based on the theories of approach-avoidance conflict and punctuated equilibrium (Pan, et al. 2006). We see in this example, that organizational aspects such as perception of their management's expectations of their performance caused the project steering committee to continue escalation to this failing course of action.

1.5 COMMUNICATION ISSUES

Recently another stream of research has emerged subsequent to Staw (1997), to provide another explanation for project escalation: failures of communication. This line of research finds its inspiration in social psychology theory (O'Neal, Levine and Frank 1979; Tesser, Rosen and Conlee 1972) and the management theories of whistle blowing (Miceli and Near 1992) and organizational communication (Morrison and Milliken 2000). It has developed an approach to viewing escalation as being caused by a failure in the organizational communication systems used to report bad news about the project to the decision maker.

The literature in this section considers how organizational communication systems result in a) suppression of bad news reports (the Mum Effect) (Keil and Robey 1999; Keil and Robey 2001; Smith and Keil 2003; Smith, Keil and Depledge 2001), b) distortion of the

message in project status reporting or through intrusive supervision, or confrontational regulation (Athanassiades 1973; Smith, Iacovou and Thompson 2005) or, c) the refusal of the decision maker to heed the report of bad news (the Deaf Effect) (Keil and Robey 2001)

1.5.1 The Mum Effect.

The Mum Effect term was coined by Tesser and Rosen (1972), and the effect has been investigated in a number of escalation studies (Smith and Keil 2003; Smith, et al. 2001; Tan, Smith, Keil and Montealegre 2003). The model proposed by Smith and Keil (2003) holds that perceptions of project situations create an assessment that the status ought to be reported which in conjunction with personal ethical standards creates an assessment that the individual has a responsibility to report. Given the assessment of a responsibility to report, the potential reporter assesses the alternatives to reporting including the probability of retaliation etc. This final assessment leads to a decision to report or not report.

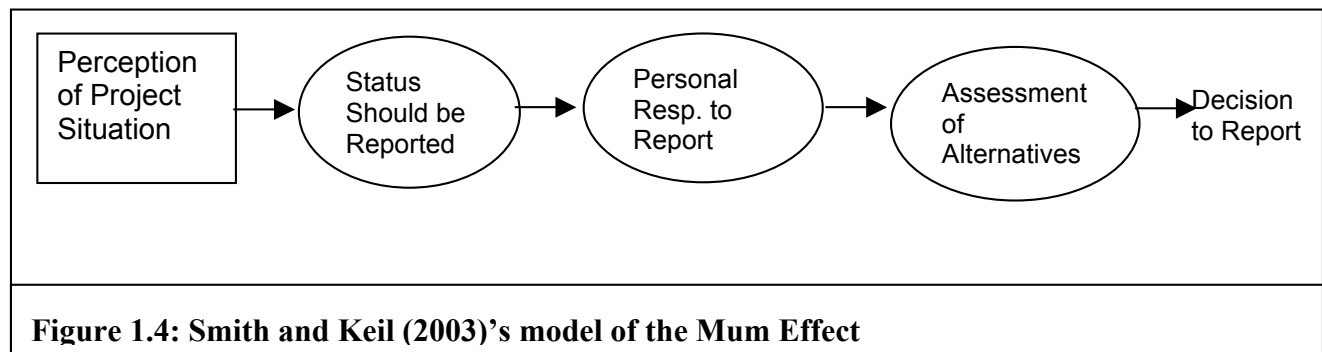


Figure 1.4: Smith and Keil (2003)'s model of the Mum Effect

1.5.2 Tourish and Robson's Theory

Tourish and Robson (2006) have recently proposed a theory that describes how critical upward communication is suppressed in organizations. Their theory (figure 1.5) argues that managers by means of the systems they set up or by their reactions suppress critical upward communication. They may simply ignore critical communications, question it more severely than supportive messages or may have information systems that filter out critical message. Thus, they consciously or unconsciously reinforce ingratiating behaviors and suppress dissenting messages so that potential reporters of bad news may cease to report it. This results in a disjunction in knowledge of the status of projects between the employees and the managers so that the managers may make decisions based on inaccurate information resulting in iatrogenic interventions leading to project failure.

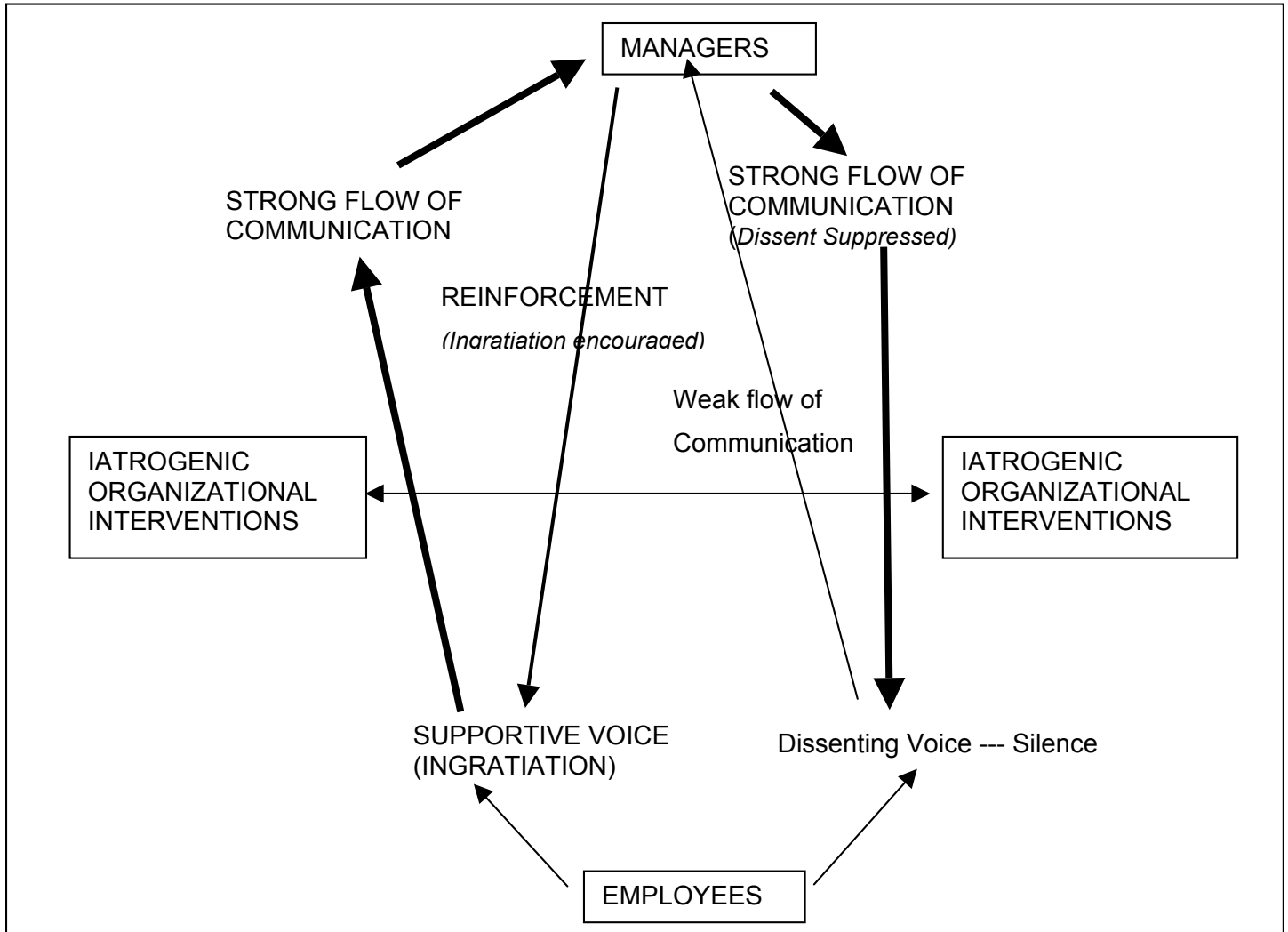


Figure 1.5: Tourish and Robson (2006)'s theory of Critical Upward Communication

1.6 THE DEAF EFFECT

The term Deaf Effect was coined by Keil and Robey (1999) and some limited evidence of the phenomenon as it relates to IT projects was reported in one subsequent study (Keil and Robey, 2001). They reported on a survey of IS auditors who were attempting to report bad news. In at least three cases their reports were ignored by decision makers. The auditors themselves on attempting to report were in some cases terminated. Another anecdotal report of the Deaf Effect comes from the report of the Challenger Disaster (Hauptman and Iwaki 1990). There, a group of engineers tried to indicate to management that the launch of the shuttle at low temperatures might result in a failure of the O-rings on the solid rocket boosters resulting in catastrophic failure. Despite

repeated attempts to communicate to management that there were significant risks of failure, they were ignored and management approved the launch.

The frequency with which the Deaf Effect occurs and the range of factors that may contribute to the phenomenon remain unknown at this time. The only empirical study that addresses the Deaf Effect appears to be that of Wissema (2002), who studied 14 cases of management failure. In those cases he identified that managers often ignored warning signals of impending failure; a phenomenon that he referred to as “red light running”. He indicated that managers either did not notice, ignored, suppressed or scorned “warning signals which . . . would have contributed to preventing an incorrect decision.” (p. 522). He found nine factors that contributed to low red-light sensitivity: tension between styles of decision making, focusing on a single issue to the exclusion of all else, haste and impatience, tiredness and stress, overconfidence, groupthink, unclear structure or culture, poor information systems and ignoring intuition.

Based on anecdotal stories from Keil and Robey (2001) and those of such non-IS occurrences as those related by Wissema and that of the Challenger Disaster, I formally define the phenomenon as occurring

When a decision maker doesn't hear, ignores or overrules a report of bad news to continue a failing course of action

In terms of bad news reporting, the Deaf Effect is distinct from the “Mum Effect” which can be defined as the failure to transmit a report of bad news (Keil and Robey 2001). Where the Mum Effect occurs, the potential bad news reporter is unwilling to report bad news whereas in the Deaf Effect, the bad news reporter transmits the message, but the intended recipient either doesn't hear it or refuses to act upon it.

1.6.1 The Deaf Effect and the Escalation Literature

The place of the Deaf Effect in the escalation literature can be seen from how it is explained by the models summarized in the literature review. In terms of Staw (1997)'s model (figure 1.1), the Deaf Effect can be seen as the result of biases that result in improper project economics being perceived by the decision maker. These biases are created by the various escalation determinants. Thus the solution to the Deaf Effect is to prevent the creation of biases by the elimination of the escalation determinants. Questions remain however, as to what the biases are that result in the Deaf Effect and which determinants lead to the Deaf Effect.

In Royer (2002)'s model, the Deaf Effect can be seen as blindly going in the face of negative news about the project and relentlessly continuing in the face of revealers. Royer's model does not however provide an explanation for why the decision maker goes blindly on or continues relentlessly.

In terms of Mahrng and Keil (2008)'s model (figure 1.3), the Deaf Effect can be seen as a factor that prevents correct identification of problems in phase 1. No problems may be identified or they may be minimized so as to not be considered correctly thus generating the mismatch between problems and solutions. However, their model does not provide us an explanatory mechanism as to why the Deaf Effect occurs in the first place.

Finally, in Tourish and Robson (2006)'s model (figure 1.5), the Deaf Effect can be seen as a mechanism for communicating the idea that dissent or critical upward communication is not desired. By not acting, this signals to the organization that the report of bad news is not welcome. This results in suppression of the report of bad news (the “Mum Effect”) or in the desire of potential reports to report bad news in a low volume

(attenuation of the salience) or to make the news appear less bad than they really believe that it is (distortion). This describes more of an organizational level of deafness. The organization doesn't respond to the report of bad news. It doesn't explain why the decision maker is "deaf" in the first place.

1.7 THIS DISSERTATION

The preceding review of the escalation literature has shown that the Deaf Effect has not previously received systematic study in either the management or IS literature. Additionally, the escalation models don't provide good explanatory purchase for the occurrence of the Deaf Effect. A gap exists in explaining how the Deaf Effect occurs and therefore how it can be avoided in project situations. This dissertation seeks to fill that gap by contributing the first systematic study of the Deaf Effect. As such it is an exploratory investigation into the phenomenon at the individual level. The first three studies (chapters 2-4) report laboratory experiments that progressively build up the parameters of a variance model. The last study (chapter 5) is a case study in which the history of a project in which the Deaf Effect occurred is explored to determine if the model developed in laboratory experiments has explanatory power in the field. The following sections briefly describe the objectives of each study. The final chapter summarizes what has been learned in this dissertation.

1.7.1 Chapter 2 (Laboratory Experiment 1): Construction and Test of a Model at the Individual Level

This study constructed a model of the occurrence of the Deaf Effect and tested it in a laboratory experiment. Using Evans' Heuristic-Analytic theory of decision making and Miceli and Near's whistle-blowing theory, it proposed hypotheses that the Deaf Effect occurs when the decision maker does not consider the report of bad news to be sufficiently relevant. Additionally, it hypothesized that the relevance of the message is a function of the credibility of the bad news reporter. The hypotheses were confirmed, but male gender was also found to be a factor in increasing the willingness to continue the current course of action.

1.7.2 Chapter 3 (Laboratory Experiment 2): Effects of Gender, Risk and Role Prescription on the Deaf Effect

In the previous study, gender was seen to be a significant factor on the decision to continue a course of action. Additionally, while the contours of the model were found to be true, the Deaf Effect was not technically observed in that study. In this study, the model from study 1 is expanded by consideration of the effects of risk propensity and risk perception to explain the effect of gender on the decision to continue the current course of action. Role Prescription is added to explain the lack of occurrence of the Deaf Effect in study 1. The model was tested in a laboratory experiment. Relevance of the bad news report, Risk Propensity, and Risk Perception were found to be significant in the explanation of the decision to continue a course of action. Male gender was found to increase Risk Propensity and decrease Risk Perception.

1.7.3 Chapter 4 (Laboratory Experiment 3): Effect of Societal Collectivism on the Deaf Effect

The previous studies were conducted in the individualistic culture of the United States. It is possible that collectivism and its emphasis on allegiance to the group may cause the occurrence of the Deaf Effect to be diminished. In this study, I considered the effects of perceived societal collectivism on the occurrence of the Deaf Effect using the GLOBE

framework of cultural variables. This experiment replicated the study of Chapter 3 in the USA, Germany and China. This study found that how the decision maker perceives the values of the culture had little effect on the occurrence of Deaf Effect but the structural model found in the previous two studies was substantially replicated in all three geographies. However, while the structural model was replicated, the effect sizes of Risk Perception and Relevance of the bad news report were reversed in China vs. the western cultures. This suggests that in China, individuals place more emphasis on the inherent riskiness of the project rather than the report of bad news in determining whether to continue a course of action. Additionally, in Germany, Role Prescription was found to not have a significant contribution to the relevance of the report of bad news. It is suggested that this occurs because in Germany, internal auditors (the description of the role prescribed bad news reporter) are viewed as time wasters who don't add value to the project.

1.7.4 Chapter 5: A Case Study of the Deaf Effect

The previous studies were conducted in laboratory experiments using student subjects. In this study, I moved the examination to the study of the occurrence in the Deaf Effect in an actual project situation. This study examined the occurrence of the Deaf Effect in an Information Systems project in a state government organization over a time period from 2003 to 2006. Gathering data through interviews of project personnel and observation of project status review meetings, this study suggests that the pattern identified in the structural model of the first three experiments holds in an actual project situation among IS professionals. It also suggests that illusion of control and highly political environments are potential causes for rejection of the report of bad news. It also found that given the motivation to shirk, information asymmetries allowed the project director to distort the status of the project in reporting to the oversight committees.

1.7.5 Chapter 6: Summary

The final chapter reviews the findings from the four studies undertaken in this dissertation and summarizes them, identifies the contribution, limitations and implications for research and practice.

1.8 SUMMARY

Escalation of commitment continues to be a serious issue in information systems project management. While various causal factors have been proposed, recently a new set of factors based in the communication of project status and critical upward communication has been proposed as explanatory factors. This dissertation adds to this stream of research by studying the Deaf Effect, when decision makers don't hear, ignore or overrule reports of bad news to continue failing courses of action. In a series of four studies, it makes an initial exploration of the Deaf Effect by building up a variance model at the individual level in laboratory experiments and then verifying that model in a case study.

2 CONSTRUCTION AND TEST OF A MODEL AT THE INDIVIDUAL LEVEL¹

2.1 ABSTRACT

Project escalation is known to frequently occur in the context of information systems (IS) projects. The reluctance to hear bad news--a phenomenon that has been labelled the "deaf effect"--has been suggested as a possible reason for why projects are allowed to escalate for as long as they sometimes do. The deaf effect response to bad news reporting has received little research attention, yet may account for many cases of project escalation. The research reported here provides a description of conditions under which the deaf effect is likely to occur. Hypotheses regarding factors involved in causing the deaf effect are articulated based on Miceli and Near's theory of bad news reporting effectiveness and further elaborated using insights from the cognitive psychology literature of decision making. The extended theory was then tested experimentally using a role-playing experiment. Results suggest that when a decision maker perceives a relevant message, s/he is willing to de-escalate the project. Bad news reporter credibility and the gender of the decision maker were found to be key factors in the determination of message relevance.

2.2 INTRODUCTION

Information systems project failures typically exhibit ample warning signs of impending failure, but for reasons that are not well understood, these warning signs are frequently ignored. In many cases, there are team members or even a single individual that seek to call attention to critical issues and ask for a delay or change of course in the project direction. In those cases, it is important to know why senior management did not heed the "bad news reporter" who warned them that the project was in danger of failing. This failure to heed the bad news reporter has been called the "deaf effect" (Keil and Robey 2001).

The information systems discipline is rife with this phenomenon. For example, the UK Child Support Agency recently spent 456 million GBP on a new system. During the development period, it received 70 audits of which 70% had identified serious concerns. Yet it was delivered with 52 critical defects and, three years after delivery, productivity has fallen from pre-implementation levels and the staff has to use 600 workarounds (Computer.Business.Review 2006). In the famous Providian Trust case (McFarlan and Dailey 1997), an internal auditor attempted to signal serious issues with a project and ended up getting fired for his trouble. The system went on to fail spectacularly.

Failures involving the deaf effect represent a serious problem, and this is an understudied area. Only one IS study has discussed this failure to respond. While Keil & and Robey (2001) have demonstrated that the deaf effect does occur, no study has yet investigated how or why this effect occurs. The research question that we seek to investigate is "What are some of the causal factors that that create the deaf effect?"

In this research, we propose that credibility of the bad news reporter affects the decision

¹This paper has been published in the e-Service Journal as Cuellar, M. J., Keil, M., and Johnson, R.D., "The Deaf Effect Response to Bad News Reporting in Information Systems Projects," e-Service Journal (5:1), pp. 75-97.

process behind the response to bad news reporting. This proposition is tested by means of a laboratory experiment. The next section of the paper provides a brief overview of relevant literature on whistle-blowing, bad news reporting, and decision making, along with the hypotheses to be tested. Then, we introduce the experimental design, present the results of the study, and briefly discuss its implications.

2.3 LITERATURE REVIEW

A review of the literature reveals that only one publication (Keil and Robey 2001) has dealt with the deaf effect in information systems project management. Keil and Robey (2001) described the “deaf effect” as a failure to respond to messages of impending project failure. Based on a survey of internal auditors, they demonstrated that the deaf effect exists in IS project management situations. The auditors surveyed recounted instances in which they had reported bad news about projects only to find that their concerns were ignored by senior management.

Without an existing literature or theory base that bears directly on this phenomenon, we review reference theories from management and cognitive psychology that can be used to construct hypotheses regarding factors that may promote the deaf effect. In this section, we examine the literature related to whistle-blowing effectiveness, and decision making theory, which can be used to inform a model of the deaf effect response to bad news reporting.

2.3.1 Near and Miceli’s Model of Whistle-Blowing Effectiveness and the Deaf Effect

Whistle-blowing as used by Near and Miceli is defined as “the disclosure by organization members (former or current) of illegal, immoral or illegitimate practices under the control of their employers, to person or organization that may be able to affect action” (Miceli and Near 2002, p. 456). In the IT project context, the bad-news reporter is not necessarily disclosing illegal, or immoral practices, but rather the fact that they believe that the present direction of the project is a failing course of action. The question then arises as to whether this literature has appropriate bearing upon consideration of the deaf effect.

We hold that the two phenomena are sufficiently similar to allow us to use the whistle blowing literature to inform our study. While in the case of the deaf effect, nothing illegal is being disclosed, the reporter is disclosing what s/he perceives to be a failing course of action that is not being addressed by the project leadership. This failing course of action is similar to illegitimate acts when sponsored by management because although management has endorsed the project, continuing a failing course of action is inappropriate and represents a waste of corporate resources. Reporters of bad news also face pressures similar to those of whistle-blowers. Whistle-blowers of illegal activities find that disclosure of the problem is a high risk activity and thus are reluctant to report (Miceli and Near 1992; Miceli, Near and Schwenk 1991). Reporters of bad news in projects perceive reporting similarly (Keil and Robey 2001; Smith, et al. 2001). Thus we find that bad news reporting is conceptually similar to whistle-blowing.

Near and Miceli (1995) describe a model of whistle-blowing effectiveness. They argue that the effectiveness of whistle-blowing is based on the personal characteristics (credibility and power) of the whistle-blower and the complaint recipient, moderated by the support for the whistle-blower and the wrongdoer as well as situational and organizational characteristics of the wrong-doing. They describe credibility as being composed of the indicators of the whistle-blower’s perceived motives, ability to convince

others of their correctness, trustworthiness and power as the whistle-blower's status, position in the hierarchy, and perceived value to the organization. Thus a well-respected whistle-blower in a position of power will be more effective than one who has little standing and resides in the lower echelons of the organization.

Near and Miceli (1995) further proposed that characteristics of the wrongdoing and the organization also have an effect on the organizational response. If the organization has been dependent on the form of wrongdoing, or there is little evidence or legal basis for complaint about the wrongdoing, the organization's willingness to change will be lower. Conversely, if the organization looks favorably on whistle blowing and is less bureaucratic, their willingness to change will be higher. From the standpoint of the deaf effect, this seems to indicate that the deaf effect would be more likely to occur when the decision maker is dependent upon continuance of the current course of the project to maintain his/her organizational status or reputation.

2.3.2 Cognitive Psychological Theories of Decision-making

Since the deaf effect response is a failure of the decision making process, an examination of decision making theory is appropriate for building a theory of its causation. In this section, we examine the cognitive psychology behind decision making to investigate the factors that come into play when a decision is made.

There are many different psychological theories of decision making. However, current theory in this area suggests that decision making can be regarded as a two-step process (Evans 1984; Evans 1989; Kahneman 2003; Stanovich and West 1998, pp. 309-310). These theories hold that the two-step process arose due to the vast amount of data available to a decision maker. In any non-trivial problem, finding a solution requires searching through a vast number of possible solution paths. Thus, humans are confronted daily with more information than can possibly be processed. To handle this onslaught of data effectively, they developed heuristic processes to conserve their scarce processing power. And when one does think about these selected pieces of information, it is in the context of a mental model of the world rather than the actual world itself as the world is too large to comprehend totally (Evans 1989). Two major theories in this area are those proposed by Evans (1984; 1989) and Kahneman (2003). In both theories, the decision is held to be made in two phases. In the first phase, (intuition/heuristic), reasoning is performed in a largely automatic, unconscious, pre-attentive manner. In phase 2 (reason/analytic), reasoning is deliberate, conscious and monitored. It is generally held that information is selected as relevant or accessed during the first phase for consideration in the second phase. We adopt the Evans' Heuristic-Analytic (HA) model for use in this paper.

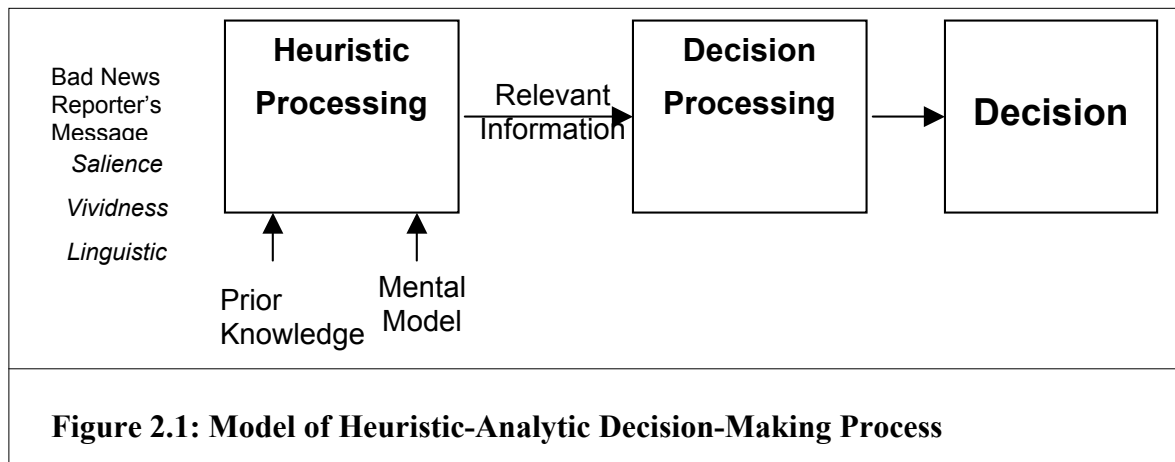
2.3.2.1. Heuristic-Analytic Theory

HA theory postulates that thinking is selectively focused on 'relevant' parts of problems and that prior knowledge, heuristics, and schemas are retrieved as determined necessary by pre-attentive heuristics (Evans, 1996). See figure 2.1. Evans (1989) postulates that the major cause of bias in human reasoning lies in the heuristic processes adopted to select information for processing. If a heuristic fails to select a key piece of information or selects an irrelevant piece of information for processing, the subsequent analysis will be flawed. The analysis itself will be accurate only to the extent that the mental model of the world that one has constructed is accurate (1989).

In the heuristic phase, two groups of factors affect the selection of relevant information:

message characteristics and the mental model of the decision maker. The message characteristics include such components as vividness/salience, comprehensibility and certain linguistic cues. Vividness/salience refers to how well the message stands out from competing messages/sensations within the decision maker’s environment. Linguistic cues signal the decision maker on how to focus their attention (Evans 1996).

The decision maker’s mental model refers to the model that the decision maker has of the real world including their conception of cause and effect relationships, expectations, beliefs and other structural factors. In the heuristic phase of decision making these structures are accessed pre-consciously to assist in filtering relevant from irrelevant information. From the decision maker’s bank of experience, additional available relevant information is also accessed.



2.4 A RESEARCH MODEL OF THE DEAF EFFECT

In this section, we use the insights from cognitive psychology and Miceli and Near’s whistle-blowing effectiveness theory to develop a research model (figure 2.2) that provides the basis for an initial experiment on the causes of the deaf effect. We adopt the basic process from Evans for the proposed model.

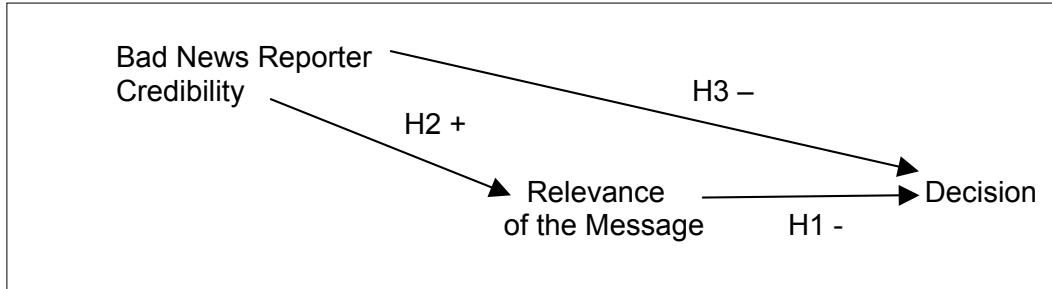


Figure 2.2: Research model for this experiment

Evans (1989) states that decision makers pre-attentionally select the information that they believe will be relevant to making the decision using their mental model heuristics. Thus the bad news reporter’s (BNR’s) message would be evaluated for relevance using the decision maker’s mental model heuristics. Once it the message passed the heuristics, it would be considered in the decision process. From this we see that to be effective, a BNR’s message must be considered as relevant before it can be actively evaluated. We therefore propose hypothesis 1:

H1: When the report of bad news is considered relevant, the decision maker will be more likely to discontinue the present course of action

Part of this pre-attentive processing is to determine whether the bad news report must be attended to. This is where the credibility of the whistle-blower as postulated by Near and Miceli (1995) may be processed. If the decision maker determines that the whistle-blower is not credible, then the message may be disregarded. We therefore propose the following hypothesis:

H2: Reporters of bad news that who are considered credible will tend to have their messages considered as relevant

Miceli and Near also indicate that whistle-blowers that who are credible are also more effective in terminating wrongdoing. The Heuristic Analytic Theory indicates that during relevance processing, information is selected and passed on to the analytic process for analysis. Thus the decision makers may bring their assessment of the credibility of the whistle-blower into their decision process. The effect of the BNR’s credibility may not be completely mediated by the relevance decision but may also have a direct effect on the decision. Therefore we propose hypothesis 3:

H3: Reporters of bad news that who are considered credible will be more effective in convincing the decision maker to change their course of action

2.5 EXPERIMENTAL DESIGN

2.5.1 Experimental Model

We tested these hypotheses using a role-playing experiment with student subjects. While the use of student subjects can pose limitations in terms of external validity, there is ample precedent for using student subjects in studies with organizational decision making tasks (Sitkin and Weingart 1995) and, specifically, decisions associated with

project management (Harrison and Harrell 1993; Smith, et al. 2001). There is support in the literature for using students as surrogates for managers in studies that focus on decision making and which do not require deep knowledge of particular domain. Remus (1986), for example, reported no differences in decision making between students and managers in the context of production scheduling. Locke (1986, p. 6) notes that “both college students and employees appear to respond similarly to goals, feedback, incentives, participation, and so forth, perhaps because the similarities among these subjects (such as in values) are more crucial than their differences.” Liyanarachchi and Milne (2005) have indicated that in situations where only psychological processes are being tested and not attitudes and knowledge that would be developed through experience, students stand as a good surrogate for experienced managers. Additionally, the role-playing scenario was constructed so as to place the subject in the role of a recent graduate, which provides a decision making context that is close to what might be expected from the subject population.

2.5.2 Scenario Description

We created a role-playing experiment that included the elements of the deaf effect described above. Modeled partially on the Providian Trust case (McFarlan, 1997), the subjects were cast as a project manager responsible for development of a new system to be put into production. As part of standard procedures, an internal auditor has reviewed the project and given a negative report on its readiness for production. The auditor has not given specific or understandable reasons for why s/he believes the project will fail and the decision maker was not given enough information to resolve the problem himself alone, forcing him to rely on the assertions of others. Exogenous factors were introduced to motivate the subjects in the direction of putting the system into production. The decision maker can choose to have a known problem in dealing with his management’s expectations if s/he chooses to delay the project, or an uncertain catastrophic problem if s/he implements the system and the auditor is right or no pain at all if the system implementation goes well.

Two alternate case scenarios manipulated the credibility of the auditor (see Appendices A and B). In creating this manipulation, we made use of source credibility theory. According to this theory, source credibility is primarily composed of two dimensions: *Expertise*, the extent to which a speaker is considered to be capable of making correct assertions and *trustworthiness*, the extent to which a speaker can be relied upon to make true assertions (Hovland, Janis and Kelley 1953). In general, a highly credible source is more effective in creating attitudinal or behavioral change than a source with low credibility. The expertise and trustworthy trustworthiness dimensions have differential weights; in general, trustworthiness has a larger impact than expertise (McGinnies and Ward 1980). In terms of the construction of the message, *evidence and argumentation* used by the source have mixed effects. The presence of *unfamiliar evidence* increased increases the credibility of the low credibility source, but left leaves the high credibility source unchanged (McCroskey 1969; McCroskey 1970). The *quality of arguments* changed changes attitudes more for the high credibility source than for the low and decision makers were are more likely to act based on strong arguments of a highly credible source and least likely to act when the highly credible source gave gives weak arguments (Moore et al, 1986).

When the *message disagrees* with the recipients’ initial opinion, a highly credible source was is more effective the more the message disagrees with the recipient’s opinions, while the low credibility sources were are more effective with only a moderate level of disagreement (Bochner and Insko 1966). When faced with various kinds of *threats*

(physical or social) for non-compliance with the message, the most effective in changing attitudes was is the strong threat delivered by a highly credible source (Miller and Basehart 1969). A bias also seems to exist in the *message style*; low credibility sources tend to have their negative information rejected more significantly than positive information. Similarly, a high credibility source has the negative information given more credence than positive (Czapinski and Lewicka 1979). *Language intensity* has a contrasting impact. For high credibility sources, it enhances their message. However, for low intensity sources it decreases their effectiveness (Hamilton, Hunter and Burgoon 1990).

In the positive scenario for our study, the auditor was portrayed as valuable to the company and had having a track record of successfully evaluating projects (i.e., possessing expertise and trustworthiness). In the negative scenario, the auditor had a poor track record. Moreover, the subject's team and manager dismissed his credibility and the auditor was said to "cry wolf" in order to gain attention (i.e., the auditor lacked expertise and trustworthiness). As indicated by the source credibility literature, the lack of evidence produced by the auditor will not hurt him in the high credibility manipulation nor provide needed enhancement in the low credibility treatment. The scenario uses a negative message contrasting with the subject's initial opinion, has extreme language ("disaster waiting to happen"), and places the subject in a socially threatening environment, all aspects that should enhance the positively placed auditor and not enhance the negatively placed auditor.

2.5.3 Operationalization of Variables

The key experimental variables were operationalized using a set of questions with a Likert scale. The individual scale items for each variable were centered prior to analysis.

Dependent Variable: Decision. The dependent variable, Decision, was operationalized as a single, eight-point Likert scale question in which the subject was asked to choose to "Test Further" or "Move to Production". Anchor points for the variable were "Definitely Test Further" and "Definitely Move to Production." Intermediate points were "strongly," "somewhat" and "slightly" on each side of the scale. While it might be thought that "Decision" is a binary yes/no variable, we wanted to additionally measure the strength of their decision. We wanted to get a reading on whether they subjects believed strongly in their decision.

Independent Variables: Relevance, Salience and Perception of Auditor Credibility. The independent variables were operationalized using multi-item seven-point Likert scale questions anchored with "Strongly Agree" and "Strongly Disagree" on the end points and "neutral" in the mid-point. The last relevance question was reverse scaled. We measured salience as a manipulation check to ensure that there was not a variation in salience of the auditor's message between the scenarios.

2.5.4 Instrument

Students were instructed to read the scenario as described above and then were asked to make a decision as to whether to move the project into production (i.e., implement it) or delay the project for further testing.

A subsequent questionnaire (Appendix C) then asked for the reasons for their decision. Demographic data were collected for Gender, Age, and Years of full-time paid work experience.

2.5.5 Statistical Controls

A number of demographic variables were statistically controlled for in the study. Gender was dummy coded (female = 0 and male =1) as was the class from which the samples were drawn. We also collected age, and years of full-time experience. These variables were centered prior to the analysis. We also collected information on the salience of the auditor’s message that we used as a manipulation check to ensure that the salience did not vary across the manipulations.

2.6 EXPERIMENTAL RESULTS

This section describes the results obtained from the study. In this study, causal linkages were noted moving in a single direction from credibility to relevance and from relevance to Decision. While many behavioral studies are non-directional, there seemed to be only one logical possibility for movement in this study.

2.6.1 Demographics

The demographics of our subject pool can be seen in Table 1. Subjects had an average age of 20.5 years and an average work experience of 2.5 years. Fifty-seven percent of the subjects were female and 43% were male.

2.6.2 Descriptive Statistics and Manipulation Checks

We obtained 60 usable responses. Table 2,1 shows the descriptive statistics for the key variables. Table 2,2 shows the same variables split into treatment groups. Two tailed t-tests were performed at 5% alpha in order to determine significant differences in the scores between the two treatment groups. These are shown in Table 2,3.

Variable	Mean	Standard Deviation	N
Decision	2.83	1.924	60
Relevance	4.95	1.303	60
Saliency	4.62	1.025	60
Auditor Credibility	4.472	1.33	60

Table 2,2 shows the same variables split into treatment groups.

Treatment	Variable	Mean	Standard Dev.	
Negative N=31	Decision	3.26	2.016	
	Relevance	4.63	1.294	
	Saliency	4.56	1.138	
	Auditor Credibility	3.67	1.128	
	Gender			16 male/15 female
Positive N=30	Decision	2.37	1.712	
	Relevance	5.26	1.26	
	Saliency	4.68	.912	
	Auditor Credibility	5.28	.995	
	Gender			11 male/19 female

Two tailed t-tests were performed at 5% alpha in order to determine significant differences in the scores between the two treatment groups. These are shown in Table 3.

Variable	Difference	t-score	Significance
Decision	.89	1.859	.068
Relevance	-.62	-1.897	.063
Saliency	-.12	-0.438	.663
Auditor Credibility	-1.61	-5.868	.000

These tests show that the perception of the auditor’s Credibility varied significantly across the treatment groups. The manipulation therefore was effective. Saliency, which was held constant, did not vary significantly indicating that the perception of the saliency of the auditor’s message was stable across the treatments. The Decision variable changed almost a point across the manipulations indicating that those receiving the positive manipulation were less likely to move the product into production than those

receiving the negative manipulation. Similarly, the subjects receiving the positive manipulation had a higher perception of the Relevance of the auditor’s message and a higher perception of the auditor’s credibility.

The Decision variable for both treatment groups showed that subjects tended to favor delaying the product implementation. They also tended to consider the auditor’s message relevant in both treatments.

2.6.3 PLS Analysis

We subjected the data to a PLS analysis using the SmartPLS program V2 M3 (Ringle, Wende and Will 2005). Our figure 2.3 shows our structural model. is as shown here: We analyzed each of the demographic variables against the model constructs to determine any effects from them as well as the predicted effects. In addition to the PLS analysis, we executed a bootstrap analysis using the default parameters of 100 sample size and 200 samples.

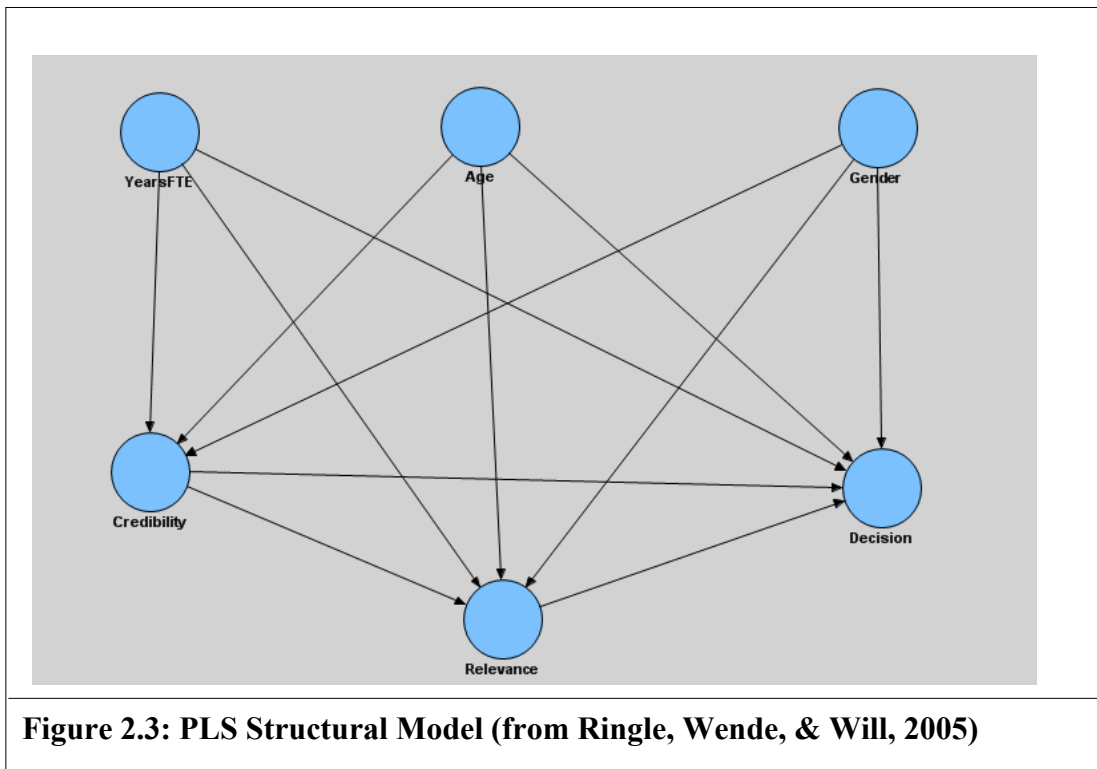


Figure 2.3: PLS Structural Model (from Ringle, Wende, & Will, 2005)

Table 2.4 shows the quality measures from the PLS analysis:

Table 2,4: Quality Measures from the PLS Analysis						
	AVE	Comp. Reliab.	R Square	Cronbach’s Alpha	Communality	Redundancy
Age	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000
Credibility	0.6476	0.8455	0.0290	0.7447	0.6476	0.0077
Decision	1.0000	1.0000	0.6183	1.0000	1.0000	-0.0018
Gender	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000

Cuellar – An Examination of the Deaf Effect

Relevance	0.7152	0.9248	0.1920	0.8943	0.7152	0.0399
YearsFTE	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000

We see that the Reliability reliabilities for both the credibility and Relevance variables are over .84, the AVE is over .64 and the Cronbach's alpha is over .74 for each, indicating that we have good convergent validity for these constructs. PLS performs a confirmatory factor analysis of the measurement model. The results of this analysis are shown in Table 2.5:

	Age	Credibility	Decision	Gender	Relevance	YearsFTE
CAge	1.0000	-0.1353	0.2774	0.1426	-0.2434	0.4564
CYearsFTE	0.4564	-0.0003	0.2550	0.1451	-0.0974	1.0000
Decision	0.2774	-0.4244	1.0000	0.1646	-0.7341	0.2550
Gender	0.1426	-0.0892	0.1646	1.0000	0.0229	0.1451
IAHighlyReg	0.0693	0.7269	-0.2662	0.0553	0.1981	0.1500
IAMostCred	-0.1696	0.8955	-0.4389	-0.1143	0.4327	-0.0085
IAOrgLoyalty	-0.1628	0.7826	-0.2635	-0.1110	0.2112	-0.1138
RelvDisIA	-0.2024	0.2816	-0.4443	-0.0574	0.5931	-0.1185
RelvHighly	-0.1461	0.3602	-0.6097	0.0529	0.9020	0.0111
RelvMorInfl	-0.2301	0.4636	-0.7186	0.0674	0.9090	-0.1020
RelvMosInfl	-0.2608	0.2685	-0.6717	0.0401	0.8849	-0.1783
RelvVeryImp	-0.1856	0.2127	-0.6128	-0.0409	0.8952	-0.0201

From this analysis, we see that all measurement items factored as expected and that we have no cross-loading. Additionally, the Latent Variable Correlations (Table 2.6) show that none of the correlations exceeds the square root of the average variance indicating good divergent validity for the Relevance and credibility constructs. The path coefficients for the study are shown in Table 2.7. The significant paths are indicated. Figure 2,4 shows the significant paths.

	Relevance	Credibility	Decision	Gender	Age	Years FTE
Relevance	0.846					
Credibility	0.3838	0.805				
Decision	-0.7341	-0.4244	1.0000			
Gender	0.0229	-0.0892	0.1646	1.0000		
Age	-0.2434	-0.1353	0.2774	0.1426	1.0000	
YearsFTE	-0.0974	-0.0003	0.2550	0.1451	0.4564	1.0000

The path coefficients for the study are shown in Table 2,7. The significant paths are indicated.

