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BAD NEWS REPORTING ON TROUBLED IT PROJECTS: THE ROLE OF PERSONAL, SITUATIONAL, AND ORGANIZATIONAL FACTORS

BY

CHONGWOO PARK

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
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2007

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ACCEPTANCE

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

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ABSTRACT

Bad News Reporting on Troubled IT Projects: The Role of Personal, Situational, and Organizational Factors

By

ChongWoo Park

August, 2007

Committee Chair: Dr. Mark Keil

Major Academic Unit: Computer Information Systems

An individual's bad news reporting behavior has been studied from a number of perspectives and has resulted in a variety of research streams including the MUM effect (or reluctance to transmit bad news), whistle-blowing, and organizational silence. While many scholars in different areas have studied reporting behavior, it has not been widely discussed in the information systems literature. This dissertation research addresses an individual's bad news reporting behavior (and its antecedents) in the troubled IT project context.

Many social phenomena are multi-causal (Hollander 1971). The silence phenomenon involved in an individual's bad news reporting behavior is multi-causal too. While prior research has identified many antecedents to the bad news reporting behavior, it has not provided any systematic approach for categorizing them. In this dissertation, the antecedents are categorized into three different levels: personal factors (i.e., individual-level factors), situational factors (i.e., project-level factors), and organizational factors. This research empirically investigates how the antecedents at different levels affect (i.e., encourage or discourage) an individual's decision to report or not report bad news in the IT project context.

The dissertation follows a multi-paper model, and includes three independent, empirical studies, each with its own research model focusing on personal, situational, and organizational factors.

Chapter 1

Introduction

1.1 Motivation

According to KPMG's recent survey on international IT project management (Zarrella et al. 2005) which included more than 600 organizations across 22 countries, 49 percent of the respondents had experienced at least one IT project failure in the past year. Although this is an improvement from the company's 2003 survey where 57% of the respondents experienced one or more IT project failures in the previous year, the survey suggests that IT project failure is still a widespread problem.

Why do IT projects fail? Many reasons have been identified over the years. IT project escalation – continued commitment to a failing IT project – has been identified as an important type or pattern of IT failure (Keil 1995). While some factors promoting project escalation have been identified and investigated in the escalation literature (Keil 1995; Staw and Ross 1987), the CONFIRM case represents one instance of an IT project failure in which an individual's reluctance to report bad news about the project and its true status appeared to lead to project escalation and ultimately to project failure (Oz 1994). In the case of CONFIRM, the IT project escalated as a result of technical and performance problems that were never brought to the attention of senior management. Apparently, multiple project team members knew about these problems, but chose not to disclose the true status of the project in a timely manner.

Cases such as CONFIRM raise two important research questions:

1. Why do people not report problems associated with troubled IT projects?
2. How do people decide whether or not to report problems?

The first question can be answered by identifying the *factors* that affect an individual's reporting behavior, and the second one can be solved by investigating an individual's *decision-making steps* for reporting.

Thus, the objective of this dissertation research is to better understand an individual's reporting behavior in the IT project context. In order to achieve this objective, this dissertation examines 1) the factors that influence an individual's reporting behavior – an individual's decision to report or not report, 2) the steps through which an individual makes a decision of reporting or not, and 3) the ways in which those factors interact with the reporting decision steps. More specifically, this dissertation addresses how the influential factors at three different levels (i.e., personal, situational, and organizational factors) affect an individual's bad news reporting behavior within the rubric of the basic whistle-blowing model.

1.2 Relevant Literature

Although there have been several areas of study dealing with the phenomenon of employee silence, they have adopted different foci and approaches to that phenomenon. The different perspectives that have been employed are reflected in the range of labels (e.g., MUM effect, whistle-blowing, and organizational silence) that are often associated with this area of research. Each of these areas is described briefly below.

1.2.1 MUM Effect

It is commonly believed that people will be more reluctant to communicate information which is negative rather than positive for the recipient. Rosen and Tesser (1970) have termed the phenomenon of keeping Mum about Unpleasant Messages the MUM effect. They also conducted a laboratory experiment to test the phenomenon and found a greater reluctance to communicate bad news compared to good news. Many studies in the MUM effect literature have replicated

and reconfirmed these findings (Tesser et al. 1972). In addition, from their thorough literature review, Tesser and Rosen (1975) showed great generality of the MUM effect across settings, individuals, and messages, and argued that the MUM effect is a pervasive and systematic bias in interpersonal communication. Thus, the MUM effect – an individual's reluctance to report bad news – may hold in various situations, independent of the context involved. The MUM effect literature provides a robust theoretical and empirical foundation for understanding an individual's willingness to report bad news, which is the dependent variable of interest in this dissertation.

In spite of its focus on the unpleasantness of messages as a driver behind the reporting decision, the MUM effect literature has also discussed other determinants of the MUM effect. Tesser and Rosen (1975, p. 200) suggest that people "may withhold the bad news out of self-concern, out of concern for the recipient, or simply to comply with norms." While the three reasons seem to be at different levels, all of them basically belong to the individual's perceptions of the situations involved in terms of self, recipient, and society. Thus, the MUM effect literature mainly introduces and discusses situational factors that can affect an individual's reluctance or willingness to report bad news. This dissertation examines the effects of several situational factors that have not been specified in the MUM effect literature.

1.2.2 Whistle Blowing

Whistle-blowing can be seen as a form of prosocial behavior (Staub 1978), which is positive social behavior that is intended to benefit both the whistle-blower and other persons in the organization (Dozier and Miceli 1985). Whistle-blowers are defined as organization members "who disclose illegal, immoral or illegitimate practices under the control of their employer to persons or organizations who may be able to effect action" (Near and Miceli 1985, p. 6). From

the definition above, whistle-blowing seems to focus more on reporting some wrongdoing, which should be bad news to the organization. Thus, whistle-blowing per se can be regarded as one form of bad news reporting. Although whistle-blowing (i.e. willingness to report) seems to be the opposite of the MUM effect (i.e., reluctance to report), studies of whistle-blowing have discussed not only why some observers of organizational wrongdoing choose to report it, but also why others ignore it (i.e., decide to remain silent).

Dozier and Miceli (1985) introduced the basic whistle-blowing model based on Latane and Darley's (1970) bystander intervention framework, describing five decision steps, through which individuals decide to blow the whistle or not to. They argued that once an individual is aware of wrongdoing, he or she first decides whether or not the wrongdoing ought to be reported, then considers whether he or she is responsible for taking action, which in turn influences his or her blowing the whistle. The three steps from the whistle-blowing literature provide us with a good approach to an individual's decision-making steps for reporting. This dissertation has adopted the basic whistle-blowing model to understand how an individual makes a decision of reporting bad news or not.

The whistle-blowing literature also introduces potential variables that may affect the whistle-blowing process, such as characteristics of the whistle-blower, the situation, the organization, and the power relationships between the whistle-blower and the organization (Miceli and Near 1992). More specifically, Dozier and Miceli (1985) suggest that personality traits and situational variables leading to moral and ethical conflicts may be critical in determining an individual's whistle-blowing. This dissertation examines several potential variables specified in the whistle-blowing literature.

1.2.3 Organizational Silence

Morrison and Milliken (2000) have noted that "many organizations are caught in an apparent paradox in which most employees know the truth about certain issues and problems within the organization yet dare not speak that truth to their superiors." They refer to this as organizational silence. While this phenomenon has been discussed with different labels such as whistle-blowing and MUM effect, organizational silence, which focuses more on collective-level dynamics rather than an individual employee's reporting decision, has recently received research attention in the management literature (Morrison and Milliken 2003). In addition, organizational silence represents a more inclusive approach to characterizing the silence phenomenon in an organization. For example, while whistle-blowing seems to be limited to a wrongdoing situation, the notion of organizational silence is not limited to any specific context, but covers widespread withholding of information about potential problems or issues by employees (Morrison and Milliken 2000). This dissertation research has adopted this inclusive approach from the organizational silence literature in defining bad news reporting in organizational settings, i.e., not limiting the origin of bad news to wrongdoing but extending it to any potential problems or issues.

In addition to its inclusive approach to bad news reporting, the organizational silence literature has identified organizational forces, rather than personal factors, that affect an employee's bad news reporting. Morrison and Milliken (2000) have theorized how silence unfolds within organizations, but their model has not been empirically tested. Their model suggests that *managers' fear of negative feedback* and *a set of implicit managerial beliefs* give rise to organizational structures/policies and managerial practices that impede the upward flow of information, which contribute to a climate of silence (meaning widely shared perceptions among

individuals that speaking up about problems or issues is fruitless and/or even dangerous). Such a climate will lead to employee silence rather than voice. This dissertation research adopts and tests some organizational forces specified as potential factors affecting employee silence or voice in the organizational silence literature.

1.3 Overall Research Model and Three Studies

This dissertation is theoretically grounded in the literature introduced above. The MUM effect studies mainly explain the phenomenon of bad news reporting (i.e., reluctance or willingness to report bad news) per se, which is the ultimate dependent variable in this research. The whistle-blowing literature provides grounding in an individual's decision-making steps that underlie the bad news reporting behavior, through which exogenous factors influence the dependent variable. While the whistle-blowing literature deals with bad news reporting focusing on wrongdoing, the organizational silence literature provides a more inclusive context of bad news reporting by extending wrongdoing to potential problems or issues involved. All three streams of literature have suggested that a variety of exogenous forces can influence bad news reporting.

This dissertation suggests an overall research model of bad news reporting on troubled IT projects as shown in Figure 1.1. The discussions and findings from the literature have been synthesized to better understand bad news reporting, in terms of its decision steps (from whistle-blowing theory) and its context (from the organizational silence literature). In order to provide some systematic understanding of the influential factors on bad news reporting, this dissertation adopts a multilevel approach to categorizing the factors in the overall research model.

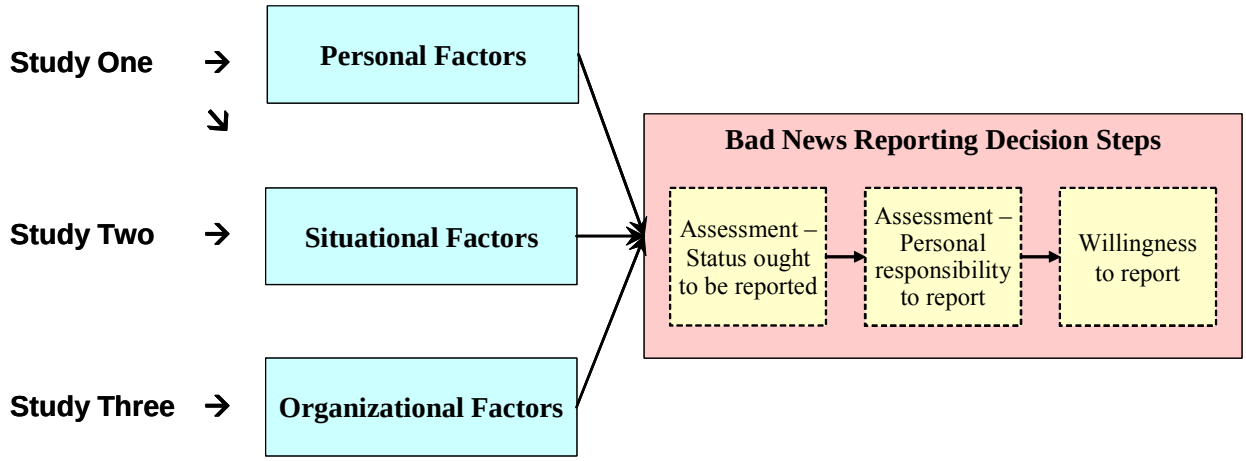


Figure 1.1 Overall Research Model

This dissertation follows the multi-paper model, and includes three independent, empirical studies under one overarching theme, which is an individual's bad news reporting behavior in the troubled IT project context. A brief introduction to the three studies follows.

1.3.1 Study One

Study One investigates the effects of four exogenous, personal and situational factors on an individual's bad news reporting behavior. It is the first study to test personal factors in the IT project bad news reporting context. The research model (see Figure 1.2 below) mainly builds upon theories of whistle-blowing, risk, and personal communications, and includes *personal morality* and *willingness to communicate* as personal factors, and *type* and *scope of impact* as situational factors. The three steps in the basic whistle-blowing model are tested as endogenous variables. Seven hypotheses (H1, H2, H3, H5, H6a, H6b, and H6c) were supported, but two hypotheses (H4 and H7) were not supported.

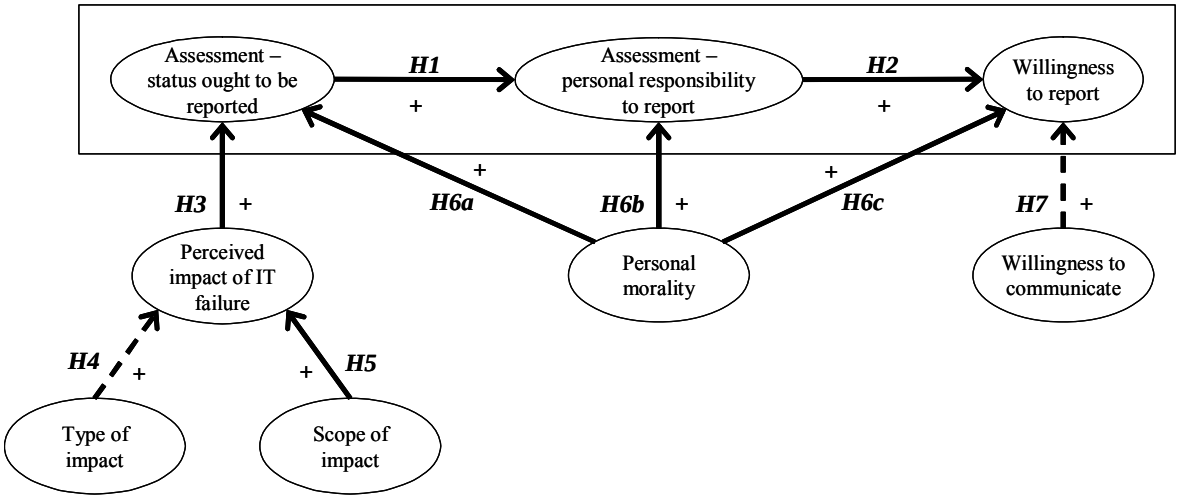


Figure 1.2 Research Model – Study One

1.3.2 Study Two

Study Two mainly focuses on two situational factors and examines how they influence the bad news reporting behavior. The research model (see Figure 1.3 below) builds upon theories of whistle-blowing, risk, and attribution. It includes *fault responsibility* and *time urgency* as exogenous, situational factors, and their effects on the three steps of the basic whistle-blowing model are tested. All six hypotheses in the research model were supported.

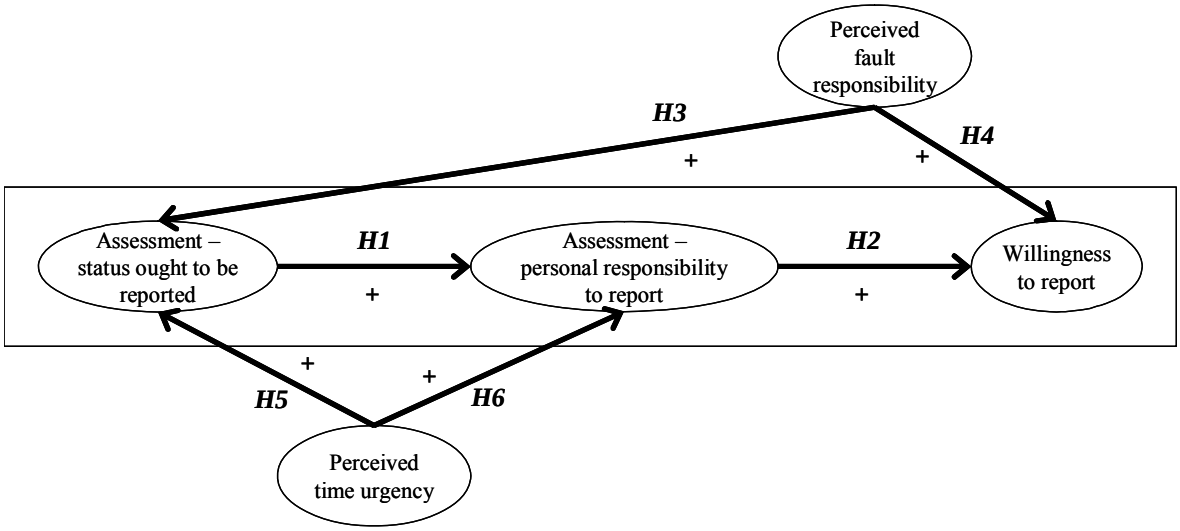


Figure 1.3 Research Model – Study Two

1.3.3 Study Three

Study Three focuses on organizational factors. It investigates how organizational forces affect a climate of silence in an organization and how the climate interacts with the three reporting decision steps within the basic whistle-blowing model. The research model (see Figure 1.4 below) mainly builds upon theories of organizational silence, whistle-blowing, and social identification, and includes *organizational structures and policies*, *managerial practices*, and *degree of demographic dissimilarity between employees and top managers* as three exogenous factors at the organizational level. All eight hypotheses in the research model were supported.

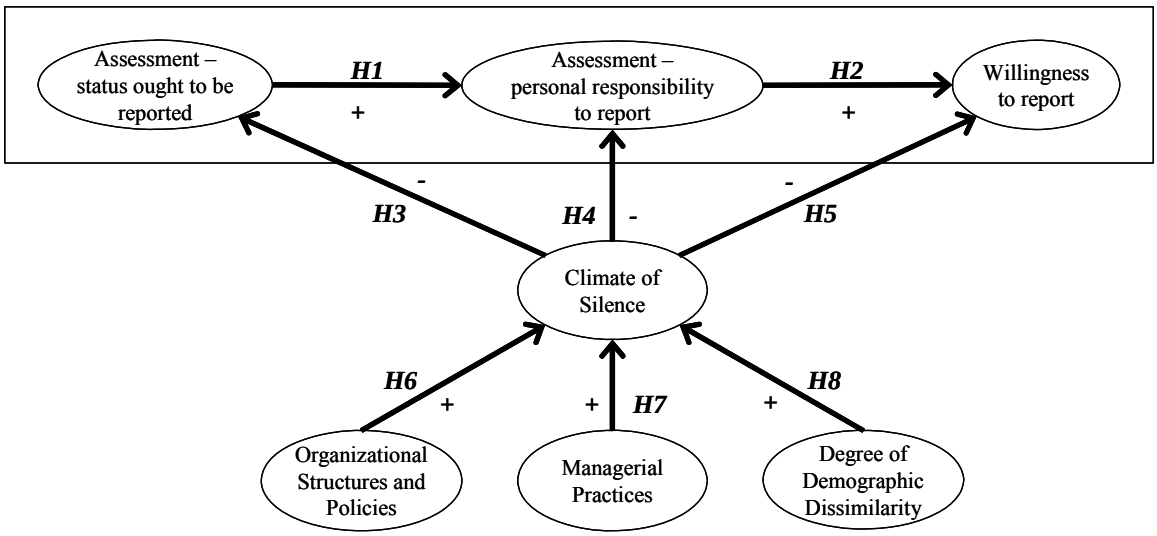


Figure 1.4 Research Model – Study Three

1.4 Methodology

Laboratory experimentation based on hypothetical scenarios was conducted to test the causal relationships between constructs in the three research models. As Jenkins (1985, p. 108) has noted, in lab experiments "the researcher manipulates the independent variables, controls the intervening variables, and measures the effect of the independent variables on the dependent variables." Each of the three studies manipulated independent variables of interest at different

levels and examined their effects on the dependent variables, which are the three decision steps in the basic whistle-blowing model. In addition, because one main objective of each study was to evaluate a project member's bad news reporting decision across a potentially wide range of IT project situations in the real world, the hypothetical scenario approach represented a good methodological option (Straub and Karahanna 1998).

All three studies in the dissertation involved a factorial design, i.e., the signal-enhancing experimental design, which directly manipulates the features of the treatment planned in the research (Trochim 2001). In this dissertation research, Study One and Study Two involved 2 x 2 factorial designs with four hypothetical scenarios, and Study Three involved a 2 x 2 x 2 factorial design with eight scenarios. Pre-tests and pilot tests for all three studies were conducted to evaluate the research instrumentation, to validate the measures statistically, and to check the clarity of the research procedure. Both paper- and web-based surveys were used for the studies in this dissertation.

Partial Least Squares (PLS) analysis was used as the primary analysis tool, which is an advanced statistical method that allows optimal empirical assessment of a structural model together with its measurement model (Wold 1982). A measurement model links each construct with a set of indicators measuring that construct while a structural model represents a network of causal relationships among constructs. PLS first estimates loadings of indicators on constructs and then estimates causal relationships among constructs iteratively (Fornell 1982). Thus, PLS is superior to such traditional methods as factor analysis, regression, and path analysis because it assesses both measurement and structural models. PLS was selected for this dissertation research because it is appropriate for testing theories in the early stages of development (Fornell 1982) and can deal with formative indicators (Chin 1998; Fornell and Bookstein 1982). Each of the

three studies in the dissertation is an early attempt to develop a theoretical model on bad news reporting with exogenous factors at different levels, and Study Two and Study Three include formative constructs in their research models.

1.5 Research History

The following table shows the list of various research activities that have been conducted to complete this dissertation research (see Table 1.1).

Table 1.1 Research History

		Study One	Study Two	Study Three
Chapter		Chapter 2	Chapter 3	Chapter 4
Factors of Interest		Personal / Situational	Situational	Organizational
Ideation		Dec 2005	Jan 2004	Dec 2005
Theoretical and Practical Check		Jan 2006	Feb 2004	Aug 2006
Research Model Development		Feb 2006	Feb 2004	Nov 2006 – Jan 2007
Scenario Development		Feb 2006–April 2006	Mar 2004 – Sept 2004	Nov 2006 – Feb 2007
Pilot Tests		Mar 2006–April 2006	Mar 2004 – Sept 2004	Dec 2006 – Mar 2007
Data Collection		April 2006–May 2006	Sept 2004 – Dec 2004	April 2007 – May 2007
Data Analysis		June 2006	Feb 2005	May 2007
Write-up		Dec 2006	July 2005	June 2007
Presentations /Publications	**Conf.**	Aug 2007 – Annual Meeting of the Academy of Management	Aug 2006 – Annual Meeting of the Academy of Management	Aug 2007 – Americas' Conference on Information Systems
	Jrnl.	IEEE Transactions on Engineering Management (Under Review)	Journal of the Association for Information Systems (Under Review)	Decision Sciences Journal (Under Review)

1.6 Conclusion

Although an individual's bad news reporting has been studied with different labels and from different perspectives in multiple academic disciplines, there has been no attempt to put

them together and provide a systematic view on the bad news reporting behavior. This dissertation advances an overall model of an individual's bad news reporting in the troubled IT project context by reviewing and synthesizing three bodies of literature (MUM effect, whistle-blowing, and organizational silence), which may contribute to a better understanding of the bad news reporting phenomenon in an organization.

In addition to presenting an overall model of bad news reporting, this dissertation includes three independent empirical studies of the phenomenon, investigating the relationships between various personal, situational, and organizational factors and bad news reporting.

The remainder of this dissertation is organized into four chapters. The next three chapters describe three independent studies (i.e., Study One, Study Two, and Study Three respectively) including their own theoretically grounded research models, data analyses and results, and implications. Chapter 5 concludes this dissertation with a brief discussion of the overall contributions and implications.

Chapter 2

The Effect of IT Failure Impact and Personal Morality on IT Project Reporting Behavior[1]

Abstract

An individual's reluctance to report the actual status of a troubled project has recently received research attention as an important contributor to project failure. While there are a variety of factors influencing the reluctance to report, prior IS research has focused only on situational factors such as risk, information asymmetry, and time pressure involved in the situation given. In this paper, we examine the effects of both situational and personal factors on an individual's reporting behavior within the rubric of the basic whistle-blowing model adapted from Dozier and Miceli (1985). Specifically, we identify perceived impact of IT failure as a situational factor and personal morality and willingness to communicate as personal factors, and investigate their effects on the assessments and decisions that individuals make about reporting the IT project's status. Based on the results of a controlled laboratory experiment, we found that perceived impact of IT failure directly affects an individual's assessment of whether a troubled project's status ought to be reported, exerting an indirect influence on willingness to report bad news, and that personal morality directly affects all three steps in the basic whistle-blowing model, as hypothesized. Willingness to communicate, however, was found not to affect an individual's willingness to report bad news. The implications of these findings and directions for future research are discussed.

Keywords: IT project management, whistle-blowing, bad news reporting, MUM effect, willingness to communicate, morality, type of impact, scope of impact, impact of IT failure

[1] Park, C., Keil, M., and Kim, J. "The Effect of IT Failure Impact and Personal Morality on IT Project Reporting Behavior," Working paper, Department of Computer Information Systems, Georgia State University, 2007.

2.1 Introduction

A recent survey shows that IT project failure is still a widespread problem (Zarrella et al. 2005). A project member's reluctance to report the true status of the project has been recognized as a factor that may contribute to IT project failure (Tan et al. 2003). If a project member withholds bad news about the project's status from senior management, the troubled project can escalate and become a runaway project. On the other hand, if the true status of a troubled project is reported to senior management, there is a chance that some corrective actions can be taken to turn around the project, or abandon it if necessary. Prior research suggests, however, that, while evidence of impending failure may be apparent to project members in the lower ranks, this negative information sometimes fails to be communicated up the hierarchy (Keil and Robey 1999). The human reluctance to transmit unpleasant messages has been termed the "MUM effect" (Rosen and Tesser 1970).

The MUM effect has been shown to generalize across a wide variety of settings, individuals, and messages (Tesser and Rosen 1975). While prior research on the MUM effect has investigated some situational factors such as self-concern, concern for the recipient, and compliance with norms, there has been comparatively little research on personal factors (e.g., morality or willingness to communicate) that may influence the MUM effect.

