
Keeping Mum as the Project Goes Under: Toward an Explanatory Model

H. JEFF SMITH, MARK KEIL, AND GORDON DEPLEDGE

H. JEFF SMITH is an associate professor at the Babcock Graduate School of Management, Wake Forest University, in Winston-Salem, North Carolina. His research focuses on the societal reactions to strategic uses of information technology. In particular, he has studied the concerns related to personal privacy that often develop when new information technologies are introduced in the marketplace. His research has appeared in *MIS Quarterly*, *Organization Science*, *Communications of the ACM*, *Harvard Business Review*, *Sloan Management Review*, and other journals. His book, *Managing Privacy: Information Technology and Corporate America* was published by the University of North Carolina Press. He has served as an associate editor of *The DATA BASE for Advances in Information Systems*.

MARK KEIL is an associate professor of Computer Information Systems in the Robinson College of Business at Georgia State University. His research focuses on software project management, with particular emphasis on understanding and preventing software project escalation—cases in which projects seem to take on lives of their own, continuing to absorb valuable resources without ever reaching their objectives. Keil's research has been published in *MIS Quarterly*, *Sloan Management Review*, *Communications of the ACM*, *Journal of Management Information Systems*, *IEEE Transactions on Engineering Management*, *Decision Support Systems*, and other journals. He has served as an Associate Editor for *MIS Quarterly*. He currently serves as coeditor of *The DATA BASE for Advances in Information Systems*, and is also an editorial board member for *IEEE Transactions on Engineering Management*.

GORDON DEPLEDGE is a doctoral student in the Computer Information Systems Department at Georgia State University. In prior careers he has worked in corporate financial and information systems management. Working mostly with smaller companies, he has wide practical experience in the design, development, implementation, and management of information systems. His present research interest focuses on the project management domain.

ABSTRACT: The problem of "runaway" information systems (IS) projects can be exacerbated by the reluctance of organizational members to transmit negative information concerning a project and its status. Drawing upon relevant bodies of literature, this paper presents a model of the reluctance to report negative project news and develops hypotheses to be tested. An experiment, which was designed to test these hypotheses for both internal and external reporting alternatives, is then described. Two factors are manipulated: (1) the level of impact associated with project failure should an individual fail to report negative information, and (2) the level of observed behavioral wrongdoing associated with the project. The results explain a significant portion of the variance in the reluctance to report negative information and suggest

that there are some differences in internal and external reporting behavior. Implications for research and practice are discussed.

KEY WORDS AND PHRASES: information system development, mum effect, project management, whistle-blowing.

In 1987, Marriott, Hilton, and Budget Rent-a-Car entered into a joint venture with AMRIS to develop a state-of-the-art \$55.7 million dollar computerized reservation system called CONFIRM that would allow consumers to make airline, hotel and car rental reservations through a single system. At the end of April 1992, the AMRIS chairperson wrote the three partners saying: "Unfortunately, things have not gone as planned . . . the individuals whom we gave responsibility for managing CONFIRM . . . have apparently deliberately concealed a number of important technical and performance problems." On May 1, 1992, AMRIS' vice-chairperson circulated a letter internally stating that "some people who have been part of CONFIRM RS management did not disclose the true status of the project in a timely manner. This has created more difficult problems—of both business ethics and finance—than would have existed if those people had come forward with accurate information." In July 1992, after spending 3.5 years and \$125 million on CONFIRM, the project was canceled [66].

THE CASE OF CONFIRM IS INTERESTING, not just because it was a well-publicized software project failure, but because the high probability of impending disaster was known by individuals within the organization long before appropriate action was taken to bring the project back under control. No doubt a significant portion of the \$125 million could have been salvaged had top executives been aware of the actual status earlier, but significant information had been kept from them due to the "mum effect"—individuals being reluctant to transmit unpleasant messages [65, p. 39].

There is good reason to believe that the mum effect contributes to the incidence of "runaway" projects. The runaway category—which includes cases like CONFIRM—appears to be a large one. The Standish Group's 1999 "CHAOS" study update, which incorporated data about several thousand software development projects, revealed that only 26 percent were completed on time and on budget. Twenty-eight percent were canceled before the development cycle was completed, and the remaining 46 percent were completed over-budget and behind schedule, with fewer functions and features than originally specified [78]. Some nontrivial proportion of projects in these two latter groups, which total 74 percent, would probably have been canceled earlier had senior managers been aware of their actual status.

Recent work by Jacovou [36] provides some theoretical support for the linkage between the reluctance to report negative project status news, a reduction in an organization's ability to prepare for a failure, and, ultimately, the increased impact of

such a failure. Further, in an empirical vein, Keil and Robey [40] provide specific evidence of problems that result from the reluctance of organizational members to transmit negative information concerning a project and its status. Based on their research, the same authors [41] suggest that even information systems (IS) auditors are frequently reluctant to report project troubles to a firm's executives due to personal and organizational issues. Because such reporting of negative project status information can be viewed as a role-prescribed activity for IS auditors, it is particularly telling that they frequently suppress the negative information. This suggests that, across the broader milieu of IS development and management, which is populated with programmers, developers, and managers, the phenomenon could be widespread. And, to the extent that one expects senior executives to make rational decisions about IS resource allocations, the phenomenon is obviously a dysfunctional one from an organizational perspective.

Of course, the mum effect is a general phenomenon that holds in many contexts beyond that of IS [70, 71, 80, 82, 83, 84, 85]. However, IS projects may be particularly susceptible for two reasons. First, even though they know an IS project is behind schedule, observers may lack confidence in their understanding of the actual extent of the trouble. Most IS projects involve software development, and its intangible nature makes it difficult to estimate the proportion of work that has been completed. Second, the scope of IS projects is often dynamic, and a project's boundaries may shift over time [1, 92]. While an observer may suspect that an IS project is in trouble, (s)he may not be completely sure and, therefore, his or her willingness to report the status information may be reduced. Thus, although the phenomenon can no doubt be observed in project environs that cut across many domains, IS projects appear to provide an especially appropriate context for its examination.

In that light, our objective is to better understand how individuals make reporting decisions regarding negative project status information. Although no single study can fully capture the complexity of this phenomenon, important progress can be made by the creation of a theoretical framework and the examination of a limited number of contributing factors. To that end, in this paper we provide background regarding the theoretical context of the phenomenon, and we then present a research model. We conduct an experiment to test the model, and we then consider the implications for both research and practice.

Background

A STREAM OF LITERATURE ON ORGANIZATIONAL "whistle-blowing" provides a general theoretical framework that is quite useful for our immediate purpose.¹ 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" [17, p. 824]. It is assumed that the individual "lacks the power and authority" to handle the situation and must therefore "appeal to someone of greater power or authority" [58, p. 15]. The reporting channels, which presumably

include those individuals of greater power and authority, could be either internal or external ones [58]. Although it is true that the majority of IS reporting decisions are likely not associated with "illegal" practices, there is certainly a possibility of arguably "immoral" behaviors (e.g., lying by a superior). And the fact that project status is not being reported accurately could be construed, in and of itself, as an "illegitimate" practice, even if there were no immoral behavior. In that light, then, we rely on the whistle-blowing literature for the central decision-making model in our study. The empirical validity of this model was recently demonstrated [42].

It is held by researchers who study whistle-blowing that individuals undertake a predictable series of assessments in these situations (see Figure 1). Based on the work of Latane and Darley [50], Dozier and Miceli [17] argued that, once an individual is aware of problematic practices, he first considers whether the situation is deserving of action. Translating this step into our context means deciding whether or not the bad news *ought* to be reported. Second, he considers whether he is *responsible* for taking action. Finally, in light of these assessments, he considers which, if any, reporting alternative to embrace. To the extent that he rejects all alternatives other than remaining silent, he reveals a reluctance to report the bad project status news. We adopt this central model as a general outline of individuals' decision-making regarding bad news reporting but we also hold that, in the context of the immediate phenomenon, it requires expansion in two areas.

First, there are obviously some issues of ethics associated with the phenomenon—for example, the vice president in the CONFIRM example invoked language of business ethics in condemning the non-reporting behavior of some individuals. Within the literature of *normative* ethics (that is, philosophical discourse about what one *ought* to do), one can certainly find theoretical arguments that demand one always tell the truth [37]. However, there are differing schools of thought on one's duty to reveal everything one knows [7], with some arguing that nondisclosure is acceptable, particularly in the business world [13]. Although those normative arguments are interesting ones, they do not tell us much about what is actually driving the reporting behaviors, since that is a question in the realm of *descriptive* ethics (that is, research about how people actually behave). There have been a few studies that relate an individual's ethical predisposition to his decision about reporting (e.g., [8, 26]), but research in this area is quite limited, and the studies that do exist were not done in a project management context. Further, these studies did not examine the importance of the relationships in a larger model and were never integrated fully into the whistle-blowing literature stream.