Table 2.7: Path Coefficients and t-Statistics for Bootstrap Analysis					
	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (O/STERR)
Age -> Credibility*	-0.1632	-0.1650	0.0774	0.0774	2.1095
Age -> Decision	-0.0032	0.0099	0.0771	0.0771	0.0421
Age -> Relevance*	-0.1973	-0.1909	0.0893	0.0893	2.2095
Credibility -> Decision*	-0.1586	-0.1548	0.0734	0.0734	2.1612
Credibility -> Relevance*	0.3648	0.3772	0.0849	0.0849	4.2971
Gender -> Credibility	-0.0783	-0.0842	0.1090	0.1090	0.7185
Gender -> Decision*	0.1411	0.1520	0.0657	0.0657	2.1680
Gender -> Relevance	0.0864	0.0909	0.1049	0.1049	0.8238
Relevance -> Decision*	-0.6605	-0.6604	0.0526	0.0526	12.5575
YearsFTE -> Credibility	0.0855	0.0805	0.1058	0.1058	0.8083
YearsFTE -> Decision*	0.1716	0.1736	0.0590	0.0590	2.9072
YearsFTE -> Relevance	-0.0198	-0.0192	0.0986	0.0986	0.2003

Drawing the significant paths in a diagram, we see figure 2.4:

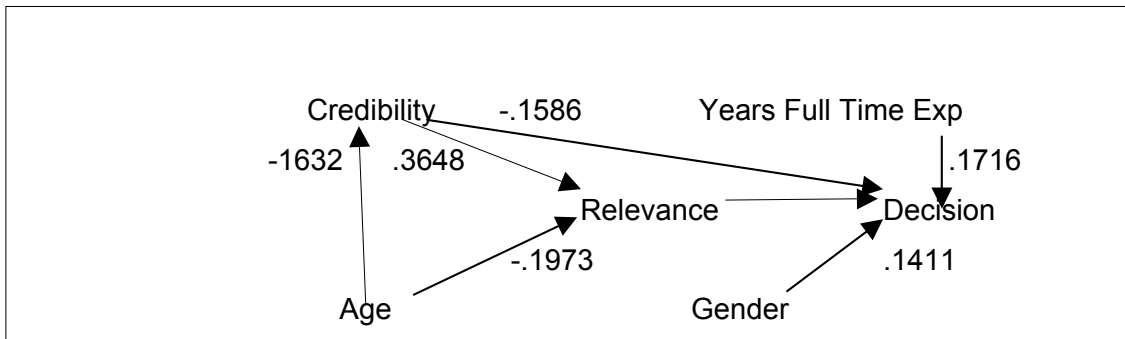


Figure 2.4: Schematic diagram of results from PLS analysis

We find that as the Relevance of the auditor's message increases, that the willingness of the subject to decide to put the system into production decreases by approximately 2/3 of a point for each point increase in the Relevance score. Additionally, we find that as the credibility of the auditor increases, the Relevance of the message to the subject's decision making process increases. Age tends to have a negative effect on the Relevance of the auditor's message. Male subjects and those who have full time work experience tend to be more likely to put the system into production.

2.7 DISCUSSION

Three hypotheses were tested:

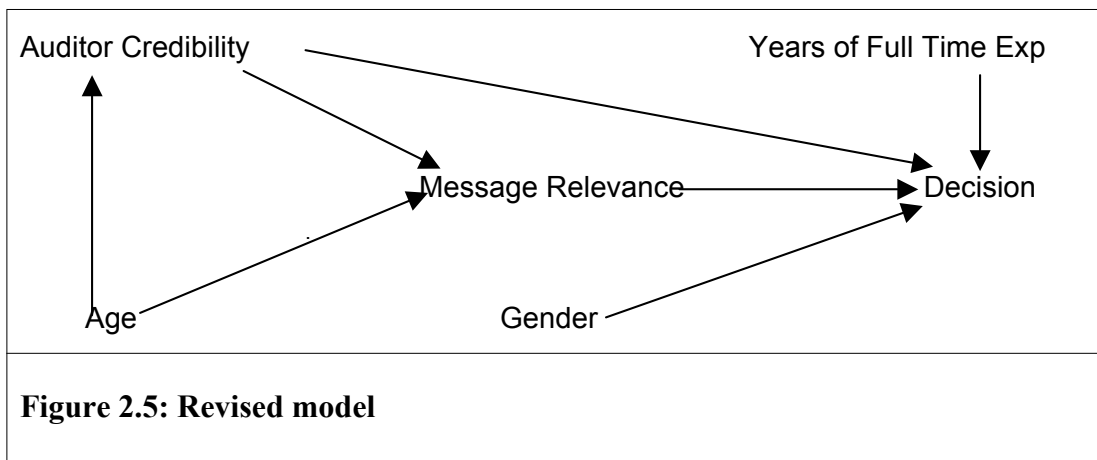
- H1: When the report of bad news is considered relevant, the decision maker will be more likely to discontinue the present course of action*
- H2: Reporters of bad news that who are considered credible will tend to have their messages considered as relevant*
- H3: Reporters of bad news that who are considered credible will be more effective in convincing the decision maker to change their course of action*

We found evidence supporting all of our hypotheses. We found that relevant messages from the auditor were strongly significant and decreased Decision by approximately 2/3 point for each point increase in the Relevance score. This result indicates that to the extent that the message is found to be relevant, the likelihood of changing course in information systems projects is significantly increased. Thus hypothesis 1 was supported. It was found that the credibility of the bad news reporter does co-vary with the Relevance measure. Bad news reporters with higher credibility tended to have their messages viewed as relevant in the context of information systems projects. Hypothesis two was thus confirmed. We also found that credibility co-varies with Decision with 40% of its effects being on Decision, which confirms hypothesis three. Thus, the whistle-blower's credibility not only affects how the subjects view the relevance of the message to their decision, it also directly influences the subjects' decisions.

Both treatment groups were strongly in favor of delaying the project. Even in the negative treatment group, where the credibility of the auditor was significantly questioned, the subjects opted to delay. One explanation for this effect stems from the position of the auditor. Miceli and Near (2002) found that whistle blowing is more effective when role-prescribed. In the descriptive comments section of the questionnaire, several of the subjects referred to credibility that accrued to the auditor as a result of his that role or the unwillingness to contradict the auditor even in the face of negative comments by their team members and manager.

In an unexpected result, it was found that Gender had an effect on Decision. Women were more likely to delay the project than men. One possible explanation for this difference is that women are more willing to accept personal negative impacts in order to avoid negative impacts to the organization. Additionally, we note that age tended to decrease the credibility of the auditor and the relevance of the message and that increasing full time work experience tended to increase the likelihood of putting the system into production. These effects could be a result of socialization in the workplace. It might be that as employees gain experience in organizations, they learn to defer to managerial pressure and do what they perceive that their manager wants done when they are in situations of uncertainty.

Because the bad news reporter's credibility was not fully mediated by perceived Relevance and because Gender had an effect on Decision, we must modify the experimental model by adding Gender as an effect on Decision and an effect from bad news reporter credibility to the decision point.



2.7.1 Implications for Research

The results on bad news reporter credibility results also support Miceli and Near's proposal that whistle-blowers that who are more credible are more effective in terminating the offending behavior. The experiment has shown that when an internal auditor is perceived as credible, the subjects are more likely to stop the project for further testing.

Additional research is required to provide further development of this theory. The study should be repeated with other subjects to test for generalizability. Active IS professionals, especially project managers, should be studied to determine if the effect occurs as described in that population. Variations of the study should be conducted with subjects asked to play roles that do not have a role prescription for bad news reporting to see whether this influences the deaf effect. More research is also needed to explore the effects of age, full time work experience and Gender that was were observed in this study.

The other areas of the model also need to be explored. Does the presence of additional "noise" in the communication channel contribute to the decision maker not perceiving that a message is trying to be sent? Are perceptual features critical to the relevance determination? What other heuristics are used to determine relevance? The entire analytic processing section needs to be researched. What is the process in by which the decision is made? How is credibility considered? What factors beyond credibility are considered in the analytic portion of the decision?

Additional research should be done on the organizational antecedents of the deaf effect. What organizational factors favor the occurrence of the deaf effect? Are there actions, deliberate or inadvertent, that managers take that incent subordinate decision makers to continue failing courses of action in spite of bad news reports? Do organizational politics make decision makers more likely to ignore bad news reporters? Does the cohort at the top of a project have an effect on the occurrence of the deaf effect? Does homogeneity or heterogeneity of the cohort modify the response to bad news?

While many questions remain to be answered, this study has shown evidence that the

deaf effect response to bad news reporting is founded in the perceived relevance of the bad news reporter's message, which in turn is influenced by his/her perceived credibility and salience of the message.

2.7.2 Implications for Practice

In terms of implications for practice, this study suggests that managers should seek to raise the credibility of bad news reporters within the organization. Particularly for auditors, who have to provide project assessments, efforts should be made to make them credible to project teams. Raising their expertise and trustworthiness could do this. They should have a significant knowledge base in the project's technology and in assessing project risk factors. Management should also provide indications of their confidence and trust in them auditors by utilizing their services and providing support for their bad news reporting actions. Auditors should also work with project teams in non-threatening situations by becoming information resources to members of project teams, thereby providing assistance in terms of providing proactive support in preventing or mitigating project risk factors.

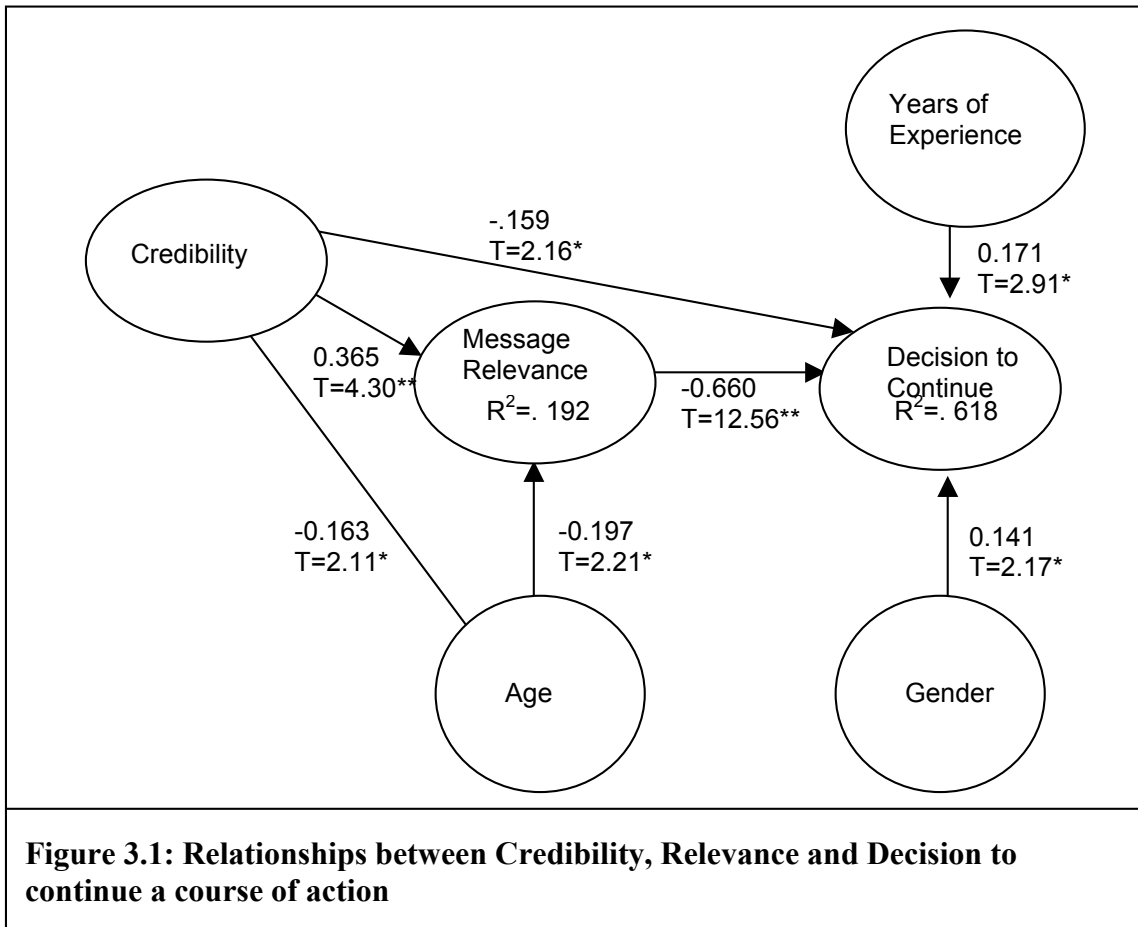
2.8 CONCLUSION

In this paper, we examined the deaf effect response to bad news reporting in information systems project management in terms of Miceli and Near's (2002) work on whistle-blowing effectiveness, and Evans' Heuristic-Analytic theory of decision making. We developed a research model that hypothesized that the credibility of the bad news reporter affected how relevant the decision maker found the bad news reporter's message. We tested the model in a role-playing experiment and found support for the basic propositions of the theory examined. Bad news reporter credibility is partially mediated by the relevance processing and has an effect on the decision.

3 EFFECTS OF GENDER, RISK AND ROLE PRESCRIPTION ON THE DEAF EFFECT

3.1 INTRODUCTION

The first paper in this dissertation found that the credibility of the bad news reporter has a negative effect on the decision to continue the current course of action. The effect of credibility was mediated by the perceived relevance of the bad news report. These effects are illustrated in figure 3.1.



The *Credibility of the auditor* and the *Relevance* of the message were associated with a *decision to discontinue the failing course of action*. When the auditor was credible and his/her message considered relevant to their decision, the subject was more likely to consider changing the course of action to hold the project for further testing. The *Credibility of the auditor* also positively impacted the *Relevance of the message of bad news* so that more credible auditors tended to have their message considered as relevant. Male gender was found to decrease the willingness to change course of action.

One limitation of paper 1 was that in spite of the manipulation, the Deaf Effect was not actually induced in a technical sense. While the relevance of the message was positively associated with the strength of the decision, most of the subjects elected to change the prior course of action regardless of the manipulation (i.e., few subjects exhibited a true Deaf Effect whereby negative feedback was ignored in the decision process). One possible explanation for this is that in the scenario, the bad news reporter

was portrayed as an auditor (i.e., someone whose role is prescribed to report bad news) and this may have lent a certain level of credibility to the message, irrespective of the attempt to manipulate the auditor's credibility.

An additional issue with the previous paper is the occurrence of gender as a significant factor in the decision to continue a failing course of action. The phenomenon that males were significantly more likely to continue the current course compared to females was unexplained by the proposed model.

The research presented here, seeks to address and propose explanations for these issues. The research questions addressed here are:

- 1) **What is the effect of Role Prescription on the Credibility of the bad news reporter and the relevance of their message and,**
- 2) **What factors are there that might account for the finding that female decision makers were more likely to discontinue the current course of action?**

This paper is organized as follows. First, the literature that provides insights on the research questions is examined and new hypotheses and an expanded research model are proposed. Then this model is subjected to a laboratory experiment. Finally, the results of the model are discussed.

3.2 RESEARCH MODEL

In order to examine both of those questions, the whistle blowing effectiveness literature as well as literature on the relationship of Gender and risk in decision making are examined.

3.2.1 Insights from the Whistle-blowing Literature:

In paper 1, it was seen that the whistle-blowing phenomenon was sufficiently similar to that of project status reporting to be able to apply its insights to this research. In the whistle-blowing effectiveness literature, Miceli and Near (2002) in two secondary analysis studies, one of anonymous survey data of the US Merit Systems Protection Board and one of anonymous survey data from federal government agencies, found that Role Prescription was positively associated with effectiveness in whistle blowing. Whistle-blowers who indicated that they believed that their complaints were resolved or expected them to be resolved tended to indicate that it was part of their job to blow the whistle on wrongdoing.

Extending this to the Deaf Effect, I can therefore hypothesize that

H1a: Role Prescription of a bad news reporter is negatively associated with continuance of the current failing course of action

Miceli and Near believed that this effect occurred as a result of their position power. Role prescribed bad news reporters therefore are inherently held to be more legitimate or to have higher expertise as a result of their roles. Pornpitakpan (2004) saw that perceived expertise was a component of Credibility. Thus the fact that in paper 1, an auditor was used as the bad news reporter could explain why they did not strongly induce the Deaf Effect. Thus the following can hypothesize:

H1b: Role Prescription of a bad news reporter is positively associated with the reporter's Credibility.

Additionally, it may be that the effect of Role Prescription is not only to increase Credibility and decrease willingness to continue the current course of action. It may also be that the report of a role prescribed reporter is considered to be more important than one from a non-role prescribed bad news reporter and thus more relevant and must be considered simply because of their position. Near and Miceli (1995) following French and Raven (1959) indicate that role prescribed whistleblowers (such as internal auditors) may possess perceived power to reward or punish organization members. Therefore their reports of bad news may take on more importance and relevance than those who are not role prescribed to report bad news. I therefore hypothesize:

H1c: Role Prescription of a bad news reporter is positively associated with the Relevance of the report of bad news.

3.2.2 Effects of Risk on Decision Making.

The experiment reported in paper 1 also found that Gender had a significant role in the decision process; males were significantly more likely to ignore the report of bad news. To explain how this finding might arise, solutions were sought in the cognitive psychology literature. This literature indicated that women differed significantly from men in the area of risk propensity. I therefore investigated the literature on risk and decision making to understand how risk propensity and risk perception might affect a decision maker's willingness to continue a course of action in the face of bad news. This section therefore describes first, Sitkin and Weingart's (1995) model of risk effects in decision making. I then follow with a discussion of the literature on the relationship between Gender and risk propensity.

Sitkin and Weingart (1995) found that risk propensity and risk perception mediated the effects of outcome history and problem framing on decision making behavior. The more risk a subject perceived, the less likely they were to engage in risky decision making behavior. In turn, the perception of risk was found to be negatively impacted by the subjects' risk propensity and the nature of the problem framing. These results have been replicated in studies of escalation (Keil, et al. 2000b) and the willingness to report bad news (Smith, et al. 2001). Therefore, I make the following hypotheses:

H2a: The level of Risk Propensity is inversely related with Risk Perception.

H2b: The level of perceived risk is positively related with discontinuance of the current course of action.

H2c: The effect of Risk Propensity on Decision will be completely mediated by Risk Perception.

3.2.3 Effects of Credibility and Role Prescription on Risk Propensity and Risk Perception

Sitkin and Weingart (1995) did not consider the effects of Credibility or Role Prescription on the perception of risk or Risk Propensity. Those relationships are addressed in this section.

Risk Propensity. I argue that Credibility and Role Prescription have no effect on Risk Propensity as that construct is developed over the decision maker's history (Sitkin and Pablo 1992). The effects of this decision making situation will not have an effect on propensity until the decision is made and the results seen.

Role Prescription. Similarly, a bad news reporter either is or is not prescribed to report bad news. This construct does not seem to be dependent upon Risk Perception or Risk Propensity. However, Risk Perception being a determination of the potential of unfavorable events occurring in the project would not seem to depend on whether the bad news reporter was role prescribed because any effect that it would have on Risk Perception would be mediated through the Credibility of the reporter or the relevance of the message.

Risk Perception. In terms of Risk Perception, the questions seem to be whether credibility is antecedent or subsequent to the perception of risk. In the Credibility to Risk Perception relationship, it could be argued that where the decision maker perceives the risk as high then they might consider a reporter of bad news as credible. However, in the case of the Deaf Effect, the scenario is that the decision maker previously had a perception of low or no risk prior to the report of bad news. Therefore, it seems in the case of the Deaf Effect, that Credibility is antecedent to Risk Perception. That is, that where a bad news reporter is credible, his message tends to increase the perception of risk. I therefore hypothesize the following:

H2d: The Credibility of the bad news reporter is positively associated with the perception of risk in the situation.

3.2.4 Gender and Risk

Sitkin and Weingart (1995) did not consider the effects of gender in their study. They noted that researchers had identified this as a potential factor, and suggested that gender might be integrated into future studies. The effects of gender on risk taking are now considered.

Prior to 1980, the literature on the effects of gender on risk propensity suggested that females were more risk averse than males (Johnson and Powell 1994). After 1980, research continued to confirm findings that women are less confident in their decisions than men and that they are therefore more cautious risk takers, although the differences appeared to be less clear-cut than before. In an important meta-analysis of 150 studies of gender differences in risk taking, Byrnes, Miller and Schafer (1999) found that males were more likely to take risks than female participants although the gender differences varied according to context and age level. In studies of hypothetical choice tasks similar to Cuellar, et al. (2006), the 25 studies analyzed suggested a strong gender influence with males being more risk accepting. There was also a significant decline in risk acceptance as the subjects became older. In a subsequent study, Nicholson, Soane, Fenton-O'Creevy and Willman (2005) again found that men report higher rates of risk taking than women although women took greater risk in the career dimension (defined as quitting a job without another one to go to) and the social dimension (defined as publicly challenging a rule or decision).

On the basis of these findings, I argue then, that the gender effect that was observed in paper 1 was a result of the fact that women in the United States have historically been more risk averse than men. This situation derives from the fact that women have had less confidence in their decision making abilities compared with men (Johnson and Powell 1994). While the Nicholson, et al. study reported that women did take more risks in publically challenging a rule, that would apply more to willingness to report bad news (the Mum Effect) than it would to being willing to hear bad news (the Deaf Effect). This should be reflected in the model by a decreased Risk Propensity and increased perception of risk among women. It is therefore hypothesized that following the Johnson et al. study:

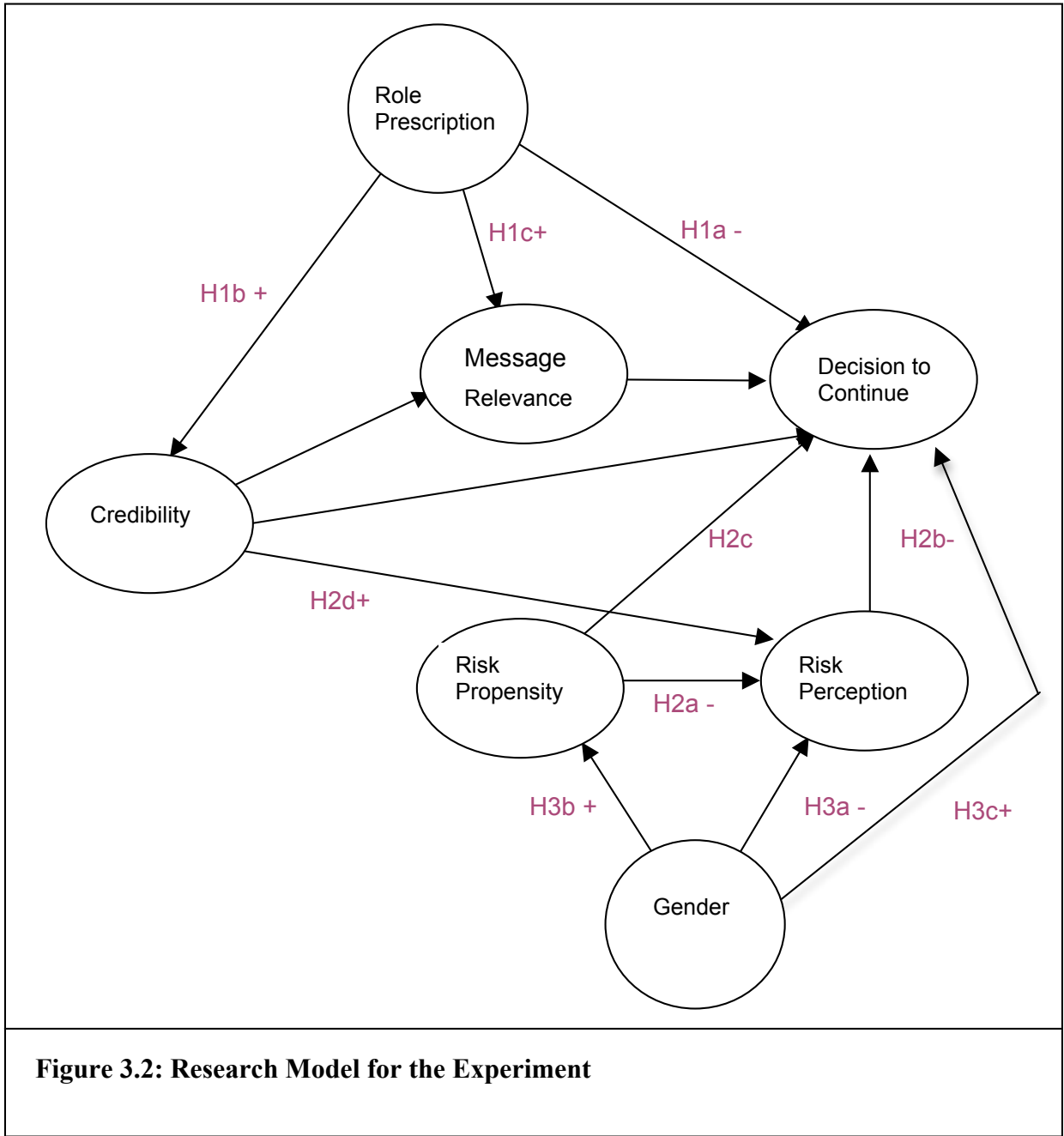
H3a: Male gender is negatively associated with Risk Perception.

H3b: Male gender is positively associated with Risk Propensity.

Extending the Sitkin and Weingart study with the insights from the effects of Gender on Risk Propensity, it can be hypothesized that:

H3c: The effect of Gender on Decision is mediated by Risk Perception and Risk Propensity.

The final research model is displayed in figure 3.2.



The basic contours of the research model from paper 1 were retained in this study. As reported in paper 1, the bad news reporter's Credibility is held to have a negative effect on the decision to continue the current course of action that is partially mediated by the perceived Relevance of the report of bad news. The perceived Relevance of the report of bad news itself is held to have a negative association with the decision to continue the current course of action. The new hypotheses show the Role Prescription construct having a positive association with both Credibility and Decision. Risk propensity is negatively associated with Risk Perception which is in turn negatively associated with the decision to continue the failing course of action. Additionally, if the gender of the decision maker is male, this is positively associated with Risk Propensity and negatively associated with Risk Perception.

3.3 DESIGN AND VALIDATION OF THE LAB EXPERIMENT

The research model was tested using a laboratory experiment in a 2x2 fully factored design in which Role Prescription and Credibility were independently manipulated .

3.3.1 Development of the Materials and Instruments

The scenarios utilized (Appendices A-D) were modified versions of the scenarios used in paper 1. For this study, language was introduced to manipulate the Role Prescription of the bad news reporter. In the positive manipulation, the bad news reporter was an auditor as in paper 1. S/he was also described as having the specific responsibility to report on project problems. In the negative manipulation, the bad news reporter is a peer project leader who volunteers to review the project. S/he is specifically described as not role prescribed to review projects and report on their findings. Additionally, the scenario was modified to specifically state that insufficient time was left in the schedule to do further testing and still make the implementation date. This change was made because in the study reported in paper 1, some subjects chose to delay and then commented that they would do the testing prior to the implementation

The instrument was improved by rewording one question to match the revision of the scenario and adding two more items measuring Credibility. I did this to improve the reliability of the construct over that reported in paper 1, which was somewhat low, although acceptable. I drew on the source credibility literature (Pornpitakpan 2004) to add two measurement items dealing with the key dimension of Credibility: trustworthiness and expertise. Additionally, I revised an item to reflect the effect of organizational power on Credibility by asking about the bad news reporter's perception in the organization. I added items on Risk Perception, Risk Propensity and Role Prescription to the instrument. The risk items were adapted from Sitkin and Weingart(1995) to fit into a seven point Likert scale format. I added a single item to assess the subject's perception of the Role Prescription of the bad news reporter.

3.3.2 Scenario

These scenarios (Appendices A-D) were modeled in part on the Providian Trust case (McFarlan, 1997) and the Challenger Disaster scenario (Hauptman and Iwaki 1990). In both cases I saw some common features that are incorporated into this scenario. In both cases, there were pressures external to the decision maker that moved the decision maker to continue the current course of action. There was also a decision maker who could not perform the evaluation on his/her own and a bad news reporter or reporters who could not communicate the potential disaster situation in terms that unambiguously indicated a coming disaster. Additionally, the decision maker was led to believe there were severe time constraints on the length of time to evaluate the situation and make a

decision. Each of these four items is included in the scenarios.

Contents of the Scenario. The subjects were instructed to play the role of a project manager responsible for development of a new application system to be put into production. The development team has indicated that the project is complete. A bad news reporter has reviewed the project and given a negative report on its readiness for production. To manipulate Role Prescription, the bad news reporter is described as an internal auditor, whose job is to assess projects and report bad news in the positive manipulation or a project manager from a different development team whose role specifically does not include examination of projects and reporting bad news. The bad news reporter does not provide understandable reasons for why S/he believes the project would fail and the subjects are thus placed in a situation in which they must decide to what extent they should rely on the assertions of others. The manipulation of Credibility is performed by describing the bad news reporter as expert and highly regarded in the organization (positive manipulation) or inexperienced and not highly regarded (negative manipulation). Additionally, the subject is informed that the environment in which they work stresses the meeting of dates and budgets by word and reward and punishment system. Additionally, the management chain above the subject is said to be pressing for on time implementation of the system. The subject could choose to delay the project and face the known problem of dealing with their management's expectations, or the subject could choose to implement the system and face the uncertain prospect of a catastrophic problem. The subject is then asked to decide whether s/he would continue with the scheduled deployment or delay the project for further testing.

3.3.3 Procedure

The experiment was administered in a classroom setting. Access was obtained by permission of the instructors. The time obtained was usually in the last part of a class or in time remaining after the administration of a test. Prior to administration of the instruments, instructions for completing the instrument were given to the class. Subjects were informed that this was an experiment on decision making and that their participation was completely voluntary and they could terminate their involvement at any time. They were randomly selected for one of the treatment groups. Subjects were instructed to read a scenario describing an information systems project and then to make a decision as to whether to move the project into production (i.e., deployment) or delay the deployment to allow time for further testing and then answer several questions about their decision. Following their completion of the survey, they returned the materials to the administrator and left the classroom. Subjects had approximately 20-30 minutes to complete the experiment. The subjects were not time constrained in responding to the instrument, the time constraint arose from the text, which indicated that there was no time to test prior to the implementation date.

3.3.4 Subjects

This experiment was conducted using undergraduate student subjects. The scenario was constructed so as to place the subject in the role of a recent graduate, which provides a decision making context that is close to what might be experienced by the subject shortly after entering the work force. While the appropriateness of student subjects has been debated, there is ample precedent for using student subjects in studies with organizational decision making tasks (Sitkin and Weingart 1995) and, specifically, decisions associated with project management (Harrison and Harrell 1993; Smith, et al. 2001). From a philosophic perspective, the question comes down to the

issue of how much emphasis to place on external validity: should the subjects of the experiment function as exact surrogates for practitioners? While some scholars insist on having external validity for every study (Lynch 1982; 1983), Calder, Phillips and Tybout (1981; 1982; 1983) argue that external validity is not a requirement for a rigorous theory test. Based on what the study is designed to demonstrate, the requirement for external validity varies. If the study is to show how the theory can be applied to real world situations, then there is a requirement for the subjects, testing and variables to be analogous to the real world. If, however, the study is designed to be a test of theory, then the requirement is to produce the strongest possible test in an attempt to falsify the theory. External validity is not required and may be sacrificed to achieve internal and construct validity. In this case homogenous samples such as student subjects and laboratory experiments are stronger. For theory testing, external validity is best addressed during theory development. After internal validity is achieved, external validity is addressed by testing across multiple contexts. Cook and Campbell (1979) also make this point saying:

The priority among validity types varies with the kind of research being conducted. For persons interested in theory testing, it is almost as important to show that the variables involved in the research are construct A and B (construct validity) as it is to show that the relationship is causal and goes from one variable to the other (internal validity). Few theories specify crucial target settings, populations, or times to or across which generalization is desired. Consequently, external validity is of relatively little importance. In practice, it is often sacrificed for the greater statistical power that comes through having isolated settings, standardized procedures and homogenous respondent populations. For investigators with theoretical interests our estimate is that the types of validity, in order of importance, are probably internal, construct, statistical conclusion, and external validity (p. 83)

Therefore in this situation, the question is whether student surrogates act similarly enough to actual practitioners to provide internal validity. Ashton and Kramer (1980) citing Zelditch and Evan (1962), indicate that students are to the behavioral researcher what the fruit fly is to the geneticist, a being that is different from the one desired to be studied but has a mechanism that operates in fundamentally the same manner as the target being. The question is therefore, whether the decision making processes of students are sufficiently similar to that of experienced professionals to enable a similar set of responses to be received in a decision situation. This question is an empirical one (Liyanarachchi and Milne 2005).

Looking at the empirical literature, Birnberg and Nath (1968) indicate that student subjects are likely to differ from real world subjects in terms of skills, experience and personality traits. The effects of experience are manifested in terms of enhanced facility with and development of job related skills, routinized patterns of behavior and attitudes toward certain situations. Some empirical studies have shown support for using students as surrogates for managers in studies that focus on decision making and which do not require deep knowledge of particular domain. Ashton and Kramer (1980) in a review of the literature to that date found at least moderate support for using student surrogates in decision making tasks although not in studies of attitudes. An example of the disparity in attitudes is shown by a study of attitudes toward corporate social responsibility by Ibrahim, Howard, and Angelides (2008). In this study, students were found to be more attuned to the ethical and philanthropic areas of social responsibility, while practicing managers were more attuned to the economic responsibilities. This shows the

differences in attitudes between students and managers as an effect of experience. Having been subject to the pressures of the marketplace, managers are necessarily more attuned to economic reality while students who haven't had that experience put more stress on ethics and philanthropy (Ibrahim, et al. 2008).

Ashton and Kramer report that psychological studies show that students and real world decision makers show "extremely similar information processing characteristics and biases" (p.3). In an experiment to test students as surrogates for experienced auditors in decision tasks, they found that students matched the auditors' decisions 67% of the time and only 7-13% of the difference was attributable to experience. Further, they found that students and auditors responded similarly in a number of different situations. They argue that students can act as surrogates in terms of theoretical studies as opposed to application studies, a conclusion similar to that described by Calder, et al. In more recent work, Remus (1986), reported no differences in decision making between students and managers in the context of production scheduling. Locke (1986, p. 6) notes that "both college students and employees appear to respond similarly to goals, feedback, incentives, participation, and so forth, perhaps because the similarities among these subjects (such as in values) are more crucial than their differences." Liyanarachchi and Milne (2005) found that accounting students making experimental investment decisions react similarly to practitioners with respect to environmental disclosures.

In this discussion, an important recent study that must be considered is that of Chang and Ho (2004). Chang and Ho ran an experiment comparing student and manager escalation behavior when project completion and market information was manipulated. Their results show that managers and students had statistically the same likelihood to continue projects on 60% of the tests with managers having a higher likelihood on the remainder. More importantly, the direction of the responses was similar between the managers and students. Both tended to have lower likelihood of completion when the project was less complete than when it was more complete. The managers and students had different responses and response patterns for the funds allocation issues. These patterns are highly influenced by attitudes developed by managers' experience in the business world in which they learn that meeting profitability targets is a key to success. Students, however, without that experience, have not been so conditioned and therefore have different attitudes towards allocation of funds. The results of the Chang and Ho study are therefore consistent with the Ibrahim study. Thus we see that in an escalation situation, students responded similarly to practitioners in the escalation decision where experience was not a factor. In the funds allocation issues, where experience is a factor, their choices were different.

Based on the literature, it would appear that student subjects can stand as surrogates for managers in decision making studies where economic issues are not involved. The studies surveyed show that students are in statistical agreement with the responses provided by managers approximately 60% of the time and the rest of the time while statistically different follow the general trend of the response pattern.

3.3.5 Operationalization of Variables

With two exceptions, the constructs in the research model were operationalized using multi-item measures with Likert-type or semantic differential scales. Decision and Role Prescription were measured with single item measures. Relevance was measured with four items taken from paper 1. Credibility was measured with three items from paper 1 with two new items designed by the authors. Risk perception and Risk Propensity were measured using items adapted from Sitkin and Weingart (1995). Details of the

operationalization of the items are found in Appendix F.

3.4 RESULTS OF THE EXPERIMENT

In this section, I present the methodology followed in assessing the data, the assessment of the measurement model, the results of the manipulation checks and then the evaluation of the structural model.

3.4.1 Methodology

In performing the analysis of the data I utilized the Partial Least Squares methodology as implemented in the SmartPLS tool (Ringle, et al. 2005). PLS is a second generation data analysis technique (Gefen, Straub and Boudreau 2000) which tests not only the structural model but also the measurement model in a single analysis rather than two separate analyses as in the first generation techniques. Additionally, PLS is able to identify path loadings across the entire model in a single run as opposed to multiple runs required using regression techniques. This results in a more rigorous analysis than using factor analysis and regression alone (Gefen, et al. 2000, p. 24). As regression analysis does, PLS seeks to show rejection of a null hypothesis of independent variables having no effect on the dependent variable while accounting for a significant amount of the variance in the dependent variable (Gefen, et al. 2000, p.27).

PLS techniques perform the analysis by iterating between factor analysis and path analysis until the change in variance explained is not significant. It then uses bootstrapping to estimate the significance of the paths. “Neither of these PLS significance estimation methods require parametric assumptions. PLS is thus especially suited for the analysis of small data samples and for data that doesn’t necessarily exhibit . . . multivariate normal distribution . . .” (Gefen, et al. 2000).

In our use of PLS, I performed the PLS calculation to generate the basic PLS values and then used bootstrapping to compute the T-statistics for significance.

3.4.2 Demographics

Table 3.1 shows the demographic distribution of our subjects.

Table 3.1: Subject Demographics	
Variable	Mean (Std. Dev.)
Gender	56 Male / 49 Female
Age	21.73 (4.6)
Years of Work Exp.	3.52 (4.48)
Years of IS Exp.	0.73 (1.48)
N	105

3.4.3 Measurement Model Assessment

Straub, Boudreau and Gefen (2004) reviewed the existing literature on instrument validation and have provided guidelines for the assessment of the measurement model of studies in the positivist tradition such as this study. They prescribe the following

validation steps:

- 1) Construct Validity
 - a. Convergent Validity
 - b. Discriminant Validity
 - c. Factorial Validity
 - d. Reliability
- 2) Manipulation Validity

They further recommend that content validity, nomological validity and common methods bias be evaluated.

In the following two sections, I review these validities for the study reported here.

3.4.3.1. Examining the Reflective Measures

Convergent Validity. Convergent validity, how the items converge to measure a particular construct, is assessed by examining the individual item validity, construct reliability and average variance extracted (AVE) (Chin 1998). I examined convergent validity for the reflective constructs by using confirmatory factor analysis, composite reliability and Cronbach’s alpha and AVE to assess construct reliability. PLS performs a *confirmatory* factor analysis (CFA) rather than an *exploratory* one as done in principal components analysis. This means that it does not seek for the proper factors, but rather confirms that the factor structure specified in the model is correct. In this study, the CFA in Table 3.2 shows the following:

Table 3.2: Confirmatory Factor Analysis Results		
Construct	Item	Item-to-Construct Loading
Relevance	Relev 1	.9203
	Relev 2	.9605
	Relev 3	.9419
	Relev 4	.8927
Risk Propensity	Risk Prop 1	.8923
	Risk Prop 2	.8333
	Risk Prop 3	.8184
Risk Perception	Risk Percept 1	.8399
	Risk Percept 2	.8330
	Risk Percept 3	.8249
	Risk Percept 4	.8215

Chin (1998) provides the guideline that the standardized loadings should exceed .707. We see that the loadings here are all over .81 meeting this standard, providing evidence of convergent validity

To assess construct reliability of the reflective constructs, the composite reliability, the Cronbach’s alpha and the AVE for each construct is examined. As shown in table 3.3,

Table 3.3: Construct Reliability			
Construct	Composite Reliability	AVE	Cronbach’s Alpha
Relevance	.9621	.8639	.9472
Risk Propensity	.8892	.7282	.8143
Risk Perception	.8988	.6895	.8508

Cronbach’s alpha and composite reliability measure the internal consistency of the constructs items. Cronbach’s alpha provides a lower bound on the reliability measurement (Cortina 1993). Composite reliability without the assumption of equally weighted indicators provides a closer estimate to the reliability figures given accurate parameter estimates (Chin 1998). In all cases the values exceed the recommended 0.7 threshold for high reliability (Straub, et al. 2004). AVE measures the amount of variance of the construct that comes from the indicators vs. that which comes from measurement error (Chin 1998). The baseline guideline is 0.5 (Chin 1998), which was exceeded by all our constructs.

Discriminant Validity. Discriminant validity, can be examined by examining the cross loadings between items and constructs and examining the AVEs of the latent constructs to ensure that they are greater than the square of the correlations among the latent constructs (Chin 1998; Henseler, Hubona and Ringle 2008). Cross loading analysis in PLS is conducted by computing the outer loadings of the items on the constructs in a confirmatory factor analysis and then comparing the loadings of the items on constructs other than its intended construct with its loading on its intended construct. This is shown in table 3.4. Chin (1998) provides the guideline that a block of indicators should load higher on the construct that it is intended to measure rather than others. Here, this condition exists providing evidence of discriminant validity.

Construct	Item	Relevance	RiskPerc	RiskProp
Relevance	Rel1	0.9207	-0.3800	-0.2307
	Rel2	0.9603	-0.4129	-0.2816
	Rel3	0.9416	-0.3941	-0.2476
	Rel4	0.8939	-0.4748	-0.1759
Risk Perception	RPr1	-0.2730	0.8388	0.0923
	RPr2	-0.2703	0.8324	0.0868
	RPr3	-0.4809	0.8269	0.1681
	RPr4	-0.4173	0.8232	0.0899
Risk Propensity	RPrp1	-0.2644	0.1854	0.8956
	RPrp2	-0.1831	0.0817	0.8341
	RPrp3	-0.1886	0.0583	0.8287

Additionally, the AVEs of the latent constructs were examined. The test here is to verify that the square root of the AVE is greater than correlations among the constructs (Chin 1998).

	Relevance	Risk Perception	Risk Propensity
Relevance	.9294		
Risk Perception	-0.4466	.8304	
Risk Propensity	-0.2529	0.1346	.8533

The AVEs here are all greater than the correlations between the constructs showing that good discriminant validity exists (Table 3-5).

3.4.3.2. Evaluating the Formative Credibility Construct

Petter, Straub and Rai (2007) provide guidance on how to validate formative constructs such as Credibility. They argue that the following steps should be taken to validate the construct: 1) Examine the weightings of the items to ensure that they are all significant; 2) Examine the Variance Inflation Factors (VIF) for the items to ensure that there is not an excessive amount of destabilizing multi-collinearity. VIF values should not exceed 3.3.

The outer weights for the Credibility construct are reported table 3.6.

² The square root of the AVE has been inserted on the diagonal.

Table 3.6: Outer Weights of the Credibility Construct

Item	Weight
Cred1	1.9725
Cred2	1.9879
Cred3	3.9287
Cred4	0.8829
Cred5	1.1374

The items are all significant or near significant except for Cred4 and Cred5. These items were dropped in the subsequent analyses.

Next, a regression analysis was conducted testing the three remaining items against the decision construct to calculate the VIF. The results of the regression are shown in table 3.7.

Table 3.7: Variance Inflation Factors of the Credibility Items

Item	Weight
Cred1	2.178
Cred2	2.621
Cred3	2.328

These items all score below the 3.3 level suggested by Petter, Straub and Rai and therefore indicate low levels of collinearity.

3.4.4 Manipulation Checks

Manipulation checks were performed to ensure that Credibility and Role prescription were effectively manipulated and that the Deaf Effect was induced. In Table 3.8, I report the mean values of the variables for each of the four treatment conditions³. As expected, the Credibility and Role Prescription variables move in the expected directions from cell to cell indicating that the manipulations were successful.

³ For the reflective constructs, this was calculated as a simple average. For the formative construct, credibility, this was calculated by using the outer weights for each item on the credibility construct from the PLS analysis and multiplying those by the items' responses and then averaging.

Table 3.8: Effects of Manipulations⁴			
	Variable	Low Credibility	High Credibility
Role Prescribed	Decision	4.12 (2.44)	2.96 (2.21)
	Credibility	2.55 (1.47)	5.06 (1.49)
	Role Prescribed	5.31 (0.88)	5.42 (1.27)
	N	26	26
Not Role Prescribed	Decision	5.30 (1.96)	3.15 (2.24)
	Credibility	1.95 (1.24)	4.59 (1.48)
	Role Prescribed	2.19 (1.57)	3.12 (1.97)
	N	27	26

Next I see, that the Deaf Effect was induced by our manipulations. When the bad news reporter (BNR) was not credible and not role prescribed, the mean of the decision variable was over five (5) indicating a decision to put the system into production. This is in marked contrast to when the Credibility of the bad news reporter was high. In that situation, there was a pronounced tendency to hold for further testing. A 2x2 multiple analysis of variance (MANOVA) with interaction was conducted with perceived Credibility and perceived Role Prescription as the dependent variables and the manipulations as the independent variables. Table 3.9 shows the results of this analysis.