In this paper, we examine how both personal and situational factors affect an individual's bad news reporting behavior in troubled IT projects. Although the area of reporting behavior in the IS context has not been widely investigated, it has recently begun to receive more research attention. IS scholars have theoretically identified (Smith and Keil 2003) and empirically tested potential factors influencing the reporting behavior in a troubled IT project. Smith and Keil (2003) have identified four situational factors and many moderating factors based on a thorough

literature review. Empirical research in this area is limited, however, and has focused almost exclusively on a small set of situational factors that affect the reporting behavior in the IS context. In order to provide more insight into the relationships between influential factors and bad news reporting behavior, this research identifies and evaluates both situational and personal factors.

As the role of IT becomes more critical in such industries as healthcare and finance, the potential impact of IT failures has become much more serious. For example, malfunction of IT equipment during LASIK eye surgery could cause irreversible blindness (FDA 2006) and a failed banking system could cause significant financial loss for clients (Nakao 2002). Smith and Keil (2003) suggest three salient factors in assessing the impact of an IT project failure: type of impact, scope of impact, and nature of the relationship between the decision-maker and those who will potentially be affected by the failure. In order to investigate how an individual assesses the magnitude of impact, we manipulated both type and scope of impact in a controlled laboratory experiment by developing four scenarios with different types (bodily harm and financial loss) and scopes (many and few) of impact.

Ethical issues are not new, but they become increasingly important in today's business environment. This is because an employee's sense of morality in business settings (i.e., business ethics) can influence business decision-making and can ultimately affect a company's business success or failure (Kidder 2002). Personal morality has been known to be associated with assessments and decisions that individuals make about reporting a project's status in certain situations (Miceli and Near 1992). In this research, we adopted personal morality measures from the Big Five (Goldberg 1999), and tested the relationship between personal morality and reporting behavior.

Willingness to communicate as a personal factor is known to be consistent over a wide variety of situations (Borgatta and Bales 1953; Chapple and Arensberg 1940; Goldman-Eisler 1951), but the construct has not been investigated within the context of bad news reporting. Prior research suggests that willingness to communicate can be used as a valid predictor of actual communication behavior such as speaking up in the classroom (Chan 1988; Chan and McCroskey 1987). In this research, we adopted twelve items to measure willingness to communicate from McCroskey and Richmond (1987), and tested the effect of willingness to communicate on willingness to report bad news.

This study represents the first time that these three factors have been empirically investigated using a theoretically grounded model. The remainder of the paper is organized into five sections. First, we briefly review the relevant literature, focusing on the reporting decision and the concepts of both situational and personal factors. Next, we introduce our research model and hypotheses. Then, we briefly describe our research methodology. After we present the results of the experiment, we conclude the paper with a brief discussion of the implications.

2.2 Background

Figure 2.1 shows the central decision-making model from the whistle-blowing literature, which provides the basic theoretical framework for this study (Miceli and Near 1992). Dozier and Miceli (1985) argued that once an individual is aware of a problem (i.e., recognition), he or she assesses whether the status ought to be reported (i.e., assessment), then considers whether he or she is responsible for reporting (i.e., responsibility), which in turn influences his or her willingness to report (i.e., choice of action). IS researchers have adopted this model as a general outline of individual decision-making regarding bad news reporting and have found support for the model in a variety of experimental contexts (Smith and Keil 2003; Smith et al. 2001). Thus,

we also adopt the central decision-making model as a building block for developing an expanded model with both situational and personal factors.

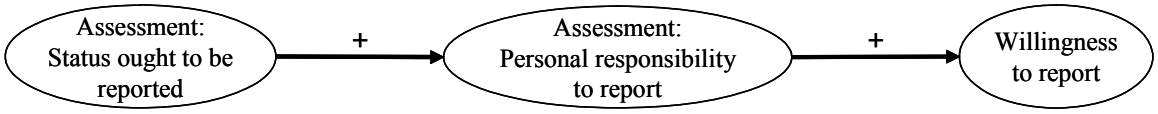


Figure 2.1 Basic Whistle-Blowing Model adapted from Dozier and Miceli (1985)

2.2.1 Situational Factors

When an individual makes a decision of reporting the IT project status, he or she may first consider several factors associated with the IT project situation itself. Smith and Keil (2003) have theoretically identified four important situational factors that can affect the perceptions of the IT project situation: risk, time pressure, level of behavioral immorality, and information asymmetry. While these four situational factors have been empirically tested and confirmed in the IS literature (Keil et al. 2004; Park et al. 2006; Smith et al. 2001), many other situational factors may exist.

From the literature review, we have found one interesting situational factor (perceived impact of IT failure) and its antecedents (type and scope of impact). Based on risk theory, Smith and Keil (2003) argue that as the magnitude of the impact from IT project failure becomes larger, the individual should feel more strongly that reporting is required. They also suggest that three factors will be salient in assessing the impact: the type of impact, the scope of impact, and the nature of the relationship between the decision-maker and those who will be affected by the impact. There is only one previous study in which perceived impact has been examined in the IT project context. Smith et al. (Smith et al. 2001) conceptualized perceived impact as *indirectly* affecting the assessment of whether something ought to be reported and consequently did not test

the direct effect of perceived impact on this assessment. Moreover, they did not examine the antecedents of perceived impact (e.g., type or scope of impact).

2.2.2 Personal Factors

Prior research clearly indicates that personality and communication are inherently related to each other. In other words, personality traits seem to be conceptually related to various types of communication including whistle-blowing. In fact, there is evidence that personal characteristics are associated with whistle-blowing even though there has been little empirical work in this area. Miceli and Near (1992) identified personal variables that are expected to affect the decision to blow the whistle (i.e., potential predictors of whistle-blowing). These include dispositional variables, values, beliefs, demographic variables, and so forth.

Smith et al. (2001) have found some empirical evidence that personal factors such as risk propensity can affect the assessments and decisions that individuals make about reporting a project's status. Based on theoretical grounds, they suggested morality as a potential personal factor. In addition, prior research has speculated about the relationship between morality and whistle-blowing (Dozier and Miceli 1985), implying that an individual having higher moral standards could have a higher propensity to judge him/herself responsible for action. Willingness to communicate has also been suggested as a personal factor that affects communication behavior. For example, MacIntyre, Babin, and Clement (1999) found from their laboratory experiment that an individual's willingness to communicate can predict his/her decision to initiate communication. While both morality and willingness to communicate have been discussed as potential personal factors influencing reporting behavior, they have not been hypothesized nor empirically tested before.

In this paper, we use the basic whistle-blowing model as a foundation upon which to build a richer model that incorporates both situational (e.g., perceived impact of IT failure) and personal factors (e.g. morality and willingness to communicate). In the next section, we describe our research model and hypotheses, which are followed by a discussion of our methodology and results.

2.3 Research Model

Prior research has identified numerous factors as having the potential to affect the reporting behavior in a troubled software project (Smith and Keil 2003). Since it would appear impossible for any one study to empirically test all of the factors, the approach that has been taken to date involves testing a small number of factors at a time and seeing how they are related to the three constructs in the whistle-blowing model. In this study, we follow this approach, testing two situational factors and two personal factors. We have selected type and scope of impact as situational factors that we believe to be important, but which have yet to be empirically tested in the context of the basic whistle-blowing model. While prior research on reporting behavior focuses on and empirically tests situational factors such as project risk (Smith et al. 2001), time pressure (Park et al. 2006), and information asymmetry (Keil et al. 2004), personal factors have not received research attention. Our research model includes two personal factors (morality and willingness to communicate), as well as two situational factors. We explicitly state nine hypotheses corresponding to the nine paths in the research model, as depicted in Figure 2.2.

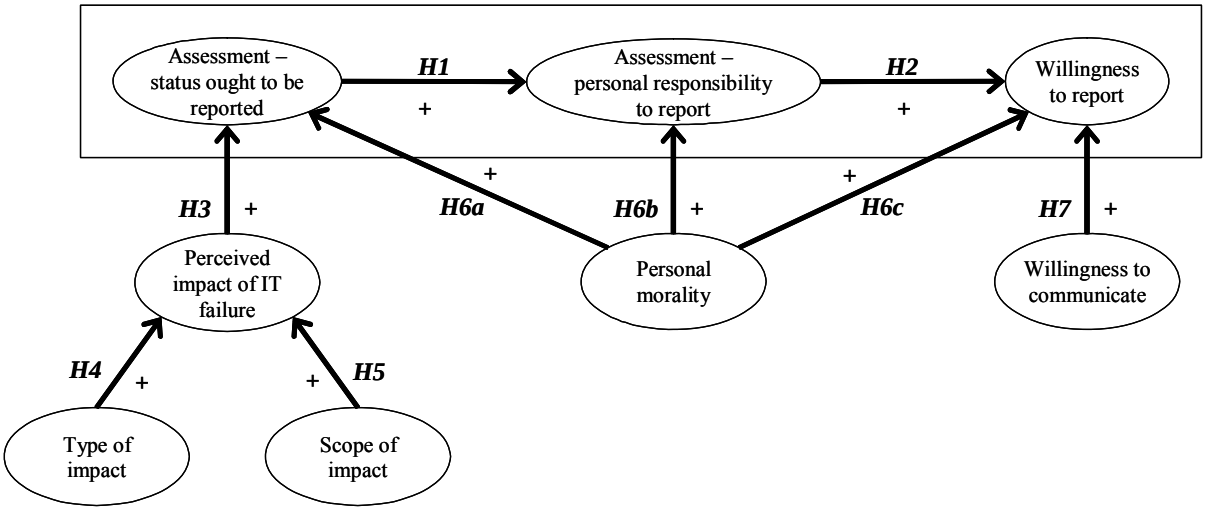


Figure 2.2 Research Model

2.3.1 Central Decision-Making Model

The top row of Figure 2.2 represents the central decision-making model grounded in the whistle-blowing literature. We adopt two hypotheses in the whistle-blowing model that were shown to hold in recent research (Keil et al. 2004), and retest them in the research model as a replication.

The whistle-blowing literature posits that the individual will make two distinct assessments of whether the bad news ought to be reported and the personal responsibility to report the bad news (Dozier and Miceli 1985), but they are inherently related. Other things being equal, an individual's stronger assessment that status information ought to be reported will be reflected in a stronger feeling of personal responsibility for reporting. Thus, we state the following hypothesis.

Hypothesis 1. A stronger assessment that information ought to be communicated will be reflected in a higher assessed level of personal responsibility for reporting.

Following the line of argument from the whistle-blowing literature (Miceli and Near 1992), personal responsibility should have a direct effect on willingness to report bad news. In addition, this causal relationship between personal responsibility and willingness to report has been empirically tested and confirmed in the IS literature (Keil et al. 2004; Smith et al. 2001) Thus, we state the following hypothesis.

Hypothesis 2. Higher levels of assessed personal responsibility will be associated with greater willingness to report bad news.

We now turn to the situational and personal factors that influence the central model.

2.3.2 Influencing Factors

It has been noted that including other factors could help to further explain the variance in reporting behavior (Tan et al. 2003). Thus it is necessary that researchers identify and test other factors that may affect an individual's reporting behavior. In this research, we focus on three such factors that have been proposed in the literature, but have not been empirically evaluated together to determine their respective influence on bad new reporting: perceived impact of IT failure, personal morality, and willingness to communicate.

2.3.2.1 Perceived Impact of IT Failure

Smith and Keil (2003) theoretically argue from the risk literature that, when the magnitude of the expected impact (or loss) from failure grows larger, the observer should feel more strongly that the situation needs to be reported. The literature suggests that risk is the product of the magnitude of potential loss and the probability of loss (Barki et al. 1993; Billings et al. 1980; Boehm 1991). However, empirical findings from the risk literature indicate that people evaluate probability and magnitude of risk separately (March and Shapira 1987). Researchers have found that managers are affected by the magnitude of potential loss rather than

the probability of bad outcomes (Kahneman et al. 1982; Shapira 1986). Therefore this research focuses on perceived impact (i.e., magnitude) rather than probability. We seek to examine the direct effect of the perceived impact from IT failure on an individual's assessment of whether the project status ought to be reported.

When an individual perceives something can cause a potential loss, it may lead to individual's assessment that the risk inherent in the situation is high (Smith et al. 2001). Perceiving the heightened risk, individuals would assess that the given situation ought to be reported. If the perceived impact of risk is minimal, individuals would be less likely to assess that the situation is worth being reported. However if the consequences of non-reporting involve serious magnitude of damage, individuals would perceive that the situation ought to be reported. Thus,

Hypothesis 3. The greater the perceived impact of IT failure, the more likely people assess that the situation should be reported.

Smith and Keil (2003) suggest that people may consider three factors in assessing the impact: the type of impact, the scope of impact, and the nature of the relationship between the decision-maker and those who will be affected by the impact. In this study, type and scope of impact are hypothesized as two salient factors affecting an individual's perception of the magnitude of the impact.

Regarding the type of impact, prior research identified two types of impact: financial loss and bodily harm. Barki et al. (1993) introduced several financial types of loss (e.g. financial health, profitability) when they proposed a measure of software development risk. When organizations engage in risk management of software development project, consideration of financial loss is commonplace. Bodily harm represents a different type of loss (Braithwaite 1982;

Matthews 1987; Miceli and Near 1992). In the software development context, medical devices operated by sophisticated software can inflict physical harm to patients if the software malfunctions due to critical bugs.

Thus, in this research, we situate our study within the IT project context and use a role playing experiment (described in more detail later) to examine these two different types of impact that could, in theory, result from software bugs. Research in the legal area suggests that people might be more likely to report bad news when it is related to bodily harm rather than financial loss (Braithwaite 1982). However, this argument has not been empirically examined in the software development context. Thus,

Hypothesis 4. Bodily harm will have a greater effect than financial loss on perception of impact.

In the context of our study, the scope of impact is related to the range of impact software bugs might inflict. For example, software bugs can negatively affect an individual, a group of people, an organization, or a society depending on the scope of loss. The larger the scope of impact is, the more likely people tend to perceive that the related impact is significant (Smith and Keil 2003). Thus,

Hypothesis 5. The scope of impact will positively affect the perceived impact of IT failure.

2.3.2.2 Morality

Whistle-blowing researchers have speculated about the relationships between morality and whistle-blowing (Graham 1983; Graham 1986; Miceli and Near 1992). Dozier and Miceli (1985) suggest that highly moral individuals are more likely to blow the whistle, especially when the organizational climate is supportive of whistle-blowing. In addition, the prosocial behavior literature shows that an individual behaves more altruistically when he or she has higher levels of

moral judgment (Rushton 1980). This implies that individuals with higher levels of moral judgment will be more likely to report a potential problem if they sense that it could do harm to others without any prevention.

Miceli and Near (1992, p. 105) argue that higher levels of morality "could heighten the awareness and assessment of wrongdoing; it could increase the observer's propensity to judge himself or herself responsible for action; and it could affect the way observers generate and evaluate action alternatives." They also suggest that an individual with higher levels of morality may highly value the termination of wrongdoing. Taken the above discussions together, it is reasonable to assume that morality may affect an individual's reporting decision directly and indirectly through his or her assessment of the project's status and perception of personal responsibility for action. Thus, we state the following three hypotheses.

Hypothesis 6a. Individuals with higher levels of morality are more likely to assess that the bad news concerning a project and its status ought to be reported.

Hypothesis 6b. Individuals with higher levels of morality are more likely to assess a personal responsibility to report a project's status.

Hypothesis 6c. Individuals with higher levels of morality will be more willing to report bad news.

2.3.2.3 Willingness to Communicate

While an individual may exhibit consistent communication behavior over a wide variety of situations (Borgatta and Bales 1953; Chapple and Arensberg 1940; Goldman-Eisler 1951), the communication behaviors of different individuals can vary under identical, situational constraints. McCroskey and Baer (1985) argue that this variability in communication behavior across individuals is rooted in a personality variable, which they call 'willingness to communicate.'

McCroskey and Richmond (1987) developed self-report instruments to measure the construct of willingness to communicate in four communication contexts such as small group interaction, public speaking, talking in meetings, and talking in dyads, and with three types of receivers: acquaintances, friends, and strangers.

While prior research has mainly focused on the antecedents of willingness to communicate such as introversion, self-esteem, cultural divergence, and communication apprehension, effects of willingness to communicate on interpersonal communication have received little research attention. A few studies have investigated the consequences of willingness to communicate, showing that the construct of willingness to communicate can be used as a valid predictor of actual communication behavior (Chan 1988; Chan and McCroskey 1987). In addition, MacIntyre and his colleague (1999) conducted research on the antecedents and consequences of willingness to communicate, and found that willingness to communicate predicts the decision to initiate communication. This suggests that willingness to communicate is an individual-difference variable that can affect an individual's actual communication behavior including reporting. It is reasonable to assume that individuals in a troubled IT project who have a greater willingness to communicate will be more likely to initiate reporting the project's status. Thus, we state the following hypothesis.

Hypothesis 7. Individuals with greater willingness to communicate will be more willing to report bad news.

In summary, while prior research has suggested that perceived impact of IT failure as a situational factor, and morality and willingness to communicate as personal factors may affect reporting behavior in the troubled IT project context, the full nature of the relationships between the three variables and the basic whistle-blowing model has not been empirically studied.

Notably, while several situational factors have been investigated in previous studies of bad news reporting on IT projects (Keil et al. 2004; Park et al. 2006; Smith et al. 2001), to our knowledge, no personal factors have been investigated within the rubric of the whistle-blowing model. In this study, we empirically examine the effects of perceived impact, morality, and willingness to communicate on bad news reporting behavior by investigating how these variables exert their influence in the central decision model from whistle-blowing theory depicted in Figure 2.2.

2.4 Research Methodology

A laboratory experiment based on hypothetical scenarios was conducted to test the causal relationships between constructs in the research model. Since one of the objectives of this study was to evaluate an individual's decision regarding whether or not to report bad news across a wide range of IT project situations, the hypothetical scenario approach was a good methodological option (Straub and Karahanna 1998). The experiment involved a two-factor, four-cell design with two exogenous variables (type and scope of impact) that were manipulated independently at two levels. We developed four treatment scenarios as well as several items for assessing one construct for which we were unable to identify reliable and valid measures. Pilot tests were conducted to refine the treatment scenarios and validate the measures. College students at a large university in the southeastern U.S. served as subjects in this process.

2.4.1 Scenario

Each subject was asked to read a short scenario about a troubled IT project called CAPS and to assume the role of a project team member (see Appendix 2A). Subjects were informed that the CAPS project involved writing a wealth management software program in one scenario and a radiation treatment software program in the other, and that a serious bug had been identified in the software. The subject's company has promised that the CAPS project will be

installed and fully operational within a week. The type of impact (bodily harm, financial loss) and the scope of impact (one in a billion, ninety-nine percent) were manipulated independently to yield four treatment conditions.

Bodily harm as a type of impact was manipulated as a software bug that produced lethal doses of radiation for patients that were treated. Financial loss as a type of impact was manipulated as a software bug that placed all of a client's wealth in penny stocks and led to bankruptcy. In both treatment conditions, the subject was informed that he or she would face no personal liability.

To manipulate the scope of impact, we varied the numbers of people to be affected. For the large scope manipulation, the subject was informed that ninety-nine percent of all clients that used the system would almost certainly be financially bankrupt in the financial loss case, and ninety-nine percent of all patients that are treated will almost certainly die in the bodily harm case. For the small scope manipulation, the subject was informed that only one in a billion clients would almost certainly be financially bankrupt in the financial loss case, and only one in a billion patients would almost certainly die in the bodily harm case.

2.4.2 Procedure

A role-playing experiment was conducted in which subjects were told that this was an experimental study about business decision-making in an IT project situation and that their answers would remain anonymous. They were reminded that their participation was voluntary and those who did not wish to participate in the experiment could leave, but most subjects chose to participate. Subjects were randomly assigned to one of the four treatment conditions (obtained by varying the type and the scope of impact). The experimental procedure consisted of two parts. In the first part, subjects received a copy of the scenario corresponding to their respective

treatment condition and were asked to read the scenario. In the second part, subjects were asked to complete a questionnaire that measured their willingness to report bad news and also answer several items regarding their perceptions of impact; their assessments of whether the information concerning the project ought to be reported; their assessments of whether they had a personal responsibility to report the information; their self-reporting of their morality; their self-reporting of their willingness to communicate; and a series of manipulation checks. They were then asked to provide some demographic information.

Several procedural remedies were taken to address common method bias. As evaluation apprehension may cause common method biases, we took two steps to minimize it. First, we made the respondents' answers anonymous. Second, we assured respondents that there were no right or wrong answers. These steps made them less likely to edit their responses to be socially desirable and consistent with their perception of how the researcher wanted them to respond. In addition, we carefully constructed the items. Vague and ambiguous terms were avoided. Instead, we used concise and simple terms and syntax to make questions focused and easy to understand.

2.4.3 Subjects

A total of 159 undergraduate students enrolled in one or more introductory business requirement courses at a large urban university in the southeastern United States in 2006 were recruited for the study. Four subjects were dropped from the subject pool because they failed the manipulation check or did not complete the questionnaire. The mean age of the remaining 155 subjects was 22.7 years and the mean work experience was 2.54 years. Forty-five percent of the subjects were male, and 55 percent were female.

While the use of student subjects can limit the generalizability of the results, student subjects are commonly used in experiments that probe human decision-making (Harrison and

Harrell 1993; Sitkin and Weingart 1995). Moreover, there is some support in the literature for using student subjects as surrogates for managers (DeSanctis 1989; Gordon et al. 1987; Remus 1986), especially when the decision-making task does not require highly specialized domain knowledge. In this study, the subjects were asked to adopt the role of a team member in an IT project and to make a decision in a certain situation. Business decision-making was discussed in the courses that the subjects were taking at the time of data collection, and they had an average of 2.54 years work experience. Thus, we believe that the subjects were able to appreciate the context of the scenario and it is reasonable to assume that they could project themselves into the role of a project team member for the purposes of the experiment.

2.4.4 Measures

Multi-item measures for perceived impact of IT failure were developed for this study. We also adopted existing multi-item measures for willingness to report bad news (Park et al. 2006), assessment of whether the project status ought to be reported, personal responsibility to report (Smith et al. 2001), morality (Goldberg 1999), and willingness to communicate (McCroskey and Richmond 1987). Single-item dichotomous measures were created as manipulation checks for type and scope of impact. All measurement scales were validated through pilot testing of the experimental materials aimed at fine-tuning the scenario, the manipulations, and the instrumentation.

The willingness to report bad news was measured using three items that were anchored on a seven-point Likert scale ranging from “very unlikely” (1) to “very likely” (7). The willingness to communicate was measured using twelve items that were anchored on a seven-point Likert scale ranging from “very unlikely” (1) to “very likely” (7). Morality was measured using twelve items that were anchored on a seven-point Likert scale ranging from “very

inaccurate" (1) to "very accurate" (7). All of the other multi-item measures were assessed on a seven-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7). Appendix 2B shows the constructs and measures used in the study along with descriptive statistics for each.

2.5 Results

2.5.1 Manipulation Checks

Manipulation checks were performed to verify that the manipulations of type and scope of impact were effective. Two manipulation check questions were developed to directly ask the subjects whether they understood the situation correctly as described in the scenario. In the financial loss scenario, we checked the manipulation for type of impact by asking 'Left uncorrected, the bug that was identified could have a financial impact on clients. [□ True / □ False],' and for scope of impact by asking 'If the bug is not resolved, it will affect [□ only one in a billion clients / □ ninety-nine percent of all clients] that use the system.' In the bodily harm scenario, we checked the manipulation for type of impact by asking 'Left uncorrected, the bug that was identified could have a medical impact on patients. [□ True / □ False],' and for scope of impact by asking 'If the bug is not resolved, it will affect [□ only one in a billion patients / □ ninety-nine percent of all patients] that are treated with the radiation machine.' Three subjects who failed their manipulation checks were removed from the data pool.

Figure 2.3 provides summary statistics for the perceived impact (IMP) and willingness to report (WTR) by each treatment condition manipulated with type and scope of impact.

Scope of Impact	Bodily Harm	Financial Loss
High	N = 37 Mean (S.D.) IMP 6.28 (0.98) WTR 6.26 (0.77)	N = 38 Mean (S.D.) IMP 6.10 (0.88) WTR 5.89 (1.18)
Low	N = 44 Mean (S.D.) IMP 3.96 (1.59) WTR 5.14 (1.62)	N = 36 Mean (S.D.) IMP 3.95 (1.52) WTR 4.71 (1.84)

Type of Impact

Figure 2.3 Perceived Impact and Willingness to Report by Treatment Condition

2.5.2 Partial Least Squares Analysis

Partial Least Squares[2] (PLS) analysis was used for measurement validation and for evaluating the hypothesized paths in the research model. PLS analysis was considered appropriate for this study because it places minimal demands on sample size, measurement scales, and distributional assumptions (Chin 1998; Fornell and Bookstein 1982) and because it has been used in previous studies involving the reporting behavior in troubled software projects (Keil et al. 2004; Park et al. 2006; Smith et al. 2001). The measurement model must be established by examining the psychometric properties of the measures before testing the structural model. A measurement model links each construct with a set of indicators measuring that construct while a structural model represents a network of causal relationships linking multiple constructs.

2.5.3 Measurement Model

Since our research model included both reflective and formative constructs, this influenced the manner in which construct validity was assessed, particularly with respect to

[2] PLS Graph version 3.0

convergent validity. As an example of this, traditional approaches for assessing construct reliability cannot be meaningfully applied to formative constructs as there is no assumption that formative indicators will covary.

2.5.3.1 Formative Constructs

For the two formative constructs, i.e., morality and willingness to communicate, we examined multicollinearity. Multicollinearity is not desirable in formative constructs because it can lead to inflated standard errors and thus can have an adverse effect on measurement reliability. As a general rule, a variance inflation factor (VIF) value above 10 indicates serious multicollinearity (Duman et al. 2006). Recent guidelines suggest that VIF values for formative measures greater than 3.3 may cause multicollinearity problems (Diamantopoulos and Siguaw 2006; Petter et al. 2007). The VIF values in Table 2.1 are all much less than 10, but a few of the WTC items exceed the 3.3 threshold. Based on this analysis, there is minimal risk of multicollinearity and all WTC items were retained to preserve content validity.