Second, none of these bodies of literature—whistle-blowing, mum effect, descriptive ethics—considers factors that may be unique to a project environment, particularly one in which systems development activities are being undertaken. It is reasonable to expect that some project-related factors (in this study, we consider project risk) could well influence how individuals assess their reporting responsibilities. At the same time, we note that the IS literature has not included many factors or theoretical arguments from these other disciplines in its previous examinations of project management.

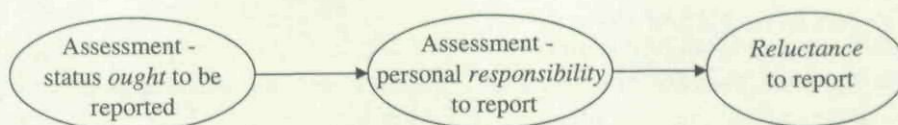


Figure 1. Central Decision-Making Model. Source: Adapted from Dozier and Miceli [17].

In this study, we utilize the constructs and relationships in Figure 1 as a central decision-making model, and we also consider some influencing factors, two of which (level of impact from failure and behavioral wrongdoing) we manipulate. With respect to the former factor—potential impact of a project's failure—two different literature streams attest to its importance. In the risk literature, this factor has been claimed to be the most salient component in managers' risk perceptions [53]. And, in the whistle-blowing literature, the extent to which an activity "involves substantial financial consequences" has been viewed as an important input into individuals' assessments [58, p. 138]. With respect to the latter factor, the whistle-blowing literature invokes research on pro-social behavior [11] to conclude that the "seriousness of wrongdoing" should be a strong causal factor in individuals' decision processes [58, p. 138]. It is also obvious that, at least in the CONFIRM example, observers came to believe that wrongdoing—in the form of inaccurate and deceptive reporting—was a contributing factor to the financial calamity that ensued. We certainly do not claim that these manipulated factors form an exhaustive set that fully explains the phenomenon. Indeed, in a later section ("Implications for Future Research"), we will explore other factors that also merit consideration within this research stream. Given the state of the present research stream, however, we claim that these two factors form a reasonable set for examination at this juncture.

In light of the aforementioned, it is worth noting that this study contributes to both the IS literature and the literature in some reference disciplines (a more extensive discussion of the contributions will be found later in the "Discussions and Implications" section). With respect to IS, the study provides some of the first empirical findings related to the reluctance to transmit bad news in an IS project management environment. It will be seen that some assertions from other disciplines regarding wrongdoing (previously untested in an overall model) hold in an IS context. In addition, specific IS-related factors (impact of project failure and perceived project risk) and an associated individual factor (risk propensity) are shown to have direct and indirect impacts on an individual's assessments. Of course, these findings should hold in more general contexts, but it is nevertheless promising to observe their direct applicability in the IS domain. With respect to reference disciplines, the study demonstrates the distinctions between internal and external reporting options, previously alluded to in the whistle-blowing literature but not given much empirical attention. Thus, the study contributes to both the IS and reference disciplines.

We now turn to a description of the model, which is followed by a discussion of our methodology and results.

Research Model and Hypotheses

THE CENTRAL DECISION-MAKING MODEL from Figure 1 is considered along with some important factors that influence it (see Figure 2).

Central Model

The top row of Figure 2 (in the box) represents the central decision-making model that is grounded in the whistle-blowing literature. With respect to that central model, we briefly state two hypotheses that were shown to hold in recent research [42]. For the sake of completeness and as a replication, we retest them here.

First, consider the assessments of whether the news ought to be reported and the personal responsibility to report. Although these constructs are theoretically distinct, this should not blur their inherent relationship. All other things being equal, an individual's assessment of personal *responsibility* will be biased upward by an assessment of whether the information *ought* to be communicated. Hence, the following hypothesis:

H1: A greater perception that information ought to be communicated will be reflected in a higher level of perceived personal responsibility for reporting.

Second, and following the line of argument from Miceli and Near [58], there should be a direct effect between personal responsibility and reluctance to report bad news. Specifically, we state the following:

H2: The level of perceived personal responsibility for reporting will be inversely related to an individual's reluctance to transmit negative information. That is, higher levels of personal responsibility will be associated with less reluctance to report bad news.

We now turn to some additional factors that are related to the central model.

Factors Related to the Central Model

Reluctance and Alternatives

DOZIER AND MICELI [17] AND FARRELL AND PETERSEN [20] HAVE ARGUED that a perceived risk of negative personal consequences acts as a "cost" in the individual's assessment of reporting alternatives [58, p. 153]. The literature suggests that an expectation of such negative consequences should be an important inhibitor of reporting behavior, and several theoretical justifications can be mounted. For example, Miceli and Near [58, pp. 153–154] rely on the work of Bandura [2] to argue that a "risk of feared consequences" can reduce one's perceived ability to manipulate one's environment (one's self-efficacy), and one will therefore be discouraged from embracing an option that was associated with such a fear. However, despite the strong theoretical hypothesis that a risk of negative personal consequences will inhibit reporting, at least

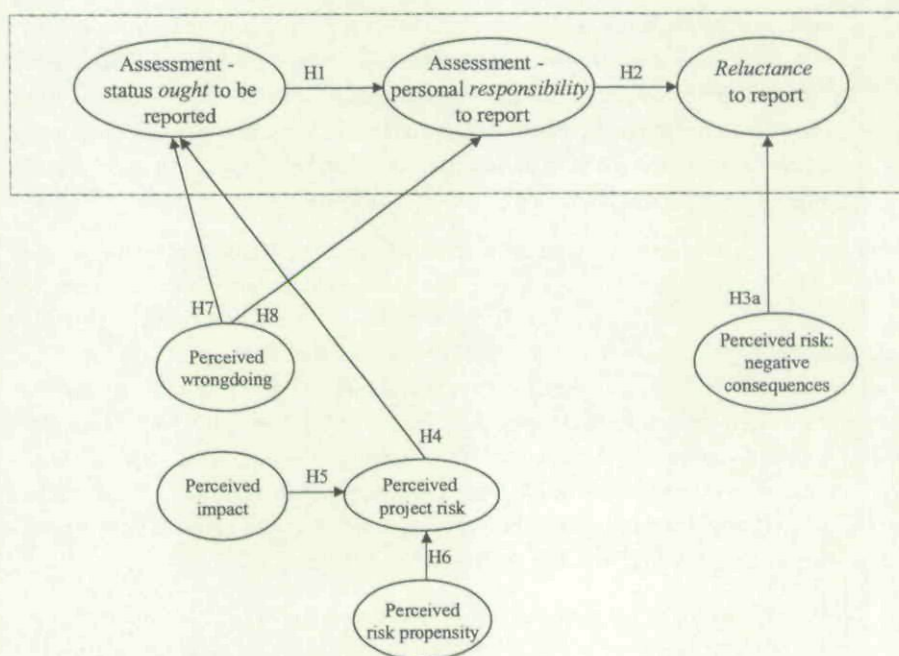


Figure 2. Research Model

five studies have attempted to test this relationship without finding clear support for it [56, 57, 59, 62, 63]. Keenan [38] has shown a relationship between fear of negative personal consequences and corporate encouragement to blow the whistle. But his findings do not tie the risk tightly to specific reporting alternatives and intended behaviors.² Consistent with the theoretical arguments but aware of the lack of prior, specific empirical support, we hypothesize:

H3a: Individuals will exhibit a greater reluctance to report negative information when they perceive a high risk of negative personal consequences for doing so.

Of course, the risk of negative consequences may vary depending on the attributes of the specific reporting alternative. In general, such reporting alternatives will be in two broad categories, with some subcategories in each. Based on an unpublished dissertation by Blackburn [6], an adaptation by Miceli and Near [58, p. 57], and our own extensions, we note that alternatives fall largely along these lines:

1. *Internal* reporting alternatives. The entity to which the individual reports the project status resides within the organization's own boundaries. There are two broad subcategories: alternatives *within* the normal reporting chain (e.g., going to an executive who is the supervisor of one's own supervisor) and alternatives *outside* that chain (e.g., reporting the project status to an organization's ombudsman).
2. *External* reporting alternatives. The entity to which the individual reports the project status resides outside the organization's own boundaries. There are

several subcategories, which can include *professional* information paths (e.g., reporting the project status to a professional organization), *publicity-related* information paths (e.g., informing a newspaper reporter), *interorganizational* information paths (e.g., informing one of the organization's customers), *regulatory* information paths (e.g., Internal Revenue Service [IRS]), and *financial market* information paths (e.g., lenders, stockholders).

Near and Miceli [63] argue that negative personal consequences are more likely when individuals pursue external channels (i.e., those that extend outside the organization itself) rather than internal ones. This is due largely to the fact that external reporting "exposes the organization to greater public scrutiny and perhaps ridicule [which] may represent a far greater challenge of organizational authority and legitimacy than a concern voiced internally to a supervisor" [63, p. 138]. Two different studies [57, 63] have found support for the assertion that negative consequences are more likely for external than internal whistle-blowers. However, we are unaware of any studies that test whether individuals, when considering reporting alternatives, hold perceptions that mirror these findings. We therefore hypothesize:

H3b: Individuals will assess the risk of negative personal consequences for external reporting options to be higher than that for internal reporting options.