⁴ Mean (Standard Deviation).

Independent Variable	Dependent Variable: Role Prescription		Dependent Variable: Credibility	
	Sum of Squares	F-value (sig)	Sum of Squares	F-value (sig)
Main Effect: Role Prescription Manipulation	193.457	88.568 (.000)	5.041	3.396 (.068)
Main Effect: Credibility Manipulation	7.173	3.284 (.073)	81.888	55.174 (.000)
Interaction: (Role Prescription) X (Credibility Manipulation)	4.356	1.994 (.161)	0.033	0.022(.881)

For the manipulations to be considered to be effective, the main effects for each manipulated variable should be strongly significant on its dependent variable and have no significant relationship with the other variables. This is the case for both variables. There are also no interaction effects. I conclude that the manipulations were successful.

3.4.5 Structural Model

With an adequate measurement model, I can now assess the hypotheses by examining the structural model. Table 3.10 shows the R^2 values associated with each variable. For the decision variable, this is .625. This is a very high amount of variance in the decision explained by this model.

Latent Variable	R^2
Decision	.625
Relevance	.530
Credibility	.230
Risk Perception	.217
Risk Propensity	.043

Table 3.11: Summary of Hypothesis Results

Hypothesis	Path	Path Coefficient	T-Statistic ⁵	Effect Size	Power ⁶
	Credibility -> Relevance	.594	7.73*	.697	.996
	Credibility -> Decision	-.208	1.78*	.013	.060
	Relevance -> Decision	-.398	3.45*	.258	.587
H1a: Role Prescription of a bad news reporter is negatively associated with continuance of the current failing course of action	Role Prescription -> Relevance	.222	2.55*	.111	.200
H1b: Role Prescription of a bad news reporter is positively associated with the reporter's Relevance.	Role Prescription -> Credibility	.500	4.75*	.215	.463
H1c: Role Prescription of a bad news reporter is positively associated with as the relevance of the report of bad news.	Role Prescription -> Decision	-.017	0.22	0	.050
H2a: The level of Risk Propensity is inversely related with Risk Perception.	Risk Propensity -> Risk Perception	-.039	0.43	.007	.055
H2b: The level of perceived risk is positively related with discontinuance of the current course of action.	Risk Perception -> Decision	-.251	2.93*	.100	.177
H2c: The effect of Risk Propensity on	Risk Propensity -	.132	1.94*	.048	.098

⁵ * = $p < .05$ level. One tailed tests were used (Baroudi and Orlikowski 1989) indicating that significance was reached at a t-statistic of 0.98 ($\alpha = .05$).

⁶ A post-hoc power analysis was done using G*Power v2.0 (Erfelder, Paul and Buchner 1996) for each path tested. The R^2 for the dependent variable of the path was calculated with and without the path to compute the effect size. The effect size was then used as input to a power analysis. For the analysis, α was set to .05 and the N value was set to 105 for both samples.

Decision will be completely mediated by Risk Perception.	> Decision				
H2d: The Relevance of the bad news reporter is positively associated with the perception of risk in the situation.	Credibility → Risk Perception	.387	3.63*	.154	.296
H3a: Male gender is negatively associated with Risk Perception.	Gender → Risk Perception	-.246	2.72*	.064	.118
H3b: Male gender is positively associated with Risk Propensity.	Gender → Risk Propensity	.208	2.20*	NA ⁷	NA
H3c: The effect of gender on Decision is mediated by Risk Perception and Risk Propensity.	Gender → Decision	.002	0.08	.022	.069

Table 3.11 shows the results of the structural path analysis. The paths of interest in this study identified in paper 1 as significant were found to be significant in this study with the exception of that from Gender to Decision which was not significant suggesting that its influence is fully mediated by the effects of Risk Propensity and Risk Perception. The power analysis shows that for all paths except for Credibility to Relevance, this experiment had low power to bring the significant paths to light.

Of the Role Prescription hypotheses, Role Prescription was found to have a significant effect on Relevance (H1a) and Credibility (H1b). It had no direct effect on the Decision (H1c). The effect of Role Prescription is thus fully mediated through the determination of Relevance.

Of the Risk Propensity hypotheses, Risk Propensity was not found to have an effect on Risk Perception (H2a), a result which contradicts findings of Sitkin and Weingart (1995), Keil and Wallace (2000) and Smith, et al. (2001). It is possible that the low power of this experiment resulted in a failure to detect the relationship between Risk Propensity and Risk Perception. It might also be that the addition of Gender changed the relationship between Risk Propensity and Risk Perception. It could be that the relationship observed between Risk Propensity and Risk Perception is actually the relationship between each variable and Gender. It is also possible that the degree to which the relationship between Risk Propensity and behavioral intention is mediated by Risk Perception is dependent upon the context. More investigation would be warranted to understand what

⁷ Only one path was defined for Risk Propensity thus not allowing calculation of effect size or power for this path.

it is about this particular context that produced this result. Risk propensity was also found to have a significant effect on Decision (H2c). Decision makers with a greater propensity for risk tended to continue the current course of action. This is at variance with our hypothesis, and that of Sitkin and Weingart (1995), that the effect of Risk Propensity would be fully mediated through perception. Again, this may occur because the path from Risk Propensity to Risk Perception was not significant or that the addition of Gender eliminated the connection. More research is required to understand this effect.

Of the Risk Perception hypotheses, Risk Perception was found to have a negative effect on the decision to continue (H2b). Credibility (H2d) had a significantly positive effect on Risk Perception. Thus when a bad news reporter was perceived to be credible the decision maker tended to have a higher perception of the risk of the project. This perception of risk tended to motivate the decision maker to change the course of action.

Of the Gender hypotheses, as expected, males tended to have a higher Risk Propensity (H3b) and lower Risk Perception (H3a). Additionally, it was shown that the influence of Gender was completely mediated by Risk Propensity and Risk Perception. (H3c).

The results are shown graphically in figure 3.3.

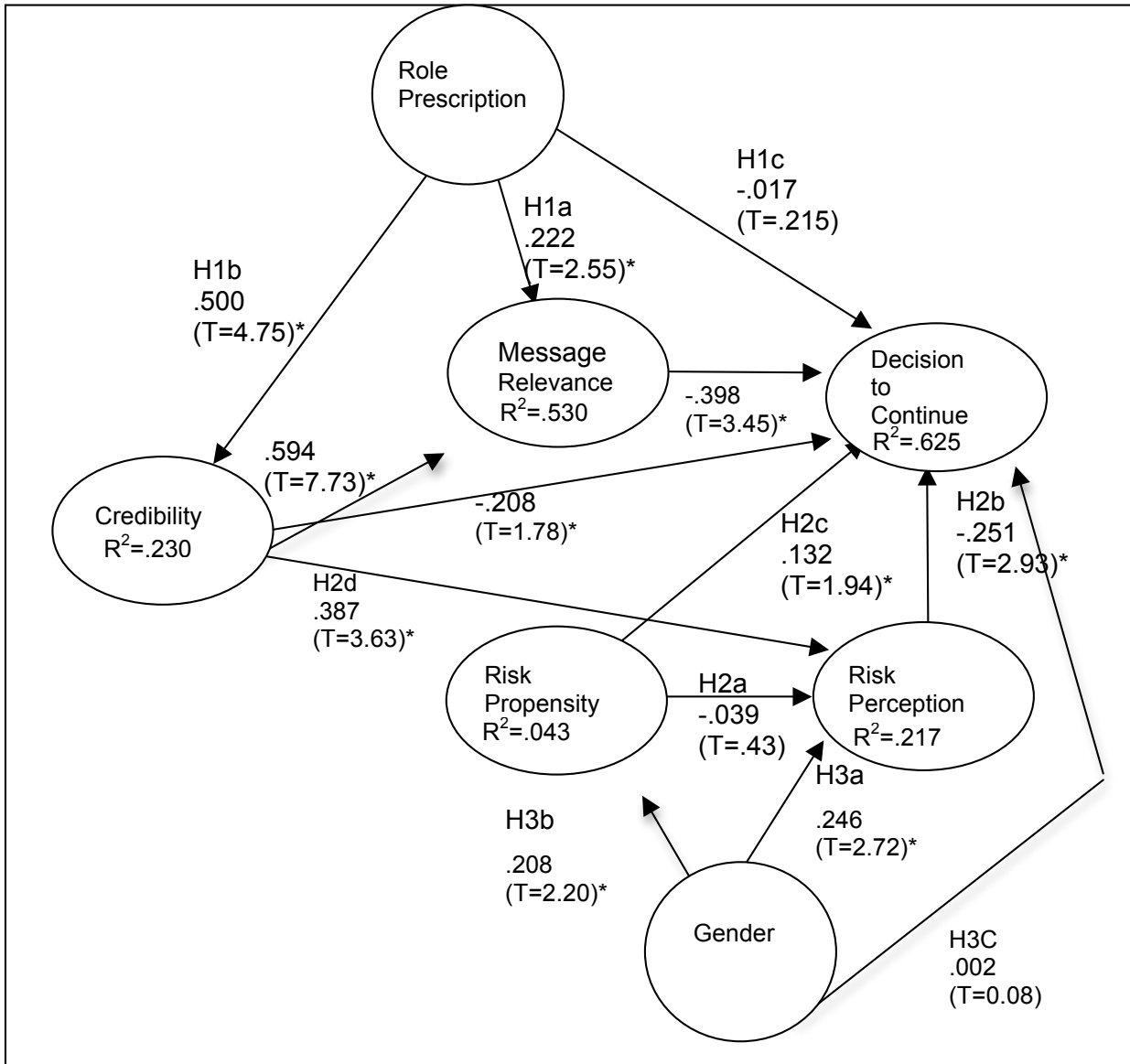


Figure 3.3: Results of the Experiment

3.5 DISCUSSION

The results of our experiment are in agreement with the results of paper 1 (figure 3). All the paths that were significant in that experiment were significant in this study. This study provides another confirmation that those relationships exist. These results persisted despite the low power of the experiment showing the strength of these relationships.

This study added Role Prescription to the factors that influence the determination of message relevance. Role prescribed bad news reporters have enhanced Credibility and their messages have increased relevance to the decision maker. Role Prescription's effects are mediated to the decision to continue the current course of action by its action on Credibility and Relevance. Once the bad news report is considered relevant, the decision maker then assesses it, influenced by their perception of the risk of the project and their propensity to accept risk.

The risk variables seem to mediate the effect of Gender on Decision. This mediation suggests that the Gender effect reported in the first study is actually the effect of differential Risk Propensity and Risk Perception on the part of men and women; women being more risk averse and more sensitive to risk than men. Based on the risk literature reviewed here, these differences seem to be based more in how women and men are socialized than in any innate biological difference. Women, prior to 1980, had a much more pronounced differential than later studies perhaps as a result in the change in women's roles in society. It is perhaps the decision maker's confidence in their decision making capabilities that results in this difference rather than biology. The study also suggests that perceived risk and the decision maker's propensity to accept risk factors into the analytical process used that results in the decision.

The R^2 of the Decision variable did not change appreciably compared with study 1 (.625 vs. .618). This appears to be due to the fact that the addition of the risk variables simply mediated the effect of Gender and that Risk Perception did not have a significant effect on Decision. The addition of Role Prescription did increase the R^2 of the message relevance (.192 in paper 1 vs. .230 here) an effect size of .165 indicating that Role Prescription has a moderate effect size on the Relevance variable.

3.6 CONCLUSION

I began this paper by asking the questions about whether the results of paper 1 were due to Role Prescription causing the Credibility of the bad news reporter and what caused the Gender effect on Decision. I saw that Role Prescription accounted for approximately 22% of the change in Credibility and also influenced the assessment of the Relevance of the message. Its effect on the Decision was mediated through Credibility and Relevance. I also saw that Risk Propensity and Risk Perception mediated the effect of Gender on the Decision to continue the current course of action.

APPENDIX A: BOTH CREDIBILITY AND ROLE PRESCRIPTION MANIPULATED NEGATIVELY

Instructions

1. The following scenario is part of a study in business decision making.
2. Read the scenario completely and thoroughly before you go to the next page.
3. Adopt the role of the project leader and then answer each of the questions in order as the project leader would answer them.

This is not a test.

There are no right answers or wrong answers.

4. Please, do not discuss this study with anyone outside of this room.

Blackstone Bank is one of the top ten banks in the southeastern United States. You joined the bank in their IT department soon after you finished school. You consider the IT department a “tough but fair” place to work. The management team has a low tolerance for poor performance. Project managers have been fired or demoted for late delivery or poor product quality. On the other hand, significant bonuses have been known to be awarded for on-time, high quality deliveries.

Six months ago, you were named to lead your first project. With this assignment, you became responsible for development of a new system with the opportunity to earn a significant bonus for on-time implementation of the system. The technology being used is unfamiliar to you so you are dependent upon your team members to track the status of the project.

Your team has impressed you with their competence and work ethic. They have cooperated with you at every turn and you’ve not had to supervise them closely to ensure that work gets done. Your experience with them suggests that **you can trust what the team is telling you**. Development has now been completed. **Your team has indicated that the system is ready to go.**

At this stage, one of Blackstone’s other project leaders, Sandy, appeared at your door and volunteered to review the project. Sandy is **NOT well respected** in the field and is **NOT particularly trustworthy**. As a project leader, it is not Sandy’s job to review other team leaders’ projects or to report perceived problems that might impact project success.

After a review of your project’s documentation, Sandy told you that **your system was effectively untested, a “disaster waiting to happen” and that you needed to**

rigorously test everything. When you asked for an explanation for this assessment, Sandy talked a lot about decision trees, regression testing and other things you didn't understand then wished you luck and left your office

When you reviewed the report with your programming team, they cited their years of experience in the profession, with this technology and success on other projects arguing that, contrary to Sandy's report, the system was ready to go

When you tried to discuss the situation with your manager, he became angry and indicated that Sandy had never successfully lead a project and often talks about things without any expertise in the subject. He then pointed out that the VP of Information Systems had promised the VP of Operations that the system would be implemented by next month and would be **extremely displeased** if that didn't occur. In which case, you had better have a good justification for your actions because YOU were going to have to explain it to him. Bad project managers had been fired before and he would hate to see your career ruined before it had really begun. At which point he told you get with your team and figure out what you were going to do.

As you left his office, you saw two courses of action. You could decide to delay the project for **further testing**. This additional testing could not be completed soon enough for an on time implementation in which case you would have to justify your decision to the VP of Information Systems. The second option is to **move the system into production as scheduled** and collect your *bonus* if it went well or ... if the system failed be *fired*.

You must decide which of the two courses of action to take.

APPENDIX B: CREDIBILITY POSITIVELY AND ROLE PRESCRIPTION MANIPULATED NEGATIVELY

Instructions

1. The following scenario is part of a study in business decision making.
2. Read the scenario completely and thoroughly before you go to the next page.
3. Adopt the role of the project leader and then answer each of the questions in order as the project leader would answer them.

This is not a test.

There are no right answers or wrong answers.

4. Please, do not discuss this study with anyone outside of this room.

Blackstone Bank is one of the top ten banks in the southeastern United States. You joined the bank in their IT department soon after you finished school. You consider the IT department a “tough but fair” place to work. The management team has a low tolerance for poor performance. Project managers have been fired or demoted for late delivery or poor product quality. On the other hand, significant bonuses have been known to be awarded for on-time, high quality deliveries.

Six months ago, you were named to lead your first project. With this assignment, you became responsible for development of a new system with the opportunity to earn a significant bonus for on-time implementation of the system. The technology being used is unfamiliar to you so you are dependent upon your team members to track the status of the project.

Your team has impressed you with their competence and work ethic. They have cooperated with you at every turn and you’ve not had to supervise them closely to ensure that work gets done. Your experience with them suggests that **you can trust what the team is telling you**. Development has now been completed. **Your team has indicated that the system is ready to go.**

At this stage, one of Blackstone’s other project leaders, Sandy, appeared at your door and volunteered to review the project. Sandy is a **well-respected** leader in the field and is **very trustworthy**. As a project leader, it is not Sandy’s job to review other team leaders’ projects or to report perceived problems that might impact project success.

After a review of your project’s documentation, Sandy told you that **your system was effectively untested, a “disaster waiting to happen” and that you needed to rigorously test everything**. When you asked for an explanation for this assessment, Sandy talked a lot about decision trees, regression testing and other things you didn’t understand then wished you luck and left your office

When you reviewed the report with your programming team, they cited their years of experience in the profession, with this technology and success on other projects arguing that, contrary to the Sandy's opinion, the system was ready to go

When you tried to discuss the situation with your manager, he pointed out that the VP of Information Systems had promised the VP of Operations that the system would be implemented by next month and would be **extremely displeased** if that didn't occur. In which case, you had better have a good justification for your actions because YOU were going to have to explain it to him. Bad project managers had been fired before and he would hate to see your career ruined before it had really begun. At which point he told you get with your team and figure out what you were going to do.

As you left his office, you saw two courses of action. You could decide to delay the project for **further testing**. This additional testing could not be completed soon enough for an on time implementation in which case you would have to justify your decision to the VP of Information Systems. The second option is to **move the system into production as scheduled** and collect your *bonus* if it went well or ... if the system failed be *fired*.

You must decide which of the two courses of action to take.

APPENDIX C: CREDIBILITY MANIPULATED NEGATIVELY AND ROLE PRESCRIPTION MANIPULATED POSITIVELY

Instructions

1. The following scenario is part of a study in business decision making.
2. Read the scenario completely and thoroughly before you go to the next page.
3. Adopt the role of the project leader and then answer each of the questions in order as the project leader would answer them.

This is not a test.

There are no right answers or wrong answers.

4. Please, do not discuss this study with anyone outside of this room.

Blackstone Bank is one of the top ten banks in the southeastern United States. You joined the bank in their IT department soon after you finished school. You consider the IT department a “tough but fair” place to work. The management team has a low tolerance for poor performance. Project managers have been fired or demoted for late delivery or poor product quality. On the other hand, significant bonuses have been known to be awarded for on-time, high quality deliveries.

Six months ago, you were named to lead your first project. With this assignment, you became responsible for development of a new system with the opportunity to earn a significant bonus for on-time implementation of the system. The technology being used is unfamiliar to you so you are dependent upon your team members to track the status of the project.

Your team has impressed you with their competence and work ethic. They have cooperated with you at every turn and you’ve not had to supervise them closely to ensure that work gets done. Your experience with them suggests that **you can trust what the team is telling you**. Development has now been completed. **Your team has indicated that the system is ready to go.**

At this stage, it is Blackstone’s policy to have its own **internal auditor**, Sandy, review the project. Sandy is **NOT well respected** in the field and is **NOT particularly trustworthy**. The role of the internal auditor is to report any perceived problems that might impact the success of the project.

After a review of your project’s documentation, Sandy told you that **your system was effectively untested, a “disaster waiting to happen” and that you needed to rigorously test everything**. When you asked for an explanation for this assessment, Sandy talked a lot about decision trees, regression testing and other things you didn’t understand then wished you luck and left your office.

When you reviewed the report with your programming team, they cited their years of experience in the profession, with this technology and success on other projects arguing that, contrary to the auditor's report, the system was ready to go

When you tried to discuss the situation with your manager, he became angry and indicated that Sandy had never identified a serious problem and often talks about things without any expertise in the subject. He then pointed out that the VP of Information Systems had promised the VP of Operations that the system would be implemented by next month and would be **extremely displeased** if that didn't occur. In which case, you had better have a good justification for your actions because YOU were going to have to explain it to him. Bad project managers had been fired before and he would hate to see your career ruined before it had really begun. At which point he told you get with your team and figure out what you were going to do.

As you left his office, you saw two courses of action. You could decide to delay the project for **further testing**. This additional testing could not be completed soon enough for an on time implementation in which case you would have to justify your decision to the VP of Information Systems. The second option is to **move the system into production as scheduled** and collect your *bonus* if it went well or ... if the system failed be *fired*.

You must decide which of the two courses of action to take.

APPENDIX D: BOTH CREDIBILITY AND ROLE PRESCRIPTION MANIPULATED POSITIVELY

Instructions

1. The following scenario is part of a study in business decision making.
2. Read the scenario completely and thoroughly before you go to the next page.
3. Adopt the role of the project leader and then answer each of the questions in order as the project leader would answer them.

This is not a test.

There are no right answers or wrong answers.

4. Please, do not discuss this study with anyone outside of this room.

Blackstone Bank is one of the top ten banks in the southeastern United States. You joined the bank in their IT department soon after you finished school. You consider the IT department a “tough but fair” place to work. The management team has a low tolerance for poor performance. Project managers have been fired or demoted for late delivery or poor product quality. On the other hand, significant bonuses have been known to be awarded for on-time, high quality deliveries.

Six months ago, you were named to lead your first project. With this assignment, you became responsible for development of a new system with the opportunity to earn a significant bonus for on-time implementation of the system. The technology being used is unfamiliar to you so you are dependent upon your team members to track the status of the project.

Your team has impressed you with their competence and work ethic. They have cooperated with you at every turn and you’ve not had to supervise them closely to ensure that work gets done. Your experience with them suggests that **you can trust what the team is telling you**. Development has now been completed. **Your team has indicated that the system is ready to go.**

At this stage, it is Blackstone’s policy to have its own **internal auditor**, Sandy, review the project. Sandy is a **well-respected** leader in the field and is **very trustworthy**. The role of the internal auditor is to report any perceived problems that might impact the success of the project.

After a review of your project’s documentation, Sandy told you that **your system was effectively untested, a “disaster waiting to happen” and that you needed to rigorously test everything**. When you asked for an explanation for this assessment, Sandy talked a lot about decision trees, regression testing and other things you didn’t understand then wished you luck and left your office.

When you reviewed the report with your programming team, they cited their years of experience in the profession, with this technology and success on other projects arguing that, contrary to the auditor's report, the system was ready to go.

When you tried to discuss the situation with your manager, he pointed out that the VP of Information Systems had promised the VP of Operations that the system would be implemented by next month and would be **extremely displeased** if that didn't occur. In which case, you had better have a good justification for your actions because YOU were going to have to explain it to him. Bad project managers had been fired before and he would hate to see your career ruined before it had really begun. At which point he told you get with your team and figure out what you were going to do.

As you left his office, you saw two courses of action. You could decide to delay the project for **further testing**. This additional testing could not be completed soon enough for an on time implementation in which case you would have to justify your decision to the VP of Information Systems. The second option is to **move the system into production as scheduled** and collect your *bonus* if it went well or ... if the system failed be *fired*.

You must decide which of the two courses of action to take.

APPENDIX E: QUESTIONNAIRE

The latent variable associated with the item is listed in parentheses following the item text.

	Test Further					Move to Production			
	Definitely	Strongly	Some- what	Slightly		Slightly	Some- what	Strongly	Definitely
1. Please indicate what you will decide, and how strong that decision will be. (Mark only one of the eight boxes)	 <input type="checkbox"/>	 <input type="checkbox"/>	 <input type="checkbox"/>	 <input type="checkbox"/>		 <input type="checkbox"/>	 <input type="checkbox"/>	 <input type="checkbox"/>	 <input type="checkbox"/>

2. Please explain the reasoning behind your decision.

3. Your gender (please circle one choice only):

Male Female

4. Your age (whole numbers only):

____ Years

5. The total number of years, full-time, paid work experience you have in any capacity (whole numbers only):

____ Years

6. The total number of years, full-time, paid work experience in information systems (whole numbers only):

____ Years

Cuellar – An Examination of the Deaf Effect

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
7. Sandy's assessment was highly relevant in forming my decision. (Relevance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Sandy's assessment was very important in forming my decision. (Decision)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. My decision was most influenced by Sandy's assessment. (Decision)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. My decision was more influenced by Sandy's assessment than any of the other views expressed. (Decision)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. This project has a high probability of success . (Risk Perception)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. This project is in a positive situation . (Risk Perception)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I believe that there is very little risk in moving this project into production. (Risk Perception)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I believe that there is high potential for a positive result in putting this project into production. (Risk Perception)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Sandy is the most credible person in the scenario. (Credibility)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Sandy is well respected within the company. (Credibility)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Sandy is motivated by a desire to see things done correctly for the bank. (Credibility)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Sandy is very trustworthy . (Credibility)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Sandy has a lot of expertise in this area. (Credibility)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
20. Part of Sandy’s job is to review projects and report on perceived problems that might affect project success. (Role Prescription)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. I would choose a risky alternative based on the assessment of others on whom I must rely (Risk Propensity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. I would choose a risky alternative relying on an assessment that is high in technical complexity . (Risk Propensity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I would choose a risky alternative which could have a major impact on the strategic direction of my organization. (Risk Propensity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX F: DETAILS OF THE OPERATIONALIZATION OF THE VARIABLES

Decision

As in chapter 2, Decision was operationalized as a single, eight (8) point semantic differential scale question in which the subject was asked to choose to “Test Further” or “Move to Production”. Anchor points for the variable were “Definitely Test Further” and “Definitely Move to Production.” Intermediate points were “strongly”, “somewhat” and “slightly” on each side of the scale. I used an eight-point scale to force the subject to select one of the two alternatives presented. A lower value indicated a stronger desire to change the course of action (i.e., to delay for testing). A higher value indicated a stronger desire to continue the existing course of action (i.e. move into production). See Appendix E, item 1, for the item that collected the Decision data.

Relevance

Here, I utilized the same scales employed in chapter 2. Relevance was operationalized as a set of four, seven (7) point Likert scale questions anchored with “Strongly Agree” and “Strongly Disagree” on the end points and “neutral” in the mid-point. A lower value indicated that the subject held the bad news reporter’s message to be of lower relevance to the decision. The items used to elicit these responses are listed below. See also Appendix E, items 7-10.

24. Sandy’s assessment was **highly relevant** in forming my decision.
25. Sandy’s assessment was **very important** in forming my decision.
26. My decision was **most influenced** by the Sandy’s assessment.
27. My decision was **more influenced** by the Sandy’s assessment than any of the other views expressed.

Bad News Reporter Credibility

I utilized the three item measures developed in chapter 2 as a starting point and added two additional questions to improve the scale reliability. As described above, I improved the measurement of this construct by replacing one question, revising one and adding two more items measuring Credibility. I did this to improve the reliability of the construct over that reported in Cuellar, et al. (2006) which was somewhat low at 0.745, although acceptable. I drew on the source credibility literature (Pornpitakpan 2004) to add two questions dealing with the key dimension of Credibility: trustworthiness and expertise. Additionally, I revised a question to reflect the effect of organizational power on Credibility by asking about the bad news reporter’s perception in the organization. Bad news reporter credibility was operationalized as a set of five, seven (7) point Likert scale questions anchored with “Strongly Agree” and “Strongly Disagree” on the end points and “neutral” in the mid-point. A lower value indicated that the subject believed the bad news reporter to have lower Credibility. The items used to elicit this information are listed below. See also Appendix E, items 15-19.

1. Sandy is the **most credible** person in the scenario.
2. Sandy is **well respected within** the company.
3. Sandy is motivated by a desire to see **things done correctly** for the bank.
4. Sandy is very **trustworthy**.
5. Sandy has a lot of **expertise** in this area.

This construct was previously operationalized as a reflective construct. However, in examining the items in the light of the new advice in Petter, Straub and Rai(2007), I find that I must reclassify this construct as a formative construct. Following their decision rules in table 2 of their paper, I recognize the following: 1) the direction of causality for most of the items is from the item to the construct. Trustworthiness and expertise are dimensions that define the perception of Credibility (Pornpitakpan 2004). Similarly, a perception of a proper motivation and respect are causal factors of Credibility (Near and Miceli 1995). However, the direct question about Credibility is reflective of Credibility existing. 2) the indicators are not interchangeable or separable. To lose one would be to underspecify the construct. 3) These indicators will not necessarily covary with each other. Expertise and trustworthiness may vary separately from each other. The other indicators are similar. 4) Antecedents of the indicators are different from each other. Trustworthiness and expertise arise from two different sets of factors. Similarly, respect and perceived desire will have different antecedents. I therefore conclude that this is a formative construct which I am measuring with four formative indicators and a reflective indicator.

Risk Propensity

I adapted the Risk Propensity measures used in Sitkin and Weingart (1995). Risk propensity was operationalized as a set of three, seven (7) point Likert scale questions anchored with “Strongly Agree” and “Strongly Disagree” on the end points and “neutral” in the mid-point. A lower value indicated increasing reluctance to agree to a risky course of action. The items used to elicit this information are listed below. See also Appendix E, items 21-23.

6. I would choose a risky alternative based on the **assessment of others** on whom I must rely
7. I would choose a risky alternative relying on an assessment that is **high in technical complexity**.
8. I would choose a risky alternative which could have a **major impact** on the strategic direction of my organization

Risk Perception

For Risk Perception, I adapted the measures used in Sitkin and Weingart (1995). Risk perception was operationalized as a set of four, seven (7) point Likert scale questions anchored with “Strongly Agree” and “Strongly Disagree” on the end points and “neutral”

as the mid-point. A higher value indicated that the subject believed the project was more likely to be successful, and therefore of lower risk. The items used to elicit this data are listed below. See also Appendix E, items 11-14.

9. This project has a **high probability of success**.
10. This project is in a **positive situation**.
11. I believe that there is **very little risk** in moving this project into production.
12. I believe that there is **high potential for a positive result** in putting this project into production.

Role Prescription

Role Prescription was measured by a single Likert scale item created for this study, with higher values indicating that the bad news reporter was role prescribed to report bad news. This variable was used as a manipulation check. See Appendix E, item 20.

Control Variables

The following constructs were entered into the analysis as control variables.

Gender. Gender was dummy coded (female = 0 and male =1).

Age related information. Age and Years of Full Time Work Experience were entered in chronological years reported by the subjects.

Class. The class from which the data was collected were dummy coded.

4 EFFECTS OF SOCIETAL COLLECTIVISM ON THE DEAF EFFECT

The previous studies have developed a model at the individual level of how the Deaf Effect occurs (figure 4.1). At base, the Deaf Effect occurs when the decision maker considers the report of bad news to be not important or irrelevant to be considered in their understanding of the project. When the report of bad news is considered to be not relevant the decision maker tends to decide not to change the course of the project. Also involved in the decision are the decision maker's propensity to assume risk and the perceived level of risk in the project. The Credibility and Role Prescription of the bad news reporter have been shown to strongly affect the perceived Relevance of the bad news reporter's message.

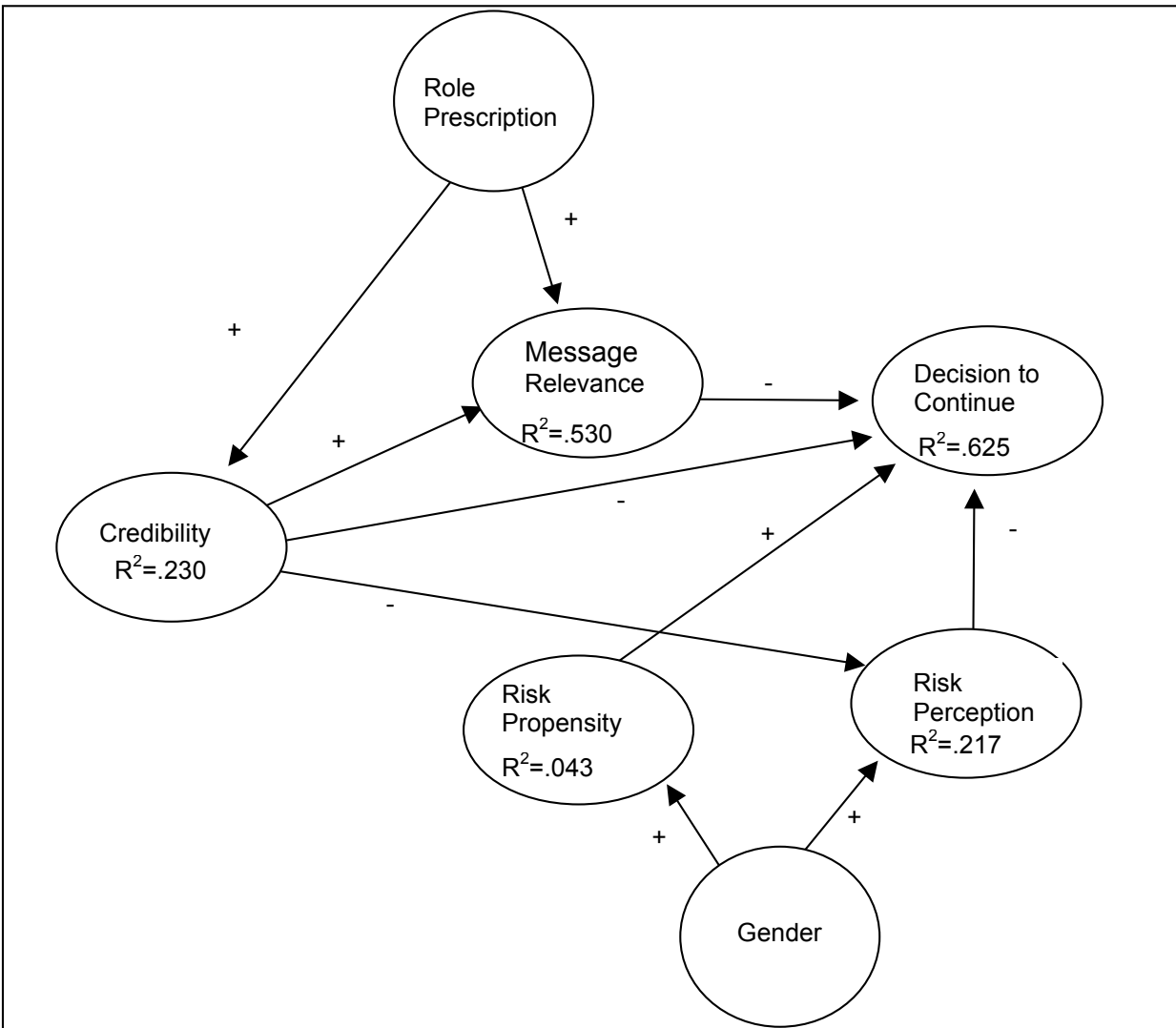


Figure 4.1: Results of the Experiment from Chapter 3

In this chapter, I examine another concept that might affect the occurrence of the Deaf Effect, the decision maker's view of societal culture. Decision makers have a view of the societal culture: what it values and what it expects of them. These concepts might have an effect upon their behavior by causing restraints on one form of behavior or enabling another form (Archer 1995). In fact, It has been noted that cultural forces influence many aspects of organizational leadership including such areas as behaviors expected of leaders in particular situations (Hofstede 2001; House, Hanges, Javidan, Dorfman and Gupta 2004). Thus it seems that examining the impact of societal culture on decision makers would be of interest in the study of the Deaf Effect.

The previous studies reported in this dissertation were conducted with American undergraduate students at a university in the southeastern part of that country. In terms of cultural values, people in the United States are believed to be among the most individualistic people in the world (Hofstede 2001; House, et al. 2004). In other societies that are less individualistic, the effects of the independent variables on the decision to continue or discontinue a course of action might be different. The collectivist identification of self with the group might influence the decision maker to view bad news reporters and their report differently than in more individualistic cultures. Similarly, an unwillingness to decide against the consensus of their work group may cause decision makers to decide in one direction although they might hold an alternative opinion. Therefore, studying the effect of societal individualism-collectivism may shed additional light on how the Deaf Effect occurs. In this study, therefore, I focus on the effects of individualism-collectivism on the occurrence of the Deaf Effect. The research question is therefore:

What is the effect of societal individualism-collectivism on the occurrence of the Deaf Effect?

4.1 THEORETICAL FOUNDATIONS

In this section, I provide a definition of culture based on that of Leidner and Kayworth (2006). Then I discuss why I select the GLOBE framework of cultural values for use in this study. Following that I discuss my selection of the values of institutional and in-group collectivism showing why I chose them and how they affect the research model of the Deaf Effect. I then propose several hypotheses regarding the effects of societal collectivism.

4.1.1 Definition of Culture

As Straub, et al. (2002) and Leidner and Kayworth (2006) have pointed out, culture is a term that has received a multitude of definitions. In this dissertation, I will be using the term as Leidner and Kayworth use it: a consistent and uniform set of values that underlies a society or organization. They indicate that while culture is manifested in artifacts as well as values, it is more easily studied as values since artifacts require interpretation and therefore are subject to interpretation bias. This has been the dominant approach to culture (Leidner and Kayworth 2006) and is the approach followed in this study.

This definition does not imply that culture is so uniform that all members of the society hold all the values of that society in common. It is rather as Archer (1988) argues, there is a set of cultural values that are dominant in the society and inform cultural practices. These values became dominant as the result of interactions between social groups that hold these values and others that espouse differing values. As a result of the action of social power, these values are adopted by consensus. Even after the establishment of

the consensus values, there are still other groups that seek to modify or abolish those values in favor of a set of values that they hold. Thus members of a society may not hold the values that inform cultural practices but to some extent they abide by them in order to participate in the society.

Studies have shown that the societal influences loom large in the formation of the other influences and on the creation of individual values. For example, House, Hanges, Javidan, Dorfman, & Gupta (2004) cited 'a wealth of literature' that shows that organizational values reflect a "variety of the aspects of the societies in which they exist" (p. 76). Similarly, Smith (1992) suggests that even when similar organizational structures are used, different national cultures give them substantially different meanings. Also, Earley and Gibson (1998) found that congruence between national culture and organization culture lead to higher job satisfaction and cooperative behavior. Additionally, the level of individual-collectivism and leadership style is related to organization effectiveness. These examples seem to suggest that societal values may be important determinants of the values used in a decision making context. In this study, therefore, I focus on the effects of the societal values on decision making.

4.2 CULTURAL VALUES FRAMEWORK

Accepting the importance of societal values in influencing a decision maker's thought processes, I now consider what framework of cultural values should be used. A threshold consideration must first be discussed. The entire concept of studying national culture has been criticized. Myers and Tan (2002) have criticized the entire enterprise. The concept of "national culture" is problematic they argue. The concept of "nation state" is recent; changes in form and makeup; and is perhaps being made obsolete by globalization. It is also not true that each nation has its own culture; there are subcultures to be found within any geographic boundary. The concept of national culture is not that accepted by anthropologists who find that the relationship between national culture values and work-related issues and attitude is not well explained by Hofstede's model. Baskerville (2003) places similar criticisms in the context of Hofstede's work. She contends that Hofstede's definition of culture is outmoded and therefore his work has had little uptake in the fields of sociology or anthropology and is not well cited in those fields. Similar to Myers and Tan, she criticizes the concept of national culture. Finally, she argues that the concept of using scales and outside observer status has been rejected by the anthropological discipline and therefore is questionable. Hofstede (2003) in a response to Baskerville, defending this approach, argues that his work has been cited widely in organizational sociological literature, but has not been cited in the anthropological literature due to little interest in that field in business related activities and general antipathy to the business management field. This led to an ignorance of his work in the social anthropology field. In terms of the national culture argument, he agrees that the national level is perhaps not the best level of analysis for culture and that nation states cannot be identified with national culture, but he finds that empirically his scales correlate well with data from other sources. Baskerville, however, remains unconvinced and argues that further examination of the replications that Hofstede claims as validating his scales needs to be done (Baskerville-Morley 2005). Given that I am undertaking a replication of a positivist study and that Hofstede style scales have been replicated, I will adopt the use of this type of methodology for this study. The question then is which set of scales to use.

The most prominent cultural values framework is that proposed by Hofstede (2001). Based on a factorial analysis of internal survey results of IBM employees in 50 countries

conducted in the late 1960s and early 1970s, he derived four cultural values: Individualism, Power Distance, Uncertainty Avoidance, and Masculinity. Later, after additional research in Asian cultures, he added another dimension: Confucian Dynamism or Long-Term Orientation. The Hofstede measures have been extensively used within the IS literature including a study of IS project escalation (Keil et al., 2000) and a study of the Mum Effect (Tan, et al. 2003). However, the Hofstede measures have been criticized as lacking construct validity and other psychometric properties (Spector, Cooper and Sparks 2001), and as being US/European or IBM centric (Baskerville 2003; McSweeney 2002; Myers and Tan 2002). They have also been criticized as atheoretical (House, et al. 2004). Also, the items used in the Hofstede measures mix organizational and societal values with values of the individual and the collective. Since, in this study, I am interested in investigating the effect of societal cultural values on the occurrence of the Deaf Effect, Hofstede's framework; with its items mixing organizational and societal levels does not meet these requirements.

Recently, the Global Leadership and Organizational Behavior Effectiveness Research Program (GLOBE) collaboration (House, et al. 2004) has proposed a framework of nine cultural values that overcomes most of the criticisms of the Hofstede framework. This framework appears to improve on that of Hofstede by, first, being theoretically based versus simply being empirically derived. The GLOBE framework is based on a conceptual model that reflects an integration of implicit leadership theory, value-belief theory of culture, implicit motivation theory and structural contingency theory of organizational form. Second, it seeks to eliminate societal and organizational centrism by being developed by an international team of 170 researchers in 62 different countries with middle manager subjects in those countries within 951 organizations in three different industries. Thirdly, they employed a rigorous validation process that conforms to the prescription of Karahanna, Evaristo and Srite (2002) for establishing cross-cultural equivalence of measures. To avoid construct bias, Karahanna, et al. first suggest informants in each culture "should be asked to describe the construct and associated behaviors" (p. 49). For each construct, items were derived through interviews and focus groups in several countries (Hanges and Dickson 2004, p. 124). These items were first reviewed for appropriateness through the use of Q-sorting, item evaluation, and translation and back translation by U.S. PhD students and then by Country Co-Investigators (CCI) in 38 countries. Item evaluation reports were provided by the CCIs to inform GLOBE as to any words or phrases that were ambiguous or could not be adequately translated. Problematic items were rewritten or dropped. Secondly, Karahanna, et al. suggest that factor analysis and multi-dimensional scaling be used to assess internal structural congruence. In two pilot tests involving results from 43 countries, the GLOBE investigators applied exploratory factor, reliability and aggregation ($r_{wg(j)}$, ICC (1) and (2), Muthen multilevel confirmatory factor) analyses to assess the validity of the items. To suppress item bias, the GLOBE researchers used the qualitative methods described above to eliminate poor translation, and complex or inappropriate wording. Fourth, the GLOBE framework presents four scales, two for measuring societal values, two for organizational values. Within these, they have a scale for measuring existing cultural values and one for measuring how the respondents believe the values should be. Thus they remove the concern of cross measurement of society and organization and how the society is now versus how it should be.

I therefore believe that these measures represent an improvement over the Hofstede measures and so propose to use them in this study to measure cultural attributes.

4.2.1 Selection of the Cultural Values Scale

As noted above, GLOBE provides four different instruments that measure the constructs at two different levels, at the societal/organizational level and at the practices (as-is)/ values (should-be) level. The societal measures ask respondents to rate the society in which they live as to the various cultural values. Similarly, the organizational scale requests them to evaluate their organizations. The practices scales, of which there is one for the society and one for the organization, ask respondents to rate a set of practices relating to the surrounding society or organization, as it exists now. The values scales, which also exist in a form for the society and one for the organization, requests the respondents to assess what the practices 'should be' which gives a view of societal values. In this study, I will use the societal practices scales to measure culture, as I am interested in assessing practices (as-is) at the societal level. In this scale the respondents are not providing their own values, but acting as individual raters to provide their perception of the society's practices. This measures precisely what is needed in this study.