Table 2.1 Variance Inflation Factor for Formative Constructs

Construct	Items	Variance Inflation Factor (VIF)	Construct	Items	Variance Inflation Factor (VIF)
Willingness to Communicate	WTC1	2.006	Morality	MOR1	1.512
	WTC2	3.169		MOR2	1.646
	WTC3	3.397		MOR3	1.577
	WTC4	2.541		MOR4	2.341
	WTC5	3.626		MOR5	1.661
	WTC6	5.267		MOR6	1.803
	WTC7	2.742		MOR7	1.498
	WTC8	3.539		MOR8	1.394
	WTC9	5.598		MOR9	1.523
	WTC10	2.279		MOR10	1.783
	WTC11	2.733		MOR11	1.730
	WTC12	3.076		MOR12	1.806

2.5.3.2 Convergent Validity

To evaluate convergent validity of reflective constructs in the model, we first examined standardized loadings. The standardized loadings should be greater than 0.707 to meet the condition that the shared variance between each item and its associated construct exceed the error variance. Loadings of 0.5 or 0.6 may still be acceptable if other indicators within the same block of measures have high loadings (Chin 1998). As seen in Table 2.2, all the loadings were 0.723 or higher. Therefore, we retained all the indicators for subsequent analysis.

In order to evaluate the internal consistency for each block of measures, we examined Cronbach's alpha, composite reliability, and average variance extracted. While the threshold values for Cronbach's alpha and composite reliability are not absolute, it is suggested that 0.70 indicates extensive evidence of reliability and 0.80 or higher provides exemplary evidence (Bearden et al. 1993; Yi and Davis 2003). As shown in Table 2.2, all of the constructs in the measurement model exhibited Cronbach's alpha of 0.77 or higher, and composite reliability of 0.87 or higher. As another measure of construct validity, Fornell and Larcker (1981) suggest average variance extracted (AVE). AVE measures the amount of variance that a latent construct captures from its indicators relative to the amount of variance from measurement error, and therefore is only applicable to reflective constructs (Chin 1998, p. 321). The acceptable level for AVE is 0.5 or higher, meaning that 50 percent or more variance of the indicators is accounted for (Chin 1998). As seen in Table 2.2, all the AVEs are above the threshold of 0.5. Thus, our evaluations of Cronbach's alpha, composite reliability, and AVE indicate that the construct reliability of all the reflective constructs' items has been established satisfactorily.

Table 2.2 Item Loadings and Construct Reliability

Construct	Item	Standardized Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Perceived Impact	IMP1	0.912	0.833	0.899	0.749
	IMP2	0.903			
	IMP3	0.775			
Assessment - Status Ought to Be Reported	OTR1	0.900	0.770	0.870	0.693
	OTR2	0.723			
	OTR3	0.865			
Assessment - Personal Responsibility to Report	RSR1	0.911	0.810	0.888	0.728
	RSR2	0.743			
	RSR3	0.896			
Willingness to Report	WTR1	0.929	0.913	0.945	0.851
	WTR2	0.936			
	WTR3	0.903			

2.5.3.3 Discriminant Validity

We conducted two tests for discriminant validity. First, each indicator's loading on its own construct and its cross-loading on all other constructs were calculated (Chin 1998). Table 2.3 shows that the loadings for the intended indicators for each construct are higher than the cross-loadings for indicators from other constructs. Moreover, each indicator has a higher loading with its intended construct than a cross-loading with any other construct.

Table 2.3 Item to Own Construct Correlation versus Correlations with Other Constructs

Construct	Item	1	2	3	4	5	6
1. Perceived Impact (IMP)	IMP1	**0.906**	0.377	0.298	0.485	0.052	0.082
	IMP2	**0.902**	0.418	0.323	0.470	0.065	0.123
	IMP3	**0.782**	0.469	0.381	0.538	0.189	0.102
2. Assessment - Status Ought to Be Reported (OTR)	OTR1	0.408	**0.875**	0.603	0.539	0.284	0.129
	OTR2	0.342	**0.776**	0.457	0.421	0.214	0.187
	OTR3	0.460	**0.839**	0.578	0.652	0.219	0.117
3. Assessment - Personal Responsibility to Report (RSR)	RSR1	0.397	0.719	**0.874**	0.642	0.305	0.076
	RSR2	0.215	0.437	**0.807**	0.433	0.313	0.083
	RSR3	0.380	0.537	**0.877**	0.650	0.348	0.086
4. Willingness to Report (WTR)	WTR1	0.525	0.613	0.642	**0.931**	0.174	0.152
	WTR2	0.563	0.587	0.612	**0.935**	0.222	0.107
	WTR3	0.500	0.586	0.602	**0.902**	0.281	0.074
5. Morality (MOR)	MOR1	0.100	0.163	0.278	0.220	**0.556**	-0.014
	MOR2	0.206	0.209	0.227	0.164	**0.516**	0.010
	MOR3	0.133	0.154	0.170	0.034	**0.479**	0.095
	MOR4	0.241	0.352	0.343	0.293	**0.702**	0.101
	MOR5	0.041	0.126	0.240	0.125	**0.600**	0.020
	MOR6	0.190	0.323	0.417	0.328	**0.679**	0.040
	MOR7	-0.068	0.103	0.116	0.069	**0.489**	0.134
	MOR8	-0.035	0.105	0.084	0.013	**0.530**	0.140
	MOR9	0.071	0.163	0.218	0.129	**0.631**	0.069
	MOR10	0.018	0.130	0.177	0.120	**0.649**	0.057
	MOR11	-0.009	0.199	0.240	0.113	**0.642**	0.139
	MOR12	0.037	0.082	0.227	0.150	**0.655**	0.050
6. Willingness to Communicate (WTC)	WTC1	-0.043	0.092	0.087	0.043	0.146	**0.627**
	WTC2	0.149	0.128	0.025	0.083	0.053	**0.788**
	WTC3	0.108	0.164	0.157	0.130	0.139	**0.791**
	WTC4	0.066	0.037	-0.081	-0.001	-0.007	**0.762**
	WTC5	0.160	0.089	0.104	0.083	0.139	**0.742**
	WTC6	0.111	0.206	0.107	0.126	0.068	**0.878**
	WTC7	0.158	0.163	0.126	0.177	0.045	**0.762**
	WTC8	0.065	0.109	0.027	0.033	0.116	**0.807**
	WTC9	0.136	0.197	0.091	0.125	0.084	**0.867**
	WTC10	0.050	0.125	0.085	0.079	0.069	**0.663**
	WTC11	0.078	0.157	0.098	0.170	0.123	**0.698**
	WTC12	0.065	0.156	0.060	0.075	0.130	**0.793**

Second, we compared AVE for each reflective construct with the shared variance between all possible pairs of reflective constructs (Fornell and Larcker 1981). Morality and willingness to communicate have been excluded in this analysis because AVE is not applicable for formative constructs (Chin 1998). Table 2.4 shows that AVE for each construct is higher than the squared correlation between the construct pairs, which indicates that more variance is shared between the latent construct and its block of indicators than with another construct representing a different block of indicators. Thus, it also establishes discriminant validity among the reflective constructs.

Table 2.4 AVEs versus Squares of Correlations between Constructs

Construct	Average Variance Extracted (AVE)	IMP	OTR	RSR	WTR
IMP	0.749	-			
OTR	0.693	0.235	-		
RSR	0.728	0.158	0.464	-	
WTR	0.851	0.327	0.425	0.470	-

2.5.4 Structural Model

The structural model was assessed by examining path coefficients and their significance levels. The explanatory power of a structural model can be evaluated by examining the R^2 value of the final dependent construct. The final dependent construct, willingness to report bad news, had an R^2 value of 0.51, indicating that the research model accounts for 51% of the variance in the dependent variable. It is also instructive to examine the R^2 values for the intermediate variables in the structural model. The R^2 value for "personal responsibility to report", "status ought to be reported", and "perceived impact" were 0.50, 0.35, and 0.44 respectively. It is apparent that the R^2 values are sufficiently high to make interpretation of the path coefficients meaningful. In particular, 51% of the variance explained in the final dependent variable stands as

compelling evidence of the research model's explanatory power, and is comparable to results obtained in prior studies that have examined other factors that influence bad news reporting. For example, Smith et al. (2001) reported an R^2 of 24% for a model that investigated the effects of perceived wrongdoing and perceived project risk, Keil et al. (2004) reported an R^2 of 38% for a model that investigated the effects of perceived information asymmetry and perceived organizational climate, and Park et al. (2006) reported an R^2 of 32% for a model that investigated the effects of time pressure and face saving.

We computed path coefficients in the structural model with the entire sample, and employed the bootstrapping method (with 500 resamples) to obtain the t-values corresponding to each path (see Figure 2.4). The acceptable t-values for two-tailed tests are 1.96 and 2.58 at the significance levels of 0.05 and 0.01. The assessment of whether the status ought to be reported had a direct positive effect on the assessment of personal responsibility to report, supporting H1 ($\beta = 0.58$, $p < 0.01$). The assessment of personal responsibility to report had a direct positive effect on the willingness to report bad news, which means that subjects were more willing to report when they perceived themselves to be personally responsible for reporting the bad news. Thus, H2 was supported ($\beta = 0.57$, $p < 0.01$). Perceived impact had a direct positive effect on the assessment of whether the status ought to be reported ($\beta = 0.38$, $p < 0.01$), thus supporting H3. Type of impact did not have a significant effect on perceived impact ($\beta = 0.03$, n.s.), and therefore H4 was not supported. Scope of impact, however, did have a positive effect on perceived impact ($\beta = 0.66$, $p < 0.01$), thus supporting H5. Morality had positive effects on the assessment of whether the status ought to be reported ($\beta = 0.35$, $p < 0.01$), the assessment of personal responsibility to report ($\beta = 0.23$, $p < 0.05$), and the willingness to report bad news ($\beta =$

0.15, p < 0.05), thus supporting H6a, H6b, and H6c. Willingness to communicate did not significantly affect willingness to report (β = 0.15, n.s.). Thus, H7 was not supported.

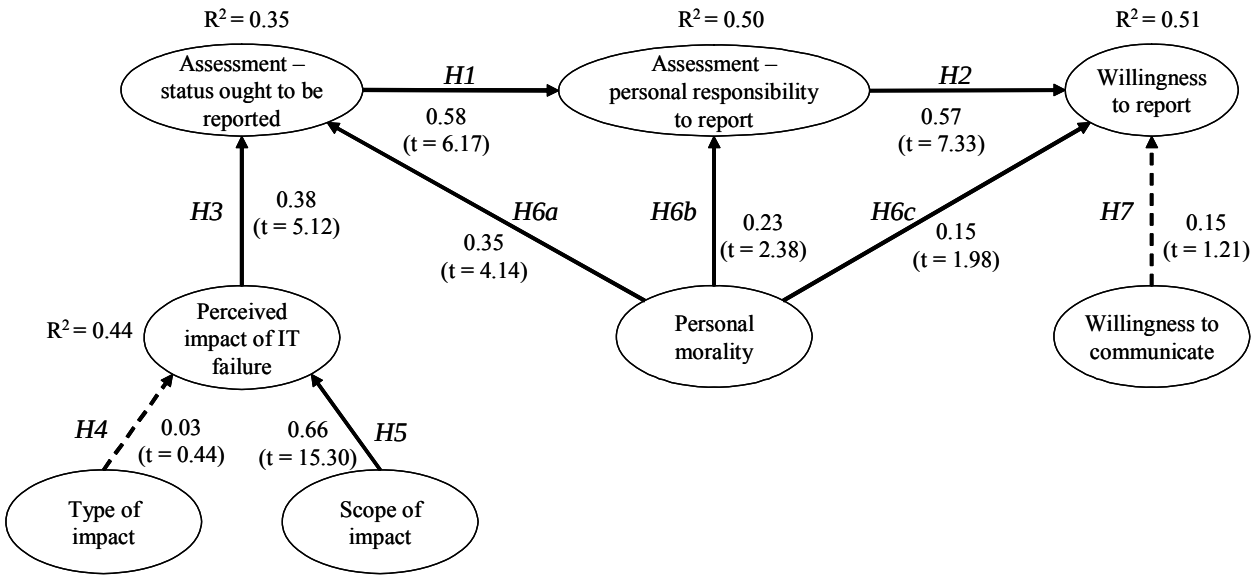


Figure 2.4 Structural Model

2.5.5 Safeguarding Against and Assessing Common Method Bias

In order to examine the existence of common method bias, we conducted two different tests. One is Harmon's single-factor analysis (Podsakoff et al. 2003). We loaded all items used to measure both independent and dependent variables into a single exploratory factor analysis. The analysis produced eight factors with eigenvalues higher than 1. Taken together, these factors explained 69.4% of the variance of the data, with the first extracted factor accounting for 23.5% of the variance in the data. Given that more than one factor was extracted from the analysis and the first factor was accountable for much less than 50% of the variance, common method bias is unlikely to be a significant issue with the collected data. The other is a latent variable approach of adding a first-order factor with all of the measures in the theoretical model as indicators (Podsakoff et al. 2003). A common method factor was therefore added in the research model

(Liang et al. 2007) and the results demonstrate that the average substantively explained variance of the indicators is 0.567, whereas the average method-based variance is 0.008. The ratio of substantive variance to method variance is 71:1. Moreover, most method factor loadings are not significant. Thus, common method bias is unlikely to be a serious concern in this study.

2.6 Discussion and Implications

This study demonstrates that both personal and situational factors can have significant effects on an individual's bad news reporting behavior. Perceived impact as a situational factor affects an individual's willingness to report indirectly through the assessment of whether the status ought to be reported. Two predictors of perceived impact (type of impact and scope of impact) were operationalized and tested. Type of impact (bodily harm versus financial loss) did not affect perceived impact, whereas scope of impact did affect perceived impact.

Morality as a personal factor was found to affect an individual's three decision steps specified in the basic whistle-blowing model: the assessment of whether the project status ought to be reported, the assessment of personal responsibility to report the status of the troubled software project, and the willingness to report the bad news about the project. Our results are consistent with the theoretical arguments of Miceli and Near (1992) and empirically confirm that personal factors such as morality can affect an individual's bad news reporting.

Unlike morality, willingness to communicate as a personal factor did not appear to have any direct effect on an individual's willingness to report. This finding is of interest because it suggests that willingness to report bad news may be influenced to a greater degree by psychological features of personality (e.g., morality) than behavioral features of personality (e.g., willingness to communicate).

2.6.1 Limitations of the Study

While laboratory experimentation provides a highly controlled environment for hypothesis testing, it does pose some methodological limitations. First, our experiment is based on role-playing scenarios to represent a real world context. While we tried to be as realistic as possible in creating the scenarios, we also sought to control extraneous sources of variance and provided only the essential information needed for role-playing and decision-making. Clearly, there are other organizational and political factors that may also influence an individual's willingness to report bad news. Those factors have not been examined in this study and may not lend themselves to our experiment. Second, the decision choice presented to the subjects in our experiment represents a necessarily simplified view of the options available to one who is faced with the decision of whether and how to report a troubled IT project's status. In this study, we framed the situation as a choice of whether or not to report the project status to his or her boss. Clearly, individuals can make other choices in responding to such a situation, such as informing another team member who may be responsible for the bug or deciding to report through some other channel. Third, we have measured a subject's self-reported behavioral intention rather than actual behavior. There is no guarantee that subjects would actually behave as they have indicated. Despite these limitations, the strong relationships among the constructs in the research model and its explanatory power shed significant light on the important factors that can influence the reporting behavior. Thus, we believe that our study represents a significant contribution to our understanding of this phenomenon.

2.6.2 Research Contributions

Our study contributes to research in several ways. First, we empirically re-confirmed strong and significant relationships among willingness to report and its antecedents in the basic

decision model derived from whistle-blowing theory. In particular, our results show greater explanatory power ($R^2 = 0.51$) of the final dependent variable (i.e., willingness to report) in the basic whistle-blowing model than previous studies.

Another significant contribution is the extension of the basic reporting model through the introduction and testing of two personal factors derived from the psychology and communication literature – morality and willingness to communicate. Personal factors have not been studied previously in the context of bad news reporting, and this is the first study including and testing personal factors. In addition, one of the two personal factors tested (i.e., morality) had significant direct and indirect effects on the willingness to report bad news about the project, thus supporting Miceli and Near's (1992) theoretical arguments. Clearly, incorporating the personal factors allowed us to construct a richer model of bad news reporting, and will provide a solid foundation for future research.

Finally, this study confirms the effect of perceived impact of IT failure on an individual's reporting behavior that was suggested by Smith and Keil (2003). While Smith et al. (2001) have tested how an individual's perception of project failure impact on his/her company's financial position affects his or her reporting behavior, an individual's perception of IT failure impact on the public has not been previously hypothesized and tested in the context of bad news reporting. In addition, we statistically tested the relationship between bodily harm and perceived impact which has not been operationalized before even though literature in management and law asserted the relationship.

2.6.3 Directions for Future Research

Although our study confirms the effect of morality as a personal factor for the first time, there may be other personal factors that can also affect an individual's reporting behavior. For

example, Smith et al. (2001) have suggested propensity for ethical reasoning and locus of control as interesting personal factors, but they have not been tested yet. In addition, while this study focused on personal morality in general, future research can investigate more business-related morality such as business ethics specific to the IT project context. Theoretically identifying and empirically testing these personal factors represents a worthwhile goal for future research and may allow further extension of the basic whistle-blowing model in the context of IT project management.

Another avenue for future research would be considering organizational factors as an extension of bad news reporting research. While prior research has mainly identified and tested situational factors and this study has investigated personal factors, organizational factors have received little research attention in the context of bad news reporting. One recent study has tested the organizational culture conducive (or not conducive) to reporting as an organizational factor and found this to have a significant effect on the assessment of personal responsibility to report (Keil et al. 2004). However, there has been no empirical work to examine the organizational culture's interaction with the first antecedent (i.e., assessment of whether the status ought to be reported) and the ultimate dependent variable (i.e., willingness to report) in the basic decision model. Moreover, there has been no investigation of specific organizational features or managerial practices affecting the organizational culture. We believe that these specific antecedents to the organizational culture represent promising avenues for future research.

Further, Smith and Keil (2003) proposed that the nature of the relationship between the bad news reporter and those affected by the impact(s) associated with failure could be an important predictor of perceived impact. For example, when loved one could get hurt in a certain

situation, individuals would presumably perceive more impact. Further research is needed to empirically examine the proposed relationship.

2.6.4 Implications for Practice

This study has several important implications for practice. First, perceived impact does appear to have a significant effect on willingness to report. Managers may be able to take advantage of the fact that individuals are more willing to report bad news when perceived impact of the failure is high. Specifically, managers can encourage their employees to report potential issues and problems by stressing the huge consequences (both inside and outside the organization) that can result from the IT project failure. In communicating with employees, managers should emphasize that in the long run, reporting that is honest and forthcoming is the best way to minimize or contain the impact associated with failure. It is almost always easier and less expensive to deal with a problem while it is small and while there is still time for corrective action to be taken before the magnitude of the impact becomes larger.

The second implication for practice relates to the observed direct and indirect effects of personal morality on decision-making (i.e., willingness to report). This becomes meaningful in the organizational context, because it suggests that managers can motivate individuals' willingness to report by educating employees in business ethics (i.e., moral beliefs and rules about right and wrong behaviors in business organizations and settings).

Finally, our results suggest that the communication of bad news in project settings is not a function of an individual's general willingness to communicate. This would seem to suggest that garrulous employees will be no more willing to communicate bad news than shy, reticent employees. Thus, managers would be ill-advised to embark on a strategy of promoting bad news reporting by seeking to recruit employees on the basis of their willingness to communicate.

Appendix 2A. Experimental Scenario and Instructions

INSTRUCTIONS: The business case that follows is part of a study that examines business decision-making. Please take a few minutes to read over the case and to answer the questionnaire that follows. There are no right or wrong answers.

Radiation Treatment Incorporated

You work for Radiation Treatment Incorporated, a company that specializes in machines that deliver prescribed doses of radiation to treat cancer patients. At the heart of the machine is a specialized software program that controls the intensity and targeting of an external radiation beam for treating cancer tumors.

For the past year, you have been working on an exciting new project, CAPS – which involves writing a new software program that promises to improve the targeting of the radiation so that there are fewer side effects to surrounding tissues in the body. Next week the new software will be installed in thousands of hospitals and treatment centers around the world.

Today, you discovered a serious bug in the software which could result in lethal doses of radiation for **ninety-nine percent of all patients** that are treated. If a patient should receive a lethal dose of radiation from the machine, s/he will **almost certainly die.** The scope of the impact would be extremely high (ninety-nine percent of all patients that are treated would be affected), but you would face no personal liability. The bug you discovered has nothing to do with your work on the project. Moreover, your company would remain financially sound.

At this point, you are now wondering whether or not you should report what you found to your boss. From past experience you know your boss does not like to hear about possible bugs or anything else that can delay a project. On multiple occasions you have observed situations in which employees at your company have been fired for reporting such news. If you remain silent, no one but you will ever know that you discovered a possible bug.

The above scenario represents the treatment used to manipulate bodily harm as type of impact and high scope of impact. The treatment for low scope of impact is identical except for the third paragraph, which the following paragraph is substitute for:

Today, you discovered a serious bug in the software which could result in lethal doses of radiation for **only one in a billion patients** that are treated. If a patient should receive a lethal dose of radiation from the machine, s/he will **almost certainly die.** The scope of the impact would be extremely low (only one in a billion patients that are treated would be affected), and you would face no personal liability. The bug you discovered has nothing to do with your work on the project. Moreover, your company would remain financially sound.

INSTRUCTIONS: The business case that follows is part of a study that examines business decision-making. Please take a few minutes to read over the case and to answer the questionnaire that follows. There are no right or wrong answers.

Wealth Management Incorporated

You work for Wealth Management Incorporated, a company that specializes in systems that manage all of the assets for individual investors. At the heart of the system is a specialized software program that controls the risk level of the investment portfolio using sophisticated math modeling.

For the past year, you have been working on an exciting new project, CAPS – which involves writing a new web-based software program that is designed to automatically invest all of a client's assets so as to maximize returns while minimizing risk. Next week the new software will be made available to thousands of clients around the world.

Today, you discovered a serious bug in the software which could place all of a client's wealth in penny stocks. These penny stocks are very high risk stocks trading at less than $1/share. Holding these stocks will result in catastrophic financial losses for **ninety-nine percent of all clients** that use the system. If a client should experience a catastrophic financial loss, s/he will **almost certainly be financially bankrupt.** The scope of the impact would be extremely high (ninety-nine percent of all clients that use the system would be affected), but you would face no personal liability. The bug you discovered has nothing to do with your work on the project. Moreover, your company would remain financially sound.

At this point, you are now wondering whether or not you should report what you found to your boss. From past experience you know your boss does not like to hear about possible bugs or anything else that can delay a project. On multiple occasions you have observed situations in which employees at your company have been fired for reporting such news. If you remain silent, no one but you will ever know that you discovered a possible bug.

The above scenario represents the treatment used to manipulate financial loss as type of impact and high scope of impact. The treatment for low scope of impact is identical except for the third paragraph, which the following paragraph is substitute for:

Today, you discovered a serious bug in the software which could place all of a client's wealth in penny stocks. These penny stocks are very high risk stocks trading at less than $1/share. Holding these stocks will result in catastrophic financial losses for **only one in a billion clients** that use the system. If a client should experience a catastrophic financial loss, s/he will **almost certainly be financially bankrupt**. The scope of the impact would be extremely low (only one in a billion clients that use the system would be affected), and you would face no personal liability. The bug you discovered has nothing to do with your work on the project. Moreover, your company would remain financially sound.

Appendix 2B. Constructs, Measures, and Descriptive Statistics

Willingness to Report Bad News

Variable	Mean	s.d.	Item Wording (1 = very unlikely; 7 = very likely)
WTR1	5.55	1.73	Please indicate your willingness to **IMMEDIATELY** (i.e., RIGHT NOW) report the bad news to your boss.
WTR2	5.37	1.62	At this time, how likely are you to go directly to your boss by yourself to report the bad news concerning the project's status?
WTR3 (reversed)	5.56	1.62	Please indicate how likely it is that you would avoid telling your boss the bad news.

Assessment of Responsibility to Report

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
RSR1	5.87	1.32	I believe that I have a personal responsibility to make more information about the status of the CAPS project known to my boss.
RSR2 (reversed)	5.71	1.49	I believe that it is not my responsibility to make more information about the status of the CAPS project known to my boss.
RSR3	5.52	1.45	I believe that it is my personal duty to tell my boss about the project's status.

Assessment of Whether Something Ought to Be Reported

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
OTR1	6.03	1.20	I believe that something should be done to make more information about the status of the CAPS project known to my boss.
OTR2 (reversed)	5.80	1.36	I don't believe that it really matters whether more information about the status of the CAPS project is made known to my boss.
OTR3	6.12	1.28	Even if it is not me, I believe someone should tell my boss about the status of the CAPS project.

Perceived Impact

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
IMP1	5.10	1.96	I believe the degree of impact to the public that could result from the bug is very high.
IMP2	4.68	2.08	I believe that there will be wide spread harm to the public if the bug is not corrected.
IMP3 (reversed)	5.32	1.86	I believe that, even if the bug is not resolved, the risk to the public is acceptable.

Morality

Variable	Mean	s.d.	Item Wording (1 = very inaccurate; 7 = very accurate)
MOR1	5.92	1.38	I would never cheat on my taxes.
MOR2	6.24	0.82	I respect the privacy of others.
MOR3	6.37	0.77	I like harmony in my life.
MOR4	6.06	0.95	I try to follow the rules.
MOR5	5.96	0.92	I respect authority.
MOR6 (reversed)	5.86	1.21	I don't care about rules.
MOR7 (reversed)	6.29	1.07	I turn my back on others.
MOR8 (reversed)	5.57	1.48	I only talk about my own interests.
MOR9 (reversed)	5.08	1.48	I overestimate my achievements.
MOR10 (reversed)	6.10	1.16	I scheme against others.
MOR11 (reversed)	5.88	1.23	I act at the expense of others.
MOR12 (reversed)	5.59	1.33	I break rules.