In the end, the key question revolves around which alternatives will be associated with more (and less) reluctance to report. In an empirical sense, "anecdotal and survey evidence suggests that members initiate complaints within the organization before turning to outsiders . . . and that whistle-blowers typically report wrongdoing first to their supervisors" [58, p. 61]. However, beyond a combination of the two arguments posited in H3a and H3b—that risk of negative personal consequences will inhibit reporting behavior and that individuals will perceive the risk of such consequences to be higher for external alternatives—there appears to be no clear theoretical development on this point. We are also unaware of any previous studies that provide comparisons of internal and external reporting alternatives. We argue that, beyond the risk of negative personal consequences, individuals may well have other reasons for preferring internal to external reporting alternatives. In particular, one might believe that those in internal channels would have a better understanding of the problems, that they might be more appreciative of subtle political issues associated with the project situation, and so on. We therefore hypothesize that:

H3c: Individuals will exhibit more reluctance to report through external than through internal reporting channels.

Perceived Project Risk, Level of Impact, and Perceived Risk Propensity

We also posit that perceptions of project risk can influence the central model. Perceived risk can be defined as "a decision-maker's assessment of the risk inherent in a

situation" [75, p. 12]. If the consequences of not reporting the bad news are minimal and would likely result in no harm, either financial or otherwise (i.e., perceived project risk is low), it is debatable whether the bad news ought to be communicated. If, however, the consequences of not reporting are high and would likely result in harm (i.e., perceived project risk is high), then individuals will be more likely to believe that something ought to be done. Thus, we state the following hypothesis:

H4: Individuals will be more likely to claim that a project's status ought to be reported when perceived project risk is high.

We are unaware of any empirical tests of such a hypothesis in any previous study.

In our proposed model, two factors influence perceived project risk: impact and perceived risk propensity. The literature suggests that perceived risk has two key components: the probability that failure will occur and the magnitude of the possible loss, or impact, from that failure [3, 18, 55]. In a review of managerial perspectives on risk taking, March and Shapira [53] suggested that magnitude, or impact, was the more salient of the two components in the minds of managers. In a laboratory experiment set in a software project context, Keil et al. [43] found evidence in support of March and Shapira's claims. Thus, for the purposes of the proposed model, we limit ourselves to examining the impact variable and state the following hypothesis:

H5: Perceived project risk will increase with perceived impact.

An individual's perceptions of risk associated with a particular situation are believed to be influenced by that individual's propensity to take or avoid risks. Risk propensity refers to the notion that many decision-makers have consistent tendencies to either take or avoid actions that they feel are risky [32, 44, 75]. It has been commonly observed that people differ in their willingness to take risks [19, 21, 27, 52]. For example, if an individual has a high risk taking propensity, he may tend to underestimate the risks involved in a situation. A risk-seeking decision-maker is more likely to recognize and weigh positive outcomes, thereby overestimating the probability of a gain relative to the probability of a loss [12, 89]. This overestimation will result in a lowering of risk perceptions. Additionally, a risk-averse decision-maker will weigh negative outcomes more highly, leading to a heightened perception of risk [73]. Thus, we state the following hypothesis:

H6: There will be a significant negative relationship between perceived risk propensity and perceived project risk. For example, decision-makers perceiving themselves to have a risk-seeking propensity will perceive risks to be lower than decision-makers perceiving themselves to have a risk-averse propensity.

A similar hypothesis received support in a previous study [76]; however, a study by Keil et al. [43], which used different measures, failed to replicate this earlier finding.

Having discussed perceived project risk, level of impact, and perceived risk propensity, we now turn to the final variable in our model: perceived behavioral wrongdoing.

Perceived Wrongdoing, Ought to Be Reported, Responsible to Report

There is reason to believe that individuals will draw different conclusions regarding a need to report status information based on the level of perceived wrongdoing in the situation [17, 58, 59]. Although individuals gravitate toward different types of moral argumentation, almost all engage in some sort of mental calculus that leads to perceptions regarding the level of wrongdoing in a certain situation. Individuals may trade off consequences of different actions, or they may trade off different principles that may be in conflict [67]. Irrespective of the path they take in making their assessment, though, they reach a conclusion regarding the level of wrongdoing they perceive to be present.

We argue that such assessments will have an influence on individuals' general assessment of whether the status *ought* to be reported. An individual may assess that principles like justice or fairness are being violated, but there may be no concomitant and overriding adherence to principles that are of a higher order. Or, alternatively, the individual may assess that the negative consequences of a certain behavior override the positive ones with respect to a certain focal point. In either of these two cases, the individual will likely conclude that the offending behavior should be curtailed—regardless of who takes the action to curtail it. This is the same reaction that leads individuals to claim that “there ought to be a law” prohibiting a certain behavior, which suggests that society ought to take action. Therefore, we state this hypothesis:

H7: Individuals are more likely to assess that negative information ought to be reported when they perceive higher levels of wrongdoing.

While we are unaware of any previous studies addressing hypothesis H7, some previous studies have provided evidence of an association between perceived wrongdoing and feelings of *personal* responsibility for reporting bad news [8, 26, 42]. Those findings suggest that individuals feel a stronger sense of personal responsibility to report when they perceive that important principles are being violated or the negative consequences seem to outweigh the positive. We therefore state:

H8: Individuals are more likely to assess a personal responsibility to report a project's status when they perceive higher levels of wrongdoing.

Research Methodology

AN EXPERIMENT WAS CONDUCTED so that causal relationships between constructs in the theoretical model could be tested with minimal interference. The experiment involved a two-factor, four-cell design, in which the level of impact and the level of wrongdoing were manipulated independently. This methodological approach is consistent with that used in some earlier studies of IS implementation with manipulation of both project and organizational factors [33, 34, 87].

for using students as surrogates for managers [68]. Further, there is ample precedent for using student subjects in tests of risk-related decision-making behaviors (see, for example, [76]) and project management decision-making (see, for example, [34]). Also note that the subjects were asked to adopt the role, not of a senior manager but, rather, of a lead systems analyst on a project. The role of systems analysts and their relationships to programmers, users, and management were discussed in their information systems course, and the subjects had sufficient work experience to appreciate the context of the scenario. Thus, it is reasonable to assume that they could project themselves into the defined role in the experiment.

Constructs and Measures

We created our own three-item measures for the assessment of whether something ought to be reported and the assessment of personal responsibility. We also created our own four-item measures for perceived impact and perceived wrongdoing. Measures for perceived risk propensity and perceived project risk were adapted from measures validated by Sitkin and Weingart [76].

We created several reporting alternatives and related items measuring the perceived risk of negative personal consequences. Four internal reporting alternatives were included: individual reporting within the chain of command (INT_INDIV), group reporting within the chain (INT_GROUP), reporting to an internal auditor (INT_AUD), and reporting through an "open door" procedure (INT_OPNDR). Three external reporting alternatives were also included: to an association of software developers (EXT_ASSOC), to a television station (EXT_TV), and to a client (EXT_CLIENT). So that the alternatives would have salience for all the treatment groups, we referred to the bad news as "the status of the CAPS project," which had meaning for all treatment conditions. And, to preserve symmetry with the internal options, we worded all of the external alternatives so that the possibility of anonymous reporting had been removed. We do *not* claim that the various reporting alternatives comprise a set of items measuring a single construct. Rather, we treat them as separate alternatives with distinct characteristics. Appendix 2 shows the measurement items arranged by construct along with descriptive statistics for each item.

Results

Manipulation Checks

MANIPULATION CHECKS WERE PERFORMED to verify that the impact and wrongdoing manipulations were effective. Composite measures were created for the impact and wrongdoing constructs by averaging the items shown in those sections of Appendix 2. These measures were found to be suitable in terms of reliability, with a Cronbach's alpha of 0.78 for impact and a Cronbach's alpha of 0.90 for wrongdoing. Figure 3 shows the mean values for perceived impact (1 = low level of impact; 7 = high level of impact) and perceived wrongdoing (1 = low level of wrongdoing; 7 = high level of

Scenario

The design involved a role-playing experiment in which subjects were asked to read a short scenario about a troubled software project called CAPS (see Appendix 1). The level of impact (high, low) and the level of wrongdoing (high, low) were manipulated independently to yield four treatment conditions.

For the high-impact condition, the subject was informed that the CAPS project was critically important to the company and that its failure would result in a significant negative effect on the company's financial position, forcing it to lay off half its employees and to file for bankruptcy. For the low-impact condition, the subject was informed that the CAPS project was *not* strategically important to the company and that its failure would have no effect on the company's financial position.

Wrongdoing was manipulated in a similar fashion. For the high wrongdoing condition, the subject was led to believe that his supervisor planned to lie about the bad news. For the low-wrongdoing condition, the subject was led to believe that his supervisor planned to act honestly.³

Procedure

Subjects were told that this was a study about business decision-making and were assured of anonymity. They were reminded that their participation was voluntary, but nearly all subjects chose to participate. Subjects were assigned randomly 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 condition. They were asked to read the scenario and to respond to a series of manipulation checks. In the second part, subjects answered several items regarding their willingness to embrace various reporting alternatives (they were told that these alternatives were *not* mutually exclusive); the likelihood of retaliation for each alternative; whether or not the information concerning the project ought to be reported; and whether they felt personally responsible for reporting the information. This portion of the instrument also contained measures for perceived risk propensity and perceived project risk, along with questions designed to gather basic demographic information (see Appendix 2).