4.3 APPLYING THE GLOBE MEASURES TO THE DEAF EFFECT

4.3.1 Selection of Societal Collectivism

The nine factors proposed by Globe (House, et al. 2004) for measuring culture include Institutional Collectivism, In-Group Collectivism, Power Distance, Uncertainty Avoidance, Assertiveness, Gender Egalitarianism, Performance Orientation, Future Orientation, and Human Orientation. In this research, I focus on societal collectivism because I believe it to be the most appropriate dimension for explaining potential cross-cultural differences in the Deaf Effect. Following Zhang, Lowry, Zhou and Fu (2007), I believe that societal collectivism (the values of Institutional Collectivism and In-group Collectivism in a societal context) is an appropriate choice because:

1. It allows us to develop a parsimonious model. Attempting to include all 9 cultural factors as independent variables would be too unwieldy. Thus, researchers normally consider only one or two dimensions.
2. Societal collectivism is the most commonly used dimension in cross-cultural research and has been shown to be a significant cultural factor in a wide variety of studies.
3. Given the context of my study, it is logical to assume that societal collectivism will affect how much credence is afforded to a bad news reporter who is not on the project team when his/her report runs counter to the project team's consensus.
4. Given the nature of the experiment and the treatments used in this study, it seems unlikely that differences in gender egalitarianism, assertiveness, and humane orientation, would have a significant effect. Gender egalitarianism is the degree to which a society minimizes gender role differences and promotes gender equality (Javidan, House and Dorfman 2004). High gender egalitarian societies have more women in positions of authority than low gender egalitarian societies. In terms of the model already advanced, gender was seen as affecting only the attitudes toward risk and not the perception of bad news reporters or their message relevance. Assertiveness is the degree to which individuals are forceful or confrontational with each other (Javidan, et al. 2004). Societies high in assertiveness value tough, direct behavior and

communications. While valuing direct communications would seem to be important, this quality is also valued by high performance orientation, which is already included in the study. Humane orientation is the degree to which a collective rewards individuals for being fair, generous, and caring towards others (Javidan, et al. 2004). In high humane orientation societies, individuals are other oriented and seek to act for the benefit of those they have relationships with. This construct doesn't appear to have any effect on the constructs in the model beyond that of the collectivism variables which encourage the decision maker to act in the interests of the collective..

4.3.2 The Effect of Societal Collectivism on the Deaf Effect

Historically, collectivism has been considered to be a single construct (e.g. Hofstede, 2001). However, recently, consideration has been given to different forms of collectivism (Triandis, 1995) and the breadth and complexity of that construct (Earley and Gibson, 1998). In the development of the GLOBE framework, they recognized during the development of the measures that the construct empirically divides into two constructs (Gelfand, Bhawuk, Nishii and Bechtold 2004). Their framework therefore divides societal collectivism into two constructs: Institutional Collectivism and In-Group Collectivism. These are two separate and uncorrelated constructs within the GLOBE framework. Institutional Collectivism is associated with what Triandis referred to as "horizontal collectivism" (Triandis 1995). Horizontal collectivism is characterized by a performance orientation in which the goal is accomplished in a collective manner without the use of aggression or power dominance. It is common in the Confucian Asian culture and the Scandinavian cultures. In-Group Collectivism, on the other hand, is associated with the concept of "vertical collectivism" (Triandis 1995). In cultures with a high degree of vertical collectivism, close ties among family and clan are important, power distance is important, but predefined workplace rules are less important (Gelfand, et al. 2004). In-Group Collectivism is not performance oriented, nor is it future oriented. This form of collectivism is commonly found in South America and Africa.

4.3.2.1. Institutional Collectivism

According to the GLOBE consortium, Institutional Collectivism is defined as "the degree to which organizational and societal institutional practices encourage and reward collective distribution of resources and collective action." (Javidan, et al. 2004, p. 30). In collectivist cultures, individuals are group oriented. They tend to view themselves as part of a group and put group goals before their own. Duties and obligations are very important to them. Institutional Collectivism also tends to be associated with higher levels of uncertainty avoidance, which leads to a desire to use rules to resolve uncertainty in the environment. I would expect then that decision makers in an institutional collectivist culture would perceive that their society encourages them to associate themselves with their work team and work on a team basis. They would, however also see that they are encouraged to strive to follow workplace conventions. Based on this description, in terms of the Deaf Effect, I make the following hypotheses: since an institutional collectivist culture encourages decision makers to work with their teams and stand with them, I hypothesize that, absent clear indications to the contrary, decision makers in institutional collectivist societies will tend to side with the opinions of their teams:

H1a: Where the surrounding culture is characterized by a high degree of Institutional Collectivism, decision makers will tend to side with the opinion of the team in terms of whether to continue or discontinue a course of action.

Additionally, since this type of culture encourages the tendency to side with their teams, the decision maker would be also be less likely to perceive bad news reported from outside their team to be relevant.

H1b: Institutional Collectivism decreases the relevance of a report of bad news by a reporter external to the work team.

Finally, I note that the Institutional Collectivism construct is highly correlated with uncertainty avoidance (Gelfand, et al. 2004). This correlation indicates that in uncertainty avoiding cultures, people seek to regulate their activities through the establishment of rules rather than making a determination when the situation arises (Gelfand, et al. 2004). Thus, workplace conventions such as having an auditor review the project prior to implementation and the formal designation of certain persons to be those who review and report project status might moderate the effect of Institutional Collectivism to lower the Relevance of the report of bad news. The report of a bad news reporter outside the organization is hypothesized to receive lower Relevance (H1b). However, if the reporter is role prescribed in a high Uncertainty Avoidance organization such as is often found in institutional collectivist societies, then the Role Prescription may offset some or all of the negative effect of Institutional Collectivism. Therefore, given this effect, I can see that a decision maker influenced by Institutional Collectivism might take into consideration the Role Prescription of a bad news reporter; giving the reports of those who are role prescribed more Relevance. Thus the effects of Role Prescription might mitigate the effect of Institutional Collectivism in decreasing Relevance. I therefore hypothesize that

H1c: Role Prescription moderates the effect of Institutional Collectivism on Relevance.

In terms of the research model, as shown in figure 4.2, Institutional Collectivism operates to defeat the bad news reporter's message. First, by the decision maker siding with the team, leading to a direct positive effect to continue the current course of action (H1a) (assuming that that is the consensus of the team). Second, Institutional Collectivism directly reduces the Decision of the bad news reporter's message to the decision maker regardless of their Credibility or Role Prescription (H1b). Finally, due to their desire to follow workplace conventions, Role Prescription moderates the effect of Institutional Collectivism on perceived Decision of the message such that the effect of Institutional Collectivism is reduced when bad news reporters are role prescribed to report bad news than when they are not role prescribed (H1c).

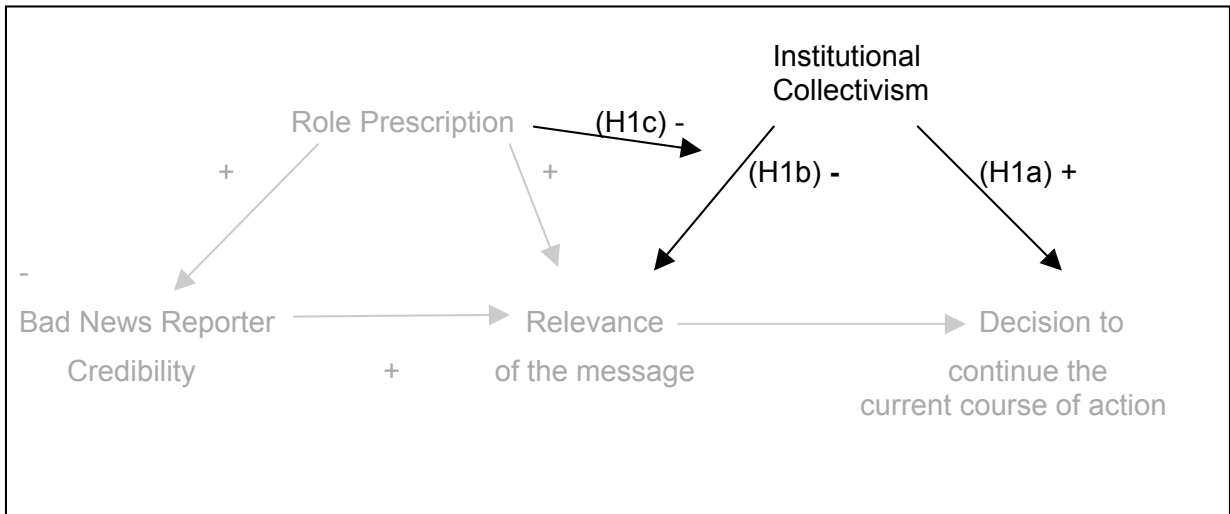


Figure 4.2: Effect of Institutional Collectivism
(Grayed out terms are from the studies of papers 1 and 2)

4.3.2.2. In-Group Collectivism

In-Group Collectivism is defined as “the degree to which individuals express pride, loyalty and cohesiveness in their organizations or families” (Javidan, et al. 2004). In contrast with Institutional Collectivism, In-Group Collectivism, is associated with the concept of “vertical collectivism” (Triandis 1995). These collectivists are more interested in clan groupings than institutions. There are close ties between the clan members and they are respectful of authority and have fewer rules than institutional collectivists (Gelfand, et al. 2004). In-Group Collectivism is associated with higher power distance and humane orientation and inversely with future orientation and uncertainty avoidance (Gelfand, et al. 2004). Thus decision makers in high in-group collectivist societies would be encouraged by that society to associate with the hierarchy in which they find themselves and defer to its leadership. I therefore hypothesize that since in-group collectivists tend to follow the leaders of their clan:

H2a: Where the surrounding culture is characterized by a high degree of in-Group Collectivism, decision makers will tend to side with the opinion of the leadership in terms of whether to continue or discontinue a course of action.

H2b: In-Group Collectivism decreases the Decision of a report of bad news when it conflicts with the opinion of the leadership in terms of whether to continue or discontinue a course of action.

Unlike Institutional Collectivism, In-Group Collectivism is not rule oriented and thus its influence would not be moderated based on a work place rule. However, since in-group collectivists tend to be more respectful of authority, this would give the opinions of management a stronger weight. This would imply that if a bad news reporter was role prescribed by management, it would lend them additional Credibility and Relevance in the decision maker’s consideration. I hypothesize that a bad news reporter whose job as

designated by the leadership is to report bad news in projects would tend to have more Credibility and Relevance than one who is not role prescribed. Therefore:

H2c: Role Prescription moderates the effect of In-Group Collectivism on Relevance.

In terms of the research model (figure 4.3), I hypothesize that In-Group Collectivism will have a positive direct effect on the decision to continue the current course of action while having a negative effect on the Relevance of the bad news reporter’s message. The effect on Relevance will be moderated by the Role Prescription of the reporter as shown in figure 4. Where the bad news reporter is role prescribed the effect of In-Group Collectivism on Relevance will be weakened.

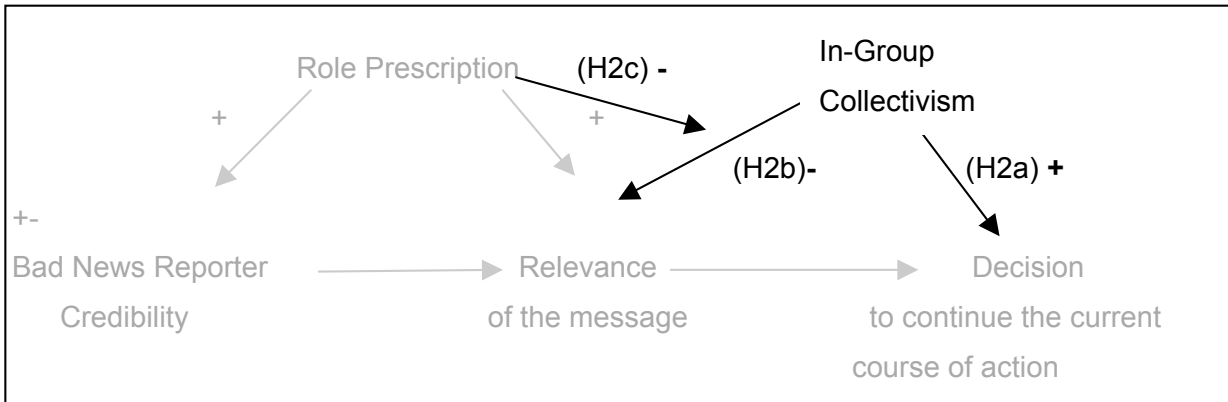
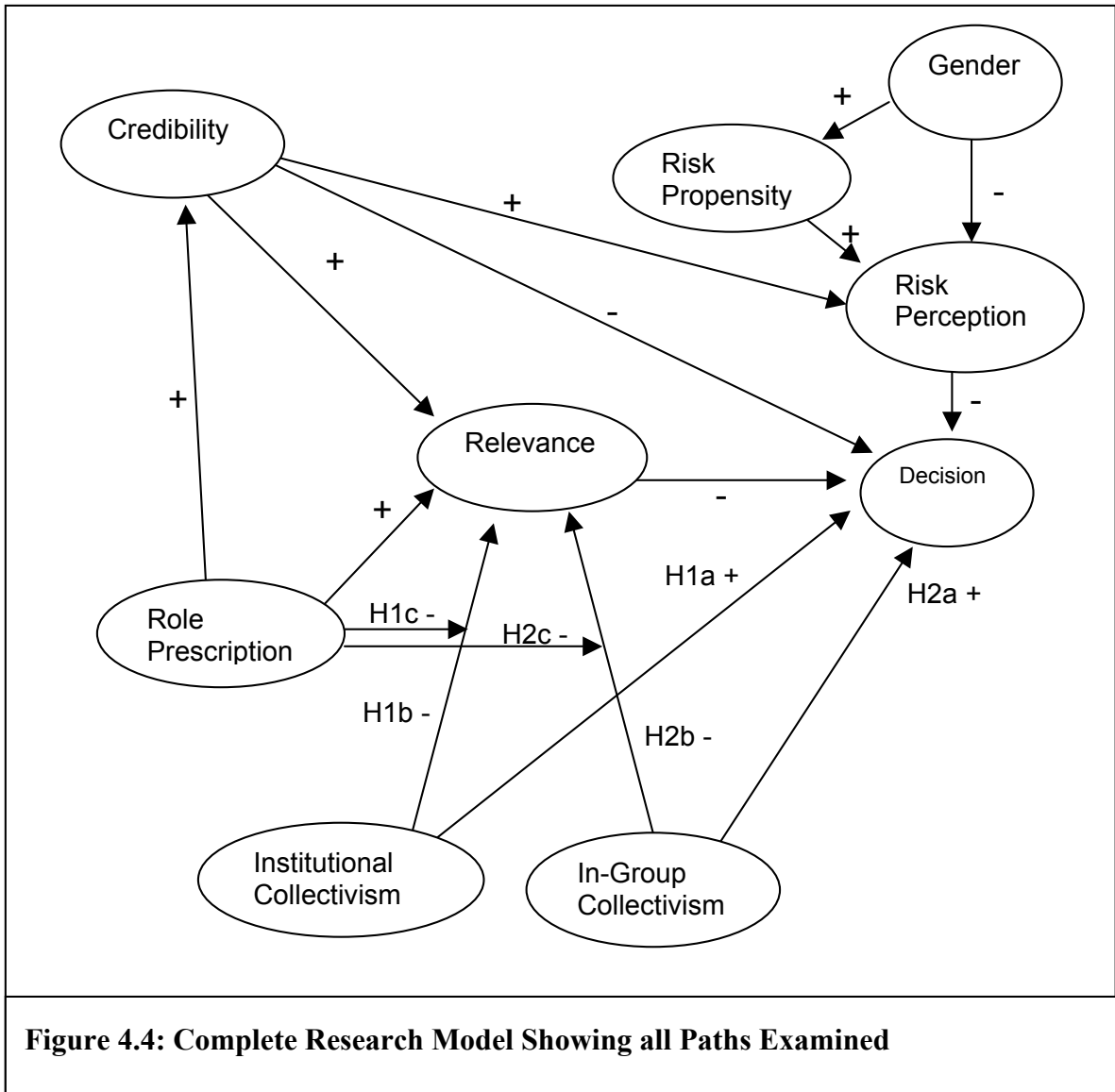


Figure 4.3: Effects of In-Group Collectivism

The entire research model investigated in this study is shown in figure 4.4. I entered the paths shown in the first two studies as significant in the model plus paths for the hypotheses advanced here.



4.4 RESEARCH METHODOLOGY

The hypotheses advanced above were examined by use of a laboratory experiment executed in different countries. Role Prescription and bad news reporter Credibility were manipulated independently. The 2x2 factorial design, scenarios, questionnaire and methodology developed in paper 2 were reused in this study. The questionnaire was augmented by the addition of the GLOBE survey questions for capturing data related to Institutional and In-Group Collectivism. Additional questions from the GLOBE survey were added to cover the cultural variables used as controls in this study: uncertainty avoidance, power distance, performance orientation, and future orientation. The cultural values of Institutional and In-Group Collectivism are varied by selection of subjects from countries determined by the GLOBE consortium study on leadership to possess levels of Institutional and In-Group Collectivism that vary from high to low. The effects of culture are analyzed by employing the subject's responses to the cultural values items as an indicator of their beliefs about the nature of the surrounding culture. These responses were analyzed for cultural response bias, appropriate psychometric properties and equivalence across the countries. They were then used in a PLS analysis to assess the effects of the societal collectivism on the occurrence of the Deaf Effect.

4.4.1 Subjects

The subjects for this experiment were undergraduate students in introductory classes within the business school or school of information sciences at major universities. This population allowed selection of subjects relatively uniform in age, and experience. This uniformity is held to reduce methods bias and ensure equivalence in the sample across the cultures (Karahanna, et al. 2002). While the use of student subjects is subject to debate, it was shown in chapter 3 that the central question to be resolved is that of how to deal with the question of external validity. Following Cook and Campbell (1979) and Calder, Phillips and Tybout (1981; 1982; 1983), it was argued that external validity can be de-emphasized in favor of internal validity as long as the subjects employed respond in the same direction as the target population. I also saw there that student populations had responded similarly to practitioner populations in decision making studies and therefore concluded that student subjects were appropriate for this research.

In order to insure variance in the cultural values that are of interest to this study, countries were selected from the GLOBE survey that reflect Institutional and In-Group Collectivism value scores that range from high to low. To make the determination of whether the geography was high or low on this value, the GLOBE computed "bands" for each cultural value were used. The GLOBE researchers rank ordered the scores for each variable and then grouped them by bands that reflect a range in which the differences between the scores are not statistically meaningful. The selected geographies and GLOBE cultural values results are found in Table 4.1.

Table 4.1: GLOBE values for the Selected Geographies (House, et al. 2004)

Country	Institutional Collectivism		In-Group Collectivism	
	Value ⁸	GLOBE Band ⁹	Value	GLOBE Band
United States	4.2	B	4.25	C
Germany	3.56	C	4.02	C
China	4.77	A	5.8	A
Average Value	4.25		5.13	
Bands		ABCD ¹⁰		ABC

Thus the selected countries meet the requirements for manipulation of the collectivism variables¹¹. Germany is projected to provide the lowest levels of both types of collectivism while China is to provide the highest levels and the USA should provide a below average sample on both values. The USA sample will also allow replication of the findings from chapter 3.

4.4.2 Experimental Methodology

The study was administered to the subjects as a voluntary activity in their classrooms. Various collaborators in the subject countries administered the survey instrument. Students were instructed to read the scenario presented to them and then answer the questions in the questionnaire. The administrator was a native of the country and followed a standard script provided to them. The sampling strategy ensured sample equivalency by controlling for demographics, background and role. Administration bias was controlled by using similar physical conditions, native language administrators and using identical administration procedures. These steps are held to procedurally reduce method bias (Karahanna, et al. 2002).

4.4.2.1. Scenario

⁸ The scale for all variables in the GLOBE framework is 1 to 7. The range of values for institutional collectivism is from 3.25 to 5.22. For in-group collectivism it is 3.53 to 6.36.

⁹ Band A is the highest range of values. Band B is next highest and so on. Institutional collectivism has 4 bands. In-group collectivism has 3.

¹⁰ Greece is the only country in the “D” band at 3.25.

¹¹ In my dissertation proposal, I included South Africa in the geographies. However, in evaluating the data received from the site, it had poor psychometric properties and was unusable. South Africa was therefore omitted in reporting the results.

In order to independently manipulate Role Prescription and bad news reporter Credibility, four different treatment scenarios were used as developed in chapter 3. Subjects were asked to assume the role of a project manager responsible for development of a new system for a bank and are informed that while they do not have the technical knowledge to evaluate the quality of the system themselves, they have learned that their team is a reliable source of information about the project status. The team reports that the project is ready for implementation. A bad news reporter from outside the team reviews the project and then reports to the project manager that the project is a “disaster waiting to happen” and must be completely retested. The organizational climate is described as one that values meeting deadlines above other considerations.

In the high Credibility manipulation, the bad news reporter is described as trustworthy and has expertise; in the low Credibility manipulation, the bad news reporter is described as untrustworthy and lacking expertise. In the high Role Prescription manipulation, the bad news reporter is described as an internal auditor whose job is to routinely audit IS projects and report on project readiness. In the low Role Prescription manipulation, the bad news reporter is described as another project leader whose job does not include routinely auditing projects and who volunteers, unasked, to review the project.

In Germany, and China, to reduce item bias, the scenarios were translated from English into German, and Chinese, respectively and then back translated by different individuals to ensure fidelity in translation (Karahanna, et al. 2002). As part of this effort, names were changed to native language names and locations were changed to locations in the native countries. The questionnaire contained three different sections. The first part requests the subject’s decision, rationale for the decision and demographic information. The second part contains the items dealing with the constructs of the model from paper 2. The third part was composed of items from the GLOBE survey. The questions in sections two and three were scrambled separately so that items relating to each of the constructs were presented in a random order with the goal of reducing method bias.

The English versions of the scenarios were reported with study 2 in chapter 3. The questionnaire used in this experiment is included in Appendix A.

4.4.2.2. Constructs

Table 4.2 lists the constructs that were evaluated in this study and how they were measured. All non-cultural value constructs are identical to those used in paper 2. The cultural values constructs and measurements are taken from the GLOBE Form Beta (societal practices scale) (GLOBE 2006).

Table 4.2: Construct Categorization and Measurement Methodology			
Construct	Type	How Measured	Source of the Items
Decision to Continue Current Course of Action	Dependent Variable	One 8 point semantic differential scale item.	Same item as used in chapters 2 and 3.
Perceived Relevance of the Bad News Reporter's Message	Endogenous Independent	Four 7 point Likert scale items	Same items as used in chapter 3.
Credibility of the Bad News Reporter	Exogenous Independent	Five 7 point Likert scale items	Same items as used in chapter 3.
Risk Propensity of the Decision Maker	Exogenous Independent	Three 7 point Likert scale items	Same items as used in chapter 3. Derived from Sitken and Weingart (1995).
Perception of Risk by the Decision Maker	Exogenous Independent	Four 7 point Likert scale items	Same items as used in chapter 3. Derived from Sitken and Weingart (1995).
Role Prescription of the Bad News Reporter	Exogenous Independent	One 7 point Likert scale item	Same item as used in chapters 2 and 3.
Institutional Collectivism of the Ambient Society	Exogenous Independent	Two 7 point Likert scale items Two 7 point semantic differential scale items	GLOBE Framework
In-Group Collectivism of the Ambient Society	Exogenous Independent	Four 7 point Likert scale items	GLOBE Framework
Power Distance of the Ambient Society	Exogenous Control	Four 7 point semantic differential items One 7 point Likert scale item	GLOBE Framework
Uncertainty Avoidance	Exogenous Control	Three 7 point Likert	GLOBE

of the Ambient Society		scale item One 7 point semantic differential item	Framework
Performance Orientation of the Ambient Society	Exogenous Control	Two 7 point semantic differential items One 7 point Likert scale item	GLOBE Framework
Future Orientation of the Ambient Society	Exogenous Control	Five 7 point semantic differential items	GLOBE Framework

In addition to the studied cultural values constructs of Institutional Collectivism and In-Group Collectivism, the constructs of Power Distance, Uncertainty Avoidance, Future Orientation and Performance Orientation are entered as control variables on the decision to continue the current course of action.

Reflective/Formative Determination. I applied the same reflective/formative determinations from chapter 3 in this study. Relevance was treated as a reflective variable; Credibility as a formative construct. Below, I discuss the nature of the GLOBE constructs.

The GLOBE Consortium (House, et al. 2004) developed and treated their 9 constructs as reflective constructs. However, in examining the items used in these constructs, it appears that they are better treated as formative constructs.

Petter, Straub and Rai's (2007) table 3 provides a set of decision rules for evaluation of the constructs. They describe four rules for evaluation of constructs to determine whether they are formative or reflective. First is the direction of causality. Reflective items are manifestations of the underlying construct and therefore causality flows from the construct to the measure. For formative constructs, the causality is in the opposite direction. The items interact to form the manifestation of the construct. Second, measurement interchangeability asks whether the items are interchangeable with each other. For reflective measures, the items should be interchangeable with each other and elimination of one item does not affect the determination of the construct. For formative constructs on the other hand, the measures are not necessarily interchangeable as they cause formation of the construct, therefore they cannot be removed without damaging the measurement of the construct. Third, measure covariance asks whether the measures statistically co-vary with each other. In reflective constructs, the items must co-vary with each other. In formative constructs however, since they measure different parts of the construct, the items will not necessarily co-vary with each other. In fact, some items might vary in opposite directions if they represent countervailing forces on the construct. Finally, they ask whether the items have the same antecedents and consequences. Do the same causal factors motivate the answers to the items or are they different. Items for reflective constructs, since they reflect the same value, will have the same antecedents. Items for formative constructs will have different antecedents and consequences.

In the sections that follow, I analyze each of these constructs to determine whether they

are reflective or formative. The third factor, measure co-variance, is assessed in the findings section.

Collectivism. The GLOBE consortium divides collectivism into two constructs: Institutional (IC) and In-Group (IG) Collectivism. The items that measure these are shown in the following table 4.3a:

Table 4.3a: Collectivism Items	
IC – 1	In this society, leaders encourage group loyalty even if individual goals suffer.
IC – 2	The economic system is design to maximize individual interests.
IC - 3	In this society being accepted by the other members of a group is very important.
IC - 4	In this society individualism is more valued than group cohesion.
IG - 1	In this society, children take pride in the individual accomplishments of their parents.
IG - 2	In this society, parents take pride in the individual accomplishments of their children.
IG – 3	In this society, aging parents generally live at home with their children.
IG – 4	In this society, children generally live at home with their parents until they get married.

In these constructs, these items all tap into different facets of the construct each adding a different aspect. The four Institutional Collectivism items assess the respondents' views of what leaders encourage, the goal of the economic system, how people are accepted and what is valued more in society. Similarly, the In-Group Collectivism questions assess what children and parents take pride in, how the aging are cared for and whether children live at home until marriage. They are thus not interchangeable and they all have different antecedents. From this qualitative analysis, they are therefore considered to be formative constructs.

Uncertainty Avoidance. The items used to measure uncertainty avoidance are listed in table 4.3b.

Table 4.3b: Uncertainty Avoidance Items	
UA - 1	In this society, orderliness and consistency are stressed, even at the expense of experimentation and innovation.
UA - 2	In this society, people lead highly structured lives with few unexpected events.
UA - 3	In this society, societal requirements and instructions are spelled out in detail so citizens know what they are expected to do.
UA - 4	This society has rules or laws to cover almost all situations.

In each of the items, different facets of the construct are being measured: orderliness, structure of the lives, and detail of instruction. Therefore I see that they are not interchangeable and have different antecedents. I therefore consider the construct as formative.

Power Distance. The items used to measure power distance are listed in table 4.3c.

Table 4.3c: Power Distance Items	
PD - 1	In this society, a person's influence is based primarily on the authority of one's position as opposed to their ability and contribution.
PD - 2	In this society, followers are expected to obey their leaders without question as opposed to questioning them when in disagreement.
PD - 3	In this society, people in position of power try to increase their social distance from less powerful people as opposed to decreasing it.
PD - 4	In this society, rank and position in the hierarchy have special privileges.
PD - 5	In this society, power is concentrated at the top

In each of the items, different facets of the construct are being measured: source of influence, obedience to leaders, activities of the powerful, privileges of the powerful, concentration of power. Therefore they are not interchangeable and have different antecedents. I therefore consider the construct as formative.

Future Orientation. The items used to measure future orientation are listed in table 4.3d.

Table 4.3d: Future Orientation Items	
FO - 1	The way to be successful in this society is to plan ahead.
FO - 2	In this society, the accepted norm is to plan for the future.
FO - 3	In this society, social gatherings are usually planned well in advance.
FO - 4	In this society, more people live for the future than live for the present.
FO - 5	In this society, people place more emphasis on planning for the future.

I see that in each of the items, different facets of the construct are being measured: path to success, and whether life is lived for the future or the past. I see that they are not

interchangeable and have different antecedents. I therefore consider the construct as formative.

Performance Orientation. Finally, the items used to measure performance orientation are listed in table 4.3e.

Table 4.3e: Performance Orientation Items	
PO - 1	In this society, teen-aged students are encouraged to strive for continuously improved performance.
PO - 2	In this society, major rewards are based on only performance effectiveness (compared with other factors such as seniority etc.)
PO - 3	In this society, being innovative to improve performance is generally substantially rewarded vs. not rewarded.

In each of the items, different facets of the construct are being measured: what students are taught to do, how rewards are bestowed and how innovation is recognized. They are not interchangeable and have different antecedents. I therefore consider the construct as formative.

Summary. In the following table 4.4, I summarize the results of my assessment of the constructs. I did not include Decision or Role Prescription in the table, as they are single measure constructs. In the previous usage of these measures, those studies all reported the constructs to have high item covariance (Cuellar, et al. 2006; Hanges and Dickson 2004). Since I determined that the constructs are formative, I will establish formative construct processing within PLS by using the measure to construct connections instead of the construct to measure connections.

Table 4.4: Categorization of Constructs as Formative or Reflective				
Construct	Direction of Causality	Measure interchangeability	Nomological Net	Construct Type
Institutional Collectivism	Measure to Construct	Not interchangeable, measure different aspects of the construct	Different Antecedents	Formative
In-Group Collectivism	Measure to Construct	Not interchangeable, measure different aspects of the construct	Different Antecedents	Formative

Uncertainty Avoidance	Measure to Construct	Not interchangeable, measure different aspects of the construct	Different Antecedents	Formative
Power Distance	Measure to Construct	Not interchangeable, measure different aspects of the construct	Different Antecedents	Formative
Future Orientation	Measure to Construct	Not interchangeable, measure different aspects of the construct	Different Antecedents	Formative
Performance Orientation	Measure to Construct	Not interchangeable, measure different aspects of the construct	Different Antecedents	Formative

4.5 ANALYSIS METHODOLOGY

Surveys were taken on paper, coded, and then keyed into spreadsheets and analyzed using SPSS for descriptive statistics and manipulation checks and SmartPLS (Ringle, et al. 2005) for measurement and structural model analysis.

4.5.1 Handling the Cultural Values.

I followed Ford, Connelly and Meister (2003) in the handling of the cultural values. They make the following five points about how cultural variables should be handled:

- 1) Values variables should have a theoretic reason for being incorporated into the study.

In this study, it has been shown how the value of Institutional Collectivism is theoretically projected to influence the Deaf Effect.

- 2) The dimensions of the framework should be used for the purposes for which they are intended.

The GLOBE framework was developed and operationalized at the societal and organizational level. The object is to use the subjects as raters of the values of the culture so that on an aggregate basis it provides a value the cultural values as perceived by the respondents. Therefore, it yields a single value that can be applied to the entire culture. However, there are reasons to not follow this particular approach. As has been discussed above, it can be argued that there is a dominant culture to which members of the society conform whether or not they agree with the values of the culture. Also, each individual's experience of that society is unique to that individual. For example, some individuals may perceive the culture as favoring individual activity while others may perceive it as favoring collective activity. These perceptions may have a different impact

on the first than on the second. Therefore, it is inappropriate to apply the same value for the cultural values for each member of the society. Therefore, the GLOBE cultural value scales are utilized as measures of the individual perceptions of the ambient culture. This approach is similar to that of Srite and Karahanna (2002) wherein they argue that to apply the same cultural value to each subject in a particular culture is to commit the ecological fallacy and argue that culture should be treated as an individual difference value.

The GLOBE framework poses the questions in such a way as to collect the respondent's perceptions of the values of the culture in which they exist. Therefore, this is an appropriate framework to use to collect the individual perception values. The instructions for use indicate that the GLOBE framework has not been verified at the individual level of analysis as they have been at the aggregate level (GLOBE 2006). I will therefore have to validate the psychometric properties of the constructs as part of this study.

3) Cultural values must be measured within the study

Ford et al. (2003) and other articles (Baskerville 2003; McCoy, Galletta and King 2005) indicate that there may have been shifts in the cultural values of some countries from those originally gathered by Hofstede or GLOBE. For this reason, it is inappropriate simply to use values from prior studies and assume that they apply to our sample. I therefore will measure the cultural values for our samples in the course of this study.

4) When selecting the sample for the study, an effort should be made to select populations expected to differ on the cultural variables under study.

As described above, I have selected geographies likely to have subject populations with societal values which will have high, low and moderate levels of Institutional and In-Group Collectivism.

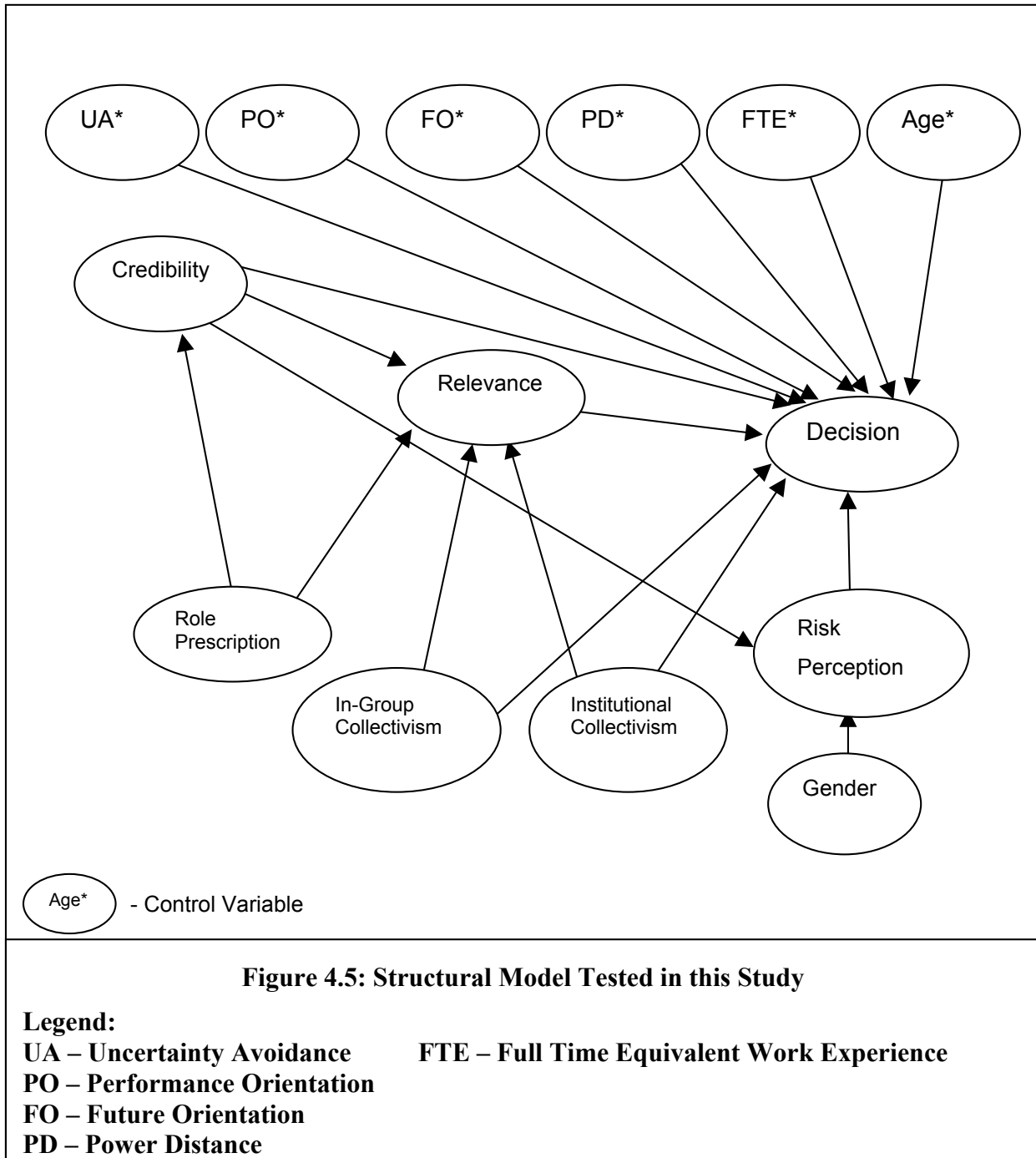
5) Use the cultural values measures as independent variables, moderating variables or control variables within the study.

Ford et al. (2003) argue that instead of collecting subject groups with differing cultural values for the purpose of comparing the results between groups, they should be measured and included in the structural model, if not as independent variables, at least as control variables. Therefore in this study, I will collect measurements on Institutional and In-Group Collectivism and include them in the structural model. Other cultural values will be entered into the model as control variables on the decision. The remaining cultural variables, power distance uncertainty avoidance, future and power orientation will be entered as control variables into the model as having a direct effect on the decision to continue an existing course of action.

4.5.2 Use of PLS.

SmartPLS (Ringle, et al. 2005) was used to assess the measurement and the structural model. PLS is a second generation statistical analysis tool that provides the ability to analyze the measurement model and the structural model in a single analysis. It also allows analysis of complex path models, mediation and moderation that allow the examination of constructs within its nomological net. This provides an increase in functionality as opposed to first generation tools such as OLS regression. PLS is appropriate when the model is in a domain where theory is weak or non-existent (Petter, et al. 2007). Additionally, PLS is appropriate for studies doing hypothesis testing as is being done here as opposed to studies that are testing theories for fit to data. For those, covariance based SEM is superior (Henseler, et al. 2008).

PLS requires the entry of the structural / measurement model to be entered prior to analysis. The structural model used to test the hypotheses defined above is shown in the figure 4.5 below:



4.6 RESULTS

In this section, I report the results of the study. The process that I followed to analyze and report the data is as follows:

1) Test and Correct for Cultural Response Bias

Different cultures tend to respond to questionnaires of this type by either avoiding or accentuating the extremes of the scales. Asian cultures tend to avoid the extremes while Mediterranean cultures tend to avoid the middle of the scale (Hanges 2004). It is therefore necessary to test for and correct this bias before doing further analysis (van de Vijver and Leung 1997).

2) Report of Demographics

In this section the demographics of the study are reported.

3) Measurement Model Assessment

In this section, the measurement model is assessed to ensure that the psychometric properties of the survey are appropriate.

4) Cross-Cultural Equivalence Testing

Here the responses are tested to ensure that they are equivalent to each other and are unbiased

5) Manipulation Checks

Here, the Credibility and Role Prescription manipulations are checked to ensure that they worked in all the geographies.

6) Structural Analysis

Finally, I report and interpret results of the PLS structural analysis.

4.6.1 Cultural Response Bias

As described above, culturally induced biases in how the respondents completed the items can cause distortions in the data that would prevent comparisons of the data across cultures. It is therefore necessary to test for these effects and if need be correct them.

The classic procedure is described in Hanges (2004). If a subject is asked to respond to a large range of constructs, the means and standard deviations of his/her responses lose any construct specific content and reflect only the subject's response biases. Therefore the procedure is to create z-scores for each respondent using the formula:

$$z = \frac{(x - \bar{x})}{\sigma}$$

Standardization is a linear transformation that neither distorts the distribution of the items nor changes their correlations (Cohen, Cohen, West and Aiken 2003). Scale scores for each construct are calculated based on both the original and standardized scores. If a large correlation exists between the original items and the standardized scores, the items are considered to be relatively free from cultural response bias.

I performed this test on the cultural variables, calculated as per GLOBE

specifications, and obtained a correlation of .919 between the two numbers. The results are displayed in table 4.5.

	Country	UA	FO	IC	IG	PD	PO
Z Scores	USA	-0.016	-0.217	-0.158	0.094	-0.296	-0.198
	Germany	-0.237	0.098	-0.060	0.215	-0.204	-0.071
	China	0.239	-0.160	-0.010	-0.403	-0.395	-0.067
Original Scores	USA	3.535	3.185	3.267	3.751	3.013	3.224
	Germany	3.228	3.820	3.532	4.001	3.280	3.515
	China	3.939	3.163	3.468	2.782	2.805	2.891
	Correlation Coefficient	0.9191					

It can be concluded that there is not an issue with cultural response bias in this sample and therefore I will use the original scores in this analysis.

4.6.2 Demographics

The demographics of the study subjects are reported in figure 4.6.

	USA	Germany	China	Total
N	153	139	171	463
Gender (F/M)	74/79	63/76	65/106	202/261
Age (SD)	21.82 (3.571)	21.62 (1.924)	20.28 (1.129)	21.19 (2.503)
Full Time Work Experience (SD)	3.98 (3.872)	0.49 (1.093)	0.13 (0.456)	1.51 (2.899)
IS Exp	0.69 (2.076)	0.10 (0.542)	0.00 (0.00)	0.26 (1.264)

The demographics show that sample sizes are similar and age is statistically the same. Gender shows more men to women in all the countries. In China, this excess of men is particularly pronounced. Work experience is relatively the same except in the USA where there is a significant amount of work experience. IS experience is very close to zero across the board and since in China all subjects reported no IS experience, this construct will not be used in the analysis.

4.6.3 Measurement Model Assessment

Straub, Boudreau and Gefen (2004) reviewed the existing literature on instrument validation and have provided guidelines for the assessment of the measurement model of studies in the positivist tradition, such as this. They prescribe that the following

validation steps be performed:

- 1) Construct Validity
 - a. Discriminant Validity
 - b. Convergent Validity
 - c. Factorial Validity
- 2) Reliability
- 3) Manipulation Validity

They further recommend that content validity, nomological validity and common methods bias be evaluated.

In the following two sections, I review these validities for the study reported here. Factorial validity is assessed by the Confirmatory Factor Analysis tests reported below.

4.6.3.1. Evaluating the Reflective Measures

Convergent validity, how the items converge to measure a particular construct, is assessed by examining the individual item validity, construct reliability and average variance extracted (AVE) (Chin 1998). Discriminant validity, how items differentiate between constructs so that one item measures only one construct, can be evaluated by examining the cross loadings between items and constructs and examining the AVEs of the latent constructs to ensure that they are greater than the square of the correlations among the latent constructs (Chin 1998; Henseler, et al. 2008). Factorial validity is discussed in the section on cross loadings.

Convergent Validity. Convergent validity for the reflective constructs was examined by using confirmatory factor analysis; PLS performs a *confirmatory* factor analysis (CFA) rather than an *exploratory* one as done in principal components analysis. This means that it does not seek for the proper factors, but rather confirms that the factor structure specified in the model is correct. The benchmark value for the loading value is .707 although in exploratory studies such as this, .5 or .6 is common (Chin 1998). In this study, the CFA in Table 4.7a shows the following results for the USA:

Table 4.7a: Confirmatory Factor Analysis Results - USA		
Construct	Item	Item-to-Construct Loading
Relevance	Relev 1	.9102
	Relev 2	.9478
	Relev 3	.9435
Risk Perception	Risk Percept 1	.8619
	Risk Percept 2	.8656
	Risk Percept 3	.8541

	Risk Percept 4	.6989
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All factor loadings are over .69 in the USA sample. These values exceed the .707 benchmark value except for Risk Percept 4 which was very close. These values provide evidence of convergent validity.

Table 4.7b shows the results from Germany.

Table 4.7b: Confirmatory Factor Analysis Results - Germany		
Construct	Item	Item-to-Construct Loading
Relevance	Relev 1	.8566
	Relev 2	.9120
	Relev 3	.9372
Risk Perception	Risk Percept 1	.8978
	Risk Percept 2	.9239
	Risk Percept 3	.5240
	Risk Percept 4	.5882

All factor loadings exceed the .707 benchmark value except for Risk Percept 3 and 4 which exceed the .5 value for exploratory studies (Chin, 1998). These values provide evidence of convergent validity.

Table 4.7c shows the results from China.

Table 4.7c: Confirmatory Factor Analysis Results - China		
Construct	Item	Item-to-Construct Loading
Relevance	Relev 1	.8374
	Relev 2	.7892
	Relev 3	.8559
Risk Perception	Risk Percept 1	.8573
	Risk Percept 2	.8530
	Risk Percept 3	.7205

	Risk Percept 4	.7196
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All factor loadings exceed the .707 benchmark value providing evidence of convergent validity.