Willingness to Communicate

Variable	Mean	s.d.	Item Wording (1 = very unlikely; 7 = very likely)
WTC1	3.75	1.80	Present a talk to a group of strangers.
WTC2	5.09	1.72	Talk with an acquaintance while standing in line.
WTC3	5.39	1.78	Talk in a large meeting of friends.
WTC4	4.07	1.75	Talk in a small group of strangers.
WTC5	5.96	1.55	Talk with a friend while standing in line.
WTC6	5.02	1.81	Talk in a large meeting of acquaintances.
WTC7	3.96	1.85	Talk with a stranger while standing in line.
WTC8	5.38	1.68	Present a talk to a group of friends.
WTC9	5.24	1.60	Talk in a small group of acquaintances.
WTC10	3.39	1.87	Talk in a large meeting of strangers.
WTC11	6.00	1.30	Talk in a small group of friends.
WTC12	4.87	1.71	Present a talk to a group of acquaintances.

Construct Correlation Table

	WTR	RSR	OTR	IMP	MOR	WTC
WTR	1					
RSR	0.671**	1				
OTR	0.646**	0.656**	1			
IMP	0.573**	0.384**	0.486**	1		
MOR	0.244**	0.379**	0.287**	0.115	1	
WTC	0.121	0.096	0.176**	0.119	0.119	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Chapter 3

Overcoming the MUM Effect in IT Project Reporting: Impacts of Fault Responsibility and Time Urgency[3]

Abstract

Troubled projects are a common problem in the information systems field. While there is a natural reluctance to report the actual status of a troubled project, doing so is sometimes the only way that the project can be brought to senior management's attention so that corrective actions can be taken to successfully turn the project around if possible, or abandon it if necessary. In this paper we draw upon the basic whistle-blowing model adapted from Dozier and Miceli (1985) to examine the effect that fault responsibility has on an individual's assessment of whether a troubled project's status ought to be reported and on that individual's willingness to report. We also examine the effect that time urgency has on an individual's assessments of whether a troubled project's status ought to be reported and whether that individual has personal responsibility to report the project's status. Based on the results of a controlled laboratory experiment, we confirmed the basic whistle-blowing model and found that both fault responsibility and time urgency are important factors affecting an individual's willingness to report bad news. Fault responsibility exerts both direct and indirect influence on willingness to report bad news, while time urgency was found only to exert an indirect influence on willingness to report bad news. The implications of these findings and directions for future research are discussed.

Keywords: Project management, whistle-blowing, MUM effect, fault responsibility, time urgency

[3] Park, C., Im, G., and Keil, M. "Overcoming the MUM Effect in IT Project Reporting: Impacts of Fault Responsibility and Time Urgency," Working paper, Department of Computer Information Systems, Georgia State University, 2006.

3.1 Introduction

Project failure is a serious problem in the information systems field. The MUM effect (O'Neal et al. 1979)—or the reluctance of people to report unpleasant messages—has been recognized as a factor that may contribute to software project failure (Tan et al. 2003). If bad news about a project's status is withheld from senior management, troubled projects can escalate and become runaway software projects. Conversely, if the status of a troubled project is reported to senior management, there is a chance that corrective actions can be immediately taken to successfully turn the project around, or terminate it if necessary, before further resources are squandered.

Prior research suggests that evidence of impending failure may be apparent to those who are closely involved in a software project, yet this information sometimes fails to be communicated up the hierarchy (Keil and Robey 1999) or, if communicated, is substantially distorted in the process (Snow and Keil 2002). One study reported that even information systems auditors—who are role prescribed to serve as watchdogs—are often reluctant to report bad news about project status due to personal and organizational factors (Keil and Robey 2001).

In this paper, we examine the MUM effect in a software development project context by conducting a role-playing experiment focusing on two factors that have not been previously investigated but which are hypothesized to influence the willingness to report bad news about project status: (1) fault responsibility, and (2) time urgency.

In today's software development environment, companies are increasingly relying on external vendors for their software development. When such projects go awry, the vendor is often at fault and becomes a ready target for blame (Bulkeley 1996; Stein 1998). While prior research investigated the effect of a blame-shifting opportunity on IT project status reporting

(Keil et al. 2007), fault responsibility was neither clearly manipulated nor empirically tested. In this paper, we directly manipulate fault responsibility so that we can examine its effect on IT project status reporting within the rubric of the whistle-blowing model.

Time urgency is a well-known factor that influences human behaviors including decision-making (Waller et al. 2001). While Smith and Keil (2003) theorized that time pressure might affect an individual's bad news reporting, this has not been empirically investigated. In this research, we examine time urgency as a surrogate for time pressure in the bad news reporting context.

Both fault responsibility and time urgency have become particularly relevant in today's software development environment that emphasizes rapid application development and increasing reliance on third parties (e.g., outsourcing partners) to create key software components (or entire systems) rather than developing them in-house. This study represents the first time that these two factors have been empirically investigated using a theoretically grounded model.

3.2 Theoretical Background

The theoretical framework for this study comes from whistle-blowing (Miceli and Near 1992) which holds that individuals undertake a predictable series of assessments in deciding whether or not to report (see Figure 3.1). Dozier and Miceli (1985) argued that once an individual is aware of a problem, he or she first decides whether or not the bad news ought to be reported, then considers whether he or she is responsible for taking action, which in turn influences his or her willingness to report. IS researchers have adopted this central model as a general outline of individual decision-making regarding bad news reporting (Keil et al. 2004;

Smith and Keil 2003; Smith et al. 2001). We also adopt the central model as a building block for developing an expanded model in two areas: fault responsibility and time urgency.

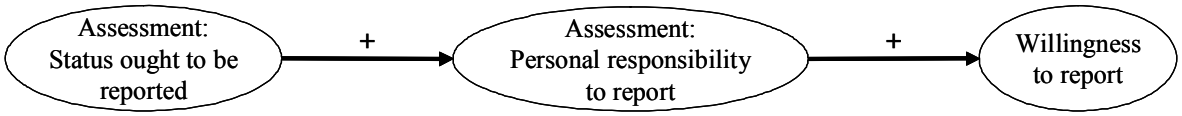


Figure 3.1 Basic Whistle-Blowing Model adapted from Dozier and Miceli (1985)

3.2.1 Attributions and Behavior

An attribution is an expression of the way people think about the relationship between a cause and an outcome (Munton et al. 1999). People make attributions about their own and others' behaviors, about incidents, and about anything that requires a causal explanation. Attribution theory, which is about how people make causal explanations, introduces two types of attribution: internal and external (Munton et al. 1999). While an external attribution assigns causality to situational factors or outside agents, an internal attribution assigns causality to factors within the person.

Relationships between attributions and individual behaviors have been discussed in the attribution literature (Eiser 1983). For example, Fincham (1983) has applied attribution theory to clinical psychology and suggested from the analysis of multiple clinical cases that attributions affect individual behavior. Attribution theory has also been used to explain the effects of attributions on individuals' behaviors in a variety of other contexts such as health (King 1983), job search, and relationship marketing (Munton et al. 1999). Shultz and Schleifer (1983) suggest that responsibility (i.e., who is responsible for the problem) is a central factor in the attribution process. Since attributions affect behavior, it is reasonable to assume that fault responsibility may affect an individual's reporting behavior.

3.2.2 Time and Behavior

Urgency comes from the Latin word, *urgentia*, meaning pressure (Price 1982). Time pressure is regarded as externally imposed urgency to accomplish a task (Staudenmayer et al. 2002). Time pressure, in the form of tight time constraints, can induce an individual to perceive a situation as being time-urgent.

A time constraint exists when there is a time deadline. Time urgency indicates that the time constraint induces some feeling of stress and creates a need to act within the limited time frame (Ordonez and Benson 1997). Time urgency has been shown to be a factor that can influence an individual's decision-making (Bronner 1982). Waller and her colleague (2001) propose that individual perceptions of a time urgent situation affect individual behaviors. In addition, Smith and Keil (2003) have suggested theoretically that time urgency may affect an individual's reporting behavior in the software project context. While prior IS research has empirically tested the basic whistle-blowing model in the context of such factors as risk, level of behavioral immorality (Smith et al. 2001), and information asymmetry (Keil et al. 2004), there has not been any empirical investigation of how time urgency fits within the rubric of the model.

In this paper, we use the basic whistle-blowing model as a foundation upon which to build a richer model that incorporates fault responsibility and time urgency. In the next section, we describe our research model and hypotheses, which is followed by a discussion of our methodology and results.

3.3 Research Model

Numerous factors have been identified in the literature as having the potential to affect an individual's willingness to report bad news on a troubled software project (Smith and Keil 2003). Since it would appear impossible for any one study to test all of these factors, the approach that

has been taken to date involves testing a small number of factors at a time and seeing how they relate to the constructs in the basic whistle-blowing model. In this study, we follow this approach, having selected two such factors that we believe to be important, but which have yet to be empirically tested in the context of the basic whistle-blowing model. We explicitly state six hypotheses corresponding to the six paths in the research model, as depicted in Figure 3.2.

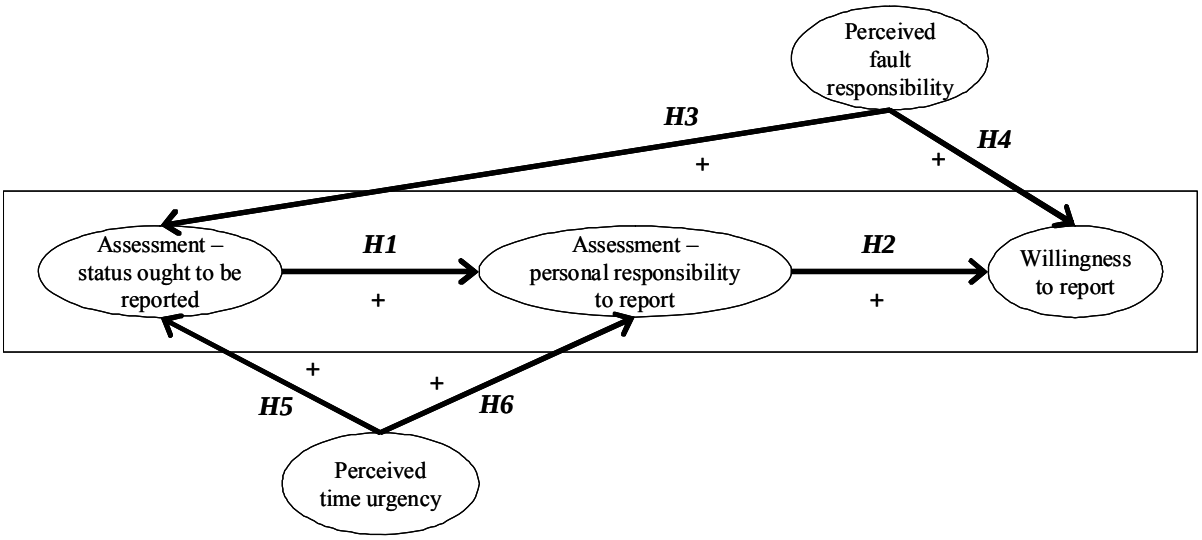


Figure 3.2 Research Model

3.3.1 Central Decision-Making Model

The middle row of Figure 3.2 (in the box) represents the central decision-making model grounded in the whistle-blowing literature. As for the whistle-blowing model, we adopt two hypotheses that were shown to hold in recent research (Keil et al. 2004), and retest them here as a replication.

Although the whistle-blowing literature posits that the individual will make two distinct assessments of whether the bad news ought to be reported and the personal responsibility to report the bad news (Dozier and Miceli 1985), the two are inherently related. Other things being

equal, an individual's stronger assessment that status information ought to be reported will be reflected in a stronger feeling of personal responsibility for reporting. Hence, the following hypothesis:

Hypothesis 1. A stronger assessment that information ought to be communicated will be reflected in a higher assessed level of personal responsibility for reporting.

Following the line of argument from the whistle-blowing literature (Miceli and Near 1992) and some empirical support from the IS literature (Keil et al. 2004; Smith et al. 2001), there should be a direct effect between personal responsibility and willingness to report bad news. Hence, the following hypothesis:

Hypothesis 2. Higher levels of assessed personal responsibility will be associated with greater willingness to report bad news.

We now turn to the two additional factors that influence the central model.

3.3.2 Influencing Factors

Prior research has noted that the inclusion of other factors could strengthen the studies on explaining the variance in reporting behavior (Tan et al. 2003). Thus it is necessary for researchers to identify and test other factors that may influence bad news reporting. In this research, we focus on two such factors that have been proposed in the literature but which have not been empirically tested to determine their respective impact on bad news reporting: fault responsibility and time urgency.

3.3.2.1 Fault Responsibility

In this study, the presence of an "at fault" external vendor was hypothesized to affect bad news reporting because it provides a mechanism for causal attribution. Without an "at fault" external vendor, individuals may be reluctant to report bad news because of a fear of being held

responsible for having caused the problem and resulting bad consequences that would likely occur. Conversely, when there is an external vendor onto which responsibility can be assigned, individuals may be more willing to report bad news because they are less likely to face reprisals.

In establishing the theoretical linkage between fault responsibility and the decision of whether something ought to be reported, we draw upon the general risk literature which suggests that perceived risk is negatively associated with the level of control one has in a given situation (Koonce et al. 2005; March and Shapira 1987). In a troubled software project, individuals in the organization will feel less controllability for the project when the core modules of the project are managed by a vendor rather than when they are managed internally. This feeling of less controllability can be ascribed to restricted windows of observing emerging problems, limited knowledge of gauging solvability of emerged problems, and delayed manifestation of problems to individuals in the organization. Thus, individuals may feel that they may not able to address the problems effectively in a timely manner when the troubled modules are in the hands of a vendor, leading to a higher level of perceived risk (i.e., emergency or crisis). The cognitive literature echoes this argument by suggesting that controllability plays a primary role in shaping judgments of risk (Lerner and Keltner 2001; Slovic 1987).

This heightened feeling of emergency or crisis will lead to the assessment that negative information ought to be reported. The presence of an at-fault external vendor for attribution will make individuals feel less responsible for the problem, allowing them to assign the responsibility easily to the vendor. In this research, we seek to examine more specifically whether fault responsibility affects an individual's assessment that the status ought to be reported within the rubric of the basic whistle-blowing model derived from Dozier and Miceli (1985). Hence:

Hypothesis 3. When fault responsibility can be placed on an external vendor, individuals are more likely to assess that negative information ought to be reported.

In order to understand the effect of fault responsibility on an individual's reporting behavior, we turn to attribution theory which suggests that individuals are likely to engage in causal attribution processing when an event is associated with negative, unexpected, or important consequences (Weiner 1986). People often go beyond causal attribution, and make judgments regarding who should be held accountable for an event and assign responsibility to a blamed target (Fincham and Jaspars 1980; Jaspars et al. 1983). In a troubled software project involving an "at fault" vendor, responsibility for the problem is likely to be attributed to the vendor because there is a perception that the vendor should have been able to anticipate and correct the problem. For that reason alone, one might reasonably expect that when fault responsibility rests with the vendor, the individual will be more likely to report the problem.

Additionally, prior research shows that responsibility can affect an individual's information processing strategy (Tetlock 1983). For example, when people feel responsible for a problem, they are more likely to engage in effortful information processing to solve the problem (Janis and Mann 1977), whereas if they do not feel responsible they are likely to adopt a lazy information processing strategy (Chaiken 1980). This would suggest that when fault responsibility cannot be assigned to the vendor, individuals will resist reporting the bad news, instead choosing to delay reporting while they attempt to resolve the issue. Conversely, when fault responsibility rests with the vendor, individuals will be more likely to report because it requires no effort to do so.

The escalation literature (Staw 1976) provides additional support for the notion that individuals will be less likely to report bad news when they cannot avoid fault responsibility.

Specifically, escalation theory suggests that when an individual is responsible for a failing course of action, he or she will be more likely to commit further resources to that course of action. In the context of our research, this would imply that individuals will be less likely to report bad news when they have fault responsibility.

The whistle-blowing literature also suggests that fear of being held responsible can inhibit an individual's willingness to report bad news (Dozier and Miceli 1985). Therefore, when fault responsibility rests with the vendor, this should remove one of the major factors that inhibit bad news reporting. In such circumstances, individuals can freely report bad news without necessarily exposing themselves to the costs that would normally be associated with blowing the whistle, as they are unlikely to be held responsible for project failure or delay. Thus, we state the following hypothesis:

Hypothesis 4. When fault responsibility can be placed on an external vendor, individuals will be more willing to report bad news.

3.3.2.2 Time Urgency

Billings, Milburn, and Schaalman (1980) suggest that without a sense of time urgency "a problem will be left to the future" and that "The more distant a future negative consequence, the less negative it will seem. The full adverse impact of a negative outcome … is not perceived when it is believed to be far away". Thus, it is reasonable to expect that an individual is less likely to perceive that something ought to be reported in the absence of time urgency.

Based on the time urgency literature, Smith and Keil (2003) argue that when time urgency is perceived to be high, individuals may be more willing to report bad news than when time urgency is perceived to be low. While they also suggest theoretically that time urgency is directly associated with the assessment of whether the project status ought to be reported, there

has been no empirical research to substantiate this. Thus we propose to test the following hypothesis:

Hypothesis 5. When higher levels of time urgency are perceived, individuals are more likely to assess that the bad news concerning a project and its status ought to be reported.

Many studies in the psychology literature show that the Type A behavior pattern is associated with time urgency (Conte et al. 1995; Conte et al. 1998; Landy et al. 1991; Rastegary and Landy 1993). The Type A behavior pattern characterizes those individuals having a set of overt behaviors such as extremes of competitiveness, time urgency, easily aroused hostility, and hypervigilance (Friedman and Rosenman 1974), and it actually refers to a specific pattern of behaviors rather than the overall personality of an individual. Notably, some physical and social environmental conditions such as a time urgent situation may encourage or discourage the acquisition and maintenance of Type A behavior (Price 1982). In addition, Furnham, Hillard, and Brewin (1985) have investigated the relationship between the Type A behavior pattern and reaction to negative outcomes. Their findings suggest that individuals showing the Type A behavior pattern may be more likely to perceive that they have personal responsibility for the events that occur in their lives. Thus, the Type A behavior pattern literature suggests a possible association between time urgency and personal responsibility, at least for those individuals who exhibit Type A behavior.

There have also been a few studies in the time urgency literature that imply a relationship between time urgency and personal responsibility (Conte et al. 1995; Waller et al. 1999). Time urgent events in an organization may increase an individual's perception of time urgency and even encourage Type A behavior (Price 1982). An individual who is induced into this behavior pattern is more attentive to time and deadlines (Burnham et al. 1975; Yarnold and Grimm 1982).

Taken the above discussions together, it is reasonable to assume that when individuals in a troubled software project perceive higher levels of time urgency, they will be more likely to feel responsible for reporting the project's status in this context, particularly if they feel that it might help get the project back on schedule or avoid negative outcomes associated with a delay. Thus, we state the following hypothesis.

Hypothesis 6. When higher levels of time urgency are perceived, individuals are more likely to assess a personal responsibility to report a project's status.

In summary, while prior literature has suggested that both fault responsibility and time urgency may affect bad news reporting behavior, the full nature of the relationships between these variables and the basic whistle-blowing model has not been empirically studied. In this study, we examine empirically the effects of fault responsibility and time urgency on bad news reporting behavior by investigating how these variables exert their influence on the central decision model from whistle-blowing theory shown in Figure 3.2.

3.4 Research Methodology

An experiment was conducted to test the causal relationships between constructs in the research model. The experiment involves a two-factor, four-cell design with two exogenous variables (fault responsibility and time urgency) that are manipulated independently at two levels. We developed four treatment scenarios as well as the measurement items for assessing those constructs for which we were unable to identify reliable and valid measures. An iterative series of pilot tests was conducted to refine the treatment scenarios and validate the measures. College students at a large university in the southeastern U.S. served as subjects in this process.

3.4.1 Scenario

Each subject was asked to read a short scenario about a troubled software called CAPS and to assume the role of a project team member (see Appendix 3A). Subjects were informed that the CAPS project consisted of two core software modules and that a serious problem has been identified in one of the two modules. The subject's company has promised that the CAPS project will be installed and fully operational for a key customer within a specified time-frame. Fault responsibility and time urgency were manipulated independently to yield four treatment conditions.

For the low fault responsibility manipulation, an external vendor was introduced and subjects were informed that the faulty module was one which the vendor was responsible for developing. In this treatment condition, the subject was informed that he or she would not be responsible for the problematic module. For the high fault responsibility manipulation, there was no external vendor involved and subjects were informed that both modules were being developed internally. In this treatment condition, the subject was informed that he or she was responsible for the problematic module.

Time urgency was manipulated by varying the amount of time left between problem identification and the point at which the problem would cause difficulties if left unresolved. For the high time urgency manipulation, subjects were informed that the project was to be delivered within 1 month and that it was urgent that the code defects be resolved soon, or delivery of the project would be delayed. For the low time urgency manipulation, subjects were informed that the project was to be delivered within 12 months and that there was no particular urgency that the code defects be resolved soon, nor much risk that the project would be delayed.

3.4.2 Procedure

Subjects were randomly assigned to one of the four treatment conditions. The experimental procedure consisted of two parts. In the first part, subjects received a copy of the scenario corresponding to their respective treatment conditions and were asked to read the scenario. In the second part, subjects were asked to complete a questionnaire that measured their willingness to report bad news and also answered several items regarding their perceptions of fault responsibility and time urgency; their assessments of whether the information concerning the project ought to be reported; their assessments of whether they have a personal responsibility to report the information; and manipulation check. They were then asked to provide some basic demographic information.

3.4.3 Subjects

A total of 192 undergraduate students enrolled in an introductory information systems course at a large urban university in the southeastern United States were recruited for the study. Thirty-three subjects were dropped from the subject pool either because they did not pass the manipulation checks or because they failed to complete the questionnaire. The mean age of the remaining 159 subjects was 22.8 years and the mean work experience was 2.6 years. Approximately 60 percent of the subjects had at least one year of work experience. Forty-five percent of the subjects were male, and 55 percent were female.

While the use of student subjects can limit the generalizability of results, student subjects are commonly used in experiments that probe human decision-making (Harrison and Harrell 1993; Sitkin and Weingart 1995). Moreover, there is some support in the literature for using student subjects as surrogates for organizational decision makers (DeSanctis 1989; Gordon et al. 1987; Remus 1986), especially when the decision-making task does not require highly

specialized domain knowledge. In this study, the subjects were asked to adopt the role of a team member in a software project, not of a leader or a manager. The roles of team members in a software development project were discussed in the software development life cycle (SDLC) topic of their information systems course, and the subjects had an average of 1.7 years work experience as a member of a software development team. Thus, we believe that the subjects were able to appreciate the context of the scenario and it is reasonable to assume that they could project themselves into the role of a software project team member for the purposes of the experiment.

3.4.4 Measures

Multi-item measures for willingness to report bad news, perceived fault responsibility, and perceived time urgency were developed for this study. We also adopted existing multi-item measures for assessments of whether the project status ought to be reported and personal responsibility to report (Smith et al. 2001). A single-item dichotomous measure was created as a manipulation check for time urgency. All measurement scales were validated through extensive pilot testing of the experimental materials involving six rounds of experimentation aimed at fine-tuning the scenario, the manipulations, and the instrumentation.

The willingness to report bad news was measured using three items that were anchored on a seven-point Likert scale ranging from “very unlikely” (1) to “very likely” (7). All of the other multi-item measures were assessed on a seven-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (7).

3.5 Results

3.5.1 Manipulation Checks

Manipulation checks were performed to verify that the fault responsibility and time urgency manipulations were effective, following the procedure used in the literature (Keil et al. 2004; Perdue and Summers 1986; Smith et al. 2001). Composite measures were created for perceived fault responsibility and perceived time urgency by averaging the two items for each (see Appendix 3B). The Cronbach's alphas (0.75 and 0.95) were deemed adequate for both. Figure 3.3 shows the mean values for perceived time urgency (1 = low time urgency; 7 = high time urgency) and perceived fault responsibility (1 = low fault responsibility; 7 = high fault responsibility) across the four treatment groups.

Time Urgency	Low	High
1 Month (High)	N = 41 Mean (S.D.) pTU 6.39 (0.71) pFR 1.80 (0.82)	N = 40 Mean (S.D.) pTU 6.36 (0.71) pFR 4.19 (1.56)
12 Months (Low)	N = 38 Mean (S.D.) pTU 5.18 (1.29) pFR 1.92 (0.88)	N = 40 Mean (S.D.) pTU 5.01 (1.14) pFR 4.12 (1.51)

Fault Responsibility

Figure 3.3 Perceived Fault Responsibility and Perceived Time Urgency by Treatment Condition

As Figure 3.3 shows, the means move in the expected direction from cell-to-cell, indicating that the manipulations are effective. A 2x2 multiple analysis of variance (MANOVA) was performed with perceived fault responsibility and perceived time urgency as the dependent variables and the treatment conditions as the independent variables (see Table 3.1).

Table 3.1 Results of 2×2 MANOVA

Dependent Variables / Independent Variables	Perceived Time Urgency		Perceived Fault Responsibility	
	Sum of Squares	F-value (Sig.)	Sum of Squares	F-value (Sig.)
Main effect: (1) time urgency manipulation	64.287	65.484 (0.000)	0.024	0.015 (0.902)
Main effect: (2) fault responsibility manipulation	0.407	0.414 (0.521)	208.005	134.941 (0.000)
Interaction effect: (1) × (2)	0.195	0.198 (0.657)	0.332	0.215 (0.643)

It was expected that the main effects of each manipulated variable would be strongly significant on its respective dependent variable (i.e., time urgency manipulation on perceived time urgency and fault responsibility manipulation on perceived fault responsibility), but have no significant relationship with the other dependent variable. As seen in the first and second data rows of Table 3.1, this was indeed the case. The third row shows that there are no interaction effects. Thus each manipulation produced the intended effect.

3.5.2 Partial Least Squares Analysis

Partial Least Squares (PLS) analysis (with PLS Graph version 3.0) was used for measurement validation and for testing the paths hypothesized in the research model shown earlier in Figure 3.2. PLS analysis was considered appropriate for this study because it places

minimal demands on measurement scales, sample size, and distributional assumptions (Chin 1998; Fornell and Bookstein 1982). In addition, the use of PLS helps us easily compare the results of this study with those of previous bad news reporting studies (Keil et al. 2004; Smith et al. 2001) since they have used PLS in their analyses. Before testing the structural model, the measurement model must be established by examining the psychometric properties of the measures. A measurement model connects each construct with a set of indicators measuring that construct while a structural model represents a network of causal relationships among multiple constructs in the research model.