Subjects

A total of 163 subjects were recruited for the study. Subjects were business students enrolled in a core information systems course at a large urban university in the southeastern United States. The mean age of the subjects was 23.4 years, and the mean work experience was 3.2 years. Forty-five percent of the subjects were male, and 55 percent were female.

Although one might argue that the use of students as subjects could limit the generalizability of the results to organizational decision-makers, there is some support

Level of Wrongdoing (WRG)	High	N=40		N=41	
		Mean		Mean	
		WRG	5.85	WRG	5.46
		IMP	3.88	IMP	5.46
	Low	N=40		N=42	
		Mean		Mean	
		WRG	2.37	WRG	2.35
		IMP	3.57	IMP	5.95
Low		High			
Level of Impact (IMP)					

Figure 3. Manipulation Check

wrongdoing) across the four treatment groups. As Figure 3 shows, the means for the two manipulated variables move in the expected direction from cell-to-cell, indicating that the manipulations were effective. A 2x2 multiple analysis of variance (MANOVA) was run, with perceived impact and perceived wrongdoing as the dependent variables and with the manipulations as the independent variables. Table 1 shows the results of this analysis.

One would expect the main effects of each manipulated variable to be strongly significant on its respective dependent variable (that is, IMPACT manipulation on perceived IMPACT and WRONGDOING manipulation on perceived WRONGDOING) but to have no significant relationship with the other dependent variable. As can be seen in the first two data rows of Table 1, such is indeed the case. As can also be seen in Table 1 (third data row), there is a modest interaction effect on perceived IMPACT. While statistically significant at $p < 0.05$, this interaction effect is quite small when compared to the very strong main effect of the IMPACT manipulation on this dependent variable (the ratio of the sums of squares is 24.95). A reasonable conclusion from this exercise is that each manipulation produced the intended effect with only a small (and, in relative terms, almost inconsequential) amount of interaction with the other manipulation for one of the two dependent variables.⁴

PLS Analyses

Partial least squares (PLS) was used as the primary analysis tool. In many respects, PLS is superior to traditional statistical methods (e.g., factor analysis, regression, and

Table 1. Results of 2x2 Manova

Independent Variable	Dependent Variable: Perceived IMPACT		Dependent Variable: Perceived WRONGDOING	
	Sum of Squares	F-Value (Sig.)	Sum of Squares	F-Value (Sig.)
Main effect: IMPACT manipulation	160.664	117.600 (0.000)	1.764	1.265 (0.262)
Main effect: WRONGDOING Manipulation	0.340	0.249 (0.619)	442.689	317.483 (0.000)
Interaction effect: (IMPACT manipulation) X (WRONGDOING manipulation)	6.440	4.714 (0.031)	1.388	0.995 (0.320)

path analysis) because it assesses the measurement model within the context of the structural model. To do so, PLS first estimates loadings of indicators on constructs and then estimates causal relationships among constructs iteratively [23]. PLS was selected because it is appropriate for testing theories in the early stages of development [24]. Given that this study is an early attempt to advance a theoretical model on individuals' reluctance to report bad news, PLS can be used to analyze the data. Many prior studies on information systems have used PLS to test early versions of theoretical models (e.g., [35, 86]). In this study, PLS-Graph Version 2.91.3.4 [14, 16] was used.

Measurement Model Assessment

The strength of the measurement model can be assessed through tests of convergent and discriminant validity [31]. We conducted tests described by Chin [15] and Fornell [25].

Convergent validity. Two different assessments were made for convergent validity: (1) individual item reliability, and (2) construct reliability. *Individual item reliability* was assessed by examining the item-to-construct loadings for each construct that was measured with multiple indicators. In order for the shared variance between each item and its associated construct to exceed the error variance, the standardized loadings should be greater than 0.707. During the early stages of scale development, even loadings of 0.5 or 0.6 may still be acceptable for an item if other indicators within the same block of measures have high loadings [15]. As can be seen in Table 2, only two of the constructs include any questionable indicators—perceived risk propensity and perceived project risk—which had been validated previously by other researchers [76]. Since each of these two constructs had one or more other indicators with high loadings and none of their loadings were below 0.5, we have retained all their indicators in the analysis.

We also considered the *construct reliability* for each block of measures, as shown in Table 3.

Composite reliability scores and Cronbach's alpha scores both measure the internal consistency within a given construct's items. Unlike the more traditional Cronbach's alpha, the composite reliability score "does not assume . . . that all indicators are equally weighted. Therefore, alpha tends to be a lower bound estimate of reliability, whereas [the composite reliability score] is a closer approximation under the assumption that the parameter estimates are accurate" [15, p. 320]. The threshold values for composite reliability and Cronbach's alpha are not absolute ones. Most established criteria seem to address Cronbach's alpha levels and do not speak specifically to composite reliability scores. In that light, we note that Bearden et al. [4, p. 7] claim that a score of 0.7 indicates "extensive" evidence of reliability, and a score of 0.8 or higher provides "exemplary" evidence. Further, Hair [31] notes that a score slightly lower than 0.7 might be acceptable for exploratory research, and Nunnally [64] recommends a threshold value of only 0.6 for exploratory research. As shown in Table 3, all of the constructs in our measurement model exhibited composite reliabilities of 0.82 or higher, and they all exhibited Cronbach's alpha of 0.67 or higher. Thus, it appears that the internal consistency of the constructs' items has been established satisfactorily.

Table 2. Item-to-Construct Loadings

Construct	Item	Item-to-Construct Loading
Perceived Wrongdoing	WRG1	0.91
	WRG2	0.78
	WRG3	0.93
	WRG4	0.90
Perceived Impact	IMP1	0.79
	IMP2	0.77
	IMP3	0.81
	IMP4	0.75
Perception of Whether Something <i>Ought</i> to Be Reported	O1	0.85
	O2	0.76
	O3	0.74
Perceived <i>Responsibility</i> to Report	RSP1	0.87
	RSP2	0.83
	RSP3	0.87
Perceived Risk Propensity	RPRO1	0.75
	RPRO2	0.66
	RPRO3	0.70
	RPRO4	0.69
	RPRO5	0.76
Perceived Project Risk	RPRJ1	0.85
	RPRJ2	0.70
	RPRJ3	0.80
	RPRJ4	0.58

Table 3. Construct Reliability

Construct	Composite Reliability	Cronbach's Alpha	Average Variance Extracted (AVE)
Perceived Wrongdoing	0.93	0.90	0.78
Perceived Impact	0.86	0.78	0.61
Perception of Whether Something <i>Ought</i> to Be Reported	0.82	0.67	0.60
Perceived <i>Responsibility</i> to Report	0.89	0.82	0.73
Perceived Risk Propensity	0.84	0.77	0.51
Perceived Project Risk	0.83	0.74	0.55

Fornell and Larcker [25] view Average Variance Extracted (AVE) as a measure of construct reliability. The guideline threshold for AVE is 0.5, meaning that 50 percent

Table 4. Item to Own Construct Correlation vs. Correlations with Other Constructs

Construct	Item	WRG	IMP	O	RSP	RPRO	RPRJ
WRG	WRG1	0.91	0.00	0.41	0.45	0.05	0.10
	WRG2	0.78	0.06	0.34	0.41	0.18	0.00
	WRG3	0.93	0.03	0.42	0.43	0.06	0.06
	WRG4	0.90	0.01	0.40	0.41	0.07	0.07
IMP	IMP1	0.07	0.79	0.16	0.15	0.17	0.37
	IMP2	0.05	0.77	0.12	0.10	0.08	0.23
	IMP3	0.05	0.81	0.10	0.07	0.06	0.24
	IMP4	0.00	0.75	0.01	0.03	0.06	0.05
O	O1	0.44	0.06	0.85	0.51	0.14	0.27
	O2	0.33	0.22	0.76	0.47	0.16	0.37
	O3	0.24	0.02	0.74	0.45	0.13	0.22
RSP	RSP1	0.39	0.13	0.64	0.87	0.07	0.16
	RSP2	0.45	0.12	0.38	0.83	0.07	0.07
	RSP3	0.39	0.04	0.51	0.87	0.10	0.07
RPRO	RPRO1	0.04	0.26	0.05	0.04	0.75	0.12
	RPRO2	0.15	0.11	0.01	0.00	0.66	0.11
	RPRO3	0.02	0.04	0.05	0.02	0.70	0.12
	RPRO4	0.05	0.03	0.17	0.07	0.69	0.18
	RPRO5	0.05	0.00	0.25	0.16	0.76	0.24
RPRJ	RPRJ1	0.01	0.33	0.30	0.05	0.21	0.85
	RPRJ2	0.04	0.22	0.21	0.01	0.16	0.70
	RPRJ3	0.20	0.16	0.36	0.26	0.16	0.80
	RPRJ4	0.08	0.05	0.18	0.03	0.15	0.58

or more variance of the indicators is accounted for [15]. As Table 3 indicates, all of the constructs in our measurement model exceeded the established criterion for AVE.