Reliability. To assess the reliability of the measures, the composite reliability, the Cronbach’s alpha and the AVE were calculated for reach construct. Cronbach’s alpha and composite reliability both measure the internal consistency of the construct’s items. Cronbach’s alpha provides a lower bound on the reliability measurement (Cortina 1993). Composite reliability without the assumption of equally weighted indicators provides a closer estimate to the reliability figures given accurate parameter estimates (Chin 1998). AVE measures the amount of variance of the construct that comes from the indicators vs. that which comes from measurement error (Chin 1998). Table 4.8 illustrates the values of these indicators for all three geographies.

Table 4.8a: Construct Reliability - USA			
Construct	Composite Reliability	AVE	Cronbach’s Alpha
Relevance	.9528	.8707	.9256
Risk Propensity	.7846	.5497	.5904
Risk Perception	.8951	.6823	.8467

Table 4.8b: Construct Reliability - Germany			
Construct	Composite Reliability	AVE	Cronbach’s Alpha
Relevance	.9309	.8101	.8881
Risk Propensity	.7558	.5104	.5259
Risk Perception	.8349	.5722	.7347

Construct	Composite Reliability	AVE	Cronbach's Alpha
Relevance	.8652	.6817	.7667
Risk Propensity	.7281	.4952	.5772
Risk Perception	.8711	.6397	.8062

As shown in table 4.8, in all geographies, for Relevance and Risk Perception, Cronbach's Alpha and Composite all exceed the threshold values of .7 standard for construct reliability suggested by Straub, et al. (2004). The AVE exceeds the baseline guideline of 0.5 (Chin 1998) for both of those constructs in all three countries. Risk Propensity failed to achieve the requisite level of Cronbach's alpha and therefore this construct was omitted from subsequent analysis.

Discriminant Validity. To assess the discriminant validity of the measurement model, the cross loadings of the items were examined. Cross loading analysis in PLS is conducted by computing the outer loadings of the items on the constructs in a confirmatory factor analysis and then comparing the loadings of the items on constructs other than its intended construct with its loading on its intended construct. This is shown in table 4.9.

	Relevance	Risk Perception
REL1	0.908	-0.481
REL2	0.947	-0.524
REL3	0.943	-0.484
RPerc1	-0.492	0.863
RPerc2	-0.411	0.872
RPerc3	-0.525	0.850
RPerc4	-0.285	0.707

Table 4.9b: Construct Cross Loading Table - Germany

	Relevance	Risk Perception
REL1	0.861	-0.481
REL2	0.913	-0.524
REL3	0.937	-0.484
RPerc1	-0.492	0.899
RPerc2	-0.411	0.923
RPerc3	-0.525	0.535
RPerc4	-0.285	0.583

Table 4.9c: Construct Cross Loading Table - China

	Relevance	Risk Perception
REL1	0.836	-0.481
REL2	0.782	-0.524
REL3	0.856	-0.484
RPerc1	-0.492	0.856
RPerc2	-0.411	0.853
RPerc3	-0.525	0.727
RPerc4	-0.285	0.727

Chin (1998) recommends that the loading on factors other than the target factor be less than that of the posited latent variable. An exploratory factor analysis found that the items in all geographies factored cleanly with a loading of over .698 for all items to their constructs with negative loadings for the other construct (see appendix B for details).

Additionally, the AVEs of the latent constructs were compared against the correlations with other constructs. The test here is to verify that the square root of the AVE is greater than correlations with the other reflective constructs (Chin 1998). This test is shown in table 4.10.

Table 4.10a: AVE - USA		
	Relevance	Risk Perception
Relevance	0.933	0.536
Risk Perception	0.499	0.827

Table 4.10b: AVE - Germany		
	Relevance	Risk Perc
Relevance	0.904	0.519
Risk Perception	0.239	0.757

Table 4.10c: AVE - China		
	Relevance	Risk Perc
Relevance	0.825	0.510
Risk Perception	0.339	0.794

The AVEs here are all greater than the correlations between the constructs showing that we have good discriminant validity (Chin 1998).

4.6.3.2. Evaluating the Formative Measures

Petter, Straub and Rai (2007) provide guidance on how to validate formative constructs such as Credibility. They argue that the following steps should be taken to validate the construct: 1) Examine the weightings of the items to ensure that they are all significant; 2) Examine the Variance Inflation Factors (VIF) for the items to ensure that there is not an excessive amount of destabilizing multi-collinearity. VIF values should not exceed 3.3.

In assessing the PLS outer weights, as shown in table 4.11, most of the weights for the items were not significant on a two-tailed basis. Only one item was significant in all three geographies, Cred – 3. Following the guidance in Petter, Straub and Rai (2007), I determined to retain all of the items in order to maintain content validity. The VIF analysis of the construct showed that all items have VIF values less than the 3.3 value recommended by Petter Straub and Rai (2007).

Table 4.11: T-Statistics of Outer Weights of Formative Items			
Item	USA	Germany	China
Cred – 1	1.7088	1.2871	4.8202*
Cred – 2	.0926	2.5815*	2.5728*
Cred – 3	2.6001*	6.4637*	5.0522*
Cred – 4	.3067	1.2387	2.1249*
Cred – 5	.3911	1.2398	.3193
IC – 1	1.1012	1.5306	.5371
IC – 2	.6440	.9472	.3445
IC – 3	1.2345	.8805	1.5462
IC – 4	1.2018	.9119	.9094
IG – 1	1.1723	1.6994	1.6061
IG – 2	1.0488	.3630	.2190
IG – 3	1.5618	.6195	.4687
IG – 4	.5543	.5959	1.3579
UA – 1	1.5153	1.3067	1.0530
UA – 2	.6893	1.1253	.0946
UA – 3	.0509	.9203	1.1586
UA – 4	1.1044	.8294	1.2201
PD – 1	1.1200	1.2585	1.2245
PD – 2	.8630	1.1145	1.3986
PD – 3	.7698	.4226	1.1736
PD – 4	1.0572	1.1630	.7497
PD – 5	.8305	.2461	.8839
FO – 1	.0475	1.2840	.8762
FO – 2	.8241	.2747	.0412
FO – 3	.5388	1.1154	1.3806
FO – 4	1.3604	1.5498	.3149
FO – 5	1.2233	1.3966	.7689
PO – 1	1.8498	.2461	.1484
PO – 2	.4483	.6021	1.8229
PO – 3	.7559	1.9303	1.0085

4.6.4 Equivalence Checking

In conducting cross-cultural research, there are unique challenges that are not found in research conducted within a single culture. Cultural differences extend to differences in conception and response. These differences can manifest themselves in biases in response to the items on a survey such as the one under consideration here. Thus difference in response to a survey between different cultural groups can be due to other factors besides the examined constructs. Procedural activities and post-administration analysis must be done to establish that the responses of the different cultures are equivalent prior to drawing any conclusions (Karahanna, et al. 2002).

The concepts of equivalence and bias are two aspects of the same idea (van de Vijver and Leung 1997). A survey that has equivalence across cultures has few biases. Similarly, a survey that has few biases is held to be equivalent. Karahanna, et al. (2002) describe three types of bias: construct, method and item. This section describes how each of these has been handled in this study. This analysis is done after the examination of the measurement model as these techniques assume good psychometric properties (van de Vijver and Leung 1997).

4.6.4.1. Construct Bias

Construct bias exists when a construct measured is not equivalent across the different geographies. This has to do with differences in conception and measurement of the constructs across geographies. One of the approaches mentioned by Karahanna, et al. (2002) is that of assessing internal structural congruence through techniques such as factor analysis, multidimensional scaling and comparison of covariance matrices. The most powerful method of detecting the presences of construct bias has been multi-group confirmatory factor analysis (Steenkamp and Baumgartner 1998). While I am not aware of any procedure that has yet been advanced for formative constructs, Steenkamp and Baumgartner (1998) have advanced a method for assessing measurement invariance in reflective constructs based on confirmatory factor analysis.

Steenkamp and Baumgartner suggest that by examining first, *configural invariance* then *metric invariance* and finally *scalar invariance*, one can assess measurement equivalence. Configural invariance indicates that the same pattern of salient and non-salient loadings should be found across cultures. Metric invariance indicates that the loadings of the items on the construct are the same. Scalar invariance indicates that the intercept of the regression equation is equivalent across cultures. For this study, since the hypotheses are tests of path significance and there will be no comparison of mean values across geographies, invariance only needs to be demonstrated up to metric invariance (Steenkamp and Baumgartner 1998).

These test were executed using Lisrel 8.71. Each construct was tested in separate runs.

Configural Invariance. Table 4.12 shows the results of the test for configurational invariance. In this test, the factor loadings, variances, co-variances and error variance were set free to test the fit of the loadings. (Steenkamp and Baumgartner 1998). The results show a perfect fit on the Decision variable and an acceptable fit on Risk Perception (Joreskog and Sorbom 1993).

Table 4.12 – Configural Invariance Results				
Construct	Chi-square Value	Chi-square Significance	RMSEA	CAIC
Relevance	0.0	1.00		
Risk Perception	4.80	0.57	0.00	176.08

Metric invariance. Metric invariance refers to the concept that the loadings for the items must be the same across the countries. Table 4.13 shows the results of a test for full metric invariance. In this test, the factor loadings were constrained to equality in all geographies. The results show that this model is not a good fit for the Risk Perception variable while it is for Relevance. This situation does not pose a fatal problem to the study. Steenkamp and Baumgartner indicate that as a practical matter, achieving full metric invariance frequently does not occur for various reasons. They suggest, following Byrne, Shavelson and Muthen (1989) that partial metric invariance be employed. If a set of items has configural invariance, and if at least one item is metrically invariant, then analysis may proceed. In this study, we see that in the Relevance construct, two items are metrically invariant and in the Risk Perception construct, one item is metrically invariant. With partial metric invariance, this allows us to associate the focal construct to other constructs in a nomological net (Steenkamp and Baumgartner 1998).

Table 4.13: Metric Invariance Results				
Construct	Chi-Square Value	Chi-Square Significance	RMSEA	CAIC
Relevance	2.94	0.570	0.00	102.87
Risk Perception	30.45	0.0024	0.099	158.54

A series of partial metric equivalence test for Risk Perception was run by freeing individual items across the geographies to attempt to find a model that fits the data. Freeing the Perc-3 variable resulting in a Chi-Square value of 10.8 (significance of 0.37), an RMSEA of .024 and a CAIC of 153.52. Thus this model shows that we have partial metric equivalence.

4.6.4.2. Method Bias

Karahanna, et al. (2002) indicate that method bias arises from issues with the instrument or its administration so that subjects do not respond to the scales in the same way. As discussed above, method bias can arise from differences in the subjects, differences in administration of the survey (Karahanna, et al. 2002) or common rater effects, item characteristics, item context, and measurement context (Podsakoff, Mackenzie, Lee and Podsakoff 2003). In this study, I addressed this bias procedurally by using student subjects who provide a consistent group in terms of age and by administering the instrument in similar locations (classrooms), having native proctors administer the experiment in the native language of the students using a standard script. Additionally, I used different scale anchors and formats, and intermixed the items on the questionnaire so that items relating to a single construct would not be located together. However other sources of this bias could not be addressed such as measuring the dependent and independent variables at the same point in time at the location and using the same

medium.

I also used a statistical test for method bias. While Harmon’s single factor test is currently the most widely used, Podsakoff, et al. (2003) point out that there are several limitations to this procedure. First, it is only an indication, but doesn’t control for method effects. Second, it is also limited in that it assumes there is only one method factor when there could be in fact multiple factors. They provide a number of different remedies they consider to be superior to Harmon’s test that could be used to test and remedy method bias depending on the characteristics of the study. In this study, the predictor and criterion variables were obtained from the same source, and measured in the same context. The sources of method bias cannot be identified, nor can they be measured at this point in time. In this situation, they recommend a single method factor approach be used in which a method variance latent variable be introduced into the model that provides a measuring point for potential methods variance. This variable acts as a predictor for the individual indicators of the model. When the methods variance variable accounts for a significant amount of the variance of the indicator, a method bias problem exists.

Liang, Saraf, Hu, and Xue (2007) have pioneered this approach in the IS literature. In this study, I followed their approach to testing for method bias in PLS. I created a separate methods variance latent variable to which all the indicators were attached as reflective indicators. Then in order to create paths from both the methods variance construct to the indicators, each indicator was created as a separate latent variable to which the reflective indicator was attached as a reflective indicator. The original substantive construct was then connected via a causal path to the indicator variable. The indicator was then modeled as being caused by both the methods variance and substantive indicators. The model was then bootstrapped and the path coefficients and t-statistics extracted. These results are shown in table 14a-14c for each geography. The path coefficients act as loading factors. The test for method variance is to identify the preponderance of significant paths where the substantive path is significant and exceeds the method variance path. Where this occurs, method bias is held not be an issue.

Liang, et al, (2007) used an average loading and count of significant paths as the test. In the following table 4.14, this information is provided. The details are provided in table 4.15.

	Average Loading – Substantive	Average Loading – Method Var.	Ratio of averages	Percent signif. Substant. Paths	Percent signif. Method Var. Paths
USA	.411	.015	27.26	90	27.3
Germany	.453	.021	21.24	97	39.4
China	.453	.007	67.63	97	33.3

Given the much larger loadings of the substantive paths, the relatively insignificant method variance path loadings and the three times larger number of significant paths for the substantive paths vs. the methods variance paths, I conclude that there is a low risk of methods bias in this study.

Table 4.15a: Results of USA Test for Methods Bias

Construct	Indicator	Substantive Factor Loading (R1)	R1²	Method Loading Factor (R2)	R2²
Credibility	Cred - 1	0.8369*	0.7004	0.0675	0.0046
	Cred - 2	0.8468*	0.7171	-0.0613	0.0038
	Cred - 3	0.6811*	0.4639	0.1447*	0.0209
	Cred - 4	0.9306*	0.8660	-0.0721	0.0052
	Cred - 5	0.9607*	0.9229	-0.0841	0.0071
Relevance	Rel – 1	0.7983*	0.6373	0.1177*	0.0139
	Rel – 2	1.0086*	1.0173	-0.0685*	0.0047
	Rel - 3	0.9866*	0.9734	-0.468	0.2190
Risk Perception	RPerc – 1	0.7429*	0.5519	-0.1368*	0.0187
	RPerc – 2	0.8478*	0.7188	-0.0335	0.0011
	RPerc – 3	0.7772*	0.6040	-0.0913*	0.0083
	RPerc – 4	0.9707*	0.9423	0.3036*	0.0922
Institutional Collectivism	IC – 1	0.0321	0.0010	0.1327*	0.0176
	IC – 2	0.2276*	0.0518	0.0295	0.0009
	IC – 3	0.304*	0.0924	0.0579	0.0034
	IC – 4	-0.0149*	0.0002	-0.0426	0.0018
In-Group Collectivism	IG – 1	0.6236*	0.3889	-0.0126	0.0002
	IG – 2	0.3707*	0.1374	0.065	0.0042
	IG – 3	0.6218*	0.3866	-0.0623	0.0039
	IG – 4	0.4144*	0.1717	0.0242	0.0006
Power Distance	PD – 1	-0.5566*	0.3098	0.011	0.0001
	PD – 2	0.5142*	0.2644	-0.1239*	0.0154
	PD – 3	0.5301*	0.2810	0.0166	0.0003
	PD – 4	0.7647*	0.5848	0.0668	0.0045
	PD – 5	0.7359*	0.5415	0.0078	0.0001
Future Orientation	FO -1	0.1571*	0.0247	-0.0151	0.0002

	FO – 2	0.0064*	0.0000	0.0911	0.0083
	FO – 3	0.0806*	0.0065	-0.0565	0.0032
	FO – 4	0.0277*	0.0008	0.128	0.0164
	FO – 5	0.0369	0.0014	-0.1049*	0.0110
Performance Orientation	PO – 1	0.5367	0.2880	-0.0638	0.0041
	PO – 2	0.6074*	0.3689	0.0191	0.0004
	PO – 3	0.7353*	0.5407	0.0344	0.0012

Table 4.15b: Results of Germany Test for Methods Bias

Construct	Indicator	Substantive Factor Loading (R1)	R1 ²	Method Loading Factor (R2)	R2 ²
Credibility	Cred - 1	0.9897*	0.9795	-0.124*	0.0154
	Cred - 2	0.6788*	0.4608	-0.0008	0.0000
	Cred - 3	0.324*	0.1050	0.5575*	0.3108
	Cred - 4	1.2481*	1.5578	-0.404*	0.1632
	Cred - 5	0.9376*	0.8791	-0.0219	0.0005
Relevance	Rel – 1	0.6583*	0.4334	0.2286*	0.0523
	Rel – 2	1.0887*	1.1853	-0.2003*	0.0401
	Rel - 3	0.9584*	0.9185	-0.0236	0.0006
Risk Perception	RPerc – 1	0.812*	0.6593	-0.0923*	0.0085
	RPerc – 2	0.8969*	0.8044	-0.0309	0.0010
	RPerc – 3	0.5558*	0.3089	0.0512	0.0026
	RPerc – 4	0.729*	0.5314	0.1375*	0.0189
Institutional Collectivism	IC – 1	0.5093*	0.2594	-0.0779	0.0061
	IC – 2	-0.563*	0.3170	0.0281	0.0008
	IC – 3	0.0171	0.0003	-0.133*	0.0177
	IC – 4	0.5899*	0.3480	0.0783*	0.0061
In-Group Collectivism	IG – 1	0.1758	0.0309	-0.1007*	0.0101
	IG – 2	0.0811*	0.0066	-0.0129	0.0002

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	IG – 3	0.3727*	0.1389	-0.0386*	0.0015
	IG – 4	0.3513*	0.1234	-0.006	0.0000
Power Distance	PD – 1	-0.4131*	0.1707	-0.11	0.0121
	PD – 2	0.4976*	0.2476	0.1176*	0.0138
	PD – 3	0.6513*	0.4242	-0.0023	0.0000
	PD – 4	0.7974*	0.6358	-0.1172*	0.0137
	PD – 5	0.7071*	0.5000	0.0131	0.0002
Future Orientation	FO -1	-0.154*	0.0237	-0.0479	0.0023
	FO – 2	-0.2568*	0.0659	0.0267	0.0007
	FO – 3	-0.4736*	0.2243	-0.0076	0.0001
	FO – 4	0.8428*	0.7103	0.0088	0.0001
	FO – 5	0.7827*	0.6126	-0.0274	0.0008
Performance Orientation	PO – 1	0.6207*	0.3853	0.0307	0.0009
	PO – 2	0.4764*	0.2270	0.0371	0.0014
	PO – 3	0.823*	0.6773	-0.0393	0.0015

Table 4.15c: Results of China Test for Methods Bias					
Construct	Indicator	Substantive Factor Loading (R1)	R1²	Method Loading Factor (R2)	R2²
Credibility	Cred - 1	0.6741*	0.4544	0.0343	0.0012
	Cred - 2	0.5577*	0.3110	0.0569	0.0032
	Cred - 3	0.4359*	0.1900	0.2054*	0.0422
	Cred - 4	0.9514*	0.9052	0.1674*	0.0280
	Cred - 5	0.9097*	0.8276	-0.07*	0.0049
Relevance	Rel – 1	0.6871*	0.4721	0.1323*	0.0175
	Rel – 2	0.8484*	0.7198	-0.0514	0.0026
	Rel - 3	0.9397*	0.8830	-0.0844*	0.0071
Risk Perception	RPerc – 1	0.7074*	0.5004	-0.1419*	0.0201
	RPerc – 2	0.8835*	0.7806	0.0228	0.0005

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	RPerc – 3	0.6628*	0.4393	-0.0615*	0.0038
	RPerc – 4	0.9330*	0.8705	0.1956*	0.0383
Institutional Collectivism	IC – 1	0.4380*	0.1918	-0.0216	0.0005
	IC – 2	-0.7331*	0.5374	0.01	0.0001
	IC – 3	0.3715*	0.1380	0.0265	0.0007
	IC – 4	0.7514*	0.5646	-0.00001	0.0000
In-Group Collectivism	IG – 1	0.6472*	0.4189	-0.0388	0.0015
	IG – 2	0.6804*	0.4629	-0.0056	0.0000
	IG – 3	0.5124*	0.2626	-0.0401	0.0016
	IG – 4	0.6423*	0.4125	0.0730*	0.0053
Power Distance	PD – 1	-0.5645*	0.3187	0.1259*	0.0159
	PD – 2	0.4479*	0.2006	0.0264	0.0007
	PD – 3	0.6338*	0.4017	0.0550	0.0030
	PD – 4	0.6989*	0.4885	0.0110	0.0001
	PD – 5	0.7209*	0.5197	0.0190	0.0004
Future Orientation	FO -1	0.1913*	0.0366	-0.026	0.0007
	FO – 2	-0.1746*	0.0305	0.0404	0.0016
	FO – 3	-0.1584	0.0251	0.1260	0.0159
	FO – 4	0.8440*	0.7123	0.0376*	0.0014
	FO – 5	0.7741*	0.5992	-0.0050	0.0000
Performance Orientation	PO – 1	0.6270*	0.3931	0.0325	0.0011
	PO – 2	0.5373*	0.2887	0.0019	0.0000
	PO – 3	0.7635*	0.5829	-0.0313	0.0010

4.6.4.3. Item Bias

Item bias is said to exist if respondents to an item of the same standing in different cultural groups do not respond to the item in the same manner. Respondents in one culture may give uniformly higher or lower scores on an item than those in another culture or they might give a differential response, e.g. scoring lower on responses in the lower part of the scale and higher on the higher part of the scale (van de Vijver and Leung 1997). To prevent item bias, I used the cultural value measures from the GLOBE consortium, which were developed by a multi-national group of investigators who

reviewed the wording for complexity and cultural appropriateness. The other variables did not have the advantage of that preparation. The items were translated by native language speakers and back translated by native language speakers and reviewed until the forward and back translations resulted in a correct transmission of meaning.

Following the recommendation of van de Vijver and Leung (1997), I used the analysis of variance with score level as an independent variable to test for item bias. A linear method such as ANOVA is appropriate for interval data such as is used in this study. Nonlinear methods such as Item Response Theory are best for nominal data. Additionally, it is superior to use conditional methods as opposed to unconditional tests. Unconditional methods compute bias statistics on the whole sample while conditional groups split the sample into score groups. Unconditional methods have been known to fail to identify biased items. The ANOVA method described below is a conditional method (van de Vijver and Leung 1997).

In this method, each culture is assigned a value and then the scores for each respondent are summed and divided into groups of approximately size 50 or greater. These groups are then analyzed under ANOVA to identify significance of the cultural, score level variables and their interactions.

To perform the analysis, the following procedure was utilized:

- 1) Each geographic region was assigned a different value (USA=1, Germany = 2, China = 3).
- 2) The sum of the all item scores was computed for each respondent. Similar to the treatment of item response bias, by summing the scores of the items, the substantive content is eliminated and only the respondent scoring remains as described above for the response bias analysis. Therefore no different treatment is required for formative constructs as opposed to reflective constructs.
- 3) Score cutoffs for 9 groups to ensure groups of 50 or more (462/50) were calculated by using a Frequency command in SPSS.
- 4) A score level variable for each respondent was computed by recoding the item scores based on the group cutoffs calculated in (3) (Score level = 1 for those in the smallest group; 2 for those in the next group, etc.).
- 5) An ANOVA was then run against each of the items with the item as the dependent variable and the score level and culture as independent variables.

The results of the Item Bias tests are reported in table 4.16.

Item	Culture Significance¹²	Score Level Significance	Interaction Significance
Decision	.187	.000*	.012*
Role Prescript	.004*	.000*	.090
Rel-1	.000*	.000*	.004*

¹² * indicates significance at the .05 level.

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Rel-2	.000*	.000*	.039*
Rel-3	.000*	.000*	.003*
Cred-1	.001*	.000*	.007*
Cred-2	.000*	.000*	.178
Cred-3	.048*	.000*	.114
Cred-4	.000*	.000*	.322
Cred-5	.000*	.000*	.061
Risk Percept -1	.574	.023*	.205
Risk Percept -2	.417	.104	.391
Risk Percept -3	.192	.007*	.017*
Risk Percept -4	.000*	.209	.414
Instit. Coll. - 1	.075	.000	.023*
Instit. Coll. - 2	.000*	.041*	.892
Instit. Coll. - 3	.041*	.000*	.167
Instit. Coll. - 4	.000*	.071	.967
In-Group Coll. - 1	.000*	.000*	.001*
In-Group Coll. - 2	.001*	.000*	.604
In-Group Coll. - 3	.000*	.034*	.541
In-Group Coll. - 4	.000*	.001*	.019*
Uncert. Avoid -1	.000*	.008*	.336
Uncert. Avoid -2	.000*	.053	.335
Uncert. Avoid -3	.219	.016	.345
Uncert. Avoid -4	.000*	.020*	.394
Power Dist - 1	.000*	.174	.763
Power Dist - 2	.220	.000*	.017*
Power Dist - 3	.000*	.004*	.556
Power Dist - 4	.336	.000*	.293
Power Dist - 5	.008*	.000*	.360
Future Orient - 1	.000*	.002*	.498
Future Orient - 2	.010*	.001*	.235
Future Orient - 3	.354	.000*	.291
Future Orient - 4	.000*	.658	.662
Future Orient - 5	.001*	.947	.642

Perf. Orient - 1	.000*	.000*	.703
Perf. Orient - 2	.000*	.005*	.760
Perf. Orient - 3	.000*	.004*	.811

The meaning of the significance scores is as follows. The score level indicates, if significant, that individuals at lower score levels have lower scores than those at higher levels. This test is not relevant to item bias (van de Vijver and Leung 1997). When the culture and interaction terms are not significant, the item is considered unbiased. When the culture variable is significant, this indicates that members of a culture are uniformly biased to score either higher or lower than those in a different culture. This indicates that scores from the culture with uniform bias will differ from scores in another by a constant amount. When the interaction term is significant, the difference in cultural groups is not invariant across score levels. The item discriminates better in one geography than another (van de Vijver and Leung 1997). This is a form of non-uniform bias.

In this sample, we have a significant amount of bias in the items related to culture (74%) and related to the interaction of culture with score level (26%). This would indicate that for a large number of items there exists a uniform bias, while a smaller number have a non-uniform bias. The source of the uniform bias can be due either to true cultural differences which are the effects we are trying to study or to a systematic difference in understanding of the item. In this study, I was expecting that the responses should be systematically different across culture. So this result is not unexpected.

The effect of this non-uniform bias is very small. Table 4.16b shows the R² value of a regression of the item on the score level, culture and the interaction of score level and culture for those items where the interaction term was significant. Note that the effect size is at best weak for all of those items.

Table 4.16b: Effect Sizes of the Interactions			
Item	R² Without Interaction	R² with Interaction	Effect Size
Rel - 1	0.232	0.259	0.036
Rel - 2	0.177	0.191	0.017
Rel - 3	0.171	0.198	0.034
Cred - 1	0.228	0.245	0.023
RPerc - 3	0.017	0.034	0.018
IC - 1	0.06	0.069	0.010
IG - 1	0.085	0.097	0.013
IG - 4	0.36	0.376	0.026
PD - 2	0.086	0.099	0.014

I conclude from this analysis that the non-uniform bias affects relatively few items and

has only a weak effect so that I can disregard this impact in substantive analysis.

4.6.4.4. Summary

To summarize the findings of this section, I found the following equivalence/bias existing in this study:

- 1) No cultural response bias
- 2) Full configuration equivalence
- 3) Partial metric equivalence
- 4) No methods bias was detected
- 5) Found significant uniform cultural bias in 75% of the items and non-uniform bias in 25% of the items. The non-uniform bias is a weak to non-existent effect.

The implications for these findings for the study follow. No cultural response bias was found in the data indicating that the data was not skewed by cultural factors. This study also has configural equivalence and partial metric equivalence and therefore provides us with the basic foundation of performing comparison across societies (Steenkamp and Baumgartner 1998; van de Vijver and Leung 1997) and allows us to examine structural relationships cross nationally (Steenkamp and Baumgartner 1998). The finding of lack of methods bias confirms this position. The uniform bias across the items is held to be a result of cultural differences rather than item bias. The weak non-uniform item bias can be ignored in the substantive analysis without grossly affecting our study, as I am not attempting to compare values across geographies but only direction of effects and structural positioning.

4.7 MANIPULATION CHECKS

In this section, I report on the analysis of the manipulations to ensure that they were effective in all geographies. The desired results are a significant difference in the values of Role Prescription and Credibility across the manipulations. I was also looking for a significant difference in Decision score where Decision was high in the situation where both manipulations were in the low condition and high where the manipulations were in the high condition to show that the Deaf Effect was induced in this study.

Table 4.17a: Full Factorial Display of USA results

		Credibility			
		Low		High	
Role Prescription	High	Decision	3.79 (2.06)	Decision	2.97 (2.10)
		Relevance	3.46 (1.45)	Relevance	5.22 (1.41)
		Role Prescription	5.95 (0.93)	Role Prescription	6.24 (0.82)
		Credibility	2.95 (1.02)	Credibility	5.74 (1.19)
		Age	22.26 (3.75)	Age	21.11 (2.92)
		FTE	4.25 (4.03)	FTE	3.26 (2.92)
		IS Exp	0.26 (0.89)	IS Exp	0.58 (1.27)

		N	38	N	38
Low	Decision		6.05 (1.99)	Decision	4.19 (2.37)
	Relevance		2.38 (1.59)	Relevance	3.79 (1.56)
	Role Prescription		2.22 (1.87)	Role Prescription	2.86 (1.99)
	Credibility		2.62 (1.44)	Credibility	4.80 (1.26)
	Age		22.50 (3.96)	Age	21.38 (3.49)
	FTE		4.48 (4.51)	FTE	3.89 (3.87)
	IS Exp		1.22 (3.27)	IS Exp	0.65 (1.90)
	N		40	N	37

The USA results (Table 4.17a) show that Role Prescription varies over three points across the treatments and Credibility over two points across the Credibility manipulation. However, Credibility is also affected by the Role Prescription manipulation. Credibility increases 0.3 points across Role Prescription manipulation in the low Credibility condition and .9 across the high Credibility condition manipulation. Decision varies 3 points from the high Role Prescription, high Credibility to its opposite, low-low condition. This indicates that the Deaf Effect was induced in this geography.

Table 4.17b: Results of MANOVA Analysis - USA

Independent Variable	Dependent Variable: Role Prescription		Dependent Variable: Credibility	
	Sum of Squares	F-value (sig)	Sum of Squares	F-value (sig)
Main Effect: Role Prescription Manipulation	480.894	213.214 (.000)	15.864	10.079 (.002)
Main Effect: Credibility Manipulation	8.252	3.659 (.058)	253.556	161.093 (.000)
Interaction: (Role Prescription) X (Credibility Manipulation)	1.173	0.520 (.472)	3.389	2.153 (.144)

It would be expected that the main effects manipulations would have a significant relationship on the targeted variables (i.e. the Role Prescription manipulation on Role Prescription and the Credibility manipulation on Credibility) but not on the other dependent variable. We see this for the Credibility manipulation (Table 4.17b). However,

for the Role Prescription manipulation, we see the effect on Credibility is also significant. There is no interaction effect. While statistically significant at $p < .05$, the F-value and sum of squares are quite small compared to the very strong Role Prescription variable. I conclude from this that the manipulations were effective, but that Role Prescription causes a small effect on Credibility.

Table 4.18a: Germany					
		Credibility			
		Low		High	
Role Prescription	High	Decision	5.75 (2.06)	Decision	4.19 (2.20)
		Relevance	2.79 (1.44)	Relevance	4.02 (1.43)
		Role Prescription	5.78 (1.21)	Role Prescription	6.19 (0.48)
		Credibility	2.92 (1.32)	Credibility	5.06 (1.21)
		Age	21.66 (1.70)	Age	21.35 (1.05)
		FTE	0.38 (0.98)	FTE	0.35 (1.05)
		IS Exp	0.06 (0.35)	IS Exp	0.19 (0.79)
		N	32	N	31
	Low	Decision	5.97 (1.99)	Decision	4.24 (2.48)
		Relevance	2.18 (1.16)	Relevance	3.56 (1.71)
		Role Prescription	1.76 (1.23)	Role Prescription	2.49 (1.87)
		Credibility	2.14 (0.90)	Credibility	4.05 (1.43)
		Age	21.70 (2.40)	Age	21.73 (1.39)
		FTE	0.65 (1.38)	FTE	0.51 (0.90)
IS Exp		0.16 (0.69)	IS Exp	0.00 (0.00)	
N		37	N	37	

The German results show that Role Prescription varies over 3 points across the treatments and Credibility over 1.9 points across the Credibility manipulation (Table 4.18a). However, Credibility is also affected by the Role Prescription manipulation and Role Prescription is affected by the Credibility manipulation. Credibility increases 0.8 point across the Role Prescription manipulation in the low Credibility condition and one point across the high Credibility manipulation. Role Prescription increases 0.4 points across the Credibility manipulation in the high Role Prescription situation and .73 points in the low Role Prescription situation. The Decision variable increased 1.8 points from the high Role Prescription, high Credibility scenario to the low-low condition indicating that the Deaf Effect had been induced.

Table 4.18b: Results of MANOVA Analysis - Germany				
Independent Variable	Dependent Variable: Role Prescription		Dependent Variable: Credibility	
	Sum of Squares	F-value (sig)	Sum of Squares	F-value (sig)
Main Effect: Role Prescription Manipulation	512.753	295.854 (.000)	12.848	17.251 (.000)
Main Effect: Credibility Manipulation	10.292	5.939 (.016)	42.819	57.492 (.000)
Interaction: (Role Prescription) X (Credibility Manipulation)	1.009	0.582 (.447)	0.006	0.008 (.928)

As in the USA analysis, it would be expected that the main effects manipulations would have a significant relationship on the targeted variables (i.e. the Role Prescription manipulation on Role Prescription and the Credibility manipulation on Credibility) but not on the other dependent variable. However, for the main effects manipulations, we see that while the intended manipulations occurred, the effect on the untargeted dependent variable is also significant (Table 4.18b). However, there is no interaction effect. While statistically significant at $p < .05$, the effects are quite small compared to the very strong intended main effects. I conclude from this that the manipulations were effective, but that the manipulations cause a small effect on the other manipulation.

Table 4.19a: China					
		Credibility			
		Low	High		
Role Prescription	High	Decision	4.60 (2.75)	Decision	3.80 (2.63)
		Relevance	3.39 (1.19)	Relevance	4.08 (1.16)
		Role Prescription	5.26 (1.11)	Role Prescription	5.38 (1.32)
		Credibility	4.56 (1.29)	Credibility	5.38 (1.32)
		Age	20.14 (1.28)	Age	20.40 (1.07)
		FTE	0.03 (0.17)	FTE	0.11 (0.32)
		IS Exp	0.00 (0.00)	IS Exp	0.00 (0.00)
		N	43	N	45
	Low	Decision	5.33 (2.56)	Decision	4.40 (2.56)
		Relevance	2.84 (1.04)	Relevance	3.06 (1.10)

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	Role Prescription	3.05 (3.05)	Role Prescription	3.14 (1.86)
	Credibility	4.22 (1.24)	Credibility	4.40 (1.32)
	Age	20.15 (1.12)	Age	20.42 (1.03)
	FTE	0.32 (0.83)	FTE	0.07 (0.23)
	IS Exp	0.00 (0.00)	IS Exp	0.00 (0.00)
	N	40	N	43

The Chinese results show that Role Prescription varies over two points across the treatments, however, Credibility varies only 0.82 and 0.18 across the Credibility manipulation (Table 4.19a). Also, Credibility is affected by the Role Prescription manipulation. Credibility increases 0.3 across Role Prescription manipulation in the low Credibility condition and .98 across the high Credibility manipulation. The Decision variable increased approximately 1.5 points from the high Role Prescription, high Credibility scenario to its low-low opposite indicating that the Deaf Effect had been induced.

Table 4.19b: Results of MANOVA Analysis - China				
Independent Variable	Dependent Variable: Role Prescription		Dependent Variable: Credibility	
	Sum of Squares	F-value (sig)	Sum of Squares	F-value (sig)
Main Effect: Role Prescription Manipulation	210.6999	92.154 (.000)	19.314	12.021(.001)
Main Effect: Credibility Manipulation	0.477	0.209 (.648)	10.651	6.629 (.011)
Interaction: (Role Prescription) X (Credibility Manipulation)	0,011	0.005 (.944)	4.638	2.887 (.091)

As in the previous analyses for the USA and Germany, it would be expected that the main effects manipulations would have a significant relationship on the targeted variables (i.e. the Role Prescription manipulation on Role Prescription and the Credibility manipulation on Credibility) but not on the other dependent variable. However, for the Role Prescription manipulation we see the effect on Credibility is also significant (Table 4.19b). There is no interaction effect. As shown in the table above, this results in a significantly higher level of Credibility in the high Role Prescription manipulation but there is still a significant variation in Credibility across the Credibility manipulation. I conclude from this that the manipulations were effective, but that in China, as hypothesized, Role Prescription has a large effect on Credibility.

4.7.1 Structural Analysis

In this section, I address first the main effects and then the moderation effects of the cultural variables.

4.7.1.1. Main Effects

The results of the analysis of my hypotheses are reported in table 4.20.

Table 4.20: Results of Hypothesis Tests

Hypothesis	Path Coefficient	T-Statistic ¹³	Effect Size	Power ¹⁴
H1a: Where the surrounding culture is characterized by a high degree of Institutional Collectivism, decision makers will tend to side with the opinion of the team in terms of whether to continue or discontinue a course of action In the scenario, the team was indicating to the subject that the project was complete and ready to be implemented.	Institutional Collectivism to Decision			
USA	-.0048	.7520	.0164	.074
Germany	.0511	.9323	.0076	.060
China	.03139	.3873	.0055	.058
H1b: Institutional Collectivism decreases the Decision of a report of bad news by a reporter external to the work team.	Institutional Collectivism to Relevance			
USA	-.0024	.5614	.0002	.050
Germany	-.0477	.6161	.0074	.060
China	-.0421	.4690	.0025	.053
H2a: Where the surrounding culture is	In-Group Collectivism to			

¹³ A T-statistic greater than 1.96 indicates a two-tailed significance less than .05. Since the hypotheses presented in this research are unidirectional hypotheses, we can use a one-tailed significance test. Therefore a t-statistic greater than .98 indicates a significance less than .05 (Baroudi and Orlikowski 1989). A “*” indicates a significance greater than .05 level.

¹⁴ A post-hoc power analysis was done using G*Power v2.0 (Erfelder, et al. 1996) for each path tested. The R² for the dependent variable of the path was calculated with and without the path to compute the effect size. The effect size was then used as input to a power analysis. For the analysis, α was set to .05 and the N value was set to the sample size of the geography for both samples.

<p>characterized by a high degree of In-Group Collectivism, decision makers will tend to side with the opinion of the leadership in terms of whether to continue or discontinue a course of action</p> <p>In the scenario used here, leadership indicated that they would be disappointed if the project was not implemented as scheduled.</p>	Decision			
USA	-.0408	.6413	.0125	.395
Germany	-.0189	.8015	.0026	.090
China	-.0038	.5014	.0011	.052
H2b: In-Group Collectivism decreases the Decision of a report of bad news when it conflicts with the opinion of the leadership in terms of whether to continue or discontinue a course of action.	In-Group Collectivism to Relevance			
USA	.0090	.5961	.0000	.050
Germany	-.0051	.5092	.0195	.078
China	-.0365	.8730	.0387	.123

As can be seen, none of the hypotheses were confirmed. The effect size of each of the cultural variables is very low with the exception of In-Group Collectivism to Relevance, which has a moderate effect size. The statistical power of each of the links is also extremely low. However, some interesting relationships can be derived from the results.

First, all the models provide confirmation that the basic model as demonstrated in paper 2 applies in all geographies. 1) Credibility of the bad news reporter is positively associated with the Relevance of the report of bad news to the decision maker, which is 2) negatively associated with a decision to continue the current course of action. 3) Role Prescription of the bad news reporter is positively associated with his/her Credibility and the Relevance of the report of bad news (except in Germany). 4) Perception of risk in the project is negatively associated with a decision to continue the current course of action.

In attempting to account for the lack of significance, the study was rerun taking each of the control cultural variables to the Credibility and Relevance variables in addition to the Decision variable. As recorded above, all of the hypothesized paths were non-significant except that for hypothesis H2b, the effect of In-Group Collectivism on Relevance. Below, I examine the results for each geography and suggest some explanation for the unique results obtained.

USA Main Effects Results

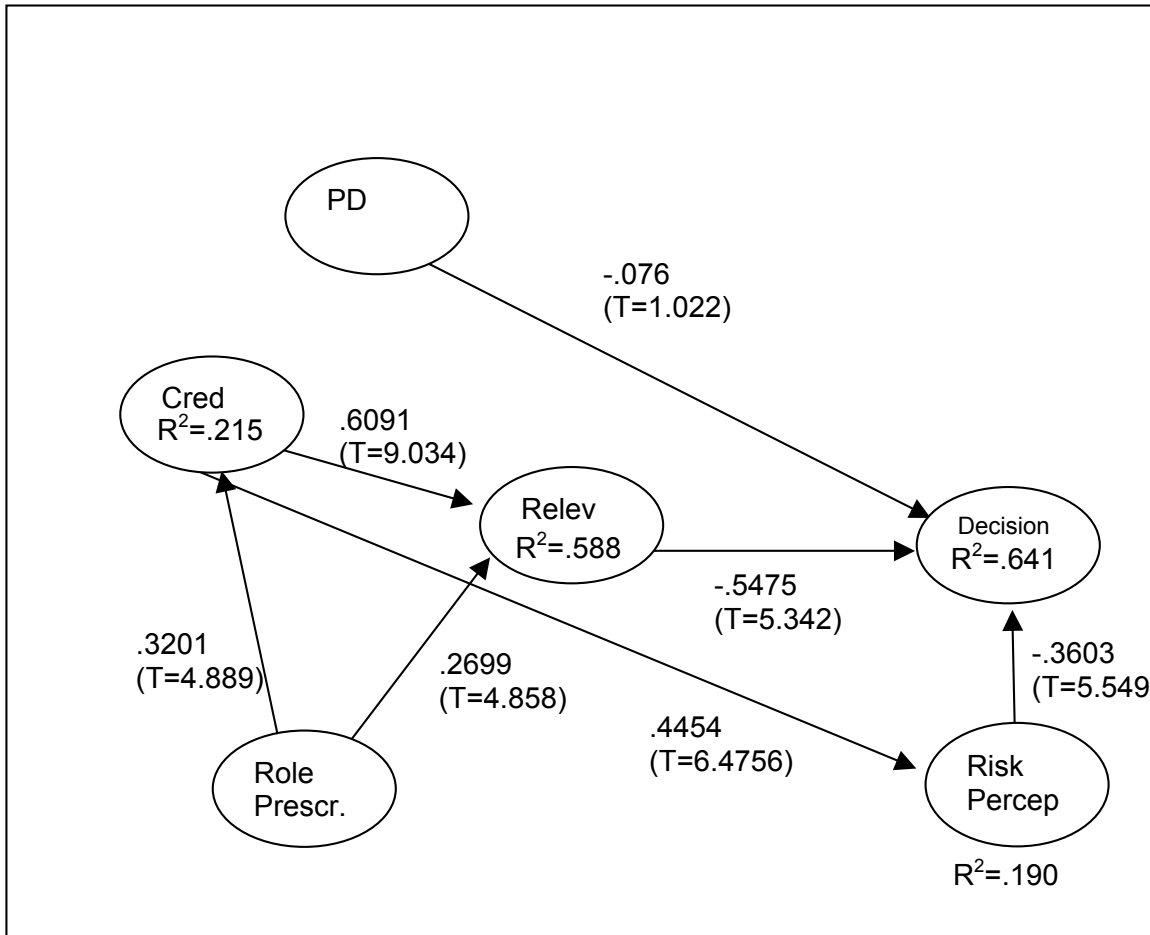


Figure 4.6: Significant Paths in USA Structural Model (only significant paths shown)

In the USA, the cultural values are insignificant except for the power distance control variable. In high power distance societies, power is differentiated into several classes, each with a different amount of power and involvement in the society (Carl, Gupta and Javidan 2004). The negative path coefficient indicates that when the decision maker views the ambient culture as being a higher power distance culture that he/she tends to discontinue the current course of action. This seems to indicate that when the decision maker views his/her society as being high in power distance, they are more likely to de-escalate. The reason for the failure of the collectivism hypotheses to be confirmed is not obvious from the data. The In-Group Collectivism construct may be insignificant due to

the action of the power distance control variable. According to the GLOBE consortium, the power distance and In-Group Collectivism constructs are highly correlated ($\rho=.55$) (Carl, et al. 2004). It may be that power distance is obscuring the effect of In-Group Collectivism (figure 4.6).