3.5.3 Measurement Model

3.5.3.1 Convergent Validity

To evaluate convergent validity of each factor model, we first examined standardized loadings. The standardized loadings should be greater than 0.707 for the shared variance between each item and its associated construct to exceed the error variance. Table 3.2 shows that all the loadings exceed this threshold.

Table 3.2 Item Loadings and Construct Measurement Properties

Construct	Item	Standardized Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Perceived Time Urgency	pTU1	.923	0.750	0.899	0.817
	pTU2	.887			
Perceived Fault Responsibility	pFR1	.977	0.948	0.975	0.951
	pFR2	.973			
Assessment - Status Ought to Be Reported	OTR1	.901	0.777	0.880	0.710
	OTR2	.853			
	OTR3	.768			
Assessment - Personal Responsibility to Report	RSR1	.906	0.752	0.862	0.678
	RSR2	.718			
	RSR3	.836			
Willingness to	WTR1	.956	0.927	0.955	0.875

Report	WTR2	.948
	WTR3	.902

We also examined Cronbach's alpha, composite reliability, and average variance extracted. Composite reliability and average variance extracted for each construct were calculated according to the procedure outlined in the literature (Gerbing and Anderson 1988). The acceptable levels for composite reliability and average variance extracted are 0.7 or higher (Yi and Davis 2003) and 0.5 or higher (Fornell and Larcker 1981), respectively. Table 3.2 shows that these thresholds were exceeded for each construct.

3.5.3.2 Discriminant Validity

We conducted two tests for discriminant validity. First, each indicator's loading on its own construct and its cross-loading on all other constructs were calculated (Chin 1998). Table 3.3 shows that the loadings for the intended indicators for each construct are higher than the cross-loadings for indicators from other constructs. Moreover, each indicator has a higher loading with its intended construct than a cross-loading with any other construct.

Table 3.3 Loadings and Cross-Loadings

Construct	Item	1	2	3	4	5
1. Perceived Time Urgency (pTU)	pTU1	**.927**	.244	.308	.298	.251
	pTU2	**.882**	.151	.228	.252	.143
2. Perceived Fault Responsibility (pFR)	pFR1	.248	**.977**	.412	.276	.303
	pFR2	.184	**.973**	.375	.258	.275
3. Assessment - Status Ought to Be Reported (OTR)	OTR1	.239	.435	**.901**	.582	.656
	OTR2	.299	.280	**.853**	.596	.499
	OTR3	.221	.300	**.770**	.443	.511
4. Assessment - Personal Responsibility to Report (RSR)	RSR1	.265	.295	.645	**.906**	.545
	RSR2	.221	.109	.427	**.718**	.261
	RSR3	.269	.236	.494	**.836**	.470
5. Willingness to Report (WTR)	WTR1	.150	.193	.479	.394	**.956**
	WTR2	.118	.202	.446	.377	**.949**
	WTR3	.155	.186	.455	.338	**.902**

Second, we compared average variance extracted for each construct with the shared variance between all possible pairs of constructs (Fornell and Larcker 1981). Table 3.4 shows that average variance extracted for each construct is higher than the squared correlation between the construct pairs, which indicates that more variance is shared between the latent construct and its block of indicators than with another construct representing a different block of indicators. Thus, it also establishes discriminant validity.

Table 3.4 AVEs versus Squares of Correlations between Constructs

Construct	Average Variance Extracted (AVE)	pTU	pFR	OTR	RSR	WTR
pTU	0.82	-				
pFR	0.95	0.05	-			
OTR	0.71	0.09	0.16	-		
RSR	0.68	0.09	0.08	0.42	-	
WTR	0.88	0.05	0.09	0.44	0.29	-

3.5.4 Structural Model

The structural model was assessed by examining path coefficients and their significance levels. The explanatory power of a structural model can be evaluated by examining the R^2 value of the final dependent construct. The final dependent construct, willingness to report bad news, had an R^2 value of 0.32, indicating that the research model accounts for 32% of the variance in the dependent variable. It is also instructive to examine the R^2 values for the intermediate variables in the structural model. The R^2 value for "personal responsibility to report" and "status ought to be reported" were 0.43 and 0.22, respectively. It is apparent that the R^2 values are sufficiently high to make interpretation of the path coefficients meaningful. In particular, 32% of the variance explained in the final dependent variable stands as compelling evidence of the research model's explanatory power, and is comparable to results obtained in prior studies that

have examined other factors that influence bad news reporting (Keil et al. 2004; Smith et al. 2001). In particular, Smith et al. (2001) reported an R^2 of 24% for a model that investigated the effects of perceived wrongdoing and perceived impact and Keil et al. (2004) reported an R^2 of 38% for a model that investigated the effects of perceived information asymmetry and perceived organizational climate.

We computed path coefficients in the structural model with the entire sample, and employed the bootstrapping method (with 500 resamples) to obtain the t-values corresponding to each path (see Figure 3.4). The acceptable t-values for two-tailed tests are 1.96 and 2.58 at the significance levels of 0.05 and 0.01. The assessment of whether the status ought to be reported had a direct positive effect on the assessment of personal responsibility to report, supporting H1 ($\beta = 0.61$, $p < 0.01$). The assessment of personal responsibility to report had a direct positive effect on the willingness to report bad news, which means that subjects were more willing to report when they perceived themselves to be personally responsible for reporting the bad news. Thus, H2 is supported ($\beta = 0.49$, $p < 0.01$). Perceived fault responsibility had an indirect positive effect through the assessment of whether the status ought to be reported ($\beta = 0.35$, $p < 0.01$) as well as a direct positive effect on the willingness to report bad news ($\beta = 0.16$, $p < 0.05$), thus supporting both H3 an H4. Perceived time urgency had a positive effect on the assessment of whether the status ought to be reported ($\beta = 0.22$, $p < 0.01$) and on the assessment of personal responsibility to report ($\beta = 0.12$, $p < 0.05$), thus supporting both H5 and H6.

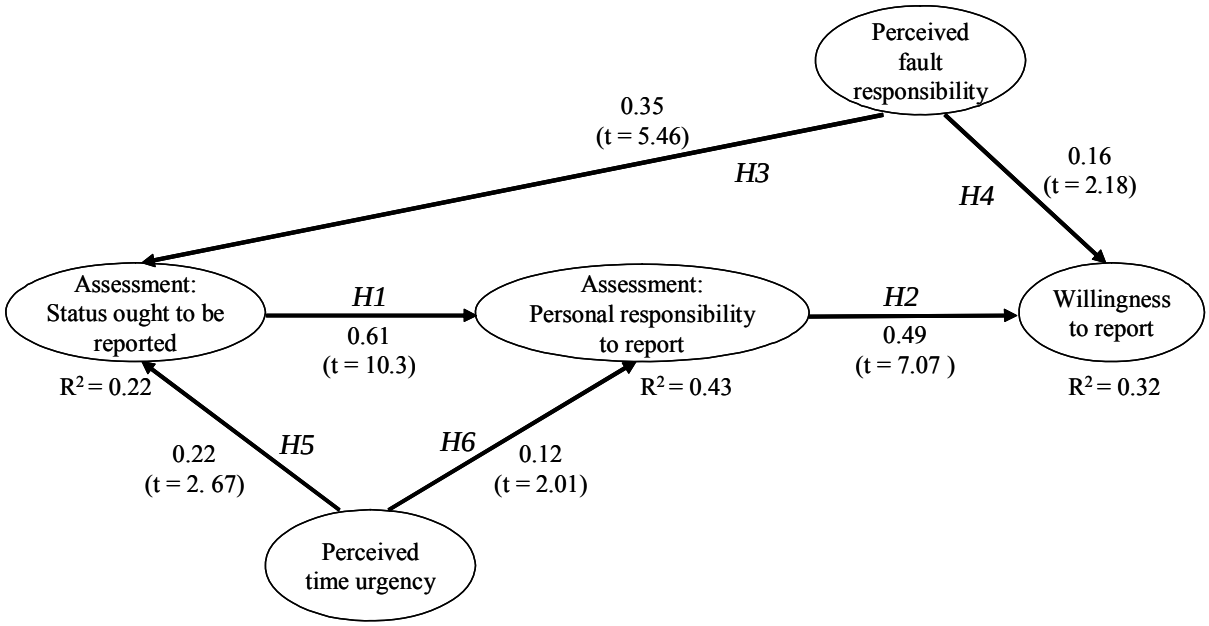


Figure 3.4 Structural Model

3.5.5 Safeguarding Against and Assessing Common Method Bias

In order to examine the existence of common method bias, we conducted a latent variable approach of adding a first-order factor with all of the measures in the theoretical model as indicators (Podsakoff et al. 2003). A common method factor was therefore added in the research model (Liang et al. 2007) and the results demonstrate that the average substantively explained variance of the indicators is 0.786, whereas the average method-based variance is 0.017. The ratio of substantive variance to method variance is 46:1. Thus, common method bias is unlikely to be a serious concern in this study.

3.6 Discussion and Implications

Before discussing the implications of our study, we note that all studies have limitations and ours is no exception. While the experimental approach provides a highly controlled environment for hypothesis testing, it does pose some methodological limitations. First, our

experiment is based on role playing scenarios. In crafting the scenario we tried to be as realistic as possible while controlling extraneous sources of variance, and providing only the essential information needed for role-playing and decision-making. Clearly, there are many organizational and political factors that may also influence an individual's willingness to report bad news. Second, the decision choice presented to the subjects in our experiment represents a necessarily narrow and simplified view of the options available to one who is faced with the decision of whether and how to report a troubled project's status. In this study, we framed this situation as a binary choice of whether or not to report the project status to his or her boss. Clearly, the team member can make other choices in responding to such a situation, such as working overtime to solve the code defects, enlisting the aid of other team member, trying to solve the problem together with the vendor, or deciding to report through some other channel. Third, we have measured subjects' self-reported behavioral intentions rather than actual behaviors. There is no guarantee that subjects would actually behave as they have indicated. Despite these limitations, the strong relationships among the constructs in our model and its explanatory power shed new light on some important factors that can influence the willingness to report bad news. Thus, we believe that the study represents a significant contribution to our understanding of this phenomenon.

This study demonstrates that perceived fault responsibility and perceived time urgency can both have significant effects on an individual's willingness to transmit bad news. Fault responsibility affects an individual's willingness to report directly and indirectly through the assessment of whether the status ought to be reported. The presence of an "at fault" vendor provides a context that allows individuals to easily disassociate themselves from the problematic situation. In doing so, they are able to assign responsibility to the vendor and are freed from fault

responsibility. Managers may be able to take advantage of the fact that individuals are more willing to report bad news when there is an opportunity to assign responsibility to an outside vendor. Given the growth in outsourced projects, this means that managers will increasingly find themselves in the position where their employees will find it easier to report problems. In order to capitalize on this strategy, however, managers must establish adequate monitoring systems that allow their employees to obtain accurate status information regarding work that is outsourced to a vendor. If the performance monitoring on the vendor is inadequate or the vendor is able to conceal the true status of their work packages, the approach will fail.

When problems occur on projects, managers need to be cautious about focusing too heavily on assigning fault responsibility as this can be counter-productive. In all cases, it seems clear that an organization should foster an environment where it is possible for individuals to report bad news without incurring severe costs. While it would be nice to believe that this can happen without finger pointing, our results suggest that it will be easier for individuals to come forward and report bad news when fault responsibility rests with an external vendor.

Like fault responsibility, time urgency affects an individual's assessment of whether the project status ought to be reported. Time urgency also affects an individual's assessment of whether he or she has personal responsibility to report the status of a troubled software project. Thus, it seems that time urgency first influences behavior in an indirect fashion by affecting an individual's perception of his or her situation (Hambrick and Mason 1984; Thomas et al. 1993). The indirect effect of time urgency on human behavior or decision-making (i.e., willingness to report) is meaningful in the organizational context because it means that managers can control individuals' willingness to report by generating a time urgent situation such as a deadline. Waller et al. (2001) develop theoretically derived propositions describing how individuals' deadline

perceptions affect their deadline-oriented behaviors under deadlines with different time horizons. Our results are consistent with the findings of Waller at al. (2001) and suggest that time urgency affects an individual's decision-making through his or her perception of status.

There has been some controversy over the direct linkage between time urgency and willingness to report. Many studies in the decision-making literature suggest that an individual's sense of time urgency significantly affects decision-making processes. Some of them show that people may change information-processing strategies to cope with the situation as their sense of time urgency increases (Christensen-Szalanski 1980; Smith et al. 1982; Zakay 1985). For example, in a time urgent situation, a decision-maker may speed up information processing (Ben Zur and Breznitz 1981; Payne et al. 1988), or reduce the amount of information to be processed (Wright 1974). However, the effect of these changes in information processing may or may not have direct influence over an individual's willingness to report bad news. For some individuals, the increased time urgency may result in a more focused search for a solution to the problem and a delay in reporting the bad news (under the hope that the problem can be resolved). For other individuals, the increased time urgency may cause them to perceive the situation as hopeless, causing them to give up trying to solve the problem (Durham et al. 2000) and accelerating their willingness to report the bad news. For this reason, we did not posit a direct linkage between time urgency and willingness to report. We did, however, perform a post-hoc test to determine if there was such a linkage, but it was not found to be statistically significant.

3.7 Contributions and Directions for Future Research

Smith and Keil (2003) argued that an individual's assessment of whether or not the status ought to be reported is likely to be associated with the individual's perceptions of the project situation. They expanded the basic whistle-blowing model theoretically by suggesting additional

constructs that may affect perceptions of a project situation, such as risk, time pressure, level of behavioral immorality, and information asymmetry. Some IS research has empirically tested these additional constructs' effects on the central decision-making model. For example, Smith et al. (2001) have empirically examined level of behavioral immorality and risk and Keil et al. (2004) have tested information asymmetry. These studies have confirmed the importance of these three factors on the individual's assessment of whether or not the status ought to be reported, which lends support for Smith and Keil's (2003) theoretical model. Our study empirically examined the effect of time urgency as a surrogate for time pressure, which is the one factor that had not been previously tested among the four factors in their theoretical model. Our results provide confirmatory evidence that time urgency does affect an individual's assessment of whether or not the status ought to be reported. Thus, one major contribution of our study is to complete the empirical testing of Smith and Keil's (2003) theoretical model which represents an extension of the basic whistle-blowing model.

Another contribution of our study is the introduction of time urgency to IS research. Time urgency is a well-known factor that can influence human behavior and has been studied in other contexts such as psychology, but there has been little research on time urgency in the IS context. Our study examines how people make a decision in a troubled software project situation under different levels of time urgency, and the results show that time urgency influences the individual's reporting behavior in a troubled software project.

Finally, this study confirms the effect of fault responsibility on the willingness to report bad news and clearly establishes that fault responsibility has both a direct and indirect influence on willingness to report. Since this is the first study that has investigated the effect of fault

responsibility on willingness to report bad news, this represents a significant contribution to our understanding of reporting behavior.

Although our study confirms the effect of time urgency postulated by Smith and Keil's (2003) theoretical model and shows how the fault responsibility fits into the rubric of the basic whistle-blowing model derived from Dozier and Miceli (1985), there may be other factors that can also affect perceptions of the project situation. These, too, may influence willingness to report bad news in a troubled software project. Theoretically identifying and empirically testing these factors represent a worthwhile goal for future research and may allow further extension of the basic whistle-blowing model in the context of software project management. While the scenarios for this study were crafted around a software project context, we believe that the pattern of results would likely hold for certain other types of projects such as high technology innovation projects. It would be, however, an interesting avenue of future research to replicate this study with different types of projects.

While both fault responsibility and time urgency are situational variables, an individual's perception of time urgency is more likely to be affected by the individual's personal characteristics such as sensitivity to time. In this study, we did not measure the subjects' personal characteristics and assumed that subjects had a similar level of sensitivity to time urgency. Future research may be able to address this individual-difference issue of time urgency. A more nuanced approach to the study of time urgency that takes into account such individual differences in time sensitivity may allow us to better understand why and how time urgency affects individuals' decision making in the context of reporting bad news.

Appendix 3A. Experimental Scenario and Instructions

INSTRUCTIONS: The business case that follows is part of a study that examines business decision-making. Please take a few minutes to read over the case and to answer the questionnaire that follows. There are no right or wrong answers.

Software Solutions Corporation

You work for Software Solutions Corporation (SSC), a U.S. computer software company that specializes in software solutions designed to meet specific customer needs.

You are working on a project called CAPS which consists of 2 core modules. SSC has promised a customer that **the CAPS system will be installed and fully operational 1 month from now.**

Before you joined the project, SSC had already contracted with an external software company called IN-TECH to develop and supply one of the core modules. This is the first time that SSC has ever used IN-TECH as a supplier and **the contract clearly specifies that IN-TECH is responsible for any project delays resulting from code defects in their module. In other words, you will not be blamed for any project delays that can be traced to IN-TECH's module.** Last week, you began working to integrate the 2 core modules. However, **you discovered major code defects in IN-TECH's module**.

Since the CAPS system will be installed in **1 month,** it is **urgent** that the code defects be resolved soon, or delivery of the project will be delayed.

At this point, you are now wondering whether or not you should **immediately** report the bad news to your boss. If you report the bad news and the project is delayed, you could lose your job **if you are found to be responsible for the delay**.

The above scenario represents the treatment used to manipulate high time urgency and low fault responsibility. The treatment for high time urgency and high fault responsibility is identical except for the third paragraph, which the following paragraph is substitute for:

Last week, you began working to integrate the 2 core modules. However, **you discovered major code defects in one of the modules that was <u>YOUR</u> responsibility**.

The treatments for low time urgency are identical to the above scenarios except that the second and fourth paragraphs of the scenarios are replaced with the following paragraphs:

You are working on a project called CAPS which consists of 2 core modules. SSC has promised a customer that **the CAPS system will be installed and fully operational <u>12 months</u> from now.**

Since the CAPS system will not be installed for another **<u>12 months</u>**, there is **<u>no particular urgency</u>** that the code defects be resolved soon, nor is there much risk that the project will be delayed.

Appendix 3B. Constructs, Measures, and Descriptive Statistics

Willingness to Report Bad News

Variable	Mean	s.d.	Item Wording (1 = very unlikely; 7 = very likely)
WTR1	5.31	1.66	Please indicate your willingness to **IMMEDIATELY** (i.e., RIGHT NOW) report the bad news to your boss.
WTR2	5.14	1.61	At this time, how likely are you to go directly to your boss by yourself to report the bad news concerning the project's status?
WTR3 (reversed)	2.87	1.80	Please indicate how likely it is that you would avoid telling your boss the bad news.

Assessment of Responsibility to Report

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
RSR1	5.64	1.20	I believe that I have a personal responsibility to make more information about the status of the CAPS project known to my boss.
RSR2 (reversed)	2.63	1.50	I believe that it is not my responsibility to make more information about the status of the CAPS project known to my boss.
RSR3	5.44	1.25	I believe that it is my personal duty to tell my boss about the project's status.

Assessment of Whether Something Ought to Be Reported

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
OTR1	5.73	1.14	I believe that something should be done to make more information about the status of the CAPS project known to my boss.
OTR2 (reversed)	2.41	1.32	I don't believe that it really matters whether more information about the status of the CAPS project is made known to my boss.
OTR3	5.43	1.62	Even if it is not me, I believe someone should tell my boss about the status of the CAPS project.

Perceived Time Urgency

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
pTU1	5.43	1.53	I believe that this matter is of considerable time urgency given the schedule under which CAPS is to be installed.
pTU2	6.06	1.05	I believe that the problems must be solved quickly because of the CAPS installation schedule.

Perceived Fault Responsibility

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
pFR1 (reversed)	3.03	1.74	If I reported the problem to my boss, I could show that the problem was not caused by me.
pFR2 (reversed)	2.99	1.72	If I reported the problem to my boss, I could show that the code defects were not my fault.

Construct Correlation Table

	WTR	RSR	OTR	pTU	pFR
WTR	1				
RSR	0.502**	1			
OTR	0.655**	0.613**	1		
pTU	0.229**	0.305**	0.301**	1	
pFR	0.296**	0.250**	0.394**	0.225**	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Chapter 4

Organizational Silence and Whistle-Blowing on IT Projects: An Integrated Model[4]

Abstract

An individual's reluctance to report bad news about a troubled IT project has been suggested as an important contributor to project failure and has been linked to IT project escalation as well (Keil and Robey 2001; Keil et al. 2004; Smith and Keil 2003; Smith et al. 2001). To date, IS researchers have drawn from the MUM effect and whistle-blowing literature to gain a better understanding of the factors that influence bad news reporting. More recent theoretical work in the area of organizational silence offers a promising new conceptual lens, but remains empirically untested. In this paper, we integrate key elements of Morrison and Milliken's (2000) model of organizational silence, which has never been empirically tested, with the basic whistle-blowing model adapted from Dozier and Miceli (1985). Using a scenario experiment, we investigate how organizational structures/policies, managerial practices, and degree of demographic dissimilarity between employees and top managers create a climate of silence, and how this climate, in turn, affects an individual's willingness to report. Our results show that all three types of factors contribute to a climate of silence in an organization, exerting both direct and indirect influence on willingness to report, as hypothesized. The implications of these findings and directions for future research are discussed.

Keywords: Climate of silence, bad news reporting, whistle-blowing, organizational silence, MUM effect, demographic dissimilarity

[4] Park, C., and Keil, M. "Organizational Silence and Whistle-Blowing on IT Projects: An Integrated Model," Working paper, Department of Computer Information Systems, Georgia State University, 2007.

4.1 Introduction

Project failure has been a serious problem in the information systems field. A recent global survey shows that IT projects are still prone to failure nowadays (Zarrella et al. 2005). While many reasons for IT project failure have been identified, a project member's reluctance to report bad news about the true status of an IT project has been recently recognized as an important factor that may contribute to IT project failure (Tan et al. 2003). If an IT project member withholds bad news about a project from his/her superiors, escalation of commitment to a failing course of action may result. On the other hand, if bad news about a troubled project is transmitted to upper managers, there is a chance that some actions can be taken to turn around the project, or give it up if necessary. Prior research suggests, however, that, while some evidence of pending failure may be apparent to project members in the lower ranks, this bad news sometimes fails to be communicated up the hierarchy (Keil and Robey 1999).

To date, IS researchers have drawn from the MUM effect and whistle-blowing literature to gain a better understanding of the factors that influence bad news reporting and their focus has primarily been on personal and situational factors. In order to provide more insight into this phenomenon, this study focuses on organizational factors and introduces a fresh theoretical perspective. Specifically, we draw upon recent theoretical work in the area of organizational silence which offers a promising new conceptual lens, but remains empirically untested. In this paper, we integrate key elements of Morrison and Milliken's (2000) model of organizational silence, which has never been empirically tested, with the basic whistle-blowing model adapted from Dozier and Miceli (1985).

Morrison and Milliken (2000) developed a theoretically grounded model of organizational silence which suggests three types of factors that can bring about an

organizational climate of silence: (1) *organizational structures/policies*, (2) *managerial practices*, and (3) *degree of demographic dissimilarity between employees and top managers*. Organizational structures/policies refer to the *centralization of decision making* and *lack of formal upward feedback mechanisms.* Managerial practices refer to the manager's *tendency to reject or respond negatively to dissent or negative feedback* and *lack of informal solicitation of negative feedback*. Degree of demographic dissimilarity between employees and top managers refers to differences in terms of *gender*, *race*, *ethnicity*, and *age*.

In this research, we examined the three types of organizational factors identified by Morrison and Milliken (2000), and tested the relationships among these factors, a climate of silence, and the decision to report bad news. In order to investigate how the three types of organizational factors contribute to a climate of silence, we manipulated them in a controlled laboratory experiment by developing eight scenarios with two different levels for each type of organizational factor. We also evaluated how the climate of silence affects an individual's decision to report (i.e., voice) or not (i.e., silence) within the rubric of the basic whistle-blowing model.

This study represents the first time that the three types of organizational factors have been empirically investigated using a theoretically grounded model. The remainder of the paper is organized into five sections. First, we briefly review the theoretical background, focusing on bad news reporting, organizational silence, and whistle-blowing. Next, we introduce the research model and hypotheses. Then, we describe our research methodology. After we present the experiment results, we conclude the paper with some discussion of the implications.

4.2 Background

4.2.1 Situating this Study in Relation to Prior Research on Bad News Reporting

Prior research on bad news reporting in the IT project context has drawn upon the MUM effect and whistle-blowing literature to hypothesize and test a variety of factors that may affect the decision to report. In a theory paper, Smith and Keil (2003) identified four important situational factors that can affect an individual's bad news reporting: risk, time pressure, level of behavioral immorality, and information asymmetry. These situational factors have been empirically tested and confirmed in the IS literature (Keil et al. 2004; Park et al. 2006; Smith et al. 2001). In terms of personal factors, Park, Keil, and Kim (2007) tested the effects of personal morality and willingness to communicate on bad news reporting in the IT project context. Thus, prior IS research on bad news reporting has mainly discussed situational and personal factors, rather than organizational factors.

In terms of organizational factors, Keil et al (2004) examined the effect of *organizational climate* on bad news reporting, but their operationalization of this construct and their model specification was not theoretically grounded in the literature on organizational silence. Thus, they tested neither the effect of organizational climate on the assessment of whether the bad news ought to be reported, nor the direct effect of organizational climate on the willingness to report bad news. In this study we operationalize a closely related construct, *climate of silence,* and the types of organizational factors that give rise to it, but we do so in a theoretically grounded fashion based on the organizational silence literature. We then examine the direct effects that a climate of silence has on all three decision steps in the central decision-making model from whistle-blowing theory. The integration of key constructs from the organizational

silence literature with the basic whistle-blowing model represents our core theoretical contribution.