Discriminant validity. We conducted two tests for discriminant validity. First, we calculated *each indicator's loading on its own construct as well as its cross-loading on all other constructs*.⁵ (See Table 4.) In the last six columns of Table 4, the loadings for the indicators for each construct are higher than the cross loadings for other constructs' indicators. Moreover, going across the rows, each indicator has a higher loading with its construct than a cross loading with any other construct. This provides good evidence of discriminant validity [15, pp. 321; 25].

As a second test of discriminant validity, we considered whether the AVEs of the latent constructs were greater than the square of the correlations *among* the latent constructs. When this is true, more variance is shared between the latent construct and its block of indicators than with another construct [15]. As can be seen by reading across the rows of Table 5, our measures passed this test, thus providing additional evidence of discriminant validity.

Table 5. AVEs vs. Square of Correlations Among Latent Constructs

Construct	Average Variance Extracted (AVE)	WRG	IMP	O	RSP	RPRO	RPRJ
WRG	0.78	—	0.00	0.20	0.23	0.00	0.01
IMP	0.61	0.00	—	0.01	0.01	0.01	0.07
O	0.60	0.20	0.01	—	0.37	0.03	0.13
RSP	0.73	0.23	0.01	0.37	—	0.01	0.01
RPRO	0.51	0.00	0.01	0.03	0.01	—	0.05
RPRJ	0.55	0.01	0.07	0.13	0.01	0.05	—

Note: Figures in last six columns represent *squared* correlations among constructs.

Structural Model

With an adequate measurement model in place, we tested hypotheses by examining several structural models, each using a specific reporting option as the ultimate dependent variable. A "perceived risk of negative personal consequences" measurement item tailored to the specific reporting channel was incorporated in each of the structural models. The remaining constructs and measures were identical across all of the models.

The explanatory power of a structural model can be evaluated by looking at the R^2 value (variance accounted for) in the final dependent construct. It is also instructive to examine the R^2 values for the intermediate variables in the structural model. For the internal reporting alternatives, the final dependent construct (reluctance to report bad news internally) has R^2 values for the various alternatives of 0.24 (INT_INDIV), 0.24 (INT_GRP), 0.23 (INT_AUD), and 0.15 (INT_OPNDR), indicating that the model accounts for between 15 and 24 percent of the variance in the dependent variable. For the external reporting alternatives, the values are 0.20 (EXT_ASSOC), 0.14 (EXT_TV), and 0.18 (EXT_CLNT). R^2 values for the other intermediate variables in the structural model were: 0.31 for whether the news ought to be reported, 0.42 for personal responsibility to report, and 0.12 for perceived project risk (of course, these intermediate R^2 values do not vary with the ultimate dependent variable). Taken as a group, these R^2 values are sufficiently high to make interpretation of path coefficients meaningful.

After computing path estimates in the structural model using the entire sample, the bootstrapping method was used to obtain the corresponding T-values. Each hypothesis (except H3b and H3c) corresponded to a path in the structural model (see Figure 4). Support for each hypothesis could be determined by examining the sign (positive or negative) and statistical significance of the T-value for its corresponding path. With significance levels of 0.05 and 0.01, the acceptable T-values for a one-tailed test would be 1.645 and 2.326, respectively (appropriate given the directional nature of the hypotheses).

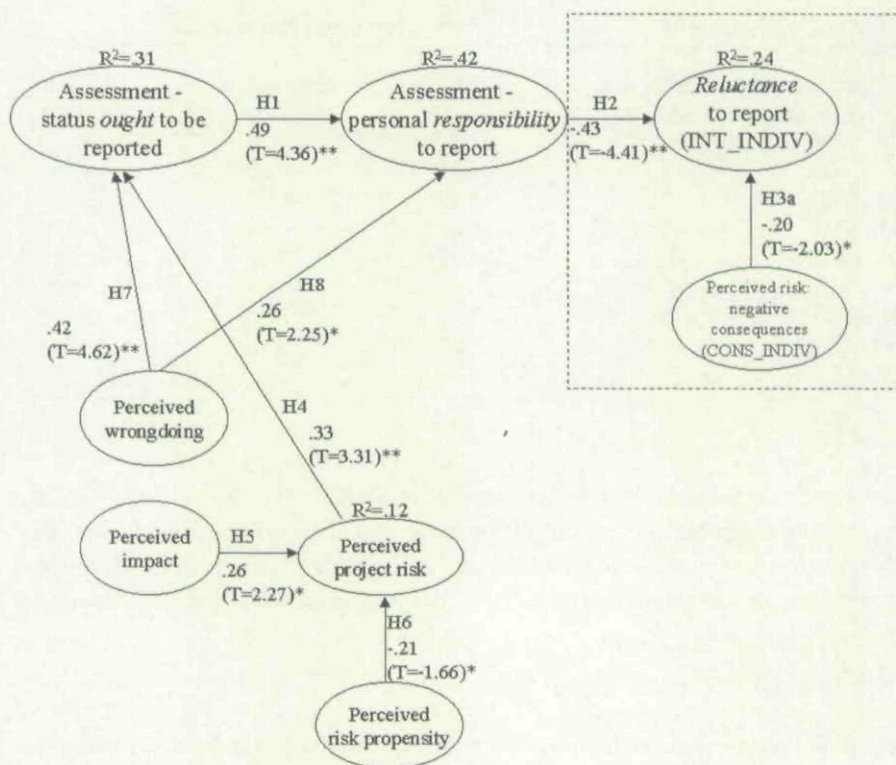


Figure 4. Results Using Final Variable INT_INDIV. Notes: * Significant at $p < 0.05$ level (one-tailed test). ** Significant at $p < 0.01$ (one-tailed test).

Consider first the situation when INT_INDIV is the final dependent variable (see Figure 4). The assessment of whether something ought to be reported had a direct positive effect on assessed responsibility for reporting. Thus, H1 was supported. The assessed responsibility for reporting had a direct negative effect on subjects' reluctance to report bad news (i.e., subjects were more willing to report when they perceived themselves to be personally responsible for reporting). Thus, H2 was supported. Perceived risk of negative personal consequences had a positive effect on reluctance to report bad news, lending support for H3a.⁶ There was also a positive effect of perceived project risk on the assessment of whether status ought to be reported, thus supporting H4. Perceived impact had a positive effect on perceived project risk, thus supporting H5. As predicted, there was a significant negative relationship between perceived risk propensity and perceived project risk. Thus, H6 was supported. H7 concerned a hypothesized path between perceived wrongdoing and whether status ought to be reported. H8 addressed the path to personal responsibility. Both paths were significant and in the expected direction, so H7 and H8 were supported.

The previous results and Figure 4 address the model with the final dependent variable INT_INDIV, but only the path coefficients within the dotted-line box of Figure 4 are subject to change when other alternatives are considered as the final dependent

Table 6. Coefficients and T-Values—Different Reporting Alternatives

Reporting Alternative	Coefficient, path H2	T-Value, path H2	Coefficient, path H3a	T-Value, path H3a
INT_INDIV	-0.43	-4.41**	-0.20	-2.03*
INT_GROUP	-0.27	-2.42**	-0.38	-3.56**
INT_AUD	-0.21	-1.82*	-0.44	-4.21**
INT_OPNDR	-0.22	-1.96*	-0.32	-3.08**
EXT_ASSOC	-0.18	-1.45	-0.42	-3.68**
EXT_TV	-0.04	-0.39	-0.37	-2.88**
EXT_CLNT	-0.13	-1.29	-0.40	-3.46**

* Significant at $p < 0.05$ (one-tailed test). ** Significant at $p < 0.01$ (one-tailed test).

variable. Table 6 shows the coefficients and T-values for the salient paths.⁷ For the external reporting alternatives, all of the same hypothesized paths were supported *with the exception of H2—the path between responsibility to report and reluctance to report*. We consider this exception in the "Discussions and Implications" section.