Table 4.21a – Effect Sizes of the Variables in the USA Model			
	Decision	Relevance	Risk Perception
Relevance	.204		
Risk Perception	.134		
Credibility	.003	0.503	.963
Role Prescription		0.111	

In the USA model (Table 4.21a), we see that Relevance and Risk Perception have large effect sizes on Decision while Credibility has very small one. This indicates that in the USA Relevance has the largest effect on the Decision. Relevance is influenced largely by Credibility with Role Prescription having a small effect.

Germany Main Effects Results

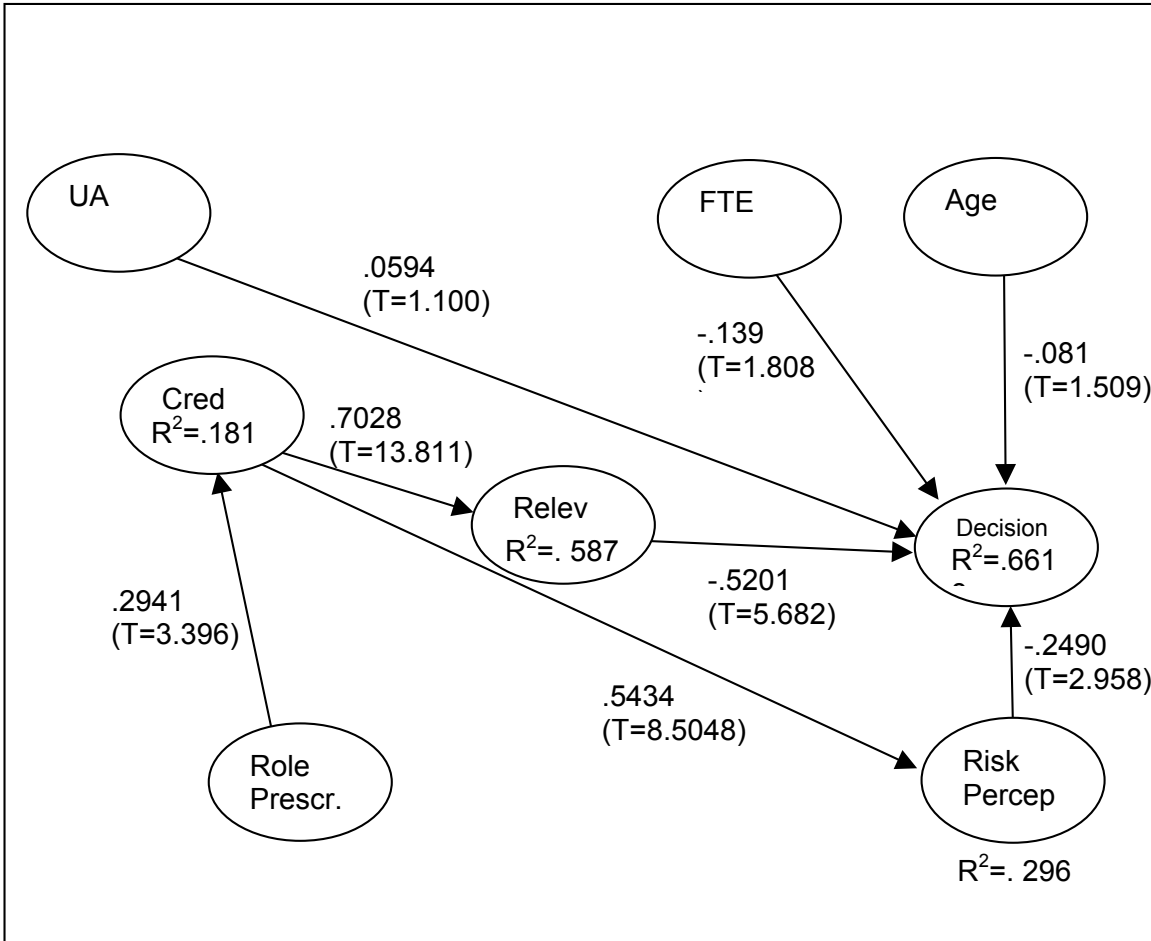


Figure 4.7: Significant Paths in Germany Structural Model (only significant paths shown)

The German subjects also did not have the collectivism variables as significant factors in their results. Moreover, the path from Role Prescription to Relevance of the message was not significant as it was in the other societies. In discussing this finding with our German colleagues, I understand that in Germany, internal auditors have a bad reputation as being “time bandits”, in other words, they do not add value to a project but rather simply audit projects after all work has been done and look to see if the right boxes on the report are checked. In this view, any concern that they raise has little claim to the decision maker’s attention and hence little relevance (Beck 2008). Since this is based on discussions with practitioners, it is uncertain if students would have a similar reaction to the report of bad news. This question deserves further research.

Also, uncertainty avoidance featured positively in the decision. High uncertainty avoidance is associated with seeking more orderliness, consistency and structure within a society. Thus high uncertainty avoidance societies tend to rely on policies and procedures, formalized interactions, and show less tolerance for breaking rules (De Luque and Javidan 2004). In this case it appears that when the German subjects view

the society as being high in uncertainty avoidance, they view bad news reporting as a deviation from workplace convention that creates uncertainty. This assessment weakens the argument for de-escalation in the decision maker’s analysis and leads to a higher tendency to reject the bad news reporter’s message and continue the current course of action. It doesn’t cause the bad news reporter to lose credibility or their message Relevance.

Table 4.21b – Effect Sizes of of the Variables in the Germany Model

	Decision	Relevance	Risk Perception
Relevance	.180		
Risk Perception	.070		
Credibility	.003	.727	.997
Role Prescription		.000	

In the Germany model, similar to the USA model, we see that Relevance and Risk Perception have large effect sizes on Decision while Credibility has very small one. This indicates that in Germany, as in the USA, Relevance has the largest effect on the Decision. Relevance is influenced solely by Credibility with Role Prescription having no effect.

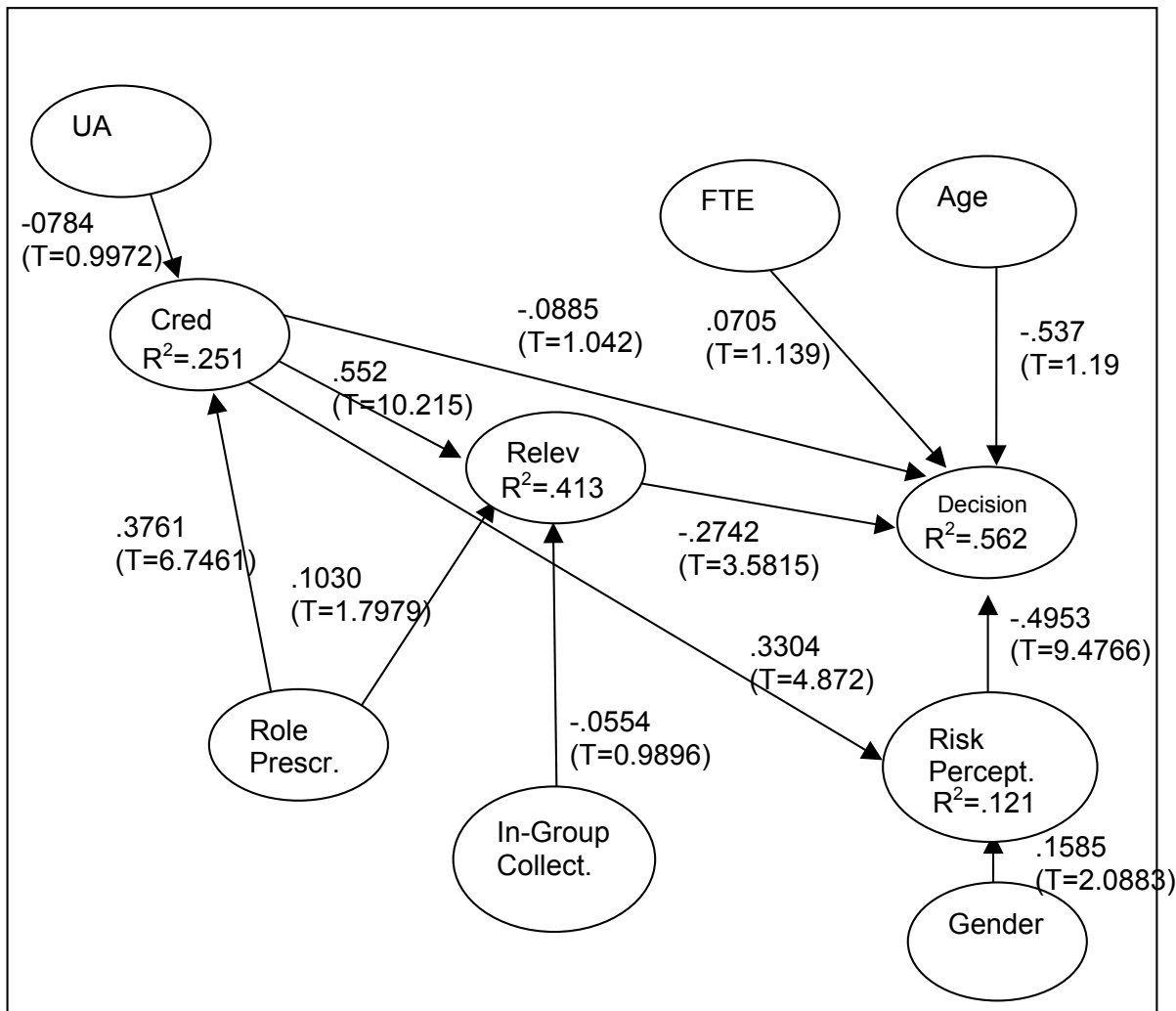


Figure 4.8: Significant Paths in the China Structural Model (only significant paths shown)

Main Effects Results for China. Figure 4.8 graphically shows the significant paths in the main effects model for China. As hypothesized, In-Group Collectivism results in a decreased Relevance of the message. An out of group bad news reporter is viewed as being outside of the hierarchy and thus breaking the chain of command. Since in the scenario used in this experiment, the management team was very interested in putting the system into production, and in an in-group collectivist society there is pressure to defer to management, it seems that the Chinese decision maker considers the report of bad news less relevant to his/her decision process than in a non-in-group collectivist society. Institutional Collectivism has no significant effect on the Deaf Effect decision process.

The control variable uncertainty avoidance appears as significant in the model with a negative influence on Credibility. It may be that when the Chinese decision maker views the society as being high in uncertainty avoidance, he/she sees the bad news reporter as one who introduces uncertainty into the environment. The report of bad news contravenes the received wisdom from the team and therefore is cause to lower their trust in the bad news reporter, which results in decreasing his Credibility.

Table 4.21c – Effect Sizes of the Variables in the China Model			
	Decision	Relevance	Risk Perception
Relevance	.060		
Risk Perception	.330		
Credibility	.009	.590	.851
Role Prescription		.027	

In the China model, contrary to the USA and Germany models, we see that Risk Perception has the largest effect size on decision while Relevance and Credibility have very small ones. This indicates that the Deaf Effect operates differently in China. It is not a function of the report of bad news but rather of the perception of risk. Credibility, in China, unlike in the USA or Germany, does not have a large effect size on Risk Perception indicating that there are other factors that the Chinese use to evaluate risk. Relevance, similar to the USA and Germany, is influenced for the most part by Credibility with Role Prescription having a small effect.

4.7.1.2. Evaluation of the Moderation Effects

In this section, I evaluate hypotheses H1c and H2c, dealing with the moderating effects of Role Prescription. At this time there is a controversy regarding the proper method to use to evaluate moderation effects in PLS. Chin, Marcolin and Newstead (2003) have advocated using the product indicator approach in which the indicator values of the main effects and moderator variables are cross multiplied to compute the interaction value indicators. They argue that this approach produces path coefficients for the interaction effect that are closer to the true value of the parameter. In a subsequent article, Goodhue, Lewis and Thompson (2007) have argued that this approach while increasing accuracy of the parameter estimate also reduces statistical power; an effect that increases with indicator count and sample size. They argue instead that the product of sums approach be used. Under this approach, the indicators of the variables are summed to produce latent variable scores, which are then centered and multiplied to produce interaction term indicator values. Neither of these approaches can be used in the current study as they both assume reflective constructs. Since Credibility is modeled as a formative construct, a different approach is needed. Henseler, Hubona and Ringle (2008) have proposed a two step approach which works with both reflective and formative variables. The process is as follows:

- 1) A main effects model is run in PLS.
- 2) The latent variable scores (unstandardized) are extracted for the moderator and the exogenous variable.
- 3) These scores are centered and element-wise multiplied to create the interaction term.
- 4) The extracted latent variable scores and interaction term are loaded into the PLS model and the model is rerun.

- 5) The significance and effect size of the terms is evaluated.
- 6) Each interaction effect is modeled separately from all others.
- 7) In interpreting the path coefficients, the original paths are no longer main effects but “single effects”, the effect that the variable has when the moderator is zero.

Table 4.22: Summary of Moderating Hypothesis Results

Hypothesis	Path	Path Coefficient	T-Statistic ¹⁵	Effect Size ¹⁶
H1c: Role Prescription dampens the effects of Institutional Collectivism.	Role Prescription X Institutional Collectivism to Relevance			
USA		.0657	1.1497*	.025
Germany		-.0172	.2159	-.009
China		-.0021	.1204	-.009
H2c: Role Prescription moderates the effects of In-Group Collectivism	Role Prescription X In-Group Collectivism to Relevance			
USA		-.0117	.1331	.017
Germany		.0563	1.2668*	.000
China		-.0322	.7170	-.008

In evaluating hypothesis H1c, I found that the path is positive and significant only in the USA. It is not significant in Germany or China. In the USA, the single effect of Institutional Collectivism on Relevance was not significant and assumed to be zero. The single effect of Role Prescription on Relevance was positive. This indicates that the interaction between Institutional Collectivism and Role Prescription is one in which Institutional Collectivism *weakens* the effect of Role Prescription (Cohen, et al. 2003). The effect size is very low and is considered to be weak to non-existent so I conclude that this weakening effect is very small.

For hypothesis H2c, we found that the interaction between In-Group Collectivism and Role Prescription was significant only in Germany. However, in this case, the effect size is zero which indicates that Role Prescription has no moderating effect on the operation of In-Group Collectivism.

¹⁵ * = p < .05 level, one –tailed test

¹⁶ The effect size is calculated as



per Henseler, et al.

(2008).

Carte and Russell (2003) suggest guidelines to prevent errors in the assessment of moderation effects. I report the results of these guidelines to show that moderation has been reported correctly.

- 1) Report effect size – This was done in table 20. The effect size was weak to non-existent for the moderating variables.
- 2) Interpret main effects with moderating effects – This was done. I included the main effects variables with the moderating variables.
- 3) Check for curvilinear effects – I found that there was a very low correlation between Institutional Collectivism and Role Prescription in the USA (-.0112) and between In-Group Collectivism and Role Prescription in Germany (.1043). Since the correlations were low, the risk of confounding curvilinear effects with mediation is low.
- 4) Clearly establish the causal ordering – This was done in the insights from whistle-blowing literature section.
- 5) Report power analysis and sample size requirements – Following Cohen, Cohen, West and Aiken (2003) we find for the USA Role Prescription and Institutional Collectivism interaction effect that $L=f^2(n-k-1) = .025(157-3-1) = 3.825$ which yields a power close to .3, a low level. The N required to achieve a power of .8 is $n^*=(10.8/.025+3+1) = 440$. This indicates that there is a possibility that interaction effect might be understated in this study. Replication with a large sample size is needed. Similarly for the German In-Group Collectivism, Role Prescription interaction, we find that since the interaction effect size is zero that the power is zero and the number required to achieve a power of .8 is undefined.
- 6) Examine scale coarseness – In this study, respondents replied to Relevance, In-Group and Institutional Collectivism and Role Prescription on seven point scales creating a potential 49 point interaction variable compared with a seven point dependent score. Carte and Russell indicate that this exhibits a potential 50% reduction in effect size due to this feature.
- 7) Report all transformations – no transformations were performed on the data prior to analysis. In calculation of the moderator variables, the predictor variables were centered, a linear transformation which does not affect R^2 or path coefficient values.
- 8) Report scale reliabilities – Being formative constructs, In-Group and Institutional Collectivism don't have reported scale reliabilities. Role Prescription was a single item variable, so its reliability is 1.0. Thus the reliability of the interaction cannot be reported.
- 9) When moderation is tested in PLS by separating samples in groups with different memberships, different factor loadings and weights are computed for each group for each latent variable. It is therefore necessary to test that the inter-item covariance matrices with scales are equal using Box's M to determine if the construct contents as determined by item loadings within scales are the same (Carte and Russell 2003). In this study, by using the two step approach advocated by Henseler et al. (2008), this problem is avoided using the calculated unstandardized latent variable scores for each of the indicator and dependent variables in the analysis thus fixing the values so they are not recalculated. This not only avoids this problem, but also assures correspondence with the main

effects analysis done.

The end result of this analysis is that the sample sizes used in this analysis are too small which results in low power in testing for the moderation effect. Additionally, the coarseness of the dependent variable results in a reduction of effect size as well. This indicates that to overcome this downward bias the interaction effect detected must be a strong one in order to be detected in such a low power experiment and we have a potential type II error on the moderation analyses.

4.8 DISCUSSION

This study replicated the study reported in Chapter 2 in the USA, Germany and China. The results of this study have shown that the pattern of association in the structural model demonstrated in previous studies in the USA is found within Germany and China. An exception to this is that in Germany, Role Prescription was not significant on Relevance. While this might be due to German attitudes toward internal auditors, additional research is required to understand why this should occur. However, while the structural model is similar, this study shows that the effect sizes of Relevance of the report of bad news and Risk Perception are different in the western cultures from that of China. In China, the effect size of Relevance of the message was much smaller than that of Risk Perception, indicating that the Chinese subjects consider the report of bad news less important than their perception of the risk in the project.

The reason for this exchange in effect size is not evident from this study, however, I can speculate that it might have to do with the difference in political cultures. In the western societies with many individual freedoms, no history of government oppression in the subjects' lifetimes and no fear of serious personal retaliation for defying authority, perceived risk may be held as less important than in China where the opposite conditions hold. In this study, since we did not achieve complete metric invariance between the subjects, we cannot make any comparison between the Risk Perception measures between the cultures. Given that, I am left to hypothesize that in the mental model of the Chinese students, they must be more risk averse or attach more importance to perceived risk in their decision processes than western students as a result of their political environment.

This study also showed that the decision maker's perceptions of ambient culture have little to no effect on the Deaf Effect. This is contrary to the deductions based on the definitions of the cultural values described in House, et. al. (2004). In the USA, power distance showed a negative effect on willingness to continue the current course of action. In Germany, perceived uncertainty avoidance in the culture caused a willingness to discontinue the current course of action. In China, perceived uncertainty avoidance reduced the Credibility of the bad news reporter while In-Group Collectivism reduced the Relevance of the report of project problems. The effect sizes of all of these effects were small to non-existent. It is possible that the generally low power for all of the paths of this experiment resulted in failure to achieve significance for these hypotheses. In which case, a larger sample size might generate significance for the cultural values. Alternatively, there might be a substantive reason for the failure of these hypotheses. Per our model, I would argue that there are other aspects of the mental model that drive the reactions to perceived cultural values.

What these aspects are is uncertain at this point, however, I can speculate several reasons as to why this study achieved no significant different in response based on perceived national culture. First, it is possible that the subjects were composed of

several different cultural subgroups that resulted in a “cancelling out” of their differences. Following Archer (1988, 1995), I recognize that while a society may have a dominant culture, it is composed of several agencies (groups of actors sharing a similar experience that have a similar viewpoint) which based on their positions in society can have different perspectives of the ambient society. Thus it may be that the members of the different agencies have divergent viewpoints of the culture and this has resulted in a “regression to the mean” when their responses are aggregated together resulting in a similarity of response across the different geographies. To resolve this issue would require separation of the different geographies into the different agencies, which would have differing responses. The instrument used here did not contain sufficient information on which to make such segregation.

An alternative explanation is that other aspects of the cultural environment are more important to the individual's values makeup than the ambient national culture. One possibility here is that the professional culture of information systems is the same across the world resulting in a commonality of response. There is some evidence for this. Couger (1986) in a study of Singaporean and American programmers and analysts found that the two different cultural groups had substantial similarities in motivational characteristics despite the different geographies and significant demographic differences. While the level of professional enculturation to be found in students at the sophomore level is likely to be low, another form of cultural homogeneity can perhaps be found in the common experiences as young people. Given the spread of western ideas via the internet and popular culture, it may be that college sophomores of the US and China may share a great deal in terms of values.

A third reason may have to do with nature of measures themselves. The GLOBE framework, while it appears superior to that of the Hofstede framework in terms of content validity, appears to need additional work on cross-country validation. The constructs they have identified are clearly formative as opposed to reflective as they have described them. The items, in this study, are beset by a systematic uniform item bias in different cultures leading to an inability to compare across countries. This creates a concern about the validity of the framework the validity of the framework and results reported when using the framework as described by the GLOBE consortium unless rigorous equivalence testing has been done to prove the equivalence of the metrics across countries. Similarly, the constructs used to measure the Deaf Effect also possess uniform item bias. It might be that the bias found or other deficiencies in the measures has resulted in a suppression of the cultural differences between the cultures.

4.9 CONCLUSIONS

I began this chapter with the question as to whether societal collectivism would change the causal linkages in the model of the Deaf Effect or whether in fact the Deaf Effect occurs. In a replication of the study in chapter 3 across the USA, Germany and China, I found that the respondents' perspective of societal practices as operationalized by the GLOBE framework had very little effect on the occurrence of the Deaf Effect. The Deaf Effect model was shown to replicate in Germany and China much as it is in the United States. The implication of this is that the mental models associated with evaluating reports of bad news within projects are similar in the three geographies examined.

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	Very Far			Neutral			Very Near
9. Regardless of your nationality, how far are you from a strict adherence to the values and culture of the country you are living in?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. How far are your own culture and values from the culture and values of the country you are living in?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
21. My decision was most influenced by the Sandy's assessment. (Relevance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Sandy has a lot of expertise in this area . (Credibility)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. I believe that there is very little risk in moving this project into production. (Risk Perception)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Part of Sandy's job is to review projects and report on perceived problems that might affect project success. (Role Prescription)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Sandy is well respected within the company . (Credibility)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Sandy's assessment was very important in forming my decision. (Relevance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I would choose a risky alternative based on the assessment of others on whom I must rely. (Risk Propensity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Sandy is motivated by a desire to see things done correctly for the bank. (Credibility)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I believe that there is high potential for a positive result in putting this project into production. (Risk Perception)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. My decision was more influenced by the Sandy's assessment than any of the other views expressed. (Relevance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Sandy is the most credible person in the scenario. (Credible)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. This project has a high probability of success . (Risk Perception)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I would choose a risky alternative relying on an assessment that is high in technical complexity . (Risk Propensity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. My decision was most influenced by the Sandy's	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. I would choose a risky alternative which could have a **major impact** on the strategic direction of my organization. (Risk Propensity)
25. Sandy is very **trustworthy**. (Credibility)
26. This project is in a **positive situation**. (Risk Perception)
27. Sandy's assessment was **highly relevant** in forming my decision. (Relevance)

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Strongly Disagree Disagree Slightly Disagree Neutral Slightly Agree Agree Strongly Agree

In this section, we are interested in your beliefs about the norms, values and practices in your society. In other words, we are interested in the way your society is – not the way you think it should be.

There are no right or wrong answers, and answers don't indicate goodness or badness of the society.

Please respond to the questions by checking the box that most closely represents your observations about your society.

28. In this society, orderliness and consistency are stressed, even at the expense of experimentation and innovation. (Uncertainty Avoidance)

Strongly Disagree			Neither Agree or Disagree			Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29. The way to be successful in this society is to (Future Orientation)

	Take Events as They Occur					Plan Ahead
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30. In this society, the accepted norm is to: (Future Orientation)

	Accept the Status Quo					Plan for the Future
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

31. In this society, a person's influence is based primarily on: (Power Distance)

	One's Ability and Contribution to the Society					The Authority of One's Position
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. In this society, leaders encourage group loyalty even if individual goals suffer. (Institutional Collectivism)

Strongly Disagree			Neither Agree or Disagree			Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. In this society, social gatherings are usually: (Future Orientation)

	Spontaneous (planned less than an hour in advance)					Planned well in advance (2 or more weeks in advance)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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34. In this society, children take pride in the individual accomplishments of their parents. (In-Group Collectivism)	Strongly Disagree			Neither Agree or Disagree			Strongly Agree
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. The economic system in this society is designed to maximize: (Institutional Collectivism)	Individual interests						Collective Interests
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. In this society, followers are expected to: (Power Distance)	Question their leaders when in disagreement						Obey their leaders without question
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. In this society, teen-aged students are encouraged to strive for continuously improved performance (Performance Orientation)	Strongly Disagree			Neither Agree or Disagree			Strongly Agree
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. In this society, people lead highly structured lives with few unexpected events. (Uncertainty Avoidance)	Strongly Disagree			Neither Agree or Disagree			Strongly Agree
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. In this society, major rewards are based on: (Performance Orientation)	Only factors other than performance effectiveness (for example, seniority or political connections)			Performance Effectiveness and other factors (for example seniority or political connections)			Only Performance Effectiveness
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. In this society, societal requirements and instructions are spelled out in detail so citizens know what they are expected to do. (Uncertainty Avoidance)	Strongly Disagree			Neither Agree or Disagree			Strongly Agree
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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41. In this society, being innovative to improve performance is generally: (Performance Orientation)

Not Rewarded

Somewhat Rewarded

Substantially Rewarded

42. In this society, parents take pride in the individual accomplishments of their children. (In-Group Collectivism)

Strongly Disagree

Neither Agree or Disagree

Strongly Agree

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43. In this society, rules or laws are generally followed. (Institutional Collectivism)	Very Few Situations	Individualism is more valued than group cohesion	Group cohesion and individualism are equally valued	Some cohesion and individualism are equally valued	Group cohesion is more valued than individualism	Almost all situations
	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. In this society, children generally live at home with their parents until they get married. (In-Group Collectivism)	Decrease their social distance from less powerful people	Strongly Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Increase their social distance from less powerful people
	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. In this society, rank and position in the hierarchy have special privileges (Power Distance)	Strongly Disagree	Strongly Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Strongly 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"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. In this society, aging parents generally live at home with their children (In-Group Collectivism)	Strongly Disagree	Strongly Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Strongly 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"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. In this society, being accepted by the other members of a group is very important (Institutional Collectivism)	Strongly Disagree	Strongly Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Neither Agree or Disagree	Strongly 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"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. In this society, more people (Future Orientation)	Live for the present than live for the future	Live for the present than live for the future	Live for the present than live for the future	Live for the present than live for the future	Live for the present than live for the future	Live for the future than live for the present
	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. In this society, people place more emphasis on: (Future Orientation)	Solving current problems	Solving current problems	Solving current problems	Solving current problems	Solving current problems	Planning for the future
	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. In this society, power is (Power Distance)	Shared throughout the society	Shared throughout the society	Shared throughout the society	Shared throughout the society	Shared throughout the society	Concentrated at the top
	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. In this society: (Institutional Collectivism)	Individualism is more valued than group cohesion	Individualism is more valued than group cohesion	Group cohesion and individualism are equally	Group cohesion and individualism are equally	Group cohesion and individualism are equally	Group cohesion is more valued than individualism
	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX B: FACTOR ANALYSIS OF THE RELEVANCE AND RISK PERCEPTION CONSTRUCTS

Table B.1: Factor Analysis in the USA Sample		
Item	Relevance	Risk Perception
Relevance – 1	.865	-.229
Relevance – 2	.892	-.271
Relevance – 3	.921	-.206
Relevance – 4	.896	-.229
Risk Perception - 1	-.337	.757
Risk Perception - 2	-.206	.846
Risk Perception - 3	-.357	.761
Risk Perception - 4	-.061	.802

Table B.2: Factor Analysis in the Germany Sample		
Item	Relevance	Risk Perception
Relevance – 1	.832	-.181
Relevance – 2	.860	-.232
Relevance – 3	.892	-.279
Relevance – 4	.906	-.182
Risk Perception - 1	-.317	.797
Risk Perception - 2	-.311	.854
Risk Perception - 3	-.118	.503
Risk Perception - 4	-.064	.703

Table B.3: Factor Analysis in the China Sample		
Item	Relevance	Risk Perception
Relevance – 1	.748	-.295
Relevance – 2	.716	-.152
Relevance – 3	.837	-.196
Relevance – 4	.837	-.113
Risk Perception - 1	-.391	.707
Risk Perception - 2	-.194	.838
Risk Perception - 3	-.251	.698
Risk Perception - 4	-.018	.814

5 A CASE STUDY OF THE DEAF EFFECT OCCURRING IN AN IS PROJECT STATUS REPORTING SYSTEM

5.1 MOTIVATION

In the previous chapters, the Deaf Effect was studied at the individual level of analysis. In chapter 2, a basic model of the Deaf Effect was created and an examination was made as to whether this model could explain why a decision maker would not respond to a report of bad news by changing the current course of action. It was seen that the perceived Relevance or importance of the report of bad news was strongly related to the willingness to change the course of action. In chapter 3, I expanded this model by examining the decision maker's individual perceptions of the Role Prescription of the bad news reporter and risk involved in the project combined with his Risk Propensity. In chapter 4, I expanded that research to include the effects of the social environment in terms of individuals' perceptions of national culture variables. In this paper, I move from the individual level effects to examine organizational effects on the occurrence of the deaf effect.

When we move to the organizational level, we shift our attention from the psychology of the individual social actors to the actions of the role-positions that are occupied by social actors and the institutional structures that condition their action. We are not so much interested in what occurs within the minds of the role incumbents as we are with the effects of organizational structures and culture upon them that impel them toward certain actions. Thus we want to analyze the structures and culture with a view toward understanding how they affect the behavior of role occupiers.

To illustrate this point, at the individual level, I defined the Deaf Effect as when an individual decision maker doesn't hear, ignores or overrules a report of bad news to continue a failing course of action. We consider the psychological factors that might cause this such as the perceived Credibility and Role Prescription of the bad news reporter and the Risk Propensity and Risk Perception of the decision maker. At the organizational level, we ask what organizational factors might cause the report of bad news to be ignored or overruled by decision makers. I therefore look at several organizational level situations that might cause the phenomenon to occur. For example: as various literature (Hambrick and Mason 1984; Near and Miceli 1995; Tourish and Robson 2006) points out, decision makers may surround themselves with those who agree with them, the organizational culture may impel them toward a particular decision, or managers' actions may cause bad news reporters to suppress or distort their message so that it does not have the impact that it should have. Thus, at the organizational level, the Deaf Effect manifests itself in actions by organizational actors that

- 1) Attenuate the salience of the message so that it does not reach the decision maker or
- 2) Distort the message so that it loses its status as a report of bad news by the time it reaches the decision maker or
- 3) Obscure the message by raising the level of "background noise" in the environment so that upon reaching the decision maker, it is not heard or understood as a report of bad news.

Examples of these effects are numerous in the literature. For example, messages of bad news may be attenuated by "yes men" who filter out messages that they believe

management does not want hear (Dunbar and Goldberg 1978). Similarly, overwork and stress or an excess of information can create “background noise” that prevents the decision maker from hearing bad news (Wissema 2002). Likewise, managerial systems and behaviors might cause the reporters of bad news or those who are responsible for passing the message along to distort the message in an effort to curry favor or avoid retributive behavior (Athanasziades 1973; Smith, Iacovou and Thompson 2007; Snow and Keil 2002)

This definition is distinct from the Mum Effect in that when the Mum Effect occurs, the bad news reporter is prevented or dissuaded from transmitting the bad news whereas when the Deaf Effect occurs, the report of bad news is transmitted, but either its salience is attenuated, the level of background noise rises so that it loses salience or the message is distorted so that it is no longer recognized as a report of bad news. Thus organizational forces that suppress the generation of the bad news report are proper subjects of Mum Effect analysis. When that message is transmitted, but attenuated, obscured or distorted by organizational forces between the transmitter of the report and the decision making receiver, this is the Deaf Effect.

Since I am examining an organizational phenomenon, it is necessary to examine the organizational environment in which it occurs. The research questions explored by this study are:

1) What organization structures and forces might cause attenuation, distortion, or obscuring of a report of bad news

Additionally, in the previous chapters, the research was conducted with laboratory experiments using student subjects. In laboratory experimentation, the experimenter attempts to “close” the field of research to isolate the mechanisms being studied (Bhaskar 1998). While this allows the experimenter to focus on the object of study it presents an artificial situation that may or may not represent how an effect may occur in the “wild”. Omission or inclusion of a “boundary variable” can affect the generalizability of the results of the study (Fromkin and Streufert 1976). Additionally, as discussed in chapter 3, while student subjects can serve as a proxy for professionals in theory testing studies, to test the external validity of the resultant theory it is necessary to use professional subjects in a real life setting. Thus while the previous chapters have demonstrated the internal validity of the model, this chapter moves to investigate the external validity of the model. Thus the questions that are investigated here are

2) How well does the model of the Deaf Effect examined in the laboratory fit the real world occurrences of the Deaf Effect?

3) What additional variables could be included in the model?

Therefore, in this chapter, the investigation moves from the laboratory to the field. This chapter reports on a study of a project in which there were a series of bad news reports within the project that were ignored or overruled and the project went on to fail.

This chapter first reports on background literature that might have explanatory value for the organizational effect; then, the methodology that I used to collect and analyze the data. Next, it reports the findings of the study. Following that is a discussion of results. The final section reports on the conclusions reached.

5.2 BACKGROUND LITERATURE

In this section, I review literature that shed light on organizational factors that might lead

to the occurrence of the Deaf Effect.

The decision maker does not operate in a vacuum. There are organizational forces surrounding the decision maker that have an effect on whether he/she receives the message or that cause him/her to act differently than he/she would otherwise choose to act. I organize these forces into three categories: attenuation, distortion and obscuration.

5.2.1 Attenuation

In this situation, organizational factors may cause the salience of a report of bad news to be lowered (attenuated) within the organization. For example, managers may establish systems to ensure that they only receive a certain kind of information (Tourish and Robson 2006). They may not establish formal upward feedback mechanisms and encourage, consciously or unconsciously, subordinates to filter out unwelcome messages before they reach the leaders (Morrison and Milliken 2000). Manager reaction to bad news reports can lead to the occurrence of the Mum Effect, but it can also cause reporters of bad news to “turn down the volume” on a report of bad news to the extent that it loses salience.

In other literatures, we see that the existence of groupthink, when a group of people share opinions and assess situations in the same manner (Wissema 2002), can be an organizational characteristic that could cause organizational deafness. Groupthink forms when a homogenous team is unchanged for a long period (Hambrick and Mason 1984; Wissema 2002). Groupthink tends to cause rigidity of response which is acceptable for routine problems but leads to difficulties when the decision making team encounter novel or ill-defined problems (Filley, et al. 1976; Janis 1972). Groupthink may also be exacerbated by the presence of “yes-men.” Managers might surround themselves with those who agree with them. The “yes-men” filter out messages that disagree with the situation as perceived by the managers thus preventing the message from reaching the decision makers with the consequence that bad news reports are not acted on (Dunbar and Goldberg 1978). This not only reinforces the groupthink, but also leads to the situation in which management perceives the situation much differently from those at a lower level in the organization.

Additionally, appropriate information may not be available to identify whether a crisis is occurring either through lack of information systems or organizational silence (Tourish and Robson 2006; Wissema 2002). Bureaucratic organizations in general suppress the effectiveness of whistle-blowing unless there are formal mechanisms to encourage internal whistle-blowing that operate as described. Thus a low bureaucracy organization or a bureaucratic organization with a formal whistle blowing mechanism will tend to respond more favorably to whistle blowing than a bureaucratic organization with no formal mechanism (Near and Miceli 1995).

Similarly, Near and Miceli's (1995) model of whistle-blowing effectiveness describes the effect of organizational structure and values on the ability of the whistle-blower to effect change in organizational behavior. They argue that the organizational characteristics that affect the organization's willingness to change direction or behavior in response to whistle-blowing include the perceived appropriateness of whistle-blowing; the climate of support/non-support of whistle blowing; and the level of bureaucracy in the organization structure. Appropriateness refers to the situation that arises when the organization views whistle blowing as a legitimate response to problems. Where whistle blowing is viewed as a legitimate function, the organization is more likely to change its behavior; whistle blowing is part of the ethical culture of the organization.

The organizational climate refers to whether an organization encourages or discourages either the wrongdoing or blowing the whistle. In terms of the Deaf Effect, it refers to whether the organization encourages or discourages maintenance of the current course of action. Where the current course of action is held to be the approved method of operation, whistle blowing is held to be less effective in changing the current course of action.

5.2.2 Distortion

By distortion, I refer to a change in the content of the message to make the message more acceptable to the recipient. It can also add linguistic cues designed to make the decision maker perceive the report of bad news as less serious than it actually is. Snow and Keil (2002) and Snow, Keil and Wallace (2007) have indicated that the true status of a project to be reported is distorted by first, errors in understanding of the actual status and then by bias. The direction of this bias is held to be twice as likely to be in an optimistic direction as a pessimistic one (Snow, et al. 2007). This positive distortion of the report of bad news results in a softening of the impact or a reduction in the perception of the seriousness of the problem to the decision maker causing it to appear less serious to the decision maker.

Even when formal feedback seeking mechanisms are implemented, management may create a climate for distortion of bad news messages through their reaction to the bad news (Morrison and Milliken 2000). Similarly when management attempts to force upward feedback by intrusive supervision, distortion of reports of bad news is likely to occur (Athanassiades 1973; Smith, et al. 2005).

Smith, Iacovou and Thompson (2007) have reported on a multiple case study of 9 projects reporting to an IT oversight board (ITOB). Utilizing regulatory theory (Scholz 1984; Scholz 1991), they found that auditors and reporters assess each other's signals in their dealings with each other and based on their perception of the meaning of the signals adopted a certain strategy. The auditors could adopt a "conciliatory" or "adversarial" strategy and the reporters could adopt a "full reporting" or "misreporting" strategy. These signals can be distorted by "noise pollution" caused by ineffective signaling. These studies illustrates that the signals used by auditors can affect the reporting strategy of the bad news reporter resulting in distortion of the message into one which does not communicate a serious problem to the decision maker which could cause the Deaf Effect.

5.2.3 Obscuring

An unclear organizational structure or weak culture could also lead to occurrence of the Deaf Effect (Wissema 2002). Where there is an unclear division of responsibilities, signals indicating problems in a project can be missed as managers assume that others are attending to those signals. A weak culture does not provide guidance to the bad news reporter as to how or to whom to report bad news. This could result in the signal being lost in wrangling over how to respond or who is to respond to the signal, a misdirection of the bad news report or even its suppression (Mum Effect).

Alternately, one manager may be overwhelmed and ignore the signal or may have so many things to attend to that the report may be lost or ignored in the clutter (Wissema 2002). Similar effects may result from stress and exhaustion.

5.3 METHODOLOGY

To address my proposed research questions, I performed a case study of a project status reporting process employed by a State Government IS organization (SISO) in the southeastern USA. This project status reporting system requires “critical” IT projects, projects with budgets over \$1 million, to report status to an executive panel on a periodic basis to ensure that these projects progress satisfactorily. The process also requires agencies with projects over \$5 million to hire an Independent Verification and Validation (IV&V) Vendor who audits their project processes. The project report and the IV&V report are then reviewed at an Executive Critical Panel Review (ECPR) meeting with the state’s COO, CFO, CIO and Director of the Office of Planning and Budget (OPB).

My relationship with the subject organization limited the choice of methodologies that could be employed. As part of the nature of our study agreement, I did not have access to become a participant or participant observer into the process. Thus ethnographic studies were not available as a method for this research as they require immersion of the researcher in the environment to gain a “native” understanding of the cultural context in order to translate the meaning of the culture to those reading his/her account (Prasad 1997). I therefore performed a case study of this process. Case study is appropriate in situations where the phenomenon is “broad and complex” and where the phenomenon cannot be examined outside of its context (Dube and Pare 2003). In this situation, the project status reporting process as described below is a multi-step process and could not be examined outside of its context.

5.3.1 Site Selection

To research the influence of organizational structures on the Deaf Effect, I needed to have a research site in which there would be 1) reports of project problems; and 2) a series of organizational interactions before the report of bad news reaches the decision maker in order to surface organization message attenuation, distortion or obscuring. The SISO project reporting process described below satisfied both of those requirements. It was instituted in order to surface project problems so that they can be identified and corrected to ensure that projects successfully complete. It also satisfies the second condition by the sequential process of reviews. Within the context of reviews there are a number of opportunities for the messages of bad news to be attenuated, distorted or obscured. I gained access to the site based on SISO’s desire to have the process audited. SISO had invested significant resources in developing the process and it consumed substantial resources in operating. They desired to have the process reviewed to ensure that it was effective and to understand how to make it more effective. They were also concerned about “surprises” that occurred in the process; where progress was reported to be good but the ultimate results were less than that reported.

I examined three projects that were tracked in that process. In two projects, Alpha and Beta, there were no occurrences of the Deaf Effect nor were there adverse surprises in the reporting project status to the ECPR panel. In the third project I examined, Gamma, there were occurrences of the Deaf Effect and there was a major surprise. Project Alpha is an in-progress project; a major effort by the state Health Services department to implement a new outsourced health care claims processing system that will result in the replacement of one outsourced vendor with another. The vendor was to provide the software and operate the service for the state. It is anticipated that the vendor will go through a two-year period of developing modifications to their standard system to meet the state requirements prior to implementation in 2010. During the time of my analysis, it went through an extended RFP process and the beginning of the design and

development process. Project Beta was also an in-progress project to develop and implement a new system to track the progress of children under supervision by the state Department of Human Services. In this project, a vendor team had modified packaged software and worked with an Agency project team to implement the software in each of the school districts in the state. This project was in the final implementation stages when I observed its status reporting process. Project Beta had experienced a serious problem with vendor performance subsequent to its first pilot installation that resulted in action by members of the ECPR panel. The third project, Gamma, was a completed project, a turn-key student information system development project for the state education department which sought to extract information from information systems in the school districts to build a student information database. In this project, an RFP was issued for the turn-key development project, a vendor team was selected, commercial software was customized and development completed. The project team and IV&V reported this project as being on track until the first production rollout at which point it was found to be seriously defective. Following a year-long remediation effort, this project was complete at the time of the data collection.

In the discussion that follows, I analyze the third project, Gamma, as it is the project that exhibited the Deaf Effect. The other two projects, Alpha and Beta are included to project contrasting examples of projects in the same environment in which the Deaf Effect did not occur.

5.3.2 Data Collection

Data collection took place from April, 2007 to July, 2008 and was accomplished by use of interviews and observation. I interviewed all the ECPR critical panel members, all SISO attendees of the ECPR meetings, the project managers and the IV&V personnel as well as other stakeholders in SISO and the agencies. The interviews with the critical panel members were arranged by the SISO director and lasted 30-40 minutes each. I directly arranged the interviews with the SISO, project and IV&V personnel. Table 5.1 shows the interviewees and their roles (pseudonyms are used for all names to ensure anonymity). All formal interviews were recorded. Due to sensitivity of the conversations, two interviewees requested that the recorder be turned off part way through the interview. For these and for informal interviews that occurred ad hoc during the course of the study, notes were taken as soon as possible during the interview and these summaries of the interviews were made as quickly as possible after the occurrence. I used snowball sampling to acquire interview subjects. When it was discovered that the Deaf Effect had occurred in project Gamma, additional interviews were scheduled to get a more in depth perspective of the project events. A total of 19 people were interviewed in 24 interviews resulting in 18 hours and 35 minutes of recordings across all three projects. I interviewed the SISO personnel, key members of the project teams and the ECPR members.