4.2.2 Organizational Silence

Morrison and Milliken (2000, p. 706) have noted that "many organizations are caught in an apparent paradox in which most employees know the truth about certain issues and problems within the organization yet dare not speak that truth to their superiors." They refer to this as organizational silence or employee silence. While this silence phenomenon has been discussed with different labels such as the MUM effect (or it's opposite, whistle-blowing), the notion of organizational silence has recently received research attention in the management literature (Morrison and Milliken 2003) and represents a new perspective. Organizational silence differs from the other related bodies of work (e.g., the MUM effect and whistle-blowing) in terms of its approach to understanding the silence phenomenon. While the MUM effect and whistle-blowing literatures emphasize an individual employee's reporting decision, organizational silence focuses more on collective-level dynamics. Additionally, organizational silence represents a more inclusive approach to characterizing the silence phenomenon in an organization. For example, while whistle-blowing seems to be limited to a wrongdoing situation, the notion of organizational silence is not limited to any specific context, but covers widespread withholding of information about potential problems or issues by employees (Morrison and Milliken 2000). In this research, we have adopted this inclusive approach from the organizational silence literature in defining bad news reporting in organizational settings. In doing so, we are not limiting the origin of bad news to wrongdoing, but instead extending it to any potential problems or issues.

In addition to its inclusive approach, the organizational silence literature is focused on organizational rather than personal factors. Morrison and Milliken (2000) developed a theoretically grounded model of how silence unfolds within organizations. Their model suggests that managers' fear of negative feedback and a set of implicit managerial beliefs give rise to organizational structures/policies and managerial practices that impede the upward flow of information, which contribute to a climate of silence (meaning widely shared perceptions among individuals that speaking up about problems or issues is fruitless and/or even dangerous). Such a climate will lead to employee silence rather than voice. In this study, we explore how the three types of organizational factors described by Morrison and Milliken (2000) create a climate of silence and how this climate, in turn, affects an individual's decision to report bad news.

4.2.3 Basic Whistle-Blowing Model as Three Decision Steps of Reporting

While the organizational silence literature provides a rich explanation of the organizational-level antecedents leading to a climate of silence and the effects of employee silence, it does not specify how an employee decides whether to exercise voice or remain silent. In this study, we understand that employee silence is a consequence of an employee's decision to report or not, and we examine how employees make a decision to report (i.e., voice) or not (i.e., silence). Thus, we integrate the basic whistle-blowing model with the climate of silence construct and the factors that are believed to underlie it.

Figure 4.1 shows the central decision-making model from the whistle-blowing literature, which provides the basic theoretical framework of an individual's reporting decision steps (Miceli and Near 1992). Dozier and Miceli (1985) argued that once an individual is aware of a problem (i.e., recognition), he or she assesses whether the status ought to be reported (i.e., assessment), then considers whether he or she is responsible for reporting (i.e., responsibility),

which in turn influences his or her willingness to report (i.e., choice of action). IS researchers have adopted this model as a general framework of individual decision-making regarding bad news reporting and have found support for the model in a variety of experimental contexts (Smith and Keil 2003; Smith et al. 2001). In this study, we adopt the basic decision-making model from whistle-blowing theory and integrate it with key elements of the organizational silence model proposed by Morrison and Milliken (2000).

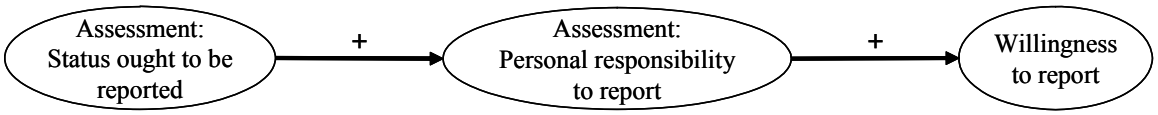


Figure 4.1 Basic Whistle-Blowing Model adapted from Dozier and Miceli (1985)

In the next section, we describe our research model and hypotheses, which are followed by a discussion of our methodology and results.

4.3 Research Model

In this study, we empirically investigate the causal relationships among three types of organizational factors, climate of silence, and decision to report. We have adopted the three types of organizational factors and the climate of silence construct from Morrison and Milliken's (2000) model and the organizational silence literature. In addition, we examine organizational silence in terms of an individual's decision to report (i.e., voice) or not (i.e., silence) by employing the central decision-making model from whistle-blowing theory. Morrison and Milliken's model of organizational silence has not been empirically tested by itself or in concert with the basic whistle-blowing decision model. We explicitly state eight hypotheses corresponding to the eight paths in the research model, as depicted in Figure 4.2.

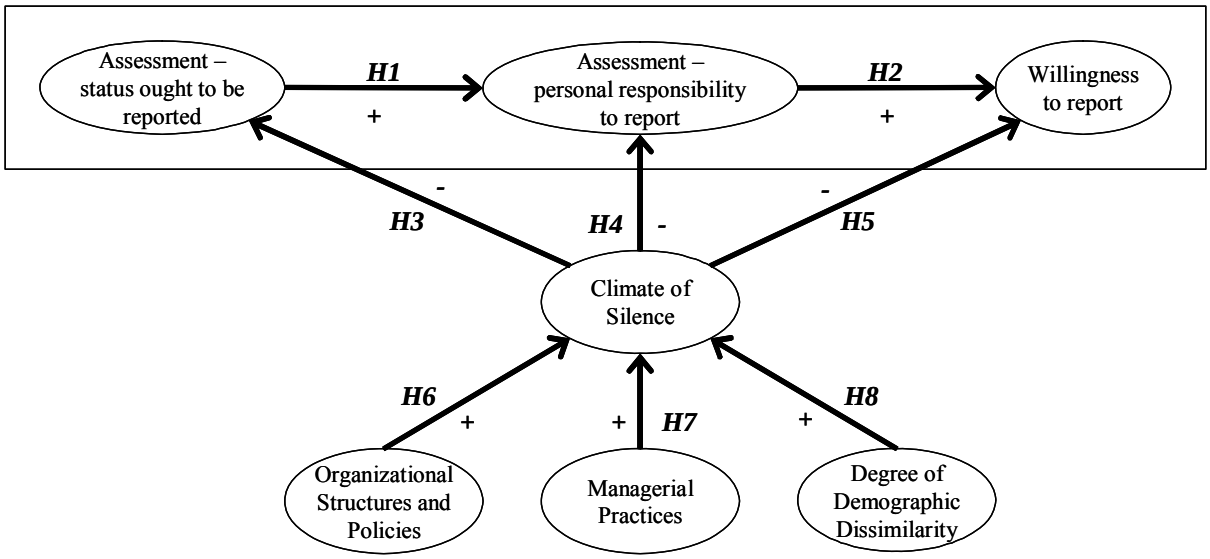


Figure 4.2 Research Model

4.3.1 Central Decision-Making Model

The upper row of Figure 4.2 shows the central decision-making model grounded in the whistle-blowing literature. We adopt two hypotheses in the whistle-blowing model that were shown to hold in recent research (Keil et al. 2004), and retest them in the research model as a replication.

The whistle-blowing literature postulates that an individual will make two distinct assessments of whether information ought to be reported and whether he or she has a personal responsibility to report it (Dozier and Miceli 1985), but they are inherently related. Other things being equal, an individual's stronger assessment that status information ought to be reported will be reflected in a stronger feeling of personal responsibility for reporting. Thus, we state the following hypothesis.

Hypothesis 1. A stronger assessment that information ought to be communicated will be reflected in a higher assessed level of personal responsibility for reporting.

Following the line of argument from the whistle-blowing literature (Miceli and Near 1992), personal responsibility should have a direct effect on willingness to report bad news. In addition, this causal relationship between personal responsibility and willingness to report has been empirically tested and confirmed in the IS literature (Keil et al. 2004; Smith et al. 2001). Thus, we state the following hypothesis.

Hypothesis 2. Higher levels of assessed personal responsibility will be associated with greater willingness to report bad news.

We now turn to the organizational factors that influence the central decision-making model.

4.3.2 Climate of Silence

Organizations seem to establish and maintain climates and cultures that support employee voice or silence. Some empirical work actually shows the relationship between organizational climate and reporting in the whistle-blowing context. For example, Baucus, Near, and Miceli (1985) found that people were more likely to report wrongdoing internally than to remain silent or report it externally when the organizational culture was more supportive of whistle-blowing, i.e., less retaliatory. Blackburn (1988) and Graham (1986) also suggested that more supportive, organizational climates would give rise to more whistle-blowing. In addition, Miceli and Near (1992, p. 158) argued from the literature that organizational climate could affect all of the decision steps in the basic whistle-blowing model.

Morrison and Milliken (2000) suggest that a climate of silence is characterized by two shared beliefs. One is that speaking up about problems in the organization is not worth the effort, and the other is that voicing one's opinions and concerns is dangerous. They also argue that, when a climate of silence exists in an organization, its employees' dominant response will be

silence rather than voice. While they focused on how and what organizational factors lead to a climate of silence, they did not specify how a climate of silence leads to employee silence. In this study, we consider employee silence as an individual's decision of silence, and adopt the basic whistle-blowing model (Dozier and Miceli 1985) to understand the individual's silence decision steps. Thus, we integrate the climate of silence construct with the basic whistle-blowing model to understand employee silence.

In the IS literature, organizational climate has been shown to have an indirect effect on an individual's willingness to report bad news through the assessment of his/her personal responsibility to report (Keil et al. 2004). However, its direct effects on the willingness to report and the assessment of whether the status ought to be reported have not been hypothesized nor empirically tested before. According to the whistle-blowing literature (Miceli and Near 1992, p. 158-164), organizational climate could affect an individual's assessment of whether the wrongdoing ought to be reported. Thus, we state the following hypothesis:

Hypothesis 3. When a greater climate of silence is present, individuals are less likely to assess that negative information ought to be reported.

The whistle-blowing literature suggests that organizational climate can affect an individual's assessment of personal responsibility for reporting (Miceli and Near 1992, p. 158). In addition, based on agency theory and the whistle-blowing literature, Keil and his colleagues (2004) hypothesized a relationship between organizational climate and personal responsibility for reporting and found empirical support for it. In this study, we seek to determine if this result can be replicated with a closely related construct—climate of silence—which we operationalized based on the organizational silence literature. Thus,

Hypothesis 4. When a greater climate of silence is present, individuals are less likely to assess a personal responsibility to report a project's status.

The effect of organizational climate on choice of action (i.e., willingness to report) in the whistle-blowing context has been theoretically developed and empirically confirmed (Dozier and Miceli 1985; Miceli and Near 1992). When an organizational climate of silence exists, it is believed that the dominant choice within the organization is for employees to withhold their opinions and concerns about organizational problems (Morrison and Milliken 2000). Thus, a climate of silence would seem to directly affect an individual's choice of silence, and we state the following hypothesis.

Hypothesis 5. When a greater climate of silence is present, individuals are less willing to report bad news.

4.3.3 Three Types of Organizational Factors

While an organizational climate of silence has been discussed as an antecedent of bad news reporting (Keil et al. 2004), there has been little research on organizational factors that may contribute to the climate of silence in an organization. Morrison and Milliken (2000) have developed a theoretical model of organizational silence in which three types of organizational factors have been identified that contribute to a climate of silence (Morrison and Milliken 2000). In this research, we examine three types of factors that have been theoretically proposed, but have not been empirically evaluated to determine their respective influence on both climate of silence and bad news reporting: organizational structures/policies, managerial practices, and degree of demographic dissimilarity between employees and top managers.

4.3.3.1 Organizational Structures and Policies

Certain organizational structures and policies discourage upward information flow in an organization. Two such structural features are *centralization of decision making* and *lack of formal upward feedback mechanisms* (Morrison and Milliken 2000). The former means that managers do not involve employees in decision-making processes because they may believe that employees are opportunistic and not knowledgeable (Hall 1982). The latter means that the organization is unlikely to have procedures such as systematic surveying or polling to solicit employee feedback. This is because there may be a tendency to believe that employee feedback is of little value or because negative upward feedback may be seen as a challenge to managers (Morrison and Milliken 2000).

Morrison and Milliken (2000) argue that the two features above can discourage upward information flow in an organization and lead to a climate of silence. Based on a qualitative study, Milliken et al. (2003) have proposed an emergent model in which organizational structures and policies affect the choice to remain silent. However, there has been no empirical research on the causal relationship between such organizational structures and policies and an organizational climate of silence. Thus, we state the following hypothesis.

Hypothesis 6. Organizational structures and policies discouraging upward information flow will lead to a greater climate of silence in the organization.

4.3.3.2 Managerial Practices

Morrison and Milliken (2000) have identified two types of managerial practices that may impede upward communication in an organization: *tendency to reject or respond negatively to dissent or negative feedback* and *lack of informal solicitation of negative feedback*. These managerial practices are believed to be related to employee silence. For example, an interviewee

in an exploratory study of employee silence mentioned, "I raised a concern about some policies and I was told to shut up … I would have pursued the issue further but presently I can't afford to risk my job" (Milliken et al. 2003, p. 1453). This demonstrates, at least anecdotally, that when a manager rejects or discounts opinions and feedback, it can lead to employee silence. Additionally, managers who believe that employees are self-interested and ill informed are not likely to engage in informal feedback seeking from subordinates (Vancouver and Morrison 1995). In this case, employees may receive some cue that speaking up is not welcome, and withhold their opinions (Saunders et al. 1992). Thus, both types of managerial practices may contribute to employee silence (Morrison and Milliken 2000).

According to Morrison and Milliken's (2000) theoretical model of organizational silence, the two types of managerial practices above directly contribute to a climate of silence in an organization. However, the causal relationship between such managerial practices and a climate of silence has not been empirically investigated before. Thus, we state the following hypothesis.

Hypothesis 7. Managerial practices impeding upward communication will lead to a greater climate of silence in the organization.

4.3.3.3 Degree of Demographic Dissimilarity between Employees and Top Managers

According to social identification theory (Tajfel 1978), individuals classify oneself and others into "us" (i.e., ingroup, those who are perceived as similar) versus "them" (i.e, outgroup, all the others), based on nationality (Hogg 1996), kinship (Underwood et al. 2001), gender (Brown 1996), age (Hogg and Terry 2000), language (Deaux 1996), vocation (Underwood et al. 2001), etc. Moreover, individuals tend to identify strongly with the reference group (i.e., ingroup) and regard the group as a salient reliable referent of what constitutes acceptable behaviors and beliefs (Hogg 1996, p. 84). In other words, the similarity-based reference group

enables individuals to evaluate whether their perceptions, attitudes, and behaviors are correct, and the stronger the feeling that the reference group is similar to him/herself, the stronger is his/her acceptance of the behaviors and beliefs of the group (Hogg 1996). This also implies that individuals may expect the group to accept their beliefs and behaviors because of such similarities. Thus, an individual's perception of social identity based on similarity may affect his or her expectation of others' attitude on his or her behavior. In addition, Hogg and Terry (2000, p. 127) theoretically propose that *demographic similarity and dissimilarity* affect organizational behavior.

While the impact of similarity/dissimilarity in social groups on attitude, perception, intention, and behavior has been studied over 50 years in the social psychology literature (Robinson 1996), the effect of dissimilarity between top-managers and lower-level employees on organizational communications has only recently received attention in the organizational silence literature (Morrison and Milliken 2000). Morrison and Milliken (2000, p. 717) suggest that "when a large number of employees see that people like themselves are underrepresented at the top, they may be more likely to conclude that the organization does not value the input of people like themselves." Such beliefs may cause individuals to conclude that it would be more risky for them to voice their concerns or opinions than it would be for employees who are more demographically similar to those at the top. Taking the above discussions together, it is reasonable to assume that demographic dissimilarity in terms of ethnicity, age, and gender between employees and top managers may contribute to an organizational climate of communications. Thus, we state the following hypothesis.

Hypothesis 8. Degree of demographic dissimilarity between employees and top managers will lead to a greater climate of silence in the organization.

In summary, while prior research has suggested that organizational factors such as organizational structures/policies, managerial practices, and degree of demographic dissimilarity between employees and top managers, may lead to a climate of silence, these relationships have not been empirically tested. Notably, while the effect of an organizational climate has been discussed in the context of bad news reporting on IT projects (Keil et al. 2004), the full nature of the relationship between a climate of silence in an organization and bad new reporting has not been empirically investigated within the rubric of the whistle-blowing model. In this study, we empirically examine how the three types of organizational factors lead to a climate of silence in an organization and how the climate of silence exerts its influence in the central decision-making model from whistle-blowing theory depicted in Figure 4.2.

4.4 Research Methodology

A laboratory experiment based on hypothetical scenarios was conducted to test the causal relationships between constructs in the research model. This hypothetical scenario approach is a good methodological option (Straub and Karahanna 1998) because this study aims to evaluate a subject's bad news reporting decision across a wide range of IT project situations that exist in practice. The experiment involved a three-factor, eight-cell design with three exogenous variables (organizational structures/policies, managerial practices, and degree of demographic dissimilarity between employees and top managers) that were manipulated independently at two levels. We developed eight treatment scenarios as well as three items for assessing one construct for which we were unable to identify reliable and valid measures. Four pilot tests were conducted to refine the treatment scenarios and validate the measures. College students at three large universities in the southeastern U.S. served as subjects in this process.

4.4.1 Scenario

Each subject was asked to read a two-page scenario about a troubled, global IT project called CAPS and to assume the role of a software developer working for a company known as SSC (see Appendix 4A). Subjects were informed that the CAPS project consisted of several globally sourced software modules and that they had found a bug in one of the contractor's modules, which was not known to others in the project team. Organizational structures/policies, managerial practices, and degree of demographic dissimilarity between employees and top managers were manipulated independently to yield eight treatment conditions.

Organizational structures/policies were manipulated by specifying the company's structural features. For the non-conducive organizational structure manipulation, the subject was informed that the company has centralized decision-making and no formal mechanisms for conveying upward feedback. For the conducive organizational structure manipulation, the subject was informed that the company has decentralized decision-making and many formal mechanisms for conveying upward feedback.

Managerial practices were manipulated by specifying the project manager's communication practice. For the open communication practice manipulation, the subject was informed that the project manager tends to accept and respond positively to bad news from subordinates, and informally seeks negative feedback from subordinates. For the closed communication practice manipulation, the subject was informed that the project manager tends to reject and respond negatively to bad news from subordinates, and never informally seeks any negative feedback from subordinates.

Degree of demographic dissimilarity between employees and top managers was manipulated by specifying similarity or dissimilarity of ethnicity, age, and gender. For the

demographic similarity manipulation, the subject was informed that the company's top managers are very similar to him/her in terms of their ethnicity, and most of them are also close in age to him/her and of the same gender. For the demographic dissimilarity manipulation, the subject was informed that the company's top managers are quite dissimilar from him/her in terms of their ethnicity, and most of them are also much older than him/her and of the opposite gender.

4.4.2 Procedure

A scenario experiment was conducted in which subjects were told that this was an experimental study about business decision-making in a global IT project situation and that their answers would remain anonymous. They were reminded that their participation was voluntary and those who did not wish to participate in the experiment could leave. Subjects were randomly assigned to one of the eight treatment conditions obtained by varying the three types of organizational factors. The survey procedure consisted of two parts. In the first part, after subjects completed the informed consent form, they received the scenario corresponding to their respective treatment condition and were asked to read the scenario. In the second part, subjects were asked to complete a questionnaire that measured their perceptions of the climate of silence and also answered several items regarding their willingness to report bad news; their assessments of whether the information concerning the project ought to be reported; their assessments of whether they had a personal responsibility to report the information; and a series of manipulation checks. They were then asked to provide some demographic information.

4.4.3 Subjects

A total of 310 students enrolled in an introductory information systems course at three large urban universities in the southeastern United States in 2007 were recruited for the study. Sixty subjects were dropped from the subject pool because they failed the manipulation check or

did not complete the questionnaire. The mean age of the remaining 250 subjects was 23.9 years and the mean work experience was 4.24 years. Fifty-five percent of the subjects were male, and 45 percent were female.

While student subjects could limit the generalizability of the results, they are commonly used in laboratory experiments that explore human decision-making (Harrison and Harrell 1993; Sitkin and Weingart 1995). Additionally, the use of student subjects as surrogates for managers has been supported in the literature (DeSanctis 1989; Gordon et al. 1987; Remus 1986), especially when the decision-making task does not require highly specialized domain knowledge. In this study, the subjects were asked to adopt the role of a team member in an IT project situation, not of a leader or a manager. The roles of team members in an IT project were discussed under the topic of the software development life cycle (SDLC) in the information systems course that the subjects were taking at the time of data collection. The subjects also had an average of 4.24 years work experience. Thus, we believe that the subjects were able to appreciate the context of the IT project scenario and it is reasonable to assume that they could project themselves into the team member role in the experiment.

4.4.4 Measures

Three measurement items for climate of silence were developed for this study. Morrison and Milliken (2000) indicate that a climate of silence is characterized by two shared beliefs: (1) speaking up about problems in the organization is not worth the effort and (2) voicing one's opinions and concerns is dangerous. We have adopted their characterization and created two formative items to measure the climate of silence – 'My speaking up about the bug would be worth the effort.' and 'My voicing the bug could be dangerous for my career at SSC.' In addition, we adopted a third measurement item, 'If I decide to inform my manager of the bug, SSC's

management will react positively to my decision', which was used and validated as a measure for *perceived organizational climate* by Keil et al. (2004).

We also adopted existing multi-item measures for willingness to report bad news (Park et al. 2006), assessment of whether the project status ought to be reported, and personal responsibility to report (Smith et al. 2001). Three dichotomous measures were created as manipulation checks for the three types of organizational factors. All measurement scales were validated through extensive pilot testing of the experimental materials involving four rounds of experimentation aimed at fine-tuning the scenario, the manipulations, and the instrumentation.

The willingness to report bad news was measured using three items that were anchored on a seven-point Likert scale ranging from "very unlikely" (1) to "very likely" (7). All of the other multi-item measures were assessed on a seven-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7). Appendix 4B shows the four constructs and the twelve measures used in this study along with some descriptive statistics.

4.5 Results

4.5.1 Manipulation Checks

Manipulation checks were employed to insure that subjects exposed to the various treatments and understood the conditions described in the scenario. In each scenario, we checked the manipulations for organizational structures/policies by asking 'SSC's decision-making processes are centralized, and SSC has no formal mechanisms for conveying upward feedback [□ True / □ False],' for managerial practices by asking 'Your manager tends to accept bad news from his subordinates, and informally seeks negative feedback from subordinates. [□ True / □ False],' and for degree of demographic dissimilarity between employees and top managers by asking 'Most top managers at SSC are very similar to you in terms of ethnicity, age, and gender.

[□ True / □ False].' Subjects who passed the manipulation checks were retained for subsequent analysis.

4.5.2 Partial Least Squares Analysis

Partial Least Squares[5] (PLS) analysis was used for measurement validation and structural path estimation in the research model. PLS is an advanced statistical method that allows optimal empirical assessment of a structural model together with its measurement model. A measurement model links each construct with its indicators while a structural model represents a network of causal relationships among multiple constructs in the research model. The measurement model should be established by examining the psychometric properties of the measures before testing the structural model.

PLS analysis was considered appropriate for testing a theoretical model in the early stages of development. This study is an initial attempt to empirically test a new model of bad news reporting in the IT project context grounded in the literature on organizational silence and informed by previous work based on whistle-blowing theory. In addition, the component-based PLS analysis was appropriate for this study because the research model includes a formative construct, which cannot be dealt with by a covariance-based SEM approach (Chin 1998; Fornell and Bookstein 1982). PLS analysis has been used in previous bad news reporting studies (Keil et al. 2004; Park et al. 2006; Smith et al. 2001).

4.5.3 Measurement Model

In the research model, we have two different types of constructs: reflective and formative. While construct validity, which is typically assessed by convergent and discriminant validity, is essential for reflective constructs, it is not required for formative constructs because the

[5] SmartPLS version 2.0 (M3)

indicators within a formative construct do not need to have higher correlations than their correlations with indicators of other constructs (MacCallum and Browne 1993). In this study, we do not test convergent validity for one formative construct (i.e., climate of silence) because the items are actually measuring different aspects of the construct. However, we evaluate multicollinearity and weights of the formative measures to check their construct validity. We also examine discriminant validity for the formative measures because we still believe that significant correlations should exist between heavily contributing aspects to the overall derived formative construct.

4.5.3.1 Multicollinearity and Validity of Formative Construct – Climate of Silence

For the formative construct included in the research model, which is *climate of silence*, we examined multicollinearity. Multicollinearity is not desirable in formative constructs because it can lead to inflated standard errors and this can have an adverse effect on measurement reliability. According to a general rule from the literature, a variance inflation factor (VIF) value above 10 indicates serious multicollinearity (Duman et al. 2006). Recent guidelines suggest that VIF values for formative measures greater than 3.3 may cause multicollinearity problems (Diamantopoulos and Siguaw 2006; Petter et al. 2007). The VIF values in Table 4.1, all of which are less than 3.3, suggest that the three items for the *climate of silence* construct explain a certain unique portion of variance, indicating no sign of multicollinearity.

In addition, we examined weights of three formative items for *climate of silence*. Based on the literature, weights of 0.05 or less tend to have little influence on the results (Chin 1998; Noonan and Wold 1982). As shown in Table 4.1, all the weights are 0.201 or higher and statistically significant. Thus, the three items are considered predictive of their respective traits, suggesting that they have adequate validity as formative measures.

Table 4.1 Variance Inflation Factor and Weights for Formative Scales

Construct	Items	Variance Inflation Factor (VIF)	Weight
Climate of Silence	COS1	1.292	0.696 (t = 8.389)
	COS2	1.622	0.201 (t = 2.241)
	COS3	1.694	0.310 (t = 3.038)

4.5.3.2 Convergent Validity

We first examined standardized loadings to test convergent validity of reflective constructs in the research model. Standardized loadings should be greater than 0.707 to meet the condition that the shared variance between each measurement item and its latent construct exceed the error variance. A loading of 0.5 or 0.6 may still be acceptable if other indicators within the same block have high loadings (Chin 1998). As seen in Table 4.2, all the loadings are 0.804 or higher, and we retained all the indicators in the analysis.