Testing Hypotheses H3b and H3c

Two final hypotheses remain to be tested. H3b predicted that individuals would assess the risk of negative personal consequences to be higher for the external reporting alternatives, and H3c predicted greater reluctance to use external reporting channels. These hypotheses cannot be tested within the PLS structural model itself, but a non-parametric procedure can be used for an approximate evaluation of each [51, pp. 598–600]. This approach allows us to examine differences in response patterns for internal and external alternatives but still allows us to respect the distinct characteristics of each alternative. (It will be recalled that the internal [external] alternatives are not to be viewed as items measuring a single scalar construct but, rather, as different alternatives.⁸)

For each retaliation item (H3b), we considered the subject's expectation of negative personal consequences to be "high" if he assessed it "likely" or "very likely" that he would suffer such consequences as a result of embracing that alternative. For each of the reporting alternatives (H3c), we considered a subject to be "reluctant" if he indicated he was "unlikely" or "very unlikely" to embrace the alternative. We then determined, for each subject, whether the subject exhibited a larger ratio of high expectations from the external or the internal alternatives. And, similarly, we determined whether he exhibited a larger ratio of reluctance towards the external or the internal alternatives. We then calculated the *proportions of subjects* that exhibited a higher "negative personal consequences" ratio for external than internal items and a higher reluctance ratio for external than internal items. These proportions were 0.67 and 0.80 for H3b and H3c, respectively. Since a null hypothesis would hold that the proportions would both be 0.5, we calculated the standard error of the proportion as

$$\sqrt{(0.5)(0.5)/163} = 0.039.$$

We then calculated the upper limit for a one-tailed test ($p < 0.01$) as $[0.5 + (2.326)(0.039)] = 0.591$. Since both of the proportions are well above this threshold, we conclude that both H3b and H3c are supported.

Discussion and Implications

IT IS CLEAR THAT OUR MODEL EXPLAINED a substantial amount of the variance in subjects' assessments and behavioral intentions, and the results showed general support for the hypotheses. Before turning to a discussion of the study's limitations and implications for both future research and practice, it will be helpful to consider the three contributions of this study in light of these results.

First, this study introduced and tested the effects of two variables—perceived *impact* and *wrongdoing*—on the willingness to report bad project status news. The development of the impact construct and how it may influence reporting behavior, through its effects on subjects' perceptions of project risk, represent distinct contributions to existing theory. And, while wrongdoing has been discussed previously in a theoretical sense [58], the relationship of this construct to the reporting of bad news has not been tested rigorously in an overall model in previous studies.

Second, this study provides some amount of quantitative empirical support for the theoretical distinctions between internal and external reporting options (H3b and H3c) that have been suggested by other authors and buttressed primarily with qualitative, anecdotal evidence [58]. But it is also interesting that tests of hypotheses within the overall model follow a different pattern for internal and external alternatives on path H2—the role of assessed personal responsibility. Although the direction of the association is the same for all alternatives, the explanatory power of this factor is stronger for internal than for external options. If this finding were to be replicated in other studies, it would suggest that the central model, based largely on the whistle-blowing work of Dozier and Miceli [17], may be fully applicable only to *internal* reporting. This is particularly salient for the construct of personal responsibility, which may be bounded more narrowly than it was originally envisioned. Once outside the organizational walls, the perceived risk of negative personal consequences may be such a strong driver that it swamps the responsibility construct. In addition, perhaps deserving more attention is the fact that this effect was weaker for some external alternatives (especially, EXT_TV) than others (see Table 6). This suggests that there may be some additional characteristics of reporting options that need greater clarity and measurement.

Third, in a broader sense, this study is one of the first attempts to examine bad news reporting in a structural equation model. By integrating relevant constructs from multiple streams of literature into a theoretical model, this study has accounted for a substantial portion of the variance in decision-makers' reluctance to report bad news. We certainly do not claim that this study's model is an exhaustive one (see "Implications for Future Research" below), but it is worth noting that even this limited model

explained a substantial portion of the decision-makers' reluctance to report bad project status news.

As noted at the outset, the general phenomenon examined in this study—reluctance to report negative project status information—is not unique to the IS domain. Nevertheless, many of these contributions may be particularly salient to IS researchers and practitioners, since IS projects may be especially susceptible to the phenomenon. Further, some of the constructs (particularly those related to risk) are known to be quite important ones for IS project management.

Limitations of the Study

As is the case with all experiments, though, we should be cautious when generalizing the results of this study for several reasons. First, the experiment conducted in this study took a necessarily narrow focus so as to achieve a high degree of control over extraneous variables. There are, without a doubt, other organizational and political factors that may also influence assessments and reporting behaviors (see "Implications for Future Research" below). These factors have not been investigated here, and some may not lend themselves to experiments. On the other hand, the present methodological approach is quite consistent with that taken by other researchers who examined some IS management decisions with project and organizational factors [33, 34, 87].

Second, our measures for the internal and external reporting alternatives and the perceived risk associated with these alternatives were assessed through single items. Such single-item measures do not render the results of structural equation modeling analysis invalid [31], but multi-item scales are obviously preferred. However, we argue that it would be quite difficult to employ a separate multi-item scale for each of the alternatives, and the distinct characteristics of the alternatives suggest that combining them into a single measure would be inappropriate.

Finally, as is customary in many experiments of this type, we have measured self-reported behavioral intentions rather than actual behaviors. There is no guarantee, of course, that individuals would actually behave as they have indicated. It is possible that their reaction to the treatment scenarios may differ from an on-the-job reaction. Certainly, this limitation is relevant when considering the generalizability of the results. However, even if there is ultimately some variance between intentions and actual behaviors, the strong associations found in this study shed significant light on the phenomenon. Therefore, in spite of the aforementioned limitations, we hold that the study has significant implications for both future research and practice.

Implications for Future Research

As previously discussed, this study provides both empirical support for previous theoretical assertions and extension of previous theory. However, it is one of the first such studies of this type to be attempted, so there is obviously more work to be done. As noted earlier, the model that was proposed and examined in this study is far from an exhaustive one. A much broader model, such as the one suggested by Smith and Keil

[77], would be almost impossible to test in a single study. However, it is clear that many additional factors could be considered at the project, personal, group, and organizational levels. We briefly consider each of these.

At the *project* level, this study considered the impact of loss in the event of failure, which is one component of project risk. In addition, researchers might profitably consider the probability of failure, the type of loss that might occur—such as differences between bodily harm (perhaps from a malfunctioning medical device) and financial losses [10, 54, 58, p. 140]—or the nature of the relationship between the decision-maker and those who might experience the loss. Researchers might also examine the amount of time pressure under which project reporting decisions must be made, since this may well impact the way in which individuals frame their assessments [5]. There are also theoretical arguments that suggest the level of sustainable information asymmetry associated with a project—that is, how likely it is that a project's status can be kept hidden—may, if accompanied by incentives to an individual to remain silent, impact assessments and reporting decisions [33].

Further, lurking in the background at the project level is a basic empirical question: how often does the phenomenon occur, and how often does it contribute to project escalation? Although we provided a brief theoretical linkage in the "Introduction," little is known about the actual frequency of the phenomenon. Most of the "project failures" documentation (e.g., [22, 29, 30]) consists of (often brief) anecdotal stories, the authors of which were unlikely to have been attuned to the phenomenon. A set of broad, field-based studies could be quite helpful in ascertaining the frequency of the phenomenon and the linkages to project failure.

At the *personal* level, a large number of individual factors may impact individuals' assessments and reporting decisions. One of these, perceived risk propensity, was incorporated in this study's model because of its probable association with perceived project risk. With respect to the moral assessments that individuals apparently conduct, there may also be some individual factors that merit inclusion in that realm, although the measurement of such factors has proven to be quite challenging in psychological research. One could attempt to measure individuals' propensities for ethical reasoning or their levels of moral judgment development. Whichever one is chosen, it appears likely that a lengthy measurement instrument that included several vignettes would be required [9, 69].

Other personal factors could also be included. For example, there is reason to believe that one's "locus of control" [72]—the degree to which one believes that events are under his control—would influence one's assessment of reporting alternatives [59]. If one accepts that assertion, then other related constructs might also merit consideration: powerlessness ("the expectancy or probability held by the individual that his [or her] own behavior cannot determine occurrence of the outcomes . . . he [or she] seeks" [45, p. 86]); self-determination ("whether a person feels shaped by social circumstances rather than capable of shaping them" [74, p. 306]); mastery ("extent to which one regards one's life-chances as being under one's own control in contrast to being fatalistically ruled" [74, p. 304]); self-efficacy [28]; and illusion of control [47, 48]. It is also known that individuals vary in their own perceptions of time urgency [46], and

this individual factor would be a good candidate for inclusion in any study that considered the time pressure associated with a project. In addition to these personality variables, there are many demographic variables (e.g., gender)⁹ and others based on an individual's affiliations (e.g., membership in a union or religious institution) that have been hypothesized to affect individuals' assessments and reporting decisions. Although beyond the scope of the present discussion, documentation for many of these variables can be found in Miceli and Near [58] and Tesser and Rosen [81].

Another avenue for future research would be to extend the decision-making to a *group* level. Given that groups in some cultures may be more cohesive and prone to "groupthink" than groups in other cultures [79], it would be interesting to observe whether multicultural groups can be used to reduce the reluctance to transmit negative information at the group level. Another feature of groups is they create an opportunity for "diffusion of responsibility." Some of the earliest research on bystander intervention concluded that individuals were less likely to offer assistance when they were part of a large group of bystanders than when they were alone [49]. In an organizational analogy, first suggested by Dozier and Miceli [17], one could surmise that as the number of individuals who are privy to negative project status information increases, *specific* individuals will feel less personal responsibility for reporting the project status. This, of course, is a testable hypothesis. Research such as this that examines the phenomenon at the group level is important because groups, rather than individuals, are often responsible for critical organizational decisions.