Code	Role	Number of Interviews
Alan	State COO, ECPR Panel member	1
Waylon	State CFO, ECPR Panel Member	1
Toby	Director, Office of Planning and Budget, ECPR Panel Member	1

Phillip	SISO Director, State CIO, ECPR Critical Panel	1
Patsy	Deputy CFO, ECPR Member	1
Sherman	SISO Critical Panel Facilitator	2
Harvey	CIO, County 1 School District	1
Oswald	CIO, County 2 School District	1
Robert	Project Alpha Executive Project Director	1
Lee	Project Beta Executive Project Director	1
Forrest	Project Gamma Executive Project Director	1
Jackson	Project Gamma, Technical Project Manager	1
Thomas	CIO Project Gamma	1
Braxton	Contractor Project Manager	1
Dolores	IV&V Project Gamma	3
Joaquin	IV&V Project Gamma	3
Frederick	CIO, Project Alpha	1
Ambrose	SISO Critical Panel	1
Isabella	SISO Critical Panel Member	1

I used a semi-structured interview approach using a set of questions developed for each interview. The initial questions were formed around the theories that informed the background investigation of the original study and organizational factors that affect the formation of the Deaf Effect. For example, from the organizational communication literature I sought to identify how the reports of bad news were received within the projects or the status reporting process (Tourish and Robson 2006). From the whistle-blowing effectiveness literature, I examined the organizational climate regarding bad news reporting and willingness to respond to bad news (Near and Miceli 1995). I examined the nature of the interactions in the status reporting process to see if there were conditions that might cause distortion of the message (Athnassiadis 1973; Scholz 1991; Smith, et al. 2005).

Observation was accomplished by attendance at the regularly scheduled meetings. I sat in an inconspicuous location and observed the subjects discussed, seating arrangements and style of interaction. I was an observer, not a participant in the meeting. Careful notes were taken during the meetings. I did not focus on any particular area but simply recorded the events, topics and tone of the conversation as it occurred. The meetings observed are listed in table 5.2.

Type of Data Collection	Number of Interviews or Observations Made
ECPR Meetings Observed	9
SISO Critical Panel meetings Observed	10
Dashboard Creation Cycles Observed	1

A total of 20 meetings were observed.

During the various observation and interview sessions various documents were collected such as copies of the dashboards, meeting agendas, project descriptions, and reports. Observation and interview notes, transcripts and documents collected were stored in notebooks in chronological order forming a project database.

5.3.3 Data Analysis Phases

In analyzing the data, I employed the following process. For the interview data, I listened carefully to the recordings and made transcripts of them. I then carefully read through the transcript data. I extracted sections of each transcript and placed them in word documents under a category title corresponding to the concept describing their contents. I then reviewed the text sections under each category to ensure consistency by rearranging them and creating new categories as necessary. For the observational data, I reviewed the notes taken at each meeting to identify common patterns and events. These data were incorporated into the analysis of the transcript data.

I examined the data for the structure of each project in terms of governance and, method of reporting for the SISO project status reporting process. For each project, I constructed the actual method by which the dashboard was created for submission to the SISO staff. I also reviewed the data on the background of the project managers and the conduct of the various review meetings that occurred during the process.

I then created a history of each of the projects constructed from comments made by all interviewees. Recognizing that project Gamma had several occurrences of the Deaf Effect during its history, I focused on this project to identify the organizational and reporting environment around the project to see if any of those conditions might have induced the occurrence of the Deaf Effect.

5.4 FINDINGS

In this section, I report the findings of the study. First, I discuss the structure of the projects including a discussion of the project manager, the project’s relationship with the IV&V vendor, and its steering committee structure. Then, the SISO ECPR process as designed by SISO and as observed in practice is described including how each project constructs the dashboard document. Finally, a history of each project is given with a focus on project Gamma.

5.4.1 Structure of the Projects

The state government is headed by the elected Governor, who in this southeastern state, appoints a Chief Operating Officer (COO) and Chief Financial Officer (CFO). All non-constitutional agencies (not headed by an elected official) report to one of these two C level executives. The financial agencies report to the CFO, the others to the COO. The Governor exerts direct control over these agencies. While the constitutional agencies nominally report to the Governor, in practice they run as independently of the Governor as possible, especially if the office holder is of the opposite political party. In this study, two of the agencies involved report to the COO, the third, project Gamma, is a constitutional office holder. In projects Alpha and Beta, the Executive Project Director of the project reported to a CIO. In project Gamma, the Executive Project Director functioned as a CIO in addition to his other responsibilities.

5.4.1.1. Project Manager

Project Alpha. The Executive Project Director (EPD) for project Alpha, Robert, was an experienced IT project manager. Formerly the Director of Operations for SISO, he had entered the state government in 1997 as a consultant for Keane managing 278 consultants responsible for all the Y2K activities for the state and eventually became director of operations for SISO managing 600 people. Earlier in his career, he had been project manager for Unisys implementing similar systems for other states (Interviewee Robert, EPD Project Alpha).

Project Beta. The Executive Project Director, Lee, was a SISO employee. When this project was begun, SISO sourced and provided project managers to agencies if they needed an experienced trained program manager and did not have or could not recruit one on their own. SISO would provide a project manager on a chargeback basis to the agencies. This process has now been discontinued as a cost saving measure (interviewee Phillip, SISO Director). This project director was hired from Deloitte and had experience with five other similar projects (Interviewee Lee, EPD, Project Beta).

Project Gamma. The Executive Project Director of project Gamma, Forrest, was an academic with some previous IT consulting experience. While his IT experience was primarily in the banking arena, he held an M.S. in CIS and an Ed.D. in Educational Information Systems. He had worked with the Agency Commissioner in other roles and after the Commissioner assumed her current position, he was recruited to be the executive director while an assistant professor at a state college.

Forrest was considered to be supremely confident in his ability and power. In his interactions with the project steering committee, he was considered to be arrogant and condescending to them (Interviewee Jackson, Project Gamma Technical Project Manager). As the project went along he was viewed as promoting himself more than the project (Interviewees Jackson, Project Gamma Technical Project Manager and Harvey, CIO, County 1 School district). Forrest was considered to be very knowledgeable but control oriented, as Sherman (SISO ECPR facilitator) indicated

... he was a guy who liked to be in control, he was a guy who thought he knew everything that was going on, that he could control all those pieces on the board and there was a big scene that he was going to come out the victor in. I don't think there was any necessarily deceit on his part. ... I think he knew what he was doing. I think Forrest understood, definitely understood education, definitely understood the laws, definitely understood what they had to do from a requirements perspective, knew a lot of the policy so he had a very good

understanding of the environment. I don't know how well, ... he understood the technology ... (Interviewee Sherman, SISO ECPR facilitator).

5.4.1.2. Steering Committee Structure and Commissioner Involvement

Each project maintained a steering committee to provide advice and direction to the project. Those of projects Alpha and Beta were similar in composition and role, while that of Gamma varied significantly.

Project Alpha. The Project Alpha Project Governance body was composed of very high ranking people from the Agency and SISO. It included the Agency Chief of Staff, CIO, the Medical Policy Chief, CFO, Chief Legal Officer, Inspector General, and the state CIO. This committee meets monthly and receives a more detailed project review than the ECPR (Interviewee Robert, EPD Project Alpha). The Commissioner or her representative attended all meetings of the ECPR.

Project Beta. Project Beta's Executive Steering Committee was also composed of very high-ranking people from the Agency and SISO. The Commissioner and two Deputy Commissioners of the Agency, the Agency CIO, the state CIO and Director of SISO Project Management Office and the policy analyst from the Office of Planning and Budget were members of the committee. This committee met monthly and received a status report from the Executive Project Director. The IV&V and the Executive Project Director briefed the Commissioner on project status each month.

Project Gamma. This steering committee was substantially different from that of the other projects studied. In those projects, it was a high-ranking policy making and involved decision body for the project. In project Gamma, while it had 29 members and the Chief Deputy, the Agency head responsible for policy, the Education Policy Advisor from the Governor's office, and a Deputy Director of SISO as members, it was largely populated with subordinates of district CIOs and other district employees. The steering committee was a therefore relatively informal body that was largely used to discuss requirements. As the project progressed, the body met more and more infrequently. (Interviewee Harvey, CIO, County 1 School District) The Commissioner and deputy Commissioners received their information about the project from the executive project director (Interviewees Forrest, EPD Project Gamma, and Delores, IV&V Projects Alpha and Gamma) and did not attend the ECPR meetings on a regular basis (Interviewee Sherman, SISO ECPR Facilitator). Unlike other projects the IV&V contractor did not have access to the Commissioner (Interviewee Delores, IV&V Projects Alpha and Gamma).

5.4.1.3. Relationship Between the Project and the Independent Verification and Validation Vendor (IV&V)

IV&V was a contracted relationship between the agency and an independent consulting firm. SISO contracted with the IV&V consultancy and then billed the charges back to the agency. IV&V is perceived by the agencies to be very expensive. (Interviewee Phillip, SISO Director). The process that the IV&V followed to collect the data that they used for their analysis was to attend major project management meetings in which project status was discussed. They also collected appropriate documents and met with the project managers independently of the meetings in order to collect additional data where there were gaps in their understanding of the project status or plans. As part of their attendance at the meetings, they would offer feedback on the project management practices and suggestions for improvement. The focus of the analysis of the IV&V was

based on the internal practices of the project and on meeting both work and budget related milestones, organizational readiness for implementation and risk and issue management (Interviewees Dolores, IV&V Project Gamma and Joaquin, IV&V Project Gamma). They did not collect any data from users as to the level of fit of the system with their requirements (Interviewee Dolores, IV&V Project Gamma). Nor did they include any review of project outputs for fit with implementation. Thus they sought to monitor project behaviors rather than outcomes. The implicit theory employed is that if the behaviors are correct then the results will be correct. This focus resulted in at least three projects where requirements definition errors were uncovered in the ECPR meetings. In project Epsilon, a fixed asset tracking system, at an ECPR meeting it was discovered that as the system was about to be implemented, there was a requirement to track several thousand vehicles that had not been considered before. Similarly, in project Beta, the conversion program specification inaccuracies were only discovered in a pilot test. Finally, in project Gamma, the system developed was totally inadequate for the needs of the users. This was only discovered after a pilot had been completed.

The project managers had a uniformly positive view of the IV&V vendor (Interviewees Forrest, EPD Project Gamma, Robert, EPD Project Alpha, Lee, EPD, Project Beta, Thomas, CIO Project Gamma, and Braxton, Contractor Project Manager). Instead of being a simple auditor, the IV&V functioned additionally as a consultant that provided value to the project. The project directors looked for the IV&V to be an active participant in the project:

You know almost every time the IV&V vendor takes a position of such independence that they become not a team member, OK? And so, what I counsel them on is look guys, you know, ... your input is valuable to us but you can't just sit back and point fingers and then write a document a week later. You know, what you've got to do is bring these issues up in meetings and become part of an active communicator within the team meetings that we're having. You're one of the team. Your view is independent, but consider yourself to be one of the team with the rest of the team members seeing that you're making a contribution. What we've done is we've run all our processes that we've defined for managing the project, ... by IV&V for input before we finalize them. Especially, [Dolores], I mean she has great ideas. ... [You] get a lot farther if the IV&V person is on the team and just contributing you know. So that's the relationship that we built with all of our IV&V. (Interviewee Robert, EPD Project Alpha).

There was some concern about "going native" in the projects:

Well, there are some going native ... It actually happened in a couple of cases. I could see it in the Paris project, where the IV&V was more ... [an] agency-aligned person. And then we even had one, on the AMP project, where the agency head actually changed our contract without us knowing about it to tell the IV&V what they needed to do in a couple of cases. So I think it should remain [the way] it is now with an IV&V contract with GTA, not with the agency. (SISO Interviewee Sherman, SISO ECPR Facilitator)

This idea of being part of the team resulted in a motivation to resolve any differences between the project and the IV&V vendor. This resulted in construction of dashboards of great similarity.

Well, you know, [having the project dashboard different from the IV&V dashboard] is obviously a concern. You don't want that. Now, so you've got to manage that. You got to manage that so that doesn't occur. If you don't do that, then you're not

doing your job. Once again, its gets back to you know sometimes you get to a point where there's just a difference of opinion on something and I've run over there with those and Dolores' in the red and I'm ...in the yellow and I'll just put my position on the table, she puts hers on the table. That's the way we go. You try not to have that be the scenario. (Interviewee Robert, EPD Project Alpha)

You try not to be too out of sync because then you go in and it's like, "Why is there the difference"? Either IV&V is not talking to the agency and explaining and recommending in all of that to the agency or the agency has a reason for them not accepting it, but IV&V still feels strongly about it. Hopefully, you don't have that type of an issue. (Interviewee Dolores, IV&V Projects Alpha and Gamma).

One ECPR member noticed that there is a “melding” between the dashboards produced by the IV&V and the projects.

... I'd say what I've noticed is a kind of melding of the grading and the evaluations by the IVV and the departments. I think that's positive. I don't think a little contention's bad because that's substantially the reason for the IVV. And sometimes the IVV can be a little too negative frankly there. That's somewhat their job. (Interviewee Alan, State COO, ECPR member).

The ECPR panelists had a generally good perception of IV&V although they also viewed the IV&V as not being perfect.

I'm not necessarily [going to] take IV&V's word for it. I've worked for plenty of consultants and you know, that if you're somewhat detached from the situation, you may not have all the information, so I don't take one [It] as gospel. You know, it's probably somewhere in the middle...to me it's more of a general indicator rather than anything that you can really bank on. (Interviewee Toby, Director, Office of Planning and Budget, ECPR Member)

I mean you know sometimes maybe the IVV, they take the other side too strongly and maybe they should kind of know where you stand. They're not going to come in and tell you everything is hunky dory when it's not but sometimes they'll come and point out all the possible flaws and possibilities of things going wrong and then you have to ... weigh that [with what] with the agency is telling you about all the things they don't think they're doing wrong. (Interviewee Alan, State COO, ECPR member)

5.4.2 The SISO Status Reporting Process

5.4.2.1. History.

Under state law, SISO has the mandate to prescribe procedures for procurement of technology resources and to provide oversight of program management for all large (over \$1 million) technology projects. Following a major disaster in 2003 with the implementation of a Medicaid Management Information System, the Executive Critical panel process was created (Interviewees Alan, State COO, ECPR member and Isabella, SISO Critical Panel Member). The panel consisted of the state COO, CFO, CIO, and Director of the Office of Planning and Budget (Interviewee Sherman, SISO ECPR Facilitator). Acquiescence to the process was achieved because most of the agencies reporting to the panel reported to members of the panel (Interviewee Isabella, SISO Critical Panel Member). Those who did not report to members of the panel but to other constitutional officers participated based on the relationship of the officers to the

Governor (Interviewee Sherman, SISO ECPR Facilitator). The object of this panel was to inform the panel members of the impact that these projects have on the state government, to ensure that business drives the technology decisions and to ensure that decisions that go across agencies are made in the Governor's office (SISO 2006). In 2004, the state legislature passed a resolution encouraging the departments and agencies of the state to engage the services of an IV&V vendor for their information technology projects over \$1 million and for all procurement activities over \$5 million (Balfour, Stephens and Johnson 2004). This led to the basic structure of the ECPR. Following the project Gamma disaster in 2006, the SISO review meeting was added to the process (Interviewee Isabella, SISO Critical Panel Member).

5.4.2.2. The SIS Project Reporting Process: As Described

The SISO project reporting process was a multi-stage process centered on the development of a "dashboard" reporting document. This document is developed in a dialogic process between a project team and the IV&V vendor and then refined through a series of reviews with increasingly senior levels of management until it is finally reviewed by a C-level executive committee (figure 5.1). The normal time span for one cycle of this activity is approximately one month (Interviewee Ambrose, SISO Critical Panel).

As shown in figure 5.1, the Project Status Report Generation Process was described as a multi-stage process in which the report of status (dashboard document) and indication of problems goes through potentially five iterations before it is reviewed by the Executive Critical Panel Review (ECPR). The first stage is the initial creation of the dashboard document. The IV&V vendor and project team simultaneously create versions of this document and then through interaction between the IV&V vendor and project team, discrepancies between the two versions are resolved. The dashboards are then reviewed by the business process owner of the project after which they may be revised again. The third stage is a review with the executive sponsor. Following this review, the documents may be revised again. The fourth stage is the review with the SISO executive leaders, following which the documents may be revised again. The final review is the ECPR panel meeting in which state government C-level executives review the project in terms of both dashboards to determine the impacts on other projects, ensure that business needs are met, and ensure that cross-agency decisions are made by the Governor's office (SISO 2006).

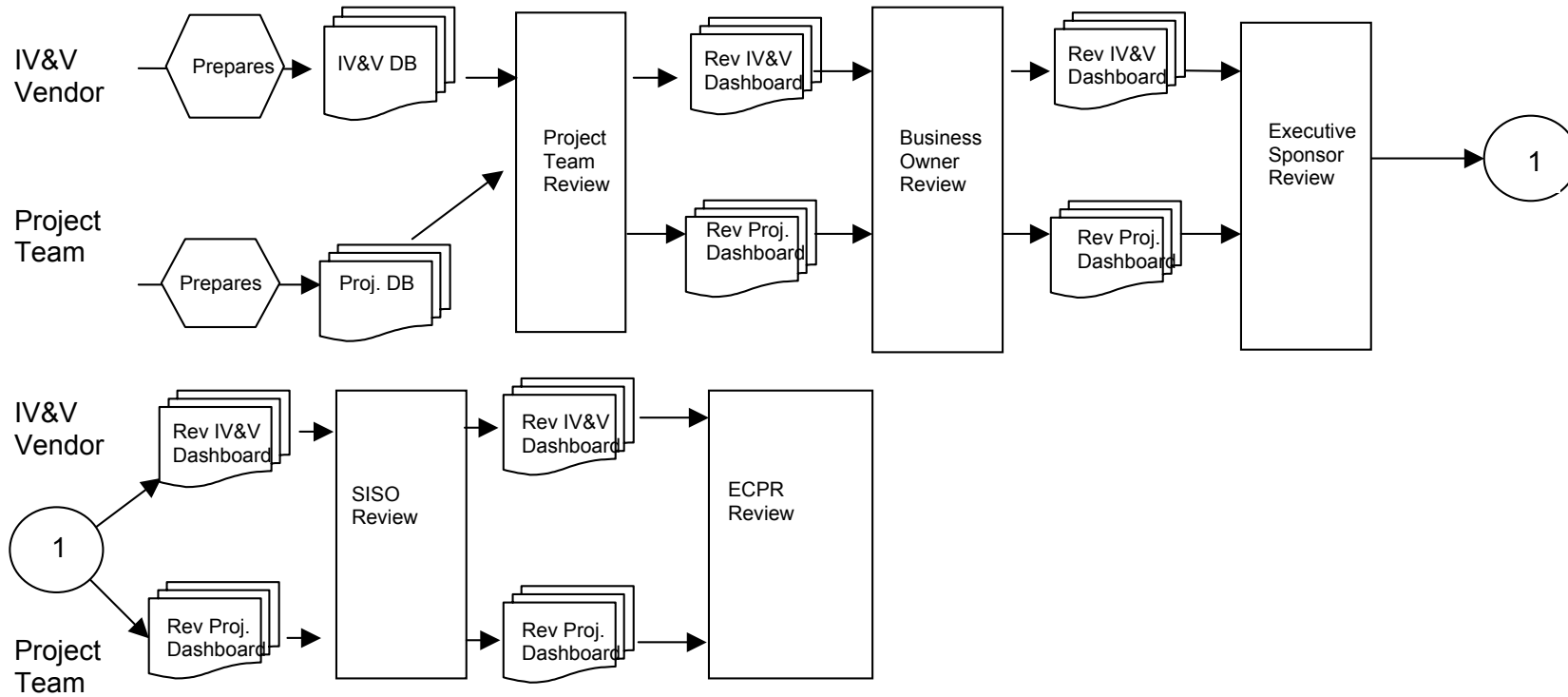


Figure 5.1: Flowchart of the SISO Project Status Report Generation Process

5.4.2.3. The SISO Project Reporting Process: As Executed in the Projects

In the three projects that I examined, I did not find that the process as described in 5.4.2.2 held. While there were interactions at the project level, I did not observe any interaction as described in the process above the project level. In project Alpha, the data for the dashboards were developed primarily at regular weekly project team meetings held immediately prior to the due date of the dashboards. I observed that the IV&V and project personnel created the dashboard document separately and a meeting was held to compare the documents. At this meeting minor changes were made to the project dashboard. These changes were made because the program manager wished to add some detail. No changes were made to the IV&V dashboard. This meeting was held the day that the dashboard documents were due to SISO.

We meet with our IV&V vendor before those meetings with GTA and the Governor's panel. And there are sometimes when we're in disagreement. And so we discuss that before hand and understand each other's position. We don't make an attempt to... [change] to the way that IV&V is perceiving things but we do tell them if we disagree with something that they put in there. And they have made changes... and so have we, its gone both ways. You know we've come up with a yellow and they say no, this is really red and so we'll sit and say you're really right and we'll go with them. So we... there's collaboration that takes place between us and IV&V (Alpha Program Manager, Robert, EPD Project Alpha).

IV&V Interviewee Dolores informed me that the documents would be sent over to the SISO personnel with a copy sent to the Commissioner. A meeting might be held with the Commissioner prior to the Critical Panel meeting if necessary but no revision to the

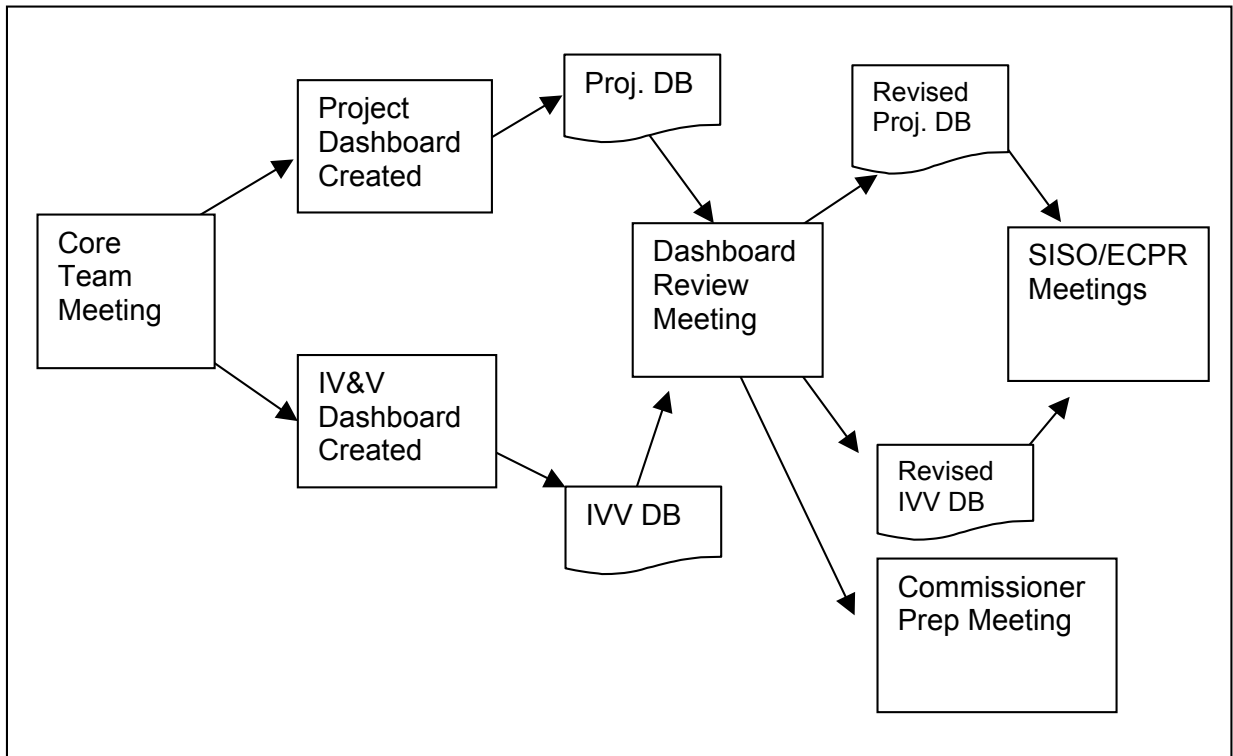


Figure 5.2: The Dashboard Creation and Review Process in Projects Alpha and Beta

dashboard was done. Between the SISO review and the ECPR meeting, no revision is done unless the SISO meeting and the ECPR meeting occurs in different months (figure 5.2).

With regard to project Beta, the process seemed to be almost identical. I observed that the IV&V and dashboard was created on the date that it was due and a copy was sent to the project manager. I was informed by Lee that he usually got the IV&V dashboard and if there were no issues, he would copy it and forward it to the SISO personnel. However, the dashboards submitted to the process were not identical and often showed variation in the colors. Interviewee Dolores indicated that the project dashboard was usually sent over a day or two late.

In both of those projects, there was a notable drive to not be too “out of sync” with the IV&V person on the project:

You try not to be too out of sync because then you go in and it's like, "Why is there the difference"? Either IV&V is not talking to the agency and explaining and recommending in all of that to the agency or the agency has a reason for them not accepting it, but IV&V still feels strongly about it. Hopefully, you don't have that type of an issue. (IV&V Interviewee Delores, IV&V Projects Alpha and Gamma)

The development of the “dashboard” document was definitely perceived as a secondary activity. The project managers of Alpha and Beta indicated that they had other status reporting mechanisms that they used and that the dashboards were constructed from those. Additionally, I observed that the dashboard documents were developed at the last minute before the due dates and were often delivered slightly late (less than 24 hours).

In project Gamma, the process was different. At the time that this project was running (2004-2006), there was no separate review by the SISO staff (Interviewees Isabella, SISO Critical Panel Member and Sherman, SISO ECPR Facilitator) and the Commissioner was not required to attend the ECPR meetings and in fact her attendance was spotty (Interviewee Sherman, SISO ECPR Facilitator). There were project team meetings similar to those in projects Alpha and Beta. IV&V attended all project management meetings. There was a “big meeting” with a large number of people and a smaller meeting with just the PMs and IV&V. Following those, the project management subcontractor created a dashboard document and sent it to an agency manager who used it created an agency version of the dashboard (Interviewees Braxton, Contractor Project Manager, and Jackson, Project Gamma Technical Project Manager). IV&V created a version and this version and the project version were reviewed in a meeting with the IV&V vendor, Agency policy manager, Project Manager and Executive Project Director (Interviewees Jackson, Project Gamma Technical Project Manager, Dolores, IV&V Project Gamma, and Joaquin, IV&V Project Gamma). After this meeting adjustments were made in the documents as agreed in the meeting and the Executive Project Director would update the Commissioner and Deputy Commissioner by himself (Interviewees Forrest, EPD Project Gamma, Dolores, IV&V Projects Alpha and Gamma, and Joaquin, IV&V Project Gamma).

During the development timeframe, serious problems became known with the functionality of the software provided by the software contractor as well as with their performance to schedule (Interviewees Braxton, Contractor Project Manager, and Jackson, Project Gamma Technical Project Manager). Apparently, the schedule performance of the subcontractor was discussed in the project team meetings and was picked up by the IV&V but the functionality issues were not. These issues were

discussed during at least one juncture with the Agency project management including the option to stop the project, but no change in direction was made (Interviewee Braxton, Contractor Project Manager).

The reporting process used in project Gamma is shown in figure 5.3.

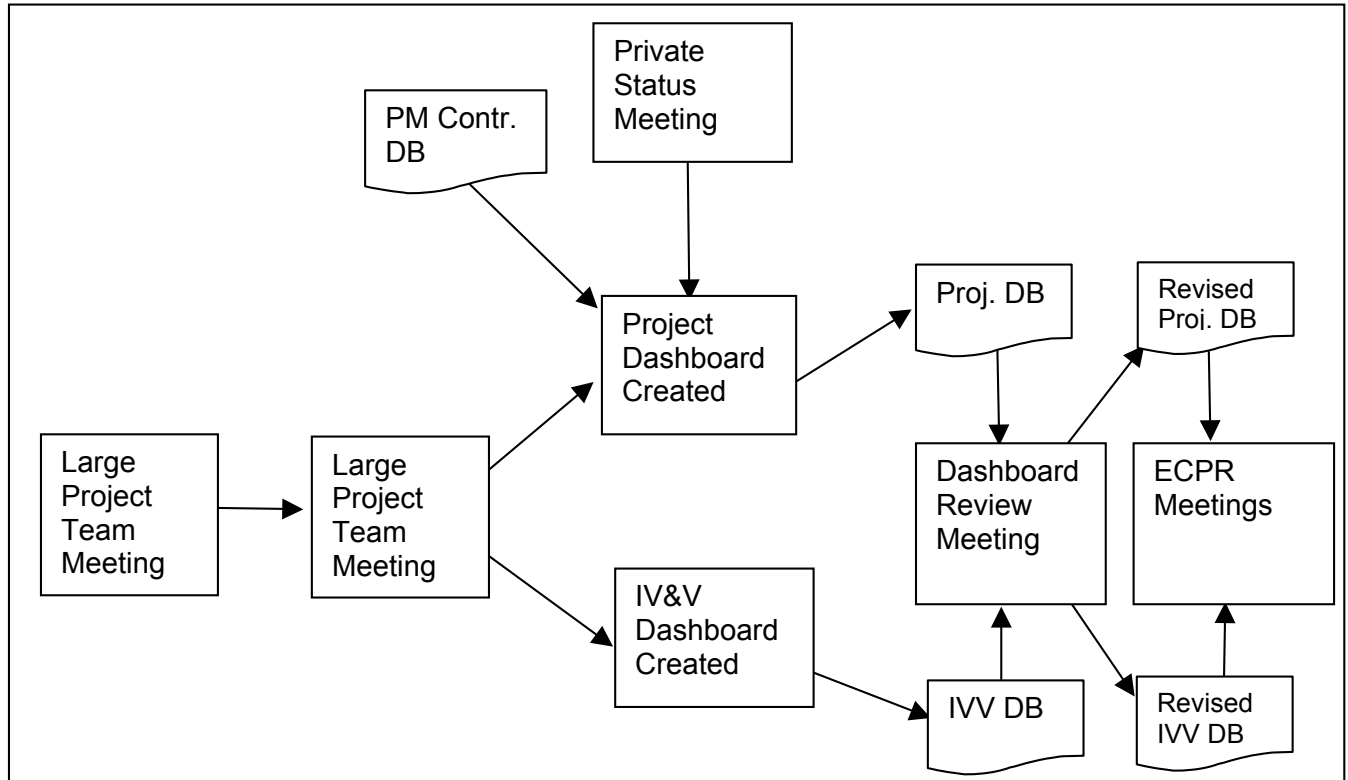


Figure 5.3: The Dashboard Creation and Review Process in Project Gamma

As a last note on the status reporting, a desire on the part of the Project Directors to control the message about the status of the project was observed. At the end of our observation period, SISO introduced a one-page status document to be provided to the ECPR members to reduce the level of effort required ECPR members to gain an understanding of the status. SISO proposed to generate this document based on the dashboard documents provided by the projects. Robert, EPD Project Alpha, expressed a desire to create the document himself as opposed to reviewing the document generated by SISO so that he could ensure that the message he wanted to send was conveyed. Similarly, Forrest attempted to control all the messages going out of the Gamma project. He was the only team member to communicate to the Commissioner and her deputy. Likewise, he controlled the conversation at the ECPR meetings (Interviewee Jackson, Project Gamma Technical Project Manager).

5.4.3 A History of the Projects

During the timeframe of the study, project Alpha began and project Beta terminated. project Gamma had terminated its first phase and was preparing for its second phase.

5.4.3.1. Project Alpha

At the beginning of our observation of the process, project Alpha was at the close of the procurement stage. An RFP had been issued. A decision had been made, the contract negotiated and the agency was waiting for a federal government approval on the award and contract amount. This approval was withheld until the end of 2007. During that time period, the panel was used to discuss how to involve the Governor or the COO to resolve the issues. After Notice of Intent to Award was issued at the end of January, 2008, the losing vendor protested the award, the protest was denied and the project finally began in the April, 2008 time period. The plan is for a two year design-development-implement with an implementation date of July, 2010.

5.4.3.2. Project Beta

At the beginning of the study in June, 2007, project Beta had completed development and was approaching deployment of the system at a pilot in one county. The biggest concern was with the data conversion from an old system to the new system. The schedule was very aggressive to implement by mid 2008 with no slack. After the pilot implementation, there were over 100 defects in the conversion process noted, and no mitigation plan was in place. By October, there were still problems with the conversion vendors. A repeatable process was not in place and there was discussion in the ECPR meeting that the vendors needed to have a meeting with the Governor or the state COO to explain why their performance was so poor. The project director indicated that they had taken a driving role with the vendor to get the conversion done. A decision was made to give them another chance before bringing the vendors to the Governor. In November, the situation had improved; they were preparing for a two county pilot and believed that the conversion had been reduced to a repeatable process. By January, the conversion issues had been resolved and the two county pilot was successful. At the February panel meeting, the first mass rollout of 72 counties was successful and they spent time discussing lessons learned from the project. By April the second rollout had been successfully accomplished, the last rollout was planned for June, 2008 and the handover to the Agency operations staff was being discussed.

5.4.3.3. Project Gamma

This was not the first attempt to develop a student information system. Various attempts had been made over the past 20 years (Interviewee Sherman, SISO ECPR Facilitator). The immediate past attempt was in 1998,

[It was created] with the idea that we would have one student management system for every district in the state and that was put through RFP and everything and SAP won that. And after 8 months, they hadn't gotten one district working. So [if that were] ...extrapolated out to 181 districts we were looking at 181 years and they took a look at the project and it was shelved. So there had been considerable, especially [among] the people in the legislature who had been there that long, ... expectations placed and expectations not delivered upon so when we got to this iteration of the project, it was almost deemed as a failure to begin with (Interviewee Thomas, CIO Project Gamma).

This is amplified by the former Governor:

... the state spent at least \$85 million on unsuccessful earlier efforts, including one championed by Gov. [X] when he was Governor.

"I spent \$50 million trying to put together a student information system that would work, and it frustrated the heck out of me," said Mr. [X], (Dillon 2006).

The Beginning of the Project. This particular effort began in 2003 when \$14.5 million was set aside to develop the system (Dillon 2006). This system was to be constructed to respond more effectively to requirements from the No Child Left Behind Act (NCLB) and to replace a set of technologically obsolete legacy systems (Interviewee Thomas, CIO Project Gamma). The executive project director, Forrest, was brought in by the new agency Commissioner (Interviewee Harvey, CIO, County 1 School District) in July, 2003 (Interviewee Forrest, EPD Project Gamma). He was charged to “get the project done” within the budget outlined (Interviewee Forrest, EPD Project Gamma) by December, 2005 (Interviewee Thomas, CIO Project Gamma). He was given the opportunity to hire a staff that was dedicated to this project alone and did not have any other responsibilities within the agency. (Interviewee Thomas, CIO Project Gamma). The technical project manager, Jackson, was hired in November of 2003. The initial steering committee for this project was put together by the Governor. It was actually a group of advisors including business executives, other state agencies, the school districts and also the agency. The committee developed a list of 21 objectives that this project would accomplish (Interviewee Thomas, CIO Project Gamma).

After these goals were established, that steering committee was disbanded and another was formed as described in section 5.4.1.2 and at first the project director met often with the committee and with the CIO of the state’s largest school district. The exact frequency is unknown, however it was described as frequent and very heavy (Interviewee Harvey, CIO, County 1 School District). This interaction continued to be very heavy until the RFP was issued (interviewee Harvey, CIO, County 1 School District). Development of the RFP was very rapid. Development started in December 2003 and it was released in late February 2004 (Interviewee Forrest, EPD Project Gamma). When the bidding process was completed, ContractCo won the contract.

They were more of the management, [and] oversight and brought in the team. They purchased or subcontracted with DatabaseCo, which was at the time the ... leading database provider for districts’ data warehouses, not state. They were getting into the state market. They also contracted with ReportingCo to do the reporting piece (Interviewee Thomas, CIO Project Gamma).

The RFP was very light on technical requirements. It was set at a very high level to allow the vendors to supply their knowledge to the project (Interviewee Forrest, EPD Project Gamma). While the districts had input through the steering committee, most of the requirements were provided by Jackson because of his knowledge of data warehousing applications (Interviewee Forrest, EPD Project Gamma). Although, the 21 goals of the project were included in the RFP they were not stressed to ContractCo and in fact the onsite contract personnel did not know what they were until relatively late in the process. (Interviewee Braxton, Contractor Project Manager).

The RFP was awarded in June, 2004 (Interviewee Forrest, EPD Project Gamma). The project used a classical waterfall style software development process (Interviewee Thomas, CIO Project Gamma). The detailed project plan was submitted in August, 2004 (Interviewee Forrest, EPD Project Gamma). The requirements statement was developed and signed off in the first six months. The design documents were developed and signed off in next six months (Interviewee Thomas, CIO Project Gamma).

The Development Phase. As development on the new system began, it was recognized that the existing legacy systems were “a train wreck”(Interviewee Harvey, CIO, County 1 School District). While the data collected by the legacy systems was noted for its

accuracy (Interviewee Forrest, EPD Project Gamma), the existing mode of data collection from the districts was extremely slow (Interviewee Harvey, CIO, County 1 School District). The legacy systems were placed under the control of Forrest, who received the title of CIO for the department, and an effort to improve the performance was undertaken as the new system would not be online until 2006 (Interviewee Forrest, EPD Project Gamma). Thomas was brought on board the department to be the head of legacy applications support and perform this project. This project was very successful. The length of time that it took to load the data from the largest district in the state was reduced from 15 hours to 35 minutes (Interviewee Harvey, CIO, County 1 School District).

The development of the new system created strains on the relationship of the project to the school districts. The amount of communication between Forrest and the districts which at first was very copious (especially Harvey) slowed after the RFP was issued and dried up to a trickle. Meetings with the steering committee became less frequent. Also, a two-year effort to develop a common data structure for the reporting data was abandoned in favor of the data structure provided by the vendor DatabaseCo's system, which caused ill will among the districts (Interviewee Harvey, CIO, County 1 School District). Finally, the new data required by the data warehouse required a revision of the files sent from the districts to the central office. This required the districts to work with the vendor that provided their student information system to get a new data feed created. This was viewed as an "unfunded mandate" placed upon the school districts (Interviewee Jackson, Project Gamma Technical Project Manager).

First Occurrence of the Deaf Effect. During 2005, it became obvious that there were problems with the product supplied by DatabaseCo. They were missing their due dates, often waiting until the last minute to inform ContractCo of the delays (Interviewee Braxton, Contractor Project Manager). ContractCo had to provide personnel to DatabaseCo in order to try to maintain the project schedule (Interviewee Jackson, Project Gamma Technical Project Manager). Additionally, the DatabaseCo system did not provide the level of data editing provided by the legacy systems, nor did it have the status and error reporting capabilities the legacy systems provided (Interviewees Thomas, CIO Project Gamma and Braxton, Contractor Project Manager). There were several closed-door meetings without the IV&V vendor in which ContractCo pointed out to Forrest and Jackson that the DatabaseCo had functional deficiencies such that it wouldn't work as promised. ContractCo management raised the topic of delaying or canceling the project (Interviewee Braxton, Contractor Project Manager). Forrest chose not to respond to these issues. This constitutes an occurrence of the Deaf Effect. During this time period, as the project reported to the ECPR panel, the overall project was reported as being in "green" status, while the schedule was reported in "yellow" status. Serious concerns with the system capabilities were not reported or were minimized by Forrest (Interviewees Jackson, Project Gamma Technical Project Manager and Braxton, Contractor Project Manager).

Second Occurrence of the Deaf Effect. The project was completed and went to pilot test in October 2005. This took the form of partial database loading at a single district. While the pilot was successfully completed, Jackson became concerned enough with the project performance to raise these concerns to Forrest in an email. The root of his concerns was that the project director was over promising and ran the risk of under delivering the project. He cited concerns with project communication, the data loading process, and operations and maintenance. He felt that more communication was

needed with the eventual users to describe the exact features of the system rather than simply communicating concepts to the leaders. He was very concerned about the data loading routines since the system required 12-20 hours of work to prep the data before loading it into the data loading templates. Additionally, the project team was receiving push back from the district SIS vendors on preparing the data loading routines for the new system. There were additional concerns about the ability to manage the vendor relationships in the operational period. Jackson recommended that instead of a full rollout that only a small “pilot” group of 20-25 districts be implemented to provide an opportunity to identify and correct issues without hurting the project reputation in all the districts. (Jackson 2005). Forrest did not accept this advice, saying it was politically impossible to back off (interviewees Forrest, EPD Project Gamma and Jackson, Project Gamma Technical Project Manager). This was another occurrence of the Deaf Effect.

Third Occurrence of the Deaf Effect. Following that pilot, the project was declared complete and ready for implementation. The rollout to the districts began in March, 2006. This took the form of another pilot in which the data loading was done with both the legacy and the new system (Interviewee Thomas, CIO Project Gamma). The revamped legacy data loads were much cleaner and much simpler than the new system. The lack of edits in the new system and the length of time required to generate the data for the loading resulted in significant dissatisfaction at the district level with it. At the same time, Jackson wrote a memo to Forrest expressing why he thought that the system would fail. Forrest became angry with him and retaliated by cutting him out of meetings and information flow (interviewee Jackson, Project Gamma Technical Project Manager). This was the third occurrence of the Deaf Effect.

Forrest indicated that he did not act on the reports of bad news from Jackson because first, it wasn't politically feasible:

I think at one time there they wanted to delay the entire process another year and [emphasize that this was only a pilot test of the system] and I said, Jackson, you have got to understand, politically that is not feasible. You know because one of the things that you learn in government is ...first of all any technological system has got to be operationally feasible, it has got to be technologically feasible and it has got to be economically feasible. Well when you are dealing in government it has got to be political and sometimes political feasibility trumps all and that is just a fact of government. [Politically feasible means] you can't sort of back track once you have gotten to a point and said we are at this point, then if you come in and back track you don't back track you fix the problem going forward. That was the point I made (Interviewee Forrest, EPD Project Gamma).

Forrest also believed that Jackson did not see the big picture. He kept Jackson working on project Gamma and Thomas working on the legacy systems without any cross project communication (Interviewee Forest). So that each never really understood what the other was doing.

[When Jackson] came on board ... we were having tremendous data collection problems and he and I were the ones who helped make the decision that ..., we are going to redo, [not repair the old system]. We just got to make it survive until we get this system up. But then when we brought in Thomas and ... they took over and started improving it, it [improved] so much ... but of course [Jackson wasn't] involved in that, so he had never seen that piece. Well I had seen both sides. So I felt comfortable with it. I don't think [he] ever did (Interviewee

Forrest, EPD Project Gamma).

The “Melt-Down” and De-escalation. The project status changed to red in June, 2006 due to the fact that there was enough resistance to the system from the users in the districts that it was considered to be impossible to hide the poor status from the ECPR panel (Interviewee Jackson, Project Gamma Technical Project Manager). The ECPR took this change in status as an indication of deception (Interviewees Toby, Director, Office of Planning and Budget, ECPR Member; Waylon, State CFO, ECPR Member; Patsy, Deputy CFO, ECPR Member; Sherman, SISO ECPR Facilitator). They repeatedly referenced project Gamma as an example of a project in which they had an unpleasant surprise. The following quotes are all responses to a question about whether there were any surprises in the reporting to the panel.

yeah, [project Gamma]. We had been given information all along that project was on time and on budget and maybe that's a little too strong but we had been given information that it was OK. It was progressing and turned out that it wasn't OK and it wasn't progressing. ... We had to escalate it so that [the Commissioner] was involved and some of her leadership. That's the one that kind of jumps off the page at me that really the information, it wasn't good information basically. (Interviewee Alan, State COO, ECPR member)

Yeah, the one [that] comes to mind [is project Gamma]. There was some scope and mission change and creep over time that I'm not quite sure was entirely detected. ... I didn't discover it, but it coincidentally happened to be about the time that we discovered, "whoa, this original concept of student information system and the Governor's idea or in the Governor's original vision isn't exactly what we think we're seeing." Now it resolved itself and I think we're to a good place. Kind of [a] compromise position. But, so that was one.. (Toby, Director, Office of Planning and Budget, ECPR Panel Member)

...[project Gamma] is a good example. They held back certain pieces of information, even during the critical panel, and then when it finally came up, they got blasted. (SISO interviewee Sherman, SISO ECPR Facilitator).