In order to test the internal consistency for each block of measures, we examined Cronbach's alpha, composite reliability, and average variance extracted. While there are no absolute threshold values for Cronbach's alpha and composite reliability, it is suggested that 0.7 indicates extensive evidence of reliability and 0.8 or higher provides exemplary evidence (Bearden et al. 1993; Yi and Davis 2003). As shown Table 4.2, all three constructs exhibited a Cronbach's alpha of 0.734 or higher, and composite reliability of 0.847 or higher. As another measure of construct validity, Fornell and Larcker (1981) suggest average variance extracted (AVE). AVE measures the amount of variance that a latent construct captures from its indicators relative to the amount of variance from measurement error, and therefore is only applicable to reflective constructs (Chin 1998, p. 321). AVE of 0.5 or higher is usually acceptable, meaning that 50 percent or more variance of the indicators is accounted for (Chin 1998). As shown in Table 4.2, all the AVEs are 0.648 or above. Thus, our evaluations of Cronbach's alpha,

composite reliability, and AVE indicate that construct reliability is above the accepted threshold and that convergent validity has been established.

Table 4.2 Item Loadings and Reliability for Reflective Scales

Construct	Item	Standardized Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Assessment - Status Ought to Be Reported	OTR1	0.804	0.734	0.847	0.648
	OTR2	0.804			
	OTR3	0.807			
Assessment - Personal Responsibility to Report	RTR1	0.887	0.833	0.900	0.749
	RTR2	0.856			
	RTR3	0.853			
Willingness to Report	WTR1	0.916	0.877	0.925	0.804
	WTR2	0.930			
	WTR3	0.842			

4.5.3.3 Discriminant Validity

We conducted two tests for discriminant validity. In the first test, we calculated each indicator's loading on its own construct and its cross-loading on all other constructs (Chin 1998). Table 4.3 shows that each construct has higher loadings with its intended indicators than cross-loadings with indicators from other constructs. Moreover, each indicator has a higher loading with its intended construct than a cross-loading with any other construct.

Table 4.3 Loadings and Cross-Loadings

Construct	Item	1	2	3	4
1. Climate of Silence (COS)	COS1	**0.915**	0.289	0.378	0.654
	COS2	**0.667**	0.072	0.174	0.376
	COS3	**0.740**	0.049	0.192	0.419
2. Assessment - Status Ought to Be Reported (OTR)	OTR1	0.085	**0.804**	0.384	0.203
	OTR2	0.166	**0.804**	0.428	0.261
	OTR3	0.270	**0.807**	0.503	0.365
3. Assessment - Personal Responsibility to Report (RTR)	RTR1	0.297	0.470	**0.887**	0.417
	RTR2	0.293	0.479	**0.856**	0.377
	RTR3	0.334	0.488	**0.853**	0.464
4. Willingness to Report (WTR)	WTR1	0.587	0.306	0.428	**0.916**
	WTR2	0.600	0.288	0.469	**0.930**
	WTR3	0.589	0.365	0.411	**0.842**

Second, we compared average variance extracted for each reflective construct with the shared variance between all possible pairs of reflective constructs (Fornell and Larcker 1981). Climate of silence has been excluded in this analysis because AVE is not applicable to a formative construct (Chin 1998). As seen in Table 4.4, the AVE for each construct is higher than the squared correlation between the construct pairs, which indicates that each latent construct shares more variance with its block of indicators than with a different block of indicators of other constructs. Thus, it also establishes discriminant validity among those reflective constructs.

Table 4.4 AVEs versus Squares of Correlations between Constructs

Construct	Average Variance Extracted (AVE)	OTR	RTR	WTR
OTR	0.648	-		
RTR	0.749	0.307	-	
WTR	0.804	0.127	0.237	-

4.5.4 Structural Model

The explanatory power of a structural model can be evaluated by examining the R^2 value of the final dependent construct. The final dependent construct, willingness to report bad news, had an R^2 value of 0.51, indicating that the research model accounts for 51% of the variance in the dependent variable. As for the R^2 values for the intermediate variables in the structural model, the R^2 values for "personal responsibility to report", "status ought to be reported", and "climate of silence" were 0.36, 0.05, and 0.28 respectively, indicating that the R^2 values are high enough to make interpretation of the path coefficients meaningful. In particular, 51% of the variance explained in the final dependent variable stands as compelling evidence of the research model's explanatory power, and is comparable to results obtained in prior studies that have examined other factors that influence bad news reporting. For example, the previous bad news reporting studies reported R^2 of 0.24 (Smith et al. 2001), 0.38 (Keil et al. 2004), 0.32 (Park et al. 2006), and 0.51 (Park et al. 2007) for the final dependent variable (i.e., willingness to report bad).

For the structural path estimation, we examined each path's coefficient and significance level. We computed path coefficients in the structural model with the entire sample, and employed the bootstrapping method (with 500 resamples) to obtain the *t*-values corresponding to each path (see Figure 4.3). The acceptable *t*-values for two-tailed tests are 1.96, 2.58, and 3.29 at the significance levels of 0.05, 0.01, and 0.001. The assessment of whether the status ought to be reported had a direct positive effect on the assessment of personal responsibility to report, supporting H1 ($\beta = 0.50$, $p < 0.001$). The assessment of personal responsibility to report had a direct positive effect on the willingness to report bad news, which means that subjects were more willing to report when they perceived themselves to be personally responsible for reporting the bad news. Thus, H2 was supported ($\beta = 0.29$, $p < 0.001$). Climate of silence had negative effects

on the assessment of whether the status ought to be reported (β = -0.23, p < 0.01), the assessment of personal responsibility to report (β = -0.24, p < 0.001), and the willingness to report bad news (β = -0.56, p < 0.001), thus supporting H3, H4, and H5. All three types of organizational factors had a significant effect on climate of silence: organizational structures/polices (β = 0.14, p < 0.01), managerial practices (β = 0.48, p < 0.001), and degree of demographic dissimilarity between employees and top managers (β = 0.18, p < 0.001), thus supporting H6, H7, and H8.

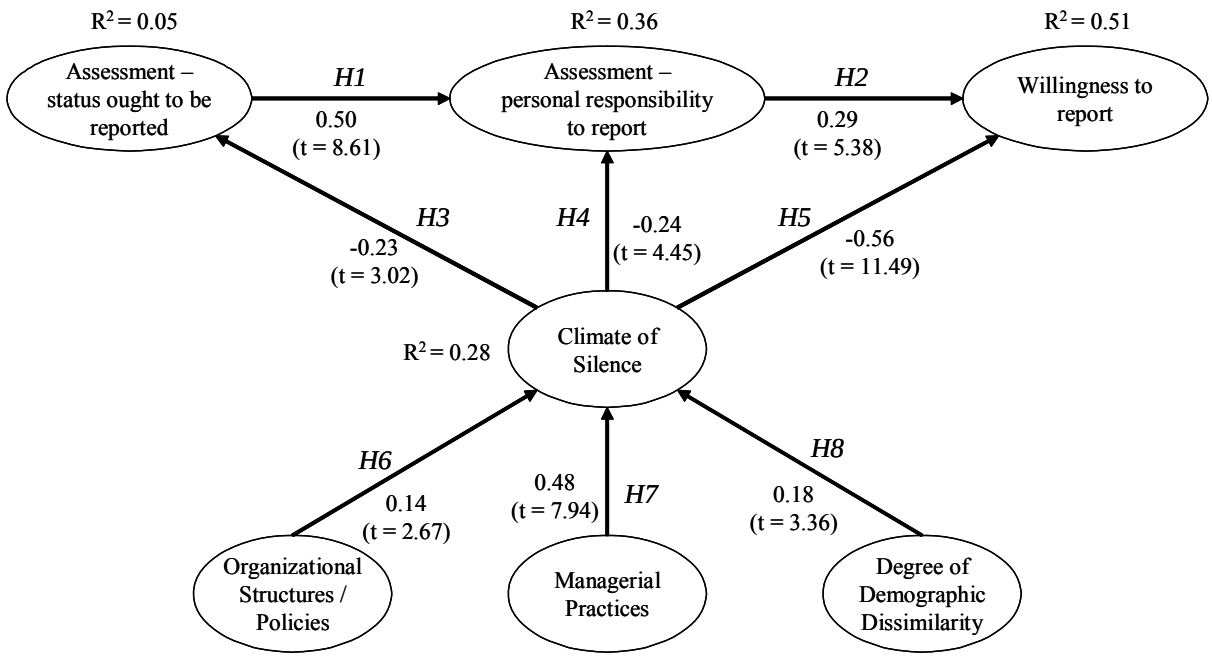


Figure 4.3 Structural Model

4.5.5 Safeguarding Against and Assessing Common Method Bias

In order to examine the existence of common method bias, we conducted a latent variable approach that involves adding a first-order factor with all of the measures in the research model as indicators (Podsakoff et al. 2003). A common method factor was therefore added to the research model (Liang et al. 2007), and the results demonstrate that the average substantively

explained variance of the indicators is 0.733, whereas the average method-based variance is 0.025. The ratio of substantive variance to method variance is 29:1. Thus, given the small magnitude of method variance, the common method bias is unlikely to be a serious concern in this study.

4.6 Discussion and Implications

This study demonstrates that organizational factors can generate a climate of silence in an organization, which in turn has a significant effect on an employee's bad news reporting behavior. The organizational climate of silence affects an individual's willingness to report both directly and indirectly through the assessments of whether the status ought to be reported and whether the individual has personal responsibility to report. More specifically, individuals are less likely to assess that the status information ought to be reported and that they have personal responsibility to report when a climate of silence is more dominant in the organization. In addition, a greater climate of silence directly lowers an individual's willingness to report bad news. Our results are consistent with Miceli and Near's (1992, p. 158) theoretical argument that organizational climates could affect all three decision steps, and empirically confirm that a climate of silence can affect an individual's bad news reporting.

Three types of organizational factors--*organizational structures/policies*, *managerial practices*, and *degree of demographic dissimilarity between employees and top managers*--were operationalized and tested. The results show that the organizational climate of silence is affected by all three types of organizational factors and that managerial practices have the strongest effect – roughly 2.5 times greater than demographic dissimilarity and roughly 3.5 times greater than organizational structures/policies. In terms of *organizational structures/policies*, employees tend to perceive a greater climate of silence when the organization has a centralized decision-making

feature and no formal mechanisms for upward feedback. In terms of *managerial practices*, employees will feel a greater climate of silence when their managers respond negatively to bad news and do not informally seek negative feedback from subordinates. As for *degree of demographic dissimilarity between employees and top managers*, employees tend to perceive a greater climate of silence when they feel that top managers are more different from themselves in terms of age, gender, and ethnicity. These findings are consistent with Morrison and Milliken's (2000) theoretical argument of the three types of organizational factors leading to employ silence, and empirically confirm the core of their organizational silence model.

One interesting finding in the results is the low R^2 (= 0.05) on the assessment of whether the status information ought to be reported, in comparison with previous bad news reporting studies that have focused solely on situational and personal factors – 0.31 (Smith et al. 2001), 0.22 (Park et al. 2006), and 0.35 (Park et al. 2007). This may imply that personal and situational factors have a greater influence than organizational factors in shaping an individual's perception of whether something ought to be reported. This makes sense because people may evaluate the seriousness of the current status based on the situation involved and their personal levels of accepting the seriousness, rather than an organizational climate in general. In addition, in comparison with prior research including situational and personal factors, climate of silence (which represents an organizational factor) in this study has the highest path coefficient (= -0.56) and t-value (= 11.49) on the willingness to report bad news. This may imply that organizational factors have different roles from situational and personal factors in the bad news reporting decision. That is, situational and personal factors are more likely to affect an employee's assessment of whether something ought to be reported, whereas an organizational factor is more likely to affect an employee's willingness to report bad news (i.e., behavioral intention).

4.6.1 Limitations of the Study

While the laboratory experiment approach provides a highly controlled environment for hypothesis testing, it could have some methodological limitations. First, our experiment is based on written, hypothetical scenarios to represent a real world context. While we tried to make the scenarios as realistic as possible by controlling extraneous factors and providing only the essential information needed for role-playing and decision-making, there may be other exogenous factors that can influence an individual's bad news reporting. Second, in our experiment, the subjects were provided with a necessarily simplified view of the options available to one who faces the decision of whether and how to report bad news. While we framed the situation as a choice of whether or not to report the bad news to the manager in the experiment, the project member can make other choices in responding to such a situation, such as trying to contact the global contractor who is responsible for the bug or delaying bad news reporting. Third, we measured a subject's behavioral intention rather than actual behavior. There is no guarantee that the subject would actually behave as he or she indicated. In spite of these limitations, the significant relationships among the constructs in the research model and its explanatory power shed new light on bad news reporting.

4.6.2 Research Contributions

This study contributes to research in several ways. First, we extended the bad news reporting model by empirically examining the three types of organizational factors derived from the organizational silence literature. The three types of organizational factors are grounded in theory, but this is the first study to empirically test them. All three types of organizational factors were found to contribute significantly to a climate of silence. Clearly, incorporating the

organizational factors allowed us to construct a richer model of bad news reporting, and will provide a solid foundation for future research.

We also extended the organizational silence model by combining it with the central decision-making model from whistle-blowing theory. While the organizational silence literature focuses on the antecedents and consequences of employee silence, it does not deal with the underlying decision steps associated with employee silence. In this study, we integrated the central decision-making model (i.e., three decision steps of reporting) from whistle-blowing theory with key constructs from the organizational silence literature and found that a climate of silence affects employee silence by influencing all three decision steps.

Another significant contribution is our operationalization of the climate of silence construct and hypothesizing and examining its effect on the three decision steps of bad news reporting. The climate of silence has been discussed in the organizational silence literature as a construct that may play an important role in the employee silence, but its measurement has not been discussed. In this study, we have developed and validated a three-item formative measure for climate of silence that is grounded in the organizational silence literature.

Finally, we empirically re-confirmed strong and significant relationships among willingness to report and its antecedents in the central decision-making model derived from whistle blowing theory. In particular, our results had very high explanatory power ($R^2 = 0.51$) for the willingness to report, as compared to previous studies.

4.6.3 Implications for Practitioners

The significant effect of organizational structures and policies on a climate of silence is meaningful in the organizational context because it means that companies can mitigate

employees' perceptions of climate of silence and promote their bad news reporting by involving them in decision-making processes and providing more formal communication channels.

Employees are more willing to report bad news when managers tend to respond positively to bad news and informally seek negative feedback from subordinates. Managers can take advantage of this by encouraging their employees to report potential issues and problems and by responding in a manner that reinforces the value of open communication.

Many of today's companies are composed of individuals from diverse backgrounds. This is especially true of global companies. In establishing promotion practices, managers at such companies should consider the fact that gross demographic dissimilarities between employees and top managers may have a chilling effect on upward communication, particularly bad news reporting.

Managers wanting to put an end to organizational silence should begin by placing primary emphasis on managerial practices as these appear to have the most significant effect. While the other two areas—organizational structure/policies and degree of demographic dissimilarity—can also play a significant role in establishing a climate of silence, their effect appears to be comparatively weaker than that of managerial practices. That being said, it is important to note that all three types of factors represent areas over which management has a high degree of control. Thus, managers should carefully assess their own organizational climate and determine if adjustments are needed in one or more of these three areas.

4.6.4 Directions for Future Research

While our study is the first to confirm the effect of three types of organizational factors on a climate of silence, there may be other organizational factors that can also affect a climate of silence in an organization. Thus, identifying and empirically testing other organizational factors

and their roles in employee silence represents a worthwhile goal for future research and may allow further extension of the organizational silence model. For example, organization size, organizational code of ethics, and industry have been discussed as potential organizational factors that can affect an individual's bad news reporting (Miceli and Near 1992).

Morrison and Milliken (2000) have also suggested that employees' interactions and communications among themselves can moderate the relationship between organizational factors and employee silence, but this has not yet been tested. In addition, the recursive relationship in the organizational silence model, whereby an employee's silence can affect another employee's silence, has not been empirically investigated.

Another promising avenue for future research is the investigation of cross-cultural differences (Hofstede 1980) and their impact on bad news reporting. Tan et al. (2003) investigate the impact of organizational climate and information asymmetry in an individualistic and collectivistic culture, and Keil, Im, and Mahring (2007) investigate the culturally constituted views of face saving on bad news reporting. These studies, however, were neither grounded in the organizational silence literature, nor did they investigate the phenomenon within the rubric of the basic whistle-blowing model. Further research is needed to empirically examine cross-cultural differences such as power distance, uncertainty avoidance, and masculinity-femininity, and their impact on organizational silence. Understanding cross-cultural differences is critical to the success of a global company and would provide useful guidance to managers working on global software projects.

Another direction for future research would be to extend this study by examining the sub-factors of the three organizational factors. While each of the three factors have two or more sub-factors by itself (i.e., *centralization of decision-making* and *lack of formal upward feedback*

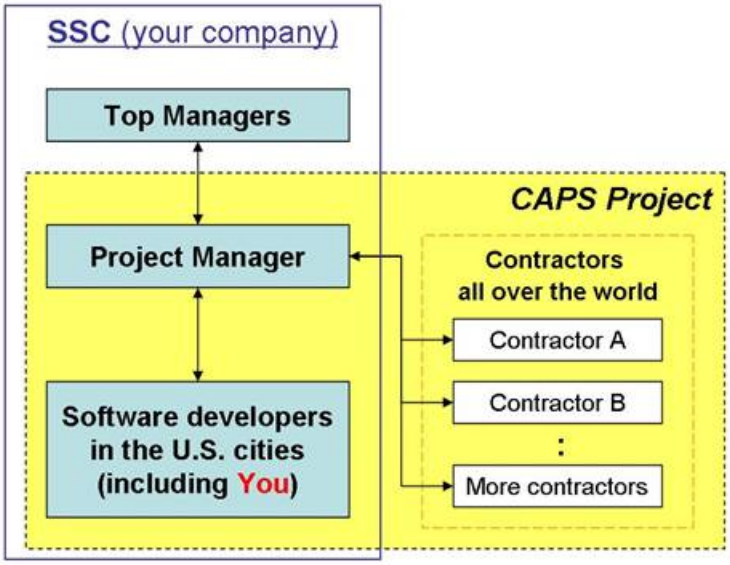
mechanism for organizational structures/policies, *tendency to reject or respond negatively to dissent or negative feedback* and *lack of informal solicitation of negative feedback* for managerial practices, and *gender*, *ethnicity*, and *age* for demographic dissimilarity), this study examined each organizational factor as a whole by manipulating its sub-factors together as a unit. For example, however, gender, ethnicity, and age can play a different role in an individual's perception of organizational climate of silence. Thus, such future research could extend Morrison and Milliken's theoretical model of organizational silence, in which the sub-factors have been aggregated with their parent factors, by shedding light on the interactions and roles of the sub-factors in the organizational silence context.

Appendix 4A. Experimental Scenario and Instructions

INSTRUCTIONS: The business case that follows is part of a study that examines business decision-making. Please take a few minutes to read over the case and to answer the questionnaire that follows. There are no right or wrong answers.

Software Solutions Corporations

You work as a software developer for Software Solutions Corporation (SSC), a global computer software integrator based in Seattle, Washington that specializes in putting together software components to meet specific customer needs. You are working on a project called CAPS which consists of several modules that have been contracted out to different firms. You are working in SSC's Atlanta office to integrate various modules for the CAPS project. Contractors for the various modules that make up CAPS are located in different areas around the world. The figure below shows your place in the organizational structure.



The SSC software developers, including you, have a monthly meeting with the project manager at the SSC headquarters in Seattle. You came back from the monthly meeting yesterday, and began to work on integration testing across the modules in the project. Today, you accidentally discovered a small bug in one module that a contractor in India is responsible for. You have no way of finding out exactly who the contractor is or how to contact them directly. You won't see your project manager for another whole month until the next monthly meeting in Seattle. In deciding whether or not to report the small bug to your project manager, you are considering several factors below that may influence your decision.

One structural feature of your company is **high decentralization of decision making**, and therefore managers in your company usually involve their subordinates in their decision-making processes. In addition, your company has **many formal mechanisms for conveying upward feedback** including a web-based reporting system, and you can use the formal web-based reporting system to report any concerns to the project manager at any time.

From past experience, you know that your project manager tends to **accept and respond positively to bad news** from subordinates. In addition, your manager **informally seeks negative feedback** from subordinates.

While SSC is a global company, its top managers are **very similar to you** in terms of their ethnicity. Most of them are also close in age to you and of the same gender.

At this point, you are wondering whether or not you should **immediately report** the small bug you found to your project manager.

The above scenario represents the treatment used to manipulate non-strict organizational structure, open communication practice, and demographic similarity. The treatment for strict organizational structure is identical except for the third paragraph, which the following paragraph is substitute for:

One structural feature of your company is **high centralization of decision making**, and therefore managers in your company completely exclude their subordinates from their decision-making processes. In addition, aside from the monthly meeting your company has **no formal mechanisms for conveying upward feedback**, and you therefore have no officially sanctioned channel to report any concerns to the project manager.

The treatment for closed communication practice is identical except for the fourth paragraph, which the following paragraph is substitute for:

From past experience, you know that your project manager tends to **reject and respond negatively to bad news** from subordinates. In addition, your manager **never informally seeks any negative feedback** from subordinates.

The treatment for demographic dissimilarity is identical except for the fifth paragraph, which the following paragraph is substitute for:

Because SSC is a global company, its top managers are **quite dissimilar from you** in terms of their ethnicity. Most of them are also much older than you and of the opposite gender.

Appendix 4B. Constructs, Measures, and Descriptive Statistics

Willingness to Report Bad News

Variable	Mean	s.d.	Item Wording (1 = very unlikely; 7 = very likely)
WTR1	5.17	1.59	Please indicate your willingness to **IMMEDIATELY** (i.e., RIGHT NOW) report the bad news to your boss.
WTR2	5.10	1.56	At this time, how likely are you to go directly to your boss by yourself to report the bad news concerning the project's status?
WTR3 (reversed)	5.38	1.51	Please indicate how likely it is that you would avoid telling your boss the bad news.

Assessment of Responsibility to Report

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
RTR1	5.52	1.12	I believe that I have a personal responsibility to make more information about the status of the CAPS project known to my boss.
RTR2 (reversed)	5.45	1.30	I believe that it is not my responsibility to make more information about the status of the CAPS project known to my boss.
RTR3	5.34	1.26	I believe that it is my personal duty to tell my boss about the project's status.

Assessment of Whether Something Ought to Be Reported

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
OTR1	5.87	0.87	I believe that something should be done to make more information about the status of the CAPS project known to my boss.
OTR2 (reversed)	5.69	0.98	I don't believe that it really matters whether more information about the status of the CAPS project is made known to my boss.
OTR3	5.97	0.97	Even if it is not me, I believe someone should tell my boss about the status of the CAPS project.

Climate of Silence

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
COS1	5.41	1.42	My speaking up about the bug would be worth the effort.
COS2 (reversed)	4.40	1.58	My voicing the bug could be dangerous for my career at SSC.
COS3	4.25	1.56	If I decide to inform my manager of the bug, SSC's management will react positively to my decision.

Construct Correlation Table

	WTR	RTR	OTR	COS
WTR	1			
RTR	0.484**	1		
OTR	0.344**	0.546**	1	
COS	0.587**	0.299**	0.150*	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Chapter 5

Conclusion

5.1 Revisit: Motivation and Objective

Motivated by a case study of IT project failure in which a project member's reluctance to report bad news appeared to lead to project failure, this dissertation raised the following questions to achieve the research objective of better understanding an individual's bad news reporting behavior in the IT project context:

Why do people not report problems associated with IT projects?

How do people decide whether or not to report problems?

To answer these research questions, this dissertation research drew upon the literature of the MUM effect, whistle-blowing, and organizational silence to develop an overall model of bad news reporting, which adopted the basic whistle-blowing model to understand an individual's reporting decision steps and categorized the influential factors on bad new reporting into three different levels – personal factors (i.e., individual-level factors), situational factors (i.e., project-level factors), and organizational factors.

In order to determine whether the overall model makes sense and is useful, I conducted three empirical, experimental studies varying the influential factors at three different levels within the rubric of the basic whistle-blowing model. The results of the three studies are detailed in Chapters 2, 3, and 4.

5.2 Contributions to Research and Practice

This dissertation makes several contributions to both research and practice. While those contributions were highlighted in the end of each chapter, the overall contributions of the dissertation can be stated as follows.

One important contribution of this dissertation is that it offers a multilevel view on the influential factors in bad news reporting. This dissertation has reviewed and synthesized the literature related to bad news reporting, categorized the influential factors into three different levels, and suggested an overall model of an individual's bad news reporting behavior. Moreover, this dissertation empirically tests and confirms the multilevel view with three independent experiments by examining factors at three levels – personal, situational, and organizational factors.

Each of the three studies contributes to the body of knowledge by providing a theoretically grounded model. Study One was the first to examine personal factors in the bad news reporting context. Study Two completed the empirical testing of Smith and Keil's (2003) theoretical model by investigating the role of time urgency in the bad news reporting context. Study Three integrated the organizational silence model with whistle-blowing theory to shed light on the relationships between organizational factors and bad news reporting. In addition, the three studies re-confirmed the three reporting decision steps in the basic whistle-blowing model and empirically demonstrated how the factors at different levels can interact with the three decision steps.

While several contributions to practice have been discussed in the individual chapters, one overall practical contribution of this dissertation is that it can help practitioners better understand an employee's bad news reporting behavior in the IT project context. By dealing with

those factors at different levels encouraging or discouraging bad new reporting, companies can avoid IT project failure that may be caused by employee silence.

5.3 Limitations and Future Research

While methodological limitations have been discussed in each of the three studies, there may be some contextual limitations across the three studies. In this dissertation, any one study has not tested all factors at three levels together. Although all three levels were not tested together in this dissertation, the findings from the three studies may provide some implications for testing all three levels in one research model. First, the assessment of whether the status ought to be reported, i.e., the first antecedent in the basic whistle-blowing model, has higher values of R^2 when personal and situational factors are involved than when organizational factors are involved. Second, personal and organizational factors yield stronger path coefficients to the assessment of personal responsibility to report than do situational factors. Third, organizational factors have stronger path coefficients to the willingness to report than do personal or situational factors. The three findings indicate that each level factor plays a different role in shaping the bad new reporting. For example, while personal and situational factors affect the willingness to report indirectly through the decision steps in the basic whistle-blowing model, organizational factors are more likely to directly affect the willingness to report, i.e., the final dependent variable. This may imply that managers can control their employees' bad news reporting decision more directly and effectively by manipulating certain organizational factors. Despite this possible speculation based on the findings in this dissertation, it would be very interesting as a future research venue that all three level factors are examined and compared together in one research model. Such future research may be able to address different roles and contributions of the three level factors in IT project reporting.