At the *organizational* level, a number of factors could be considered. An organization's "ethical climate" [88] may also influence individuals' assessments and decisions. According to Wimbush and Shepard [91], there are five different dimensions of climate, and each of the five could conceivably have an impact. Perhaps at a more fundamental level are the reporting norms that develop in an organization, which no doubt could also influence an individual's assessment and decisions.

Implications for Practice

This study has several implications for practice. First, both impact and wrongdoing have been shown to have indirect effects on individuals' willingness to transmit negative information. This is significant, because managers can greatly impact these variables through their own actions and the type of organizational environment that they create through these actions.

Managers can take steps to create an environment in which wrongdoing is not tolerated and reporting of inappropriate behaviors is the norm. With respect to non-tolerance of wrongdoing, public reprimands—and, in the cases of serious wrongdoing, dismissals—can go a long way in sending an organizational message, as long as employees perceive that the punishments are being meted out fairly rather than indiscriminately. Of course, a prerequisite for such a response is that senior executives become aware of the wrongdoing, which leads to the need for a culture in which reporting of wrongdoing becomes the norm. How might this be effected? As an example, consider changes within the U.S. federal government over a 15-year period. In

1978, a new law (the "Civil Service Reform Act of 1978") created a structure that provides encouragement to employees who are making a reporting decision (for example, "hot lines" were introduced), and a 1989 law (the "Whistleblower Protection Act of 1989") expanded the protections. There are specific prohibitions against retaliation against employees who blow the whistle, and an Office of Special Council is in place to provide protection [58, p. 223; 60, pp. i-iii; 61, pp. i-ii]. Two surveys of federal employees, conducted in 1981 and 1993, showed an increase over this period (from 30 to 50 percent) in employees' willingness to report illegal and wasteful activities they observed [60, 61]. Although the causal link is not fully established, it seems reasonable to assume that the changes had some impact on reporting behaviors.

Managers in for-profit enterprises can embrace many of the same techniques as the federal government, with hot lines and specific policies that prohibit retaliation against an employee who makes a report. In addition, an organizational ombudsman, who reports directly to the chief executive officer (CEO), could also be employed to field employee reports.

In terms of the impact of a project's failure, the managerial actions are less clear-cut. However, the evidence suggests that the managers may be able to promote accurate status reporting by instilling in employees the importance of their projects with respect to the well-being of the organization. At a minimum, employees should be made aware, both at the outset of a major project and at frequent intervals during the duration, of its importance to the organization's success. Frequent communications from senior management, in both formal (e.g., meetings) and informal (e.g., e-mails) channels, can go a long way in keeping an IS team focused on the criticality of the project's outcome.

From a practical perspective, perhaps of even greater organizational import is the relationship between perceived risk of negative consequences and a reluctance to transmit negative project status news. A management consultant who specializes in studying troubled software projects has told us of his conclusion that, if an organization's unwritten norms suggest that "bad news gets you killed," this will serve as ample warning to those who may otherwise provide useful input to their superiors [90]. In addition to our own findings in the present study, one other exercise in the limited research stream provides tangential support for the consultant's assertion [39]. Our own conclusion, influenced by our findings, is that it will likely be fruitful for managers to provide positive rather than negative organizational reinforcement to incite preferred reporting behaviors. As examples, some firms give cash rewards to employees who come forward, and federal law provides for such rewards under certain circumstances (e.g., reports of physicians defrauding Medicare). Other firms place written commendations in employees' files when they report improper behavior [58, pp. 299-301].

And there is yet another level at which the phenomenon could be addressed—a level that extends beyond the boundaries of the firm. Many IS professional organizations have "codes of ethics" or "standards of conduct" that could offer useful input to IS developers when faced with reporting quandaries. If a developer were aware of a stated professional obligation to make all project status news known, this would likely impact his assessment of personal reporting responsibility. However, it is unlikely

that IS professionals would find clarity on this point through reference to the existing professional codes of major organizations. In assessing the CONFIRM project problems (discussed at the outset of this paper), Oz [66] noted that the codes of the Data Processing Management Association (DPMA), the Association for Computing Machinery (ACM), and the Institute of Certified Computer Professionals (ICCP) all reference a normative obligation to avoid misrepresentations regarding information technology. However, deeper analysis suggests that most such references relate to disclosure of a system's limitations or an obligation to avoid misrepresentation of system capabilities. There is actually little in these codes that is narrowly on point for the phenomenon of *project status* reporting. Thus, it is easy to see why IS professionals might not impute a normative professional obligation, since the cognitive connection from existing codes is a somewhat muted one. The recommendation from our perspective is rather obvious, then: the IS professional organizations' codes should provide more narrow normative guidance on the issue of status reporting.¹⁰

Conclusion

THIS STUDY IS ONE OF THE FIRST ATTEMPTS to examine bad news reporting through structural equation modeling. By incorporating constructs and relationships from multiple streams of literature, we demonstrated the effects of perceived impact and perceived wrongdoing on subjects' willingness to report bad project status news. We also provided some empirical support for the theoretical distinctions between internal and external reporting options.

Our model provides useful insights into this organizational phenomenon. With evidence suggesting that IS project success is the exception rather than the norm [78], senior managers obviously need to take proactive steps in managing failing initiatives. An executive may choose to manage a failing project by canceling it or by devoting more resources to it to help it succeed. But there is one obvious prerequisite for such a decision: the executive must know the actual project status. Otherwise, the project is most likely to languish until it blows up in a costly and potentially embarrassing manner, as did CONFIRM in the early 1990s.

We hope that, through the findings and future directions outlined herein, a trend of improved project status communication can emerge.

Acknowledgments: The authors gratefully acknowledge the support of Jie Yin and Murat Kara. Wynne Chin, Steve Hora, Jon Pinder, Arun Rai, and Ron Thompson provided helpful insights on some methodological issues. The research support of the Babcock Graduate School of Management, Wake Forest University, and the Robinson College of Business, Georgia State University is appreciated.

NOTES

1. Although the premise of the mum effect literature appears on point for examination of the phenomenon within the IS project domain, for two reasons its applicability is somewhat limited. First, the mum effect literature stream is actually comprised of fewer than a dozen

studies from the 1970s with little work after that point. In spite of a promising start, the theoretical foundations were never well developed, and only a few independent factors were given research attention. Second, the mum effect literature assumed, for the most part, a dyadic unit of analysis bereft of any organizational context. It is obvious, however, that the reporting decisions in the IS project domain are almost exclusively within organizational environs. Thus, we view the whistle-blowing literature as providing a much stronger theoretical base.

2. In the cited empirical studies, researchers typically focused on the narrower concept of "retaliation" as they operationalized their constructs. However, the theoretical development (cited in text) is targeted to the broader construct of "negative consequences," which could include consequences such as embarrassment, time lost in seeing one's reporting alternative through to completion, and so on. In this study, we have embraced the broader definition.

3. Materials were developed through an iterative process that used four different samples over a period of 11 months. This process allowed us to refine the treatment scenarios and the measurement instrument. The final administration, reported herein, used a fifth and distinct sample.

4. We are particularly indebted to Professor Steve Hora, University of Hawaii, for his assistance with this analysis.

5. PLSGraph does not provide cross-loadings on other constructs, so we calculated them as follows: (1) We created a standardized version of each indicator in SPSS (that is, for each case, the number of standard deviations above or below the mean). (2) We calculated a weighted score for each construct, using the PLSGraph weights from the outer model and the standardized indicator values. (3) We correlated all standardized indicator values against all weighted scores. For an indicator's intended construct, this correlation represents its "loading" in PLS, and the SPSS correlations did indeed match those calculated by PLSGraph. For other constructs, this correlation represents the "cross-loading" value shown in Table 4.

6. The sign on this path coefficient is negative because of the reverse scaling used to assess risk of negative personal consequences.

7. Because the standard deviation for each path is estimated by the bootstrap procedure, some small variations in the T-values can be observed throughout the model when different alternatives are used as the final dependent variable. However, all the referenced internal (external) alternatives exhibited identical patterns of significance, as detailed in the text. Thus, minor differences in the T-values are not documented here.

8. We conducted an exploratory factor analysis on these items and obtained results that are generally consistent with the existence of two factors: one representing external reporting options and the other representing internal reporting options.

9. Most of the previous hypotheses regarding demographic variables that have been proffered have been largely conjectural or reflective of a set of mixed findings, so we did not state any a priori hypotheses for them in our study. Nevertheless, we undertook a post hoc analysis in an additional PLS run, using INT_INDIV as the ultimate dependent variable as in Figure 4, and we added direct relationships between three demographic variables and INT_INDIV: age, gender, and how much experience the subject has on software development teams. None of these three variables has a significant effect ($p < 0.05$) on the reporting decision INT_INDIV. The gender variable has the strongest effect of the three, with women being more likely to suggest they would report than would men, but at only a very marginal level of significance ($p < 0.14$ in a two-tailed test, which is appropriate given that a directional hypothesis had not been stated).