Following the disclosure of the serious problems with project Gamma, a de-escalation process was pursued. Forrest decided to change the data loading mechanism from using the new method that had proved problematic (Interviewee Forrest, EPD Project Gamma). It was determined that they would investigate using the legacy data collection mechanism to front end the data warehouse and the state ID system. Over the next two months, Thomas planned this activity. Jackson who had led the project effort resigned in August, 2006. At about the same time, Forrest stepped down as agency CIO (Interviewee Thomas, CIO Project Gamma).

Apparently, no communication of this activity was made to the districts, because in October, 2006, a delegation went to the deputy Commissioner to protest using the new system for the next year's reporting (Interviewee Harvey, CIO, County 1 School District). About the same time, the relationship manager for ContractCo met with the deputy Commissioner and reported serious problems with the project as currently structured (Interviewee Braxton, Contractor Project Manager).

Thomas became the agency CIO about that same time. The project then followed a course of integrating the legacy data collection with the data warehouse and the ID system along with development of additional reports requested by the districts. In doing this activity, they expended the funds allocated for the project and completed the project

Cuellar – An Examination of the Deaf Effect

with operational funds (Interviewees Thomas, CIO Project Gamma and Patsy, Deputy CFO, ECPR Member).

Forrest left the employ of the department and returned to his college at the end of 2006. The project continued under the direction of Thomas until it was declared complete in August 2007 (Interviewee Thomas, CIO Project Gamma).

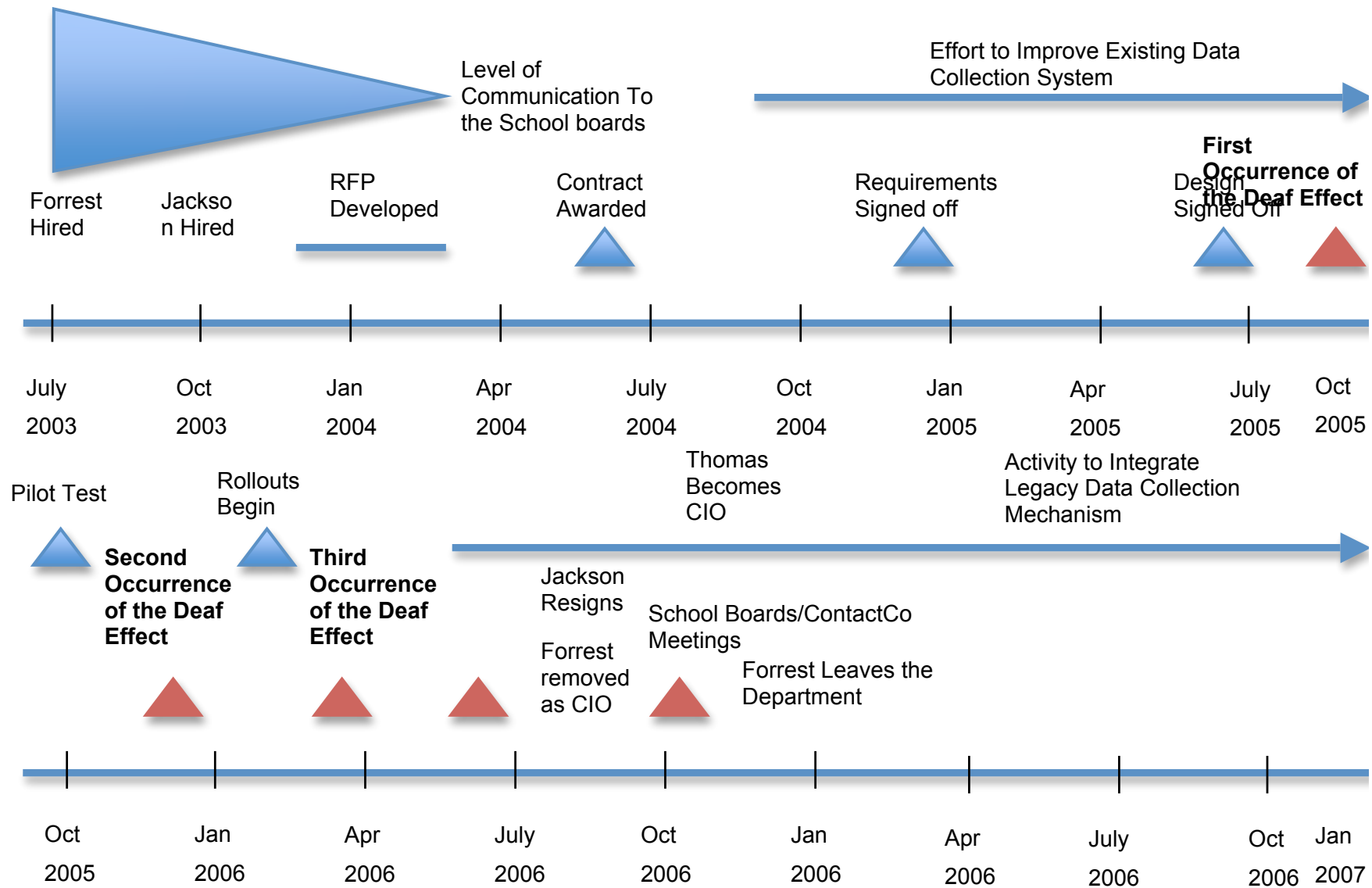


Figure 5.4: Timeline of Project Gamma

5.5 DISCUSSION AND IMPLICATIONS

The findings of this study show two status reporting issues. First, there was distortion of status reporting to the ECPR panel in the case of project Gamma. Second, that the Deaf Effect occurred in the case of project Gamma while it did not occur in the cases of project Alpha and Beta.

The findings of this study also show that the existing SISO status reporting process is dependent upon the voluntary disclosure of information by the projects. Projects Beta and Gamma encountered similar problems. How they responded to the problems determined the success or failure of the process. Project Beta responded by disclosure of the problems to the panel, which led to their resolution. Project Gamma responded by a systematic reduction in communication about the problems, which resulted in the ultimate failure of the project. Despite the monitoring by the IV&V, the SISO process and a steering committee, the project Gamma management was able to avoid disclosure of the issues until the first attempt at implementation. This illustrates that the IV&V, which acquired its information largely through attendance at various project management meetings, was dependent upon the project team in order to get information to assess the status of projects.

Table 5.3 illustrates the differences in the information gathering opportunities between projects Alpha and Beta and project Gamma. The Agency Commissioner in projects Alpha and Beta was highly involved in the monitoring process as part of the steering committee, as a participant in the ECPR process. They also received status reports directly from the IV&V vendor. In project Gamma, however, the Agency Commissioner was largely left out of the process. SISO was involved in the process as part of the steering committee and by virtue of their review meeting prior to the ECPR meeting in projects Alpha and Beta. In project Gamma however, GTA was not involved in the process. Agency executives and stakeholders populated the steering committee in projects Alpha and Beta whereas that of project Gamma was comprised of relatively low-level stakeholders.

Table 5.3: Differences Between the Projects			
	Project Alpha	Project Beta	Project Gamma
Involvement of Commissioner	Part of Dashboard Review Process	Part of Dashboard Review Process	Oblivious (Interviewee Harvey, CIO, County 1 School District)
GTA Review Meeting	Part of Process	Part of Process	Not part of process
Steering Committee	Formal, Populated with top department and SISO personnel	Formal, Populated with top department and SISO personnel	Informal. Populated with low-level department personnel (Interviewee Harvey, CIO, County 1 School District). No SISO

			personnel (Interviewee Sherman, SISO ECPR Facilitator).
IV&V Participation in Project Meetings	Yes	Yes	Yes
Full Disclosure of Issues in Project Meetings	Yes	Yes	No (Interviewee Braxton, Contractor Project Manager)
IV&V Access to Commissioner	Yes	Yes	No (Interviewee Joaquin, IV&V Project Gamma)
EPD Agency Reporting structure	To CIO	To CIO	Acted as CIO, reported to Commissioner
State Government Relationship	Reports Directly to Governor	Reports Directly to Governor	Reports to Constitutional Officer
Results	In process. No issues noted.	Finalizing. Major issue occurred in 7/06 but overcome.	Finalized in 12/05 but determined to have failed in 10/06.

5.5.1 Distortion of the Message

The distortion of the status report in project Gamma occurred in the reporting of status of project Gamma as “green” during the development and pilot stages of the project, when by testimony of the project management (Braxton, Contractor Project Manager and Jackson, Project Gamma Technical Project Manager), the status was actually “yellow” or “red”. The responsibility for the distortion was placed on Forrest. Table 5.4 displays the various theories that were discussed in section 5.2.2 that might cause distortion of the message and whether they occurred in project Gamma.

Table 5.4 – Distortion Causing Conditions in Project Gamma		
Source of Distortion	Theory / Source	Condition in Project Gamma
Errors of Understanding	Status Reporting Bias (Snow and Keil, 2002)	This condition does not seem to exist. Braxton, Jackson, Forrest agreed on the facts. They differed on the required action.
Bias in Reporting	Status Reporting Bias (Snow and Keil, 2002) Upper Echelons	In the history of project Gamma, we see evidence of self-efficacy, a political interpretation of facts and a control fixation.

	(Hambrick and Mason 1984)	
Reaction to Management Responses to Reports of Bad News	Critical Upward Communication (Tourish and Robson (2006), Morrison and Milliken (2000))	Forrest had not experienced any bad repercussions from reporting bad news on this project. The actual responses by the ECPR and SISO were very encouraging as reported by project Beta. However, Forrest did not know this.
Intrusive Supervision	Athanassiades (1973)	No evidence exists that show that Forrest considered the supervision intrusive.
Adversarial Approach by Regulators	Regulatory Theory (Scholz 1984, 1991)	No evidence exists that an adversarial relationship existed between IV&V, SISO, or ECPR and Forrest.

The table shows that the theories that had been considered in section 5.2.2 do not explain the occurrence of distortion in the status report of project Gamma with the exception of Snow and Keil’s status reporting theory. Status reporting distortion may occur as a result of misunderstanding of the situation (Snow and Keil 2002; Snow, et al. 2007). This situation did not occur in project Gamma. Jackson and Braxton indicated that there were serious problems. Forrest did not disagree with the facts, but rather with the seriousness and the proposed solution. Similarly, the responses of supervisors and regulators may cause distortion (Athanassiades 1973; Morrison and Milliken 2000; Scholz 1984; Scholz 1991; Tourish and Robson 2006). In project Gamma, we do not see any adverse responses to bad news by management, IV&V or the ECPR panel to Forrest that would cause such distortion. However, the findings do show potential biases to reporting in that Forrest considered the situation in which he found himself a highly political situation in which he felt he had to control the communications of the project so that the project would be viewed correctly. Thus he would bias the reporting in an effort to avoid loss of power.

There is however, another theory which could add additional insight into this situation: agency theory (Eisenhardt 1989; Jensen and Meckling 1976). Agency theory seeks to address the situation in which one party (the principal) delegates work to a second party (the agent) under a contractual relationship. Two problems arise under the contract: the *agency problem* where the goals of the principal and agent differ and it is difficult and/or expensive for the principal to verify that the agent is fulfilling his desires. This manifests itself in two issues: *moral hazard* in which the agent does not perform as agreed under the contract (shirking) and the principal does not have the information or the ability to acquire the information to verify the performance of the agent; and *adverse selection* in which the agent misrepresents his abilities in order to get the job and the principal cannot verify his statements. The second issue in the agency relationship is risk sharing in which the principal and agent have different attitudes toward risk. The object of the theory is to identify the most effective contracting mechanism between them; whether behavior based or outcome based mechanisms are more effective (Eisenhardt 1989).

Two studies have applied agency theory in escalation situations. Harrison and Harrell (1993) investigated adverse selection. They found that managers who initiated unprofitable projects tended to consider them. This is due to the information asymmetry that existed which allow them to hide their incompetence. Where adverse selection did not exist, the agents behaved in the interests of the principal. Tuttle, Harrell and Harrison (1997) investigated moral hazard conditions in IS implementation situations. They found that agency theory predicted the behavior of students in moral hazard situations well. In laboratory experiments students indicate willingness to implement systems with known quality issues under conditions of moral hazard. This result was tempered with the finding that this effect is moderated by the individual's moral code. In some cases, it overrides self-interest to not implement the system.

In the situation of project Gamma, a definite moral hazard situation existed. Moral hazard exists when an agent has an incentive to not perform as expected by the principal and information asymmetries exists so that the principal cannot verify the performance of the agent (Eisenhardt 1989; Tuttle, et al. 1997). In that project, as discussed above, Forrest viewed his position as politically charged and that the maintenance of his position required the perception that all was well with the project. There was therefore a significant temptation to shirk. Similarly, table 5.5.1 shows that significant information asymmetries existed. Forrest controlled the communications external to the project so that external entities only received the information he wanted to provide them. Project Gamma therefore conforms to an agency theoretic view of project reporting.

Thus in this situation, I suggest that Forrest's perception of a highly politicized environment and need to control the information flow created an incentive to distort the status of the project which when combined with the information asymmetries in the project created a moral hazard situation resulting in distortion of the project status in the reports to the ECPR and the Agency Commissioners.

5.5.2 Evaluating Project Gamma using the Individual Model from this Dissertation.

The findings of this study showed that the Deaf Effect occurred at least three times in the case of project Gamma. This section addresses how well the model developed in chapters two through four explains the occurrence of the Deaf Effect in project Gamma and then addresses additional factors that could be added to the model that are illustrated in the case study.

The individual model developed in the previous chapters placed the subject in a particular organizational environment. For the model to be validly applied, it must first be ascertained that that environment existed in this case.

Four factors were included in the environment used in the scenarios:

- 1) External pressures that moved the decision maker to continue the current course of action;
- 2) A decision maker who could not perform the evaluation on his/her own;
- 3) A report of bad news that did not communicate the potential disaster situation in terms that unambiguously indicated a coming disaster;
- 4) Severe time constraints on the length of time to evaluate the situation and make a decision that prevented either evaluation of the situation or cut off alternative solutions.

There is no direct evidence of Forrest's superiors constantly pressuring him to deliver. However, it is obvious that he felt some pressure. He stated that he had been brought in "to make it happen" whereas it had failed twice before. When presented with issues by Jackson, he repeatedly stated that it was "politically impossible" to take any alternative course. On the second point, Forrest did not have the technical skills to evaluate the technical performance of the project. He was reliant upon the representations of others. Third, while in retrospect, the warnings of the October, 2005 memo seem very prescient, at the time, Forrest may have been able to rationalize continuing by considering them to be overblown or perhaps he considered them capable of resolution by other means. Lastly, he definitely felt pressure to deliver a system by 12/05, which prevented him from considering any other alternatives at that late date.

Given that the same conditions existed in the case that existed in the experiments, I now consider whether the model developed in chapters two, three and four holds in this case. Since there was an occurrence of the Deaf Effect, based on the model, we would expect that 1) the message of bad news was not considered relevant by the decision maker; 2) that there would be a perception of little risk in the project; 3) there would be a perception of low credibility in the bad news reporter; and 4) the bad news reporter would be not role prescribed to report bad news.

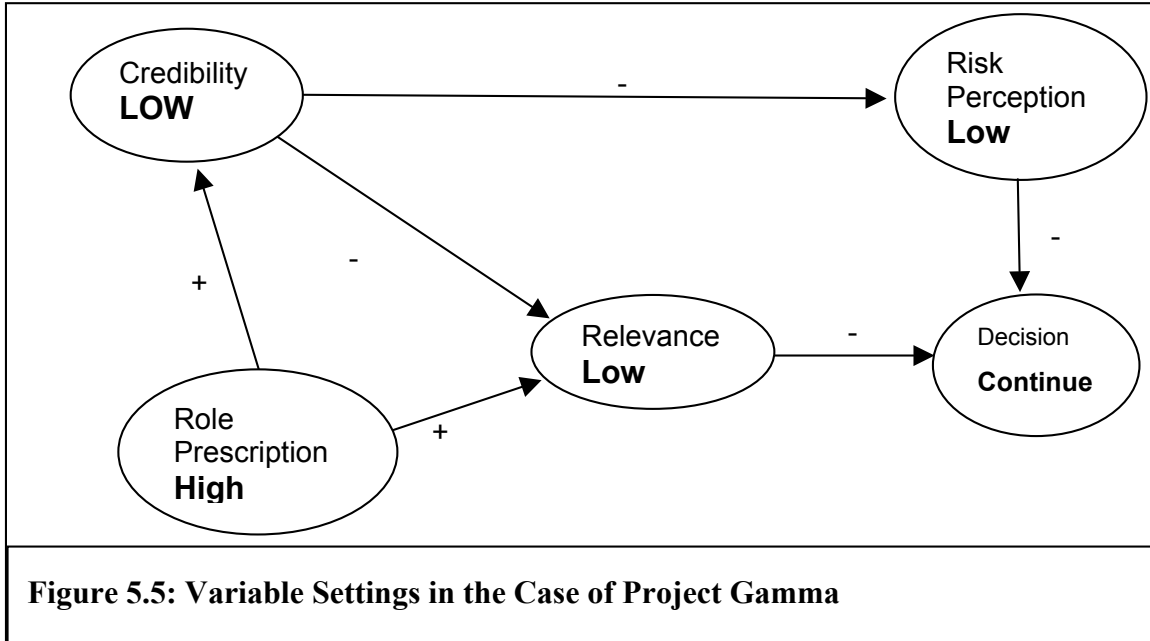
Considering point 1, in the findings, there are statements that Forrest considered Jackson's concerns to be irrelevant because they were 1) politically not feasible and 2) not based in knowledge of everything going on. He stated that a system had to be technically, operationally, economically and politically feasible and political feasibility would trump all other concerns. This meant that in order to maintain his political position, he couldn't back track on the course of action. Therefore, given the situation, the report of bad news was not as relevant to the decision as the political factors, so, we see here a low Relevance ascribed to the report of bad news.

Considering point 2 above, in the findings we see no indications that Forrest perceived the risk in the project to be exceptionally high or at least not beyond his capability to manage it. He believed that Jackson did not know about his work with the legacy systems that were going to resolve the data loading problem and therefore Jackson's concerns did not escalate his perception of risk. He also perceived the legacy data collection system as his contingency plan in the event of failure of the project data loading system. Therefore, given that he perceived he had multiple paths to accomplish his goal, he did not perceive that there was a high risk of project failure..

Considering point 3, the credibility of the bad news reporter, we understand from source credibility literature that Credibility is formed from two primary constructs, trustworthiness and expertise (Pornpitakpan 2004). We see that Forrest held the reporter, Jackson in high regard. He considered him an excellent project manager. But he felt that his knowledge of what was going on in the rest of the project was lacking. He therefore lacked expertise. Therefore, his Credibility was low in this area.

For point, 4, Role Prescription of the bad news reporter, we see that there was no specific aspect of his job which required Jackson, who reported the bad news in this project, to "blow the whistle" on the project. However, it is usually assumed that a project manager will report serious project problems to his superiors.

Considering these factors within the model developed above, we see the following conditions (figure 5.4). Forrest considered the risk of the project as low which would have the effect of reducing his willingness to change course of action. Because Forrest considered Jackson to lack complete knowledge of the situation, he had a lowered opinion of his credibility as a bad news reporter. This low Credibility acted to lower the perceived Decision of the report of bad news. While Role Prescription of the bad news reporter is seen as high, given the combination of low Credibility with high Role Prescription, we have seen that the effect size of Credibility is greater than that of Role



Prescription (chapter 3) resulting in a low Relevance of the message. The low Credibility would also act to lower the perceived risk of the project. Given this set of conditions, a low relevance and low Risk Perception, the model predicts that Forrest have continued the current course of action which is what I found.

Thus the individual model holds in predicting the decision to be made by the decision maker in this situation.

5.5.3 Examining Other Escalation Factors

In this section, I seek to expand the model to identify other factors by examining the other escalation determinants as defined in Staw's (1997) classification of escalation. I examine each one in turn

5.5.3.1. Illusion of Control

One of the determinants for project escalation referenced by Staw (1997) is that of optimism and illusion of control. Keil, Depledge and Rai (2007) found that when a subject perceived that they had the ability to market around software quality issues they were more likely to not recognize the software quality problems and to escalate the commitment to the project by shipping a defective software product.

In the current case, the project manager was supremely confident in his knowledge and abilities and it is therefore possible that he might consider himself able to deal with a software product with issues on implementation. In terms of the model, it can be hypothesized that when a project manager perceives that he has substantial skills and

abilities that can exert control over the project outcome, it might cause him to perceive a report of bad news as less relevant. I could also hypothesize that his perceived abilities might come into play in the decision whereby he decides that he can compensate for problems in the product and thus overrule a relevant report of bad news.

I then make the following propositions about the illusion of control:

- P1) Illusion of Control will reduce the relevance of the report of bad news to the decision maker.
- P2) Illusion of Control will increase willingness of a decision maker to continue the current course of action.

5.5.3.2. Highly Politicized Environment

Staw (1997) also describes a social determinant of escalation that derives from highly politicized environments. In these types of environments, to stop a project or admit error can lead to loss of power, standing or position. Once a project is bound to the manager, the manager's identity can be linked with the project's fate. This can lead to escalation if the manager attempts to maintain his reputation by putting more effort into retrieving a failing project.

In project Gamma, we see that in response to Jackson's bad news reports and requests for de-escalation, Forrest responded that it was politically infeasible meaning that once started down the path, to back track is not possible, they would have to correct the problems that occur going forward.

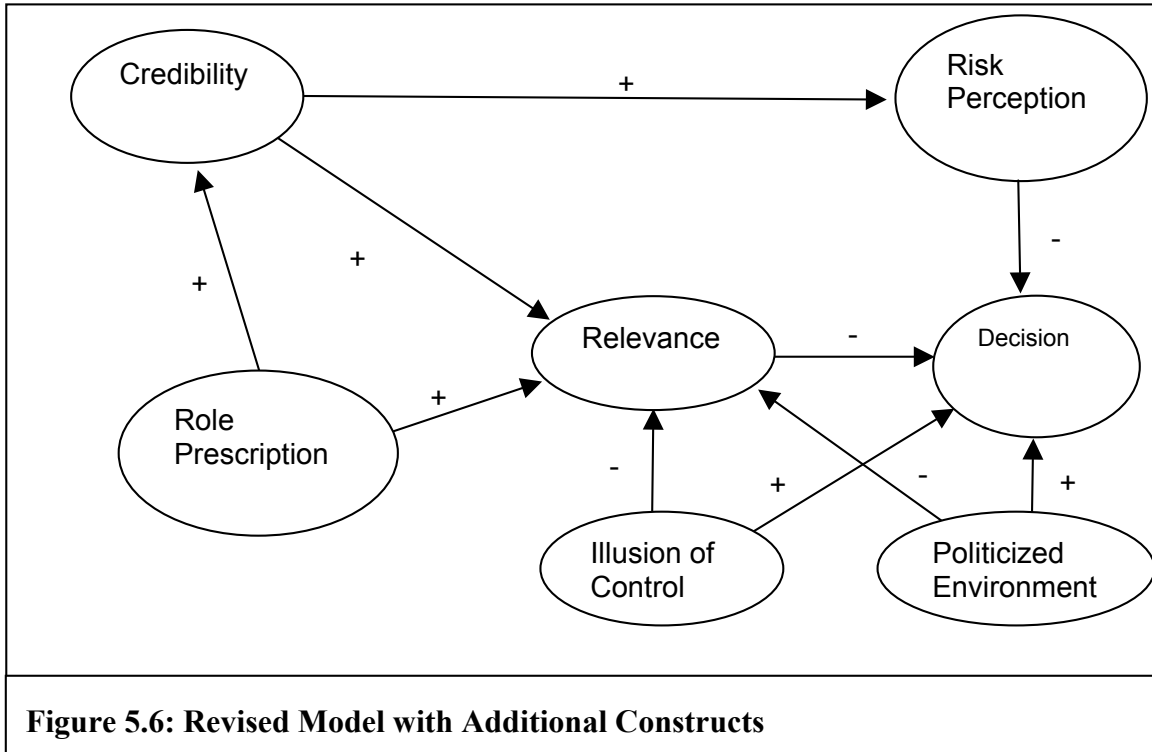
Thus in terms of the model, a perception of a highly politicized environment may act on the decision maker by suppressing the relevance of the report of bad news in favor of defending his political position. It may also impact the decision maker by introducing the consideration during the decision process that while the report of bad news is perceived to be important, it is overruled by political aspects of the situation to continue the current course of action.

I make the following propositions about a politicized environment:

- P3) A highly politicized environment will reduce the relevance of the report of bad news to the decision maker
- P4) A highly politicized environment increases the willingness of a decision maker to continue the current course of action.

5.5.3.3. Revised Model

The existence of other escalation factors shows that there are two additional areas of research that can be examined, that of illusion of control and the politicization of the environment.



5.6 CONCLUSIONS

In this chapter, we have seen that Project Gamma contained three occurrences of the Deaf Effect. In evaluating the situation, we see that the individual model of the Deaf Effect was consistent with the situation that occurred. The decision maker continued the current course of action in an environment where he perceived low risk of continuance and where the relevance of the report of bad news was reduced by the highly political situation and a perceived lack of credibility by the bad news reporter on this issue. This lack of credibility was perceived because of the lack of knowledge that the reporter had on the entire situation.

We also saw that the case supports the addition of two new constructs to the model: illusion of control and highly politicized environment which are held to potentially reduce the relevance of the bad news report and increase the willingness of the decision maker to continue the current course of action.

Separate from the occurrence of the Deaf Effect, we saw that the distortion in the report of the status of the project to the reviewing panel to be consistent with the predictions of agency theory. In this case, information asymmetries existed between the decision maker and the reviewing panel. Additionally, the perceived politically charged situation created a powerful motivation to shirk which in the presence of the information asymmetries that existed would create the distortion of the message to the reviewing panel. Thus having made his decision in accord with our model of the Deaf Effect, the EPD of project Gamma distorted his report of project status due to a perceived political environment enabled by information asymmetries that existed.

6 SUMMARY OF FINDINGS

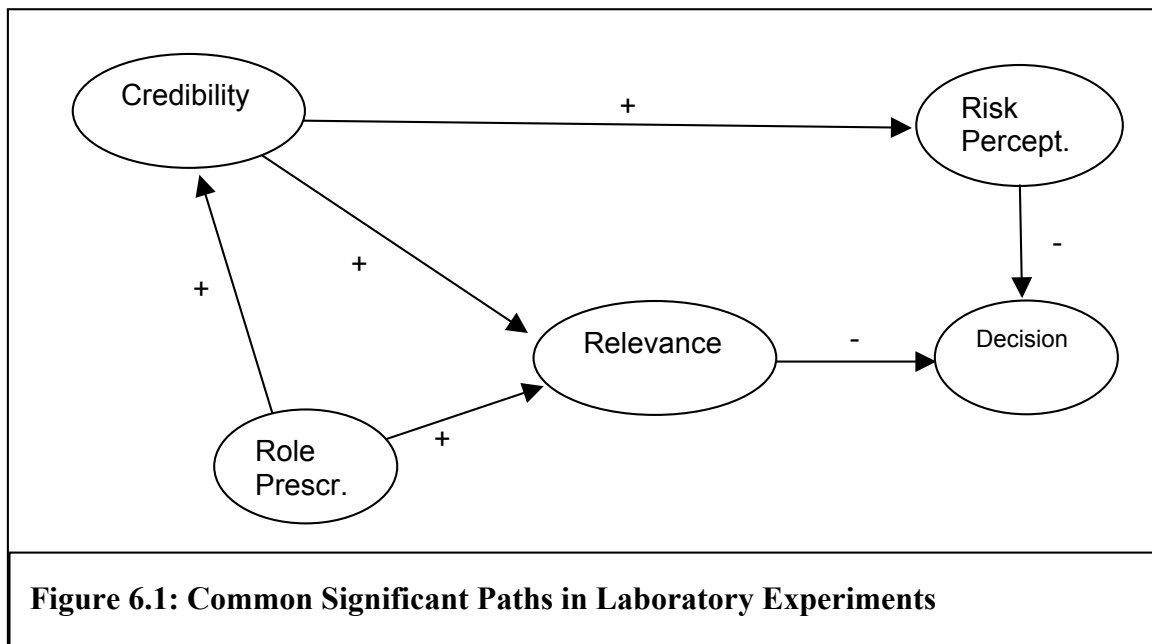
This chapter seeks to summarize and bring together the results of the four studies to propose a consolidated model and draw out some implications for research and practice.

6.1 LABORATORY EXPERIMENTS

While there are other situations in which the Deaf Effect might occur, in the laboratory experiments I explored the Deaf Effect as it occurs under the environmental conditions of 1) an environment which places strong emphasis on meeting deadlines and budgets; 2) pressure from peers and management to retain the current course of action in a project; 3) inability for the decision maker to analyze the data and determine the situation for himself; 4) a report of bad news which is ambiguous in establishing the severity of the issue; and 5) time pressure. The following findings with respect to the occurrence of the Deaf Effect hold across multiple experiments:

- 1) The continuance of the current course of action depends upon the perceived relevance of the report of bad news and the perceived risk of the project to achieving the desired end result.

The consistent pattern of significant paths throughout all the lab experiments is shown below:



The Relevance of the bad news report and perceived risk in the situation are the key direct effects on the decision to continue the current course of action. The effect sizes of variables show that Relevance has a large effect on Decision, while Risk Perception has a moderate effect in the western countries. In China, however, the perception of risk is the most important variable with a large effect size. Relevance has only a small effect sizes.

Table 6.1 – Effect Sizes of Relevance, Risk Perception, and Credibility on Decision			
	Relevance	Risk Perception	Credibility
Study 1	.921	NA	.055
Study 2	.104	.061	.032
Study 3 - USA	.204	.134	.003
Study 3 – Germany	.180	.070	.003
Study 3 – China	.060	.330	.009

The path from Credibility to Decision was significant in study 1 and in study 3 – China models and was near significant in study 2. The effect sizes of this variable were however very small.

This finding shows that the decision to discontinue a course of action is made differently in western countries vs. China. In the west, Relevance has a moderate effect size while Risk Perception has a small to moderate effect size. Thus, the decision to continue a course of action is made largely upon how important the decision maker considers the report of bad news with some consideration of the risk of the project. However, in China, the perception of risk is the most important factor. Risk perception has a large effect size whereas the Relevance of the bad news report has a small one. The reason for this exchange in effect size is not evident from this study, however, as I speculated in chapter 4, it may be do to the difference in political cultures. In the western societies with many individual freedoms, no history of government oppression in the subjects' lifetimes and no fear of serious personal retaliation for defying authority, perceived risk may be held as less important than in China where the opposite conditions hold. In this study, since we did not achieve complete metric invariance between the subjects, we cannot make any comparison between the Risk Perception measures between the cultures. Given that, I am left to hypothesize that in the mental model of the Chinese students, they must be more risk averse or attach more importance to perceived risk in their decision processes than western students as a result of their political environment.

- 2) The Relevance of the report of bad news depends upon the Credibility and Role Prescription of the bad news reporter.

As shown in the table below, the effect sizes show that Credibility has a very large effect on Relevance in all the studies while Role Prescription has only a small to non-existent effect.

Table 6.2 – Effect Sizes of Role Prescription and Credibility on Relevance		
Study	Credibility	Role Prescription
Study 1	.160	NA

Study 2	.483	.064
Study 3 - USA	.504	.111
Study 3 – Germany	.000	.000
Study 3 – China	.410	.019

This finding indicates that the effect of Role prescription and Credibility is completely mediated by the Relevance of the bad news report, indicating that the function of these two constructs is to indicate whether the message is relevant to be considered.

3) Credibility has a positive effect on the perception of risk in the project

Credibility has a moderate effect size in China and the US and a large effect size in Germany. This indicates that the report of bad news from a credible reporter increases the perceived level of risk in the project.

Table 6.3 – Effect Size of Credibility on Risk Perception	
Study	Effect Size
Study 1	NA
Study 2	.159
Study 3 - USA	.226
Study 3 – Germany	.417
Study 3 – China	.117

4) These findings are stable across cultures

As shown in study 3, the significance of the paths and direction of paths is the same across all the cultures with some exceptions. Gender to Risk Perception and Risk Propensity is significant in study 2 and in the study 3 China sample but not in study 3 USA or Germany samples. Similarly, Credibility is significant to Decision in study 1 and in the study 3 China samples and near significant in study 2. This indicates that these paths are probably weakly significant. The results will vary based on the sample.

The major difference across the samples is the fact that Role Prescription does not have a significant effect on Relevance in the German sample. This was hypothesized to be due to a pervasive belief in Germany that auditors fulfill a non-value added role within the projects and therefore Role Prescription would not make a bad news reporter’s message more relevant. This finding deserves further study.

5) This model has strong explanatory power for Decision.

As shown in the table below, the R² of the Decision variable is over .56 in all the studies and over .6 in all the studies in western cultures. This indicates that the model has a high explanatory power for the Deaf Effect.

Table 6.4 – R² of the Decision Variable	
Study	Decision R²
Study 1	0.618
Study 2	0.612
Study 3 - USA	0.641
Study 3 – Germany	0.661
Study 3 – China	0.562

6.2 CASE STUDY

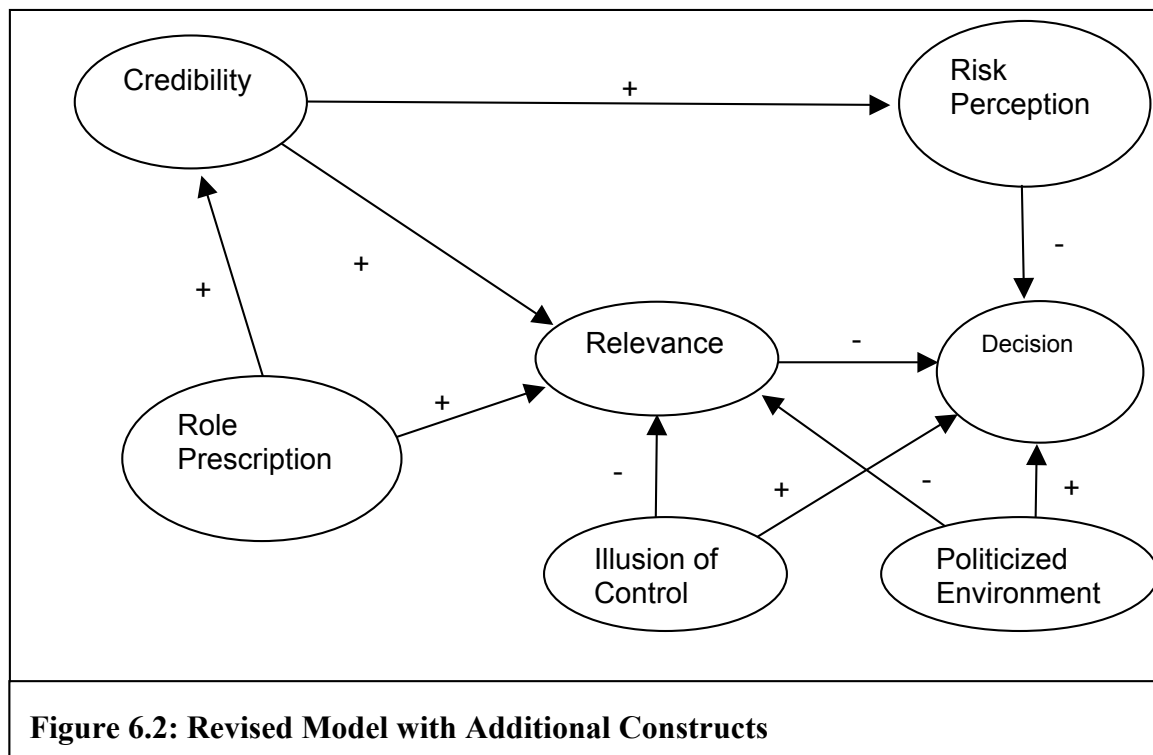
In this case study, the project status reporting system of a southeastern state in the U.S. was examined. In addition to observing the creation of the status reporting document (the dashboard) and the status reporting meetings, a detailed case history of project Gamma, a development effort to create a student information system was conducted. The results of this case history showed distortion of the status message as transmitted to the decision maker and an example of the occurrence of the Deaf Effect.

The case of distortion was found to lie in the biases brought to the status reporting process by the Executive Project Director (Snow and Keil 2002; Snow, et al. 2007) consisting of a political interpretation of the facts, a control fixation and self-efficacy. These biases however only provided a motivation for the distortion. The information asymmetries that were allowed to exist made it possible for the Executive Project Director to distort the message and prevent this distortion from being detected. Agency theory was used to explain how the distortion occurred. The biases created a motivation to shirk while the information asymmetries created the opportunity.

The examination of project Gamma also resulted in the confirmation of the findings of the laboratory experiments and the addition of new potential constructs: illusion of control and politicization of the environment. I also proposed four new propositions about the effect of those constructs.

- P1) Illusion of Control will reduce the relevance of the report of bad news to the decision maker
- P2) Illusion of Control will increase willingness of a decision maker to continue the current course of action.
- P3) A highly politicized environment will reduce the relevance of the report of bad news to the decision maker.
- P4) A highly politicized environment will increase the willingness of a decision maker to continue the current course of action.

These new constructs are incorporated into a revised model (figure 6.2).



6.3 CONTRIBUTIONS AND FUTURE DIRECTIONS FOR RESEARCH AND PRACTICE

6.3.1 Limitations

In the cross-cultural study, the item biases and lack of demonstrated scalar equivalence creates an inability to compare means across the different geographies. Therefore while we know that the relationships are similar, we cannot know if the relationships are the same strength across geographies. Similarly the low power and coarse scales used in the laboratory experiments result in a lowered effect size in the moderation analyses. The moderation effects may be understated in this study.

6.3.2 Implications for Research

This dissertation has contributed to the scientific knowledge about bad news reporting by developing and testing a model of the Deaf Effect at the individual level. It has shown that one reason for the Deaf Effect is the determination by the decision maker that the report of bad news is not relevant to be considered in determination of the future course of action of the project. This determination is based upon the Credibility and Role Prescription of the bad news reporter.

There are several directions for future research. There are other variables that should be examined such as the message characteristic variables. Future studies should examine such areas as message salience, recency, primacy and linguistic cues to determine how these characteristics of messages allow the message to break through or be lost in the background clutter or how they affect message relevance. Additionally, while the literature indicates that female decision makers have less confidence in their decisions, future studies should investigate this attribute of self-confidence and other beliefs about

themselves explicitly rather than using gender as a proxy.

These studies have only examined a project situation in which there were the following four conditions:

- 1) External pressures that moved the decision maker to continue the current course of action;
- 2) A decision maker who could not perform the evaluation on his/her own;
- 3) A report of bad news that did not communicate the potential disaster situation in terms that unambiguously indicated a coming disaster;
- 4) Severe time constraints on the length of time to evaluate the situation and make a decision that either prevented evaluation of the situation or cut off alternative solutions

There should be studies of the Deaf Effect that would be carried out in different situations. For example, as seen in the case study, self-efficacy and illusion of control may play a part. Studies in environment where the Deaf Effect occurred without external pressure or time constraints and the decision maker had or believed that he had the knowledge to determine the situation for himself should be undertaken to determine if self-efficacy could induce the occurrence of the Deaf Effect in those environments.

This study also utilized the GLOBE metrics to assess the respondents' view of the ambient culture. The use of these metrics resulted in insignificant differences in response to the cultural values across the different geographies. The values returned also differ significantly from that reported in House, et. al. (2004) (figure 6.5).

Table 6.5 – Comparison of Calculated GLOBE Variables vs. that Reported by the GLOBE Study						
Calculated from this Study						
	UA	FO	IC	IG	PD	PO
Germany	3.23	3.82	3.53	4.00	3.27	3.53
China	3.94	3.16	3.47	2.78	2.81	2.89
USA	3.54	3.19	3.27	3.75	3.01	3.22
Reported in House, et. al. (2004)						
Germany	5.22	4.27	3.56	4.02	5.25	4.25
China	4.94	3.75	4.77	5.8	5.04	4.45
USA	4.15	4.15	4.2	4.25	4.88	4.49

The differences exist in both value and rank order. For example, in Institutional Collectivism, while the value for Germany returned by this study is very similar to that developed by the GLOBE study, those of China and the USA are very different (1.3 points lower for China and .95 points for the USA). Additionally, China was highest in the GLOBE sample by 1.19 points over Germany. In the results from this study, their scores are virtually identical with Germany being slightly higher.

This could be due to a number of differences in the samples. The GLOBE metrics were developed and operationalized for middle-management professionals. It could be that the perceptions of students of societal values are significantly different that those of middle-management professionals. Alternatively, it could be that the measures do not mean the same thing to students as to professionals (item bias). Or it could be that the

items require a certain level of experience that students do not possess (item bias). These results might indicate that these measures are only appropriate for use with middle-management professionals. Other possible causes could be that cultural values have shifted in those regions in the 14 years since the GLOBE study was performed. Additional research is required to validate these metrics for groups other than those under which the GLOBE consortium validated them.

6.3.3 Implications for Practice

For practitioners, this study points to some ways to avoid occurrences of the Deaf Effect. One key enabler of the Deaf Effect is a “high performance environment” characterized by unnecessarily short deadlines and lack of tolerance for project management errors. While there is always a need for deadlines and gross mismanagement should not be tolerated, there should be in addition a “quality” emphasis in which, it should be stressed that where possible a quality product should be delivered even if some dates are missed.

For role prescribed bad news reporters such as auditors, every effort should be made to increase their credibility within the organization. Source credibility theory suggests that steps should be taken to increase their perceived expertise and trustworthiness. Keil and Robey (2001) have suggested that increasing the size of the audit staff, management support for the audit function, preservation of their independence and being able to add value to projects improve the credibility of the audit function. The actions of the IV&V vendor in the case study point toward a way that this can be achieved. By walking the fine line between independence and team membership, they contributed to the team by suggesting improvements to the methods used in the projects and then audited them on conformance to those “best practices”.

Since Role Prescription enhances the Credibility of the bad news reporter, management should make reporting of bad news a component of each employee’s job. They should be trained to report bad news on the project to their leaders and up the chain of command as necessary to ensure project success. The effects of Risk Propensity and Risk Perception indicate that perhaps factors used in the selection of project leaders might include their propensity to accept risk. Management should ensure that they do not select “daredevils” for the role of project leaders. Similarly, all project decision makers should be trained to identify project risks so that when identified they might be more willing to change project direction and avoid failure.

Another implication for practice concerns status-reporting systems. In the case study illustrated herein, the system as practiced avoided errors due to internal project management practices such as schedule adherence and internal risk and issue management. However, as was seen, at least three projects going through the process experienced requirements failures two resulting in serious crises. This may result from two aspects of the process: implementation of the IV&V activity only at the construction phase of the project and use of behavior controls to monitor the projects.

Until the advent of project Alpha in 2007, IV&V was typically implemented only after the implementing contractor was assigned. This allowed the projects to go through the RFP development and bid process without independent review allowing for requirement errors to be passed through to implementation phase where the requirements were not reviewed by IV&V resulting in issues in implementation. IV&V should be placed at the beginning of the process to ensure that proper steps are taken to ensure correct requirement analysis.

The IV&V review process is largely that of reviewing the processes used and conformance to milestones such as schedule and budget. As described above, this review is limited to internal project controls and does not include requirements, the process therefore cannot ensure that the system developed can be successfully implemented or meets the need of the users. To close this gap, two additional activities can be undertaken. The IV&V can work with the users to ensure that the system meets their requirements and expectations and can be implemented.

Another approach can be to implement the use of outcome controls. Agency theory suggests that outcome controls are more likely to motivate the agent to behave in the interests of the principal (Eisenhardt 1989). Outcome based controls are also a good way to pass risk to the agent and to resolve the goal conflict that occurs between contractors and outsourcing organizations (Eisenhardt 1989). To implement outcome controls, the outsourcing organization should require the contractor to use a more iterative approach to development such as prototyping, extreme programming or at least requirement interim useful deliverables. This approach would allow the outsourcing organization to verify that the contractor is meeting the requirements of the information system project. The use of outcome-based controls would also prevent the distortion of status reporting. By requiring frequent small deliverables of functionality, it prevents the status report from being distorted by either misunderstanding of the facts by the project manager or by bias as shown in the case study.

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