Another promising avenue for future research would be to examine the basic whistle blowing model in more detail to determine if the relationship between "ought" to report and "willingness" to report is fully mediated by "personal responsibility" to report, or whether this relationship is only partially mediated. In this dissertation, the decision steps have been simply adopted from the whistle-blowing theory and tested as given. However, the possibility of a partially mediated relationship cannot be ruled out based on the analysis performed in this dissertation. In a post-hoc analysis, a mediation test was performed for each of the three studies (Baron and Kenny 1986). The results suggest that the relationship between "ought" and "willingness" is one that is partially mediated, but not fully mediated, by "personal responsibility." Therefore, an interesting avenue for future research would be to theoretically develop and empirically confirm the partially mediated relationship among the three decision steps in the basic whistle-blowing model.

5.4 Conclusion

Motivated by the issue of reluctance to report bad news in the IT project context and the lack of a systematic approach to understanding an individual's bad news reporting behavior, this dissertation suggested an overall, hierarchical model of bad news reporting, building upon the literature of the MUM effect, whistle-blowing, and organizational silence. Three empirical, experimental studies were conducted to determine whether the overall, hierarchical model makes sense and is useful. The three empirical studies 1) identified such factors at three different levels (individual, project, and organization) that influence an individual's bad news reporting, 2) confirmed the steps through which an individual makes a decision of reporting or not, within the rubric of the basic whistle-blowing model, and 3) demonstrated the ways in which those factors interact with the reporting decision steps. In addition, the empirical studies showed that the

hierarchical view can help researchers reach better explanations of the relationship between bad news reporting and factors at different levels. Overall, this dissertation contributes by 1) providing the multilevel approach to understand factors affecting bad news reporting in the IT project context, 2) testing the effects of the factors at different levels that were theoretically suggested, but empirically not examined in the literature, 3) providing new validated measures (e.g., climate of silence), and 4) providing managers with a variety of clues for dealing with their employees' bad news reporting behaviors.

References

Barki, H., Rivard, S., and Talbot, J. "Toward an Assessment of Software Development Risk," *Journal of Management Information Systems* (10:2), 1993, pp. 203-225.

Baron, R.M., and Kenny, D.A. "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology* (51:6), 1986, pp. 1173-1182.

Baucus, M.S., Near, J.P., and Miceli, M.P. "Organizational Culture and Whistle-Blowing," in: *Presented at the Academy of Management*, San Diego, CA, 1985.

Bearden, W.O., Netemeyer, R.G., and Mobley, M.F. *Handbook of Marketing Scales*, Sage, Newbury Park, CA, 1993.

Ben Zur, H., and Breznitz, S.J. "The Effect of Time Pressure on Risky Choice Behavior," *Acta Psychologica* (47:2), 1981, pp. 89-104.

Billings, R.S., Milburn, T.W., and Schaalman, M.L. "A Model of Crisis Perception: A Theoretical and Empirical Analysis," *Administrative Science Quarterly* (25:2), 1980, pp. 300-316.

Blackburn, M.S. "Employee Dissent: The Choice of Voice Versus Silence," University of Tennessee, Knoxville, TN, 1988.

Boehm, B.W. "Software Risk Management: Principles and Practices," *IEEE Software* (8:1), 1991, pp. 32-41.

Borgatta, E.F., and Bales, R.F. "Interaction of Individuals in Reconstituted Groups," *Sociometry* (16:4), 1953, pp. 302-320.

Braithwaite, J. "Challenging Just Deserts: Punishing White-Collar Criminals," *The Journal of Criminal Law and Criminology* (73:2), 1982, pp. 723-763.

Bronner, R. *Decision Making under Time Pressure: An Experimental Study of Stress Behavior in Business Management*, Lexington Books, Lexington, MA, 1982.

Brown, R. "Tajfel's Contribution to the Reduction of Intergroup Conflict," in: *Social Groups and Identities: Developing the Legacy of Henri Tajfel,* W.P. Robinson (ed.), Butterworth-Heinemann, Oxford, UK, 1996, pp. 169-190.

Bulkeley, W.M. "When Things Go Wrong: Foxmeyer Drug Took a Huge High-Tech Gamble; It Didn't Work," in: *The Wall Street Journal*, New York, NY, 1996, pp. R25-R26.

Burnham, M.A., Pennebaker, J.W., and Glass, D.C. "Time Consciousness, Achievement Striving, and the Type a Coronary-Prone Pattern," *Journal of Abnormal Psychology* (84:1), 1975, pp. 76-79.

Chaiken, S. "Heuristic Versus Systematic Information Processing and the Use of Source Versus Message Cues in Persuasion," *Journal of Personality and Social Psychology* (39:5), 1980, pp. 752-766.

Chan, B.M. "The Effects of Willingness to Communicate on Student Learning," West Virginia University, Morgantown, WV, 1988.

Chan, B.M., and McCroskey, J.C. "The Wtc Scale as a Predictor of Classroom Participation," *Communication Research Reports* (4:2), 1987, pp. 47-50.

Chapple, E.D., and Arensberg, C.M. "Measuring Human Relations: An Introduction to the Study of the Interaction of Individuals," *Genetic Psychology Monographs* (22), 1940, pp. 3-147.

Chin, W.W. "The Partial Least Squares Approach to Structural Equation Modeling," in: *Modern Methods for Business Research,* G.A. Marcoulides (ed.), Lawrence Erlbaum Associates, Mahwah, NJ, 1998, pp. 295-336.

Christensen-Szalanski, J.J. "A Further Examination of the Selection of Problem-Solving Strategies: The Effects of Deadlines and Analytical Aptitudes," *Organizational Behavior and Human Performance* (25:1), 1980, pp. 107-122.

Conte, J.M., Landy, F.J., and Mathieu, J.E. "Time Urgency: Conceptual and Construct Development," *Journal of Applied Psychology* (80:1), 1995, pp. 178-185.

Conte, J.M., Mathieu, J.E., and Landy, F.J. "The Nomological and Predictive Validity of Time Urgency," *Journal of Organizational Behavior* (19:1), 1998, pp. 1-13.

Deaux, K. "Social Identification," in: *Social Psychology Handbook of Basic Principles,* E.T. Higgins and A.W. Kruglanski (eds.), The Guilford Press, New York, NY, 1996, pp. 777-798.

DeSanctis, G. "Small Group Research in Information Systems: Theory and Method," in: *The Information Systems Research Challenge: Experiment Research Methods*, Harvard Business School, Cambridge, MA, 1989, pp. 53-82.

Diamantopoulos, A., and Siguaw, J.A. "Formative Versus Reflective Indicators in Organizational Measure Development: A Comparison and Empirical Illustration," *British Journal of Management* (17), 2006, pp. 263-282.

Dozier, J.B., and Miceli, M.P. "Potential Predictors of Whistle-Blowing: A Prosocial Behavior Perspective," *The Academy of Management Review* (10:4), 1985, pp. 823-836.

Duman, T., Kocak, G.N., and Tutuncu, O. "The Role of Non-Monetary Costs in a Model of Leisure Travel Value," in: *Progress in Tourism Marketing,* M. Kozak and L. Andreu (eds.), Elsevier Science, Amsterdam, Netherlands, 2006, pp. 221-238.

Durham, C.C., Locke, E.A., Poon, J.M.L., and McLeod, P.L. "Effects of Group Goals and Time Pressure on Group Efficacy, Information-Seeking Strategy, and Performance," *Human Performance* (13:2), 2000, pp. 115-138.

Eiser, J.R. "From Attributions to Behaviour," in: *Attribution Theory: Social and Functional Extensions,* M. Hewstone (ed.), Basil Blackwell, Oxford, UK, 1983, pp. 160-169.

FDA "Lasik Eye Surgery," in: *http://www.fda.gov/cdrh/LASIK/default.htm*, Center for Devices and Radiological Health, 2006.

Fincham, F.D. "Clinical Applications of Attribution Theory: Problems and Prospects," in: *Attribution Theory: Social and Functional Extensions,* M. Hewstone (ed.), Basil Blackwell, Oxford, 1983, pp. 187-203.

Fincham, F.D., and Jaspars, J.M. "Attribution of Responsibility: From Man the Scientist to Man as Lawyer," in: *Advances in Experimental Social Psychology,* L. Berkowitz (ed.), Academic Press, New York, NY, 1980, pp. 81-138.

Fornell, C. *A Second Generation of Multivariate Analysis: Method Volume 1*, Praeger, New York, NY, 1982.

Fornell, C., and Bookstein, F.L. "Two Structural Equation Models: Lisrel and Pls Applied to Consumer Exit-Voice Theory," *Journal of Marketing Research* (19:4), 1982, pp. 440-452.

Fornell, C., and Larcker, D.F. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (18:1), 1981, pp. 39-50.

Friedman, M., and Rosenman, R. *Type a Behavior and Your Heart*, Knopf, New York, NY, 1974.

Furnham, A., Hillard, A., and Brewin, C.R. "Type a Behavior Pattern and Attributions of Responsibility," *Motivation and Emotion* (9:1), 1985, pp. 39-51.

Gerbing, D.W., and Anderson, J.C. "An Updated Paradigm for Scale Development Incorporating Unidimensionality and Its Assessment," *Journal of Marketing Research* (25:2), 1988, pp. 186-192.

Goldberg, L.R. "A Broad-Bandwidth, Public Domain, Personality Inventory Measuring the Lower-Level Facets of Several Five-Factor Models," in: *Personality Psychology in Europe,* I. Mervielde, I. Deary, F. De Fruyt and F. Ostendorf (eds.), Tilburg University Press, Tilburg, The Netherlands, 1999, pp. 7-28.

Goldman-Eisler, F. "The Measurement of Time Sequences in Conversational Behavior," *British Journal of Psychology* (42), 1951, pp. 355-362.

Gordon, M.E., Slade, L.A., and Schmitt, N. "Student Guinea Pigs: Porcine Predictors and Particular Phenomena," *Academy of Management Review* (12:1), 1987, pp. 160-163.

Graham, J.W. "Principled Organizational Dissent," Northwestern University, Evanston, IL, 1983.

Graham, J.W. "Principled Organizational Dissent: A Theoretical Essay," in: *Research in Organizational Behavior*, JAI Press, Greenwich, CT, 1986, pp. 1-52.

Hall, R.H. *Organizations: Structure and Process*, Prentice-Hall, Englewood Cliffs, NJ, 1982.

Hambrick, D.C., and Mason, P.A. "Upper Echelons: The Organization as a Reflection of Its Top Managers," *Academy of Management Review* (9:2), 1984, pp. 193-206.

Harrison, P.D., and Harrell, A. "Impact of 'Adverse Selection' on Managers' Project Evaluation Decisions," *Academy of Management Journal* (36:3), 1993, pp. 635-643.

Hofstede, G. *Culture's Consequences: International Differences in Work-Related Values*, Sage, Beverly Hills, CA, 1980.

Hogg, M.A. "Intragroup Processes, Group Structure and Social Identity," in: *Social Groups and Identities: Developing the Legacy of Henri Tajfel,* W.P. Robinson (ed.), Butterworth-Heinemann, Oxford, UK, 1996, pp. 65-94.

Hogg, M.A., and Terry, D.J. "Social Identity and Self-Categorization Processes in Organizational Contexts," *Academy of Management Review* (25:1), 2000, pp. 121-140.

Hollander, E.P. *Principles and Methods of Social Psychology*, (2nd ed.), Oxford University Press, London, UK, 1971.

Janis, I.L., and Mann, L. *Decision Making*, Free Press, New York, NY, 1977.

Jaspars, J., Fincham, F.D., and Hewstone, M. *Attribution Theory and Research: Conceptual, Developmental and Social Dimensions*, Academic Press, London, 1983.

Jenkins, A.M. "Research Methodologies and Mis Research," in: *Research Methods in Information Systems,* E. Mumford (ed.), Elsevier Science Publishers B.V. (North-Holland), Amsterdam, Netherlands, 1985, pp. 315-320.

Kahneman, D., Slovik, P., and Tversky, A. *Judgment under Uncertainty: Heuristics and Biases*, Combridge University Press, Cambridge, MA, 1982.

Keil, M. "Pulling the Plug: Software Project Management and the Problem of Project Escalation," *MIS Quarterly* (19:4), 1995, pp. 421-447.

Keil, M., Im, G.P., and Mahring, M. "Reporting Bad News on Software Projects: The Effects of Culturally Constituted Views of Face-Saving," *Information Systems Journal* (17:1), 2007, pp. 59-87.

Keil, M., and Robey, D. "Turning around Troubled Software Projects: An Exploratory Study of the Deescalation of Commitment to Failing Courses of Action," *Journal of Management Information Systems* (15:4), 1999, pp. 63-87.

Keil, M., and Robey, D. "Blowing the Whistle on Troubled Software Projects," *Communications of the ACM* (44:4), 2001, pp. 87-93.

Keil, M., Smith, H.J., Pawlowski, S., and Jin, L. "'Why Didn't Somebody Tell Me?': Climate, Information Asymmetry, and Bad News About Troubled Projects," *The DATA BASE for Advances in Information Systems* (35:2), 2004, pp. 65-84.

Kidder, R.M. "Ethics at Enron," in: *Ethics Newsline*, Institute for Global Ethics, 2002.

King, J. "Attribution Theory and the Health Belief Model," in: *Attribution Theory: Social and Functional Extentions,* M. Hewstone (ed.), Basil Blackwell, Oxford, UK, 1983, pp. 170-186.

Koonce, L., McAnally, M.L., and Mercer, M. "How Do Investors Judge the Risk of Financial Items?," *Accounting Review* (80:1), 2005, pp. 221-242.

Landy, F.J., Rastegary, H., Thayer, J., and Colvin, C. "Time Urgency: The Construct and Its Measurement," *Journal of Applied Psychology* (76:5), 1991, pp. 644-657.

Latane, B., and Darley, J.M. *The Unresponsive Bystander: Why Doesn't He Help*, Prentice Hall, Englewood Cliffs, NJ, 1970.

Lerner, J.S., and Keltner, D. "Fear, Anger, and Risk," *Journal Of Personality And Social Psychology* (81:1), 2001, pp. 146-159.

Liang, H., Saraf, N., Hu, Q., and Xue, Y. "Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management," *MIS Quarterly* (31:1), 2007, pp. 59-87.

MacCallum, R.C., and Browne, M.W. "The Use of Causal Indicators in Covariance Structure Models: Some Practical Issues," *Psychological Bulletin* (114:3), 1993, pp. 533-541.

MacIntyre, P.D., Babin, P.A., and Clement, R. "Willingness to Communicate: Antecedents and Consequences," *Communication Quarterly* (47:2), 1999, pp. 215-229.

March, J.G., and Shapira, Z. "Managerial Perspectives on Risk and Risk Taking," *Management Science* (33:11), 1987, pp. 1404-1418.

Matthews, M.C. "Codes of Ethics Organizational Behavior and Misbehavior," in: *Research in Corporate Social Performance and Policy,* W.C. Frederick (ed.), JAI Press, Greenwich, CT, 1987, pp. 107-130.

McCroskey, J.C., and Baer, J.E. "Willingness to Communicate: The Construct and Its Measurement," in: *Annual Convention of the Speech Communication Association*, Denver, CO, 1985.

McCroskey, J.C., and Richmond, V.P. "Willingness to Communicate," in: *Personality and Interpersonal Communication,* J.C. McCroskey and J.A. Daly (eds.), Sage Publications, Newbury Park, 1987, pp. 129-156.

Miceli, M.P., and Near, J.P. *Blowing the Whistle: The Organizational and Legal Implications for Companies and Employees*, Lexington Books, New York, NY, 1992.

Milliken, F.J., Morrison, E.W., and Hewlin, P.F. "An Exploratory Study of Employee Silence: Issues That Employees Don't Communicate Upward and Why," *Journal of Management Studies* (40:6), 2003, pp. 1453-1476.

Morrison, E.W., and Milliken, F.J. "Organizational Silence: A Barrier to Change and Development in a Pluralistic World," *Academy of Management. The Academy of Management Review* (25:4), 2000, pp. 706-725.

Morrison, E.W., and Milliken, F.J. "Speaking up, Remaining Silent: The Dynamics of Voice and Silence in Organizations," *Journal of Management Studies* (40:6), 2003, pp. 1353-1358.

Munton, A.G., Silvester, J., Stratton, P., and Hanks, H. *Attributions in Action: A Practical Approach to Coding Qualitative Data*, John Wiley & Sons, Chichester, UK, 1999.

Nakao, M. "Mizuho Financial Group Banking System Failure," Japan Science and Technology Agency, Tokyo, Japan, 2002.

Near, J.P., and Miceli, M.P. "Organizational Dissidence: The Case of Whistle-Blowing," *Journal of Business Ethics* (4:1), 1985, pp. 1-16.

Noonan, R., and Wold, H. "Pls Path Modeling with Indirectly Observed Variables: A Comparison of Alternative Estimates for Latent Variables," in: *Systems under Indirect Observations: Causality, Structure, Prediction,* K.G. Joreskog and H. Wold (eds.), North-Holland, Amsterdam, Netherlands, 1982, pp. 75-94.

O'Neal, E.C., Levine, D.W., and Frank, J.F. "Reluctance to Transmit Bad News When the Recipient Is Unknown: Experiments in Five Nations," *Social Behavior and Personality* (7:1), 1979, pp. 39-47.

Ordonez, L., and Benson, L.I. "Decisions under Time Pressure: How Time Constraint Affects Risky Decision Making," *Organizational Behavior and Human Decision Processes* (71:2), 1997, pp. 121-140.

Oz, E. "When Professional Standards Are Lax: The Confirm Failure and Its Lessons," *Communications of the ACM* (37:10), 1994, pp. 29-36.

Park, C., Im, G.P., and Keil, M. "Overcoming the Mum Effect in It Project Reporting: The Effect of Time Pressure and Blame Shifting," Academy of Management Best Papers Proceedings, Atlanta, GA, 2006.

Park, C., Keil, M., and Kim, J. "Willingness to Report Bad News on Troubled It Projects: Impacts of Personal and Situational Factors," in: *Presented at the Academy of Management*, Philadelphia, PA, 2007.

Payne, J.W., Bettman, J.R., and Johnson, E.J. "Adaptive Strategy Selection in Decision Making," *Journal of Experimental Psychology: Learning, Memory, And Cognition* (14:3), 1988, pp. 534-552.

Perdue, B.C., and Summers, J.O. "Checking the Success of Manipulations in Marketing Experiments," *Journal of Marketing Research* (23:4), 1986, pp. 317-326.

Petter, S., Straub, D., and Rai, A. "Specifying Formative Constructs in Information Systems Research," *MIS Quarterly* (31:4), 2007, pp. 623-656.

Podsakoff, P.M., MacKenzie, S.B., Lee, J., and Podsakoff, N.P. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88:5), 2003, pp. 879-903.

Price, V.A. *Type a Behavior Pattern: A Model for Research and Practice*, Academic Press, New York, NY, 1982.

Rastegary, H., and Landy, F.J. *The Interactions among Time Urgency, Uncertainty, and Time Pressure*, Plenum, New York, NY, 1993.

Remus, W. "Graduate Students as Surrogates for Managers in Experiments on Business Decision Making," *Journal of Business Research* (14:1), 1986, pp. 19-25.

Robinson, W.P. (ed.) *Social Groups and Identities: Developing the Legacy of Henri Tajfel*. Butterworth-Heinemann, Oxford, UK, 1996.

Rosen, S., and Tesser, A. "On Reluctance to Communicate Undesirable Information: The Mum Effect," *Sociometry* (33:3), 1970, pp. 253-263.

Rushton, J.P. *Altruism, Socialization, and Society*, Prentice-Hall, Englewood Cliffs, NJ, 1980.

Saunders, D.M., Sheppard, B.H., Knight, V., and Roth, J. "Employee Voice to Supervisors," *Employee Responsibilities and Rights Journal* (5:3), 1992, pp. 241-259.

Shapira, Z. "Risk in Managerial Decision Making," Hebrew University, Jerusalem, Israel, 1986.

Shultz, T.R., and Schleifer, M. "Towards a Refinement of Attribution Concepts," in: *Attribution Theory and Research: Conceptual, Developmental and Social Dimensions,* J. Jaspars, F.D. Fincham and M. Hewstone (eds.), Academic Press, London, UK, 1983, pp. 37-62.

Sitkin, S.B., and Weingart, L.R. "Determinants of Risky Decision-Making Behavior: A Test of the Mediating Role of Risk Perceptions and Propensity," *Academy of Management Journal* (38:6), 1995, pp. 1573-1592.

Slovic, P. "Perception of Risk," *Science* (236:4799), 1987, pp. 280-285.

Smith, H.J., and Keil, M. "The Reluctance to Report Bad News on Troubled Software Projects: A Theoretical Model," *Information Systems Journal* (13:1), 2003, pp. 69-95.

Smith, H.J., Keil, M., and Depledge, G. "Keeping Mum as the Project Goes Under: Toward an Explanatory Model," *Journal of Management Information Systems* (18:2), 2001, pp. 189-227.

Smith, J.F., Mitchell, T.R., and Beach, L.R. "A Cost-Benefit Mechanism for Selecting Problem-Solving Strategies: Some Extensions and Empirical Tests," *Organizational Behavior and Human Performance* (29:3), 1982, pp. 370-396.

Snow, A.P., and Keil, M. "The Challenge of Accurate Software Project Status Reporting: A Two-Stage Model Incorporating Status Errors and Reporting Bias," *IEEE Transactions on Engineering Management* (49:4), 2002, pp. 491-504.

Staub, E. *Positive Social Behavior and Morality: Social and Personal Influences*, Academic Press, New York, NY, 1978.

Staudenmayer, N., Tyre, M., and Perlow, L. "Time to Change: Temporal Shifts as Enablers of Organizational Change," *Organization Science* (13:5), 2002, pp. 583-597.

Staw, B.M. "Knee-Deep in the Big Muddy: A Study of Escalating Commitment to a Chosen Course of Action," *Organizational Behavior and Human Performance* (16:1), 1976, pp. 27-44.

Staw, B.M., and Ross, J. "Behavior in Escalation Situations: Antecedents, Prototypes, and Solutions," in: *Research in Organizational Behavior,* B.M. Staw and L.L. Cummings (eds.), JAI Press Inc., Greenwich, CT, 1987, pp. 39-78.

Stein, T. "Behind the News: Sap Sued over R/3," in: *Information Week*, 1998.

Straub, D., and Karahanna, E. "Knowledge Worker Communications and Recipient Availability: Toward a Task Closure Explanation of Media Choice," *Organization Science* (9:2), 1998, pp. 160-175.

Tajfel, H. "Social Categorization, Social Identity and Social Comparison," in: *Differentiation between Social Groups,* H. Tajfel (ed.), Academic Press, London, UK, 1978, pp. 61-76.

Tan, B.C.Y., Smith, H.J., Keil, M., and Montealegre, R. "Reporting Bad News About Software Projects: Impact of Organizational Climate and Information Asymmetry in an Individualistic and a Collectivistic Culture," *IEEE Transactions on Engineering Management* (50:1), 2003, pp. 64-77.

Tesser, A., and Rosen, S. "The Reluctance to Transmit Bad News," in: *Advances in Experimental Social Psychology,* L. Berkowitz (ed.), Academic Press, New York, NY, 1975, pp. 193-232.

Tesser, A., Rosen, S., and Batchelor, T.R. "On the Reluctance to Communicate Bad News (the Mum Effect): A Role Play Extension," *Journal of Personality* (40:1), 1972, pp. 88-103.

Tetlock, P.E. "Accountability and Complexity of Thought," *Journal of Personality and Social Psychology* (45:1), 1983, pp. 74-83.

Thomas, J.B., Clark, S.M., and Gioia, D.A. "Strategic Sensemaking and Organizational Performance: Linkages among Scanning, Interpretation, Action, and Outcomes," *Academy of Management Journal* (36:2), 1993, pp. 239-270.

Trochim, W.M. *The Research Methods Knowledge Base*, Atomic Dog Publishing, Cincinnati, OH, 2001.

Underwood, R., Bond, E., and Baer, R. "Building Service Brands Via Social Identity: Lessons from the Sports Marketplace," *Journal of Marketing Theory and Practice* (9:1), 2001, pp. 1-13.

Vancouver, J.B., and Morrison, E.W. "Feedback Inquiry: The Effect of Source Attributes and Individual Differences," *Organizational Behavior and Human Decision Processes* (62:3), 1995, pp. 276-285.

Waller, M.J., Conte, J.M., Gibson, C.A., and Carpenter, M.A. "The Effect of Indivdual Perceptions of Deadlines on Team Performance," *Academy of Management Review* (26:4), 2001, pp. 586-600.

Waller, M.J., Giambatista, R.C., and Zellmer-Bruhn, M.E. "The Effects of Individual Time Urgency on Group Polychronicity," *Journal of Managerial Psychology* (14:34), 1999, pp. 244-256.

Weiner, B. *An Attributional Theory of Motivation and Emotion*, Springer-Verlag, New York, NY, 1986.

Wold, H. "Soft Modeling: The Basic Design and Some Extensions," in: *Systems under Indirect Observations: Part 2,* K.G. Joreskog and H. Wold (eds.), North-Holland, Amsterdam, Netherlands, 1982, pp. 1-54.

Wright, P. "The Harassed Decision Maker: Time Pressures, Distractions, and the Use of Evidence," *Journal of Applied Psychology* (59:5), 1974, pp. 555-561.

Yarnold, P.R., and Grimm, L.G. "Time Urgency among Coronary-Prone Individuals," *Journal of Abnormal Psychology* (91:2), 1982, pp. 175-177.

Yi, M.Y., and Davis, F.D. "Developing and Validating an Observational Learning Model of Computer Software Training and Skill Acquisition," *Information Systems Research* (14:2), 2003, pp. 146-169.

Zakay, D. "Post-Decisional Confidence and Conflict Experienced in a Choice Process," *Acta Psychologica* (58:1), 1985, pp. 75-80.

Zarrella, E., Tims, M., Carr, B., and Palk, W. "Global It Project Management Survey: How Committed Are You?," KPMG International, Hong Kong, China, pp. 1-40.