10. We acknowledge that there is not (to our knowledge) any previous research showing a linkage between professional codes and actual behaviors. In fact, even research on corporate codes of ethics (that is, rules of behavior for a firm's own employees) has focused on the content of the codes rather than on their effects on behavior (for example, see [54]). Referring to corporate codes of ethics, Miceli and Near [58, p. 161] report that "there is no research in whistle-blowing contexts concerning the efficacy of codes of ethics." The same assertion appears to hold for professional codes of ethics.

REFERENCES

1. Abdel-Hamid, T., and Madnick, S.E. *Software Project Dynamics: An Integrated Approach*. Englewood Cliffs, NJ: Prentice Hall, 1991.

2. Bandura, A. *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall, 1977.
3. Barki, H.; Rivard, S.; and Talbot, J. Toward an assessment of software development risk. *Journal of Management Information Systems*, 10, 2 (Fall 1993), 203-225.
4. Bearden, W.O.; Netemeyer, R.G.; and Mobley, M.F. *Handbook of Marketing Scales*. Newbury Park, CA: Sage, 1993.
5. Billings, R.S.; Milburn, T.W.; and Schaalman, M.L. A model of crisis perception: A theoretical and empirical analysis. *Administrative Science Quarterly*, 25 (June 1980), 300-316.
6. Blackburn, M.S. Employee dissent: The choice of voice versus silence. Ph.D. dissertation, University of Tennessee-Knoxville, 1988.
7. Bok, S. *Lying: Moral Choice in Public and Private Life*. New York: Vintage Books, 1978.
8. Brabeck, M. Ethical characteristics of whistle blowers. *Journal of Research in Personality*, 18, 1 (1984), 41-53.
9. Brady, F.N., and Wheeler, G.E. An empirical study of ethical predispositions. *Journal of Business Ethics*, 15, 9 (1996), 927-940.
10. Braithwaite, J. Challenging just deserts: Punishing white-collar criminals. *Journal of Criminal Law and Criminology*, 73, 2 (1982), 723-745.
11. Brief, A.P., and Motowidlo, S.J. Prosocial organizational behaviors. *Academy of Management Review*, 11, 4 (1986), 710-725.
12. Brockhaus, R.H. Risk taking propensity of entrepreneurs. *Academy of Management Journal*, 23, 3 (1980), 509-520.
13. Carr, A. Is business bluffing ethical? *Harvard Business Review*, 46, 1 (1968), 143-153.
14. Chin, W.W. *PLS-Graph Manual Version 2.7*. Unpublished manual. Calgary, Alberta: University of Calgary, 1994.
15. Chin, W.W. The partial least squares approach to structural equation modeling. In G.A. Marcoulides (ed.), *Modern Methods for Business Research*. Mahwah, NJ: Lawrence Erlbaum, 1998, pp. 295-336.
16. Chin, W.W. *PLS Graph*. Houston: University of Houston, 1998.
17. Dozier, J.B., and Miceli, M.P. Potential predictors of whistle-blowing: A prosocial behavior perspective. *Academy of Management Review*, 10, 4 (1985), 823-836.
18. Dunegan, K.; Duchon, D.; and Barton, S. Affect, risk, and decision criticality: Replication and extension in a business setting. *Organizational Behavior and Human Decision Processes*, 53, 3 (1992), 335-351.
19. Farmer, T.A. Testing the effect of risk attitude on auditor judgments using multiattribute utility theory. *Journal of Accounting, Auditing, and Finance*, 8, 1 (1993), 91-114.
20. Farrell, D., and Petersen, J.C. Patterns of political behavior in organizations. *Academy of Management Review*, 7, 3 (1982), 403-412.
21. Fishburn, P.C. Mean-risk analysis with risk associated with below-target returns. *American Economic Review*, 67, 2 (1977), 116-126.
22. Flowers, S. *Software Failure: Management Failure*. Chichester, UK: John Wiley & Sons, 1996.
23. Fornell, C. *A Second Generation of Multivariate Analysis: Methods Volume 1*. New York: Praeger, 1982.
24. Fornell, C., and Bookstein, F.L. Two structural equation models: LISREL and PLS applied to customer exit-voice theory. *Journal of Marketing Research*, 19, 11 (1982), 440-452.
25. Fornell, C., and Larcker, D.F. Structural equation models with unobservable variables and measurement errors. *Journal of Marketing Research*, 18, 2 (1981), 39-50.
26. Fritzsche, D.J., and Becker, H. Linking management behavior to ethical philosophy: An empirical investigation. *Academy of Management Journal*, 27, 1 (1984), 166-175.
27. Fu, J. Increased risk aversion and risky investment. *Journal of Risk and Insurance*, 60, 3 (1993), 494-501.
28. Gardner, D.G., and Pierce, J.L. Self-esteem and self-efficacy within the organizational context: An empirical examination. *Group and Organization Management*, 23, 1 (1998), 48-70.
29. Glass, R.L. *Software Runaways*. Upper Saddle River, NJ: Prentice Hall, 1998.
30. Glass, R.L. *Computing Calamities*. Upper Saddle River, NJ: Prentice Hall, 1999.
31. Hair, J.F.; Anderson, R.E.; Tatham, R.L.; and Black, W.C. *Multivariate Data Analysis*. Englewood Cliffs, NJ: Prentice Hall, 1998.

32. Harnett, D.L., and Cummings, L.L. *Bargaining Behavior: An International Study*. Houston: Dame Publications, 1980.
33. Harrell, A., and Harrison, P. An incentive to shirk, privately held information, and managers' project evaluation decisions. *Accounting, Organizations and Society*, 19, 7 (1994), 569-577.
34. Harrison, P.D., and Harrell, A. Impact of 'adverse selection' on managers' project evaluation decisions. *Academy of Management Journal*, 36, 3 (1993), 635-643.
35. Igbaria, M.; Parasuraman, S.; and Badawy, M.K. Work experiences, job involvement and quality of work life among information systems personnel. *MIS Quarterly*, 18, 4 (1994), 175-201.
36. Jacovou, C.I. Managing IS project failures: A project management perspective. Ph.D. dissertation, University of British Columbia-Vancouver, 1999.
37. Kant, I. *Grounding for the Metaphysics of Morals*, trans. J.W. Ellington. Indianapolis: Hackett Publishing, 1981 [1804].
38. Keenan, J.P. Upper-level managers and whistleblowing: Determinants of perceptions of company encouragement and information about where to blow the whistle. *Journal of Business and Psychology*, 5, 2 (1990), 223-235.
39. Keenan, J.P. Whistleblowing and the first-level manager: Determinants of feeling obliged to blow the whistle. *Journal of Social Behavior and Personality*, 10, 3 (1995), 571-584.
40. 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), 63-87.
41. Keil, M., and Robey, D. Blowing the whistle on troubled software projects. *Communications of the ACM*, 44, 4 (2001), 87-93.
42. 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. Working paper, Georgia State University, Atlanta, 2000.
43. Keil, M.; Wallace, L.; Turk, D.; Dixon-Randall, G.; and Nulden, U. An investigation of risk perception and risk propensity on the decision to continue a software development project. *Journal of Systems and Software*, 53, 2 (2000).
44. Kogan, N., and Wallach, M.A. *Risk Taking: A Study in Cognition and Personality*. New York: Holt, Rinehart, and Winston, 1964.
45. Kohn, M., and Schooler, C. *Work and Personality: An Inquiry into the Impact of Social Stratification*. Norwood, NJ: Ablex, 1983.
46. Landy, F.J.; Rastegary, H.; Thayer, J.; and Colvin, C. Time urgency: The construct and its measurement. *Journal of Applied Psychology*, 76, 5 (1991), 644-657.
47. Langer, E.J. The illusion of control. *Journal of Personality and Social Psychology*, 32, 2 (1975), 311-328.
48. Langer, E.J., and Roth, J. Heads I win, tails it's chance: The illusion of control as a function of the sequence of outcomes in a purely chance task. *Journal of Personality and Social Psychology*, 32, 6 (December 1975), 951-955.
49. Latane, B., and Darley, J.M. Group inhibition of bystander intervention. *Journal of Personality and Social Psychology*, 10, 3 (1968), 215-221.
50. Latane, B., and Darley, J.M. *The Unresponsive Bystander: Why Doesn't He Help?* Englewood Cliffs, NJ: Prentice Hall, 1970.
51. Levin, R.I., and Rubin, D.S. *Statistics for Management*, 5th ed. Englewood Cliffs, NJ: Prentice Hall, 1991.
52. MacCrimmon, K.R., and Wehrung, D.A. Characteristics of risk taking executives. *Management Science*, 36, 4 (1990), 422-435.
53. March, J.G., and Shapira, Z. Managerial perspectives on risk and risk taking. *Management Science*, 33, 11 (1987), 1404-1418.
54. Matthews, M.C. Codes of ethics: Organizational behavior and misbehavior. In W.C. Frederick (ed.), *Research in Corporate Social Performance and Policy*, vol. 9. Greenwich, CT: JAI Press, 1987, pp. 107-130.
55. Mellers, B.A., and Chang, S. Representations of risk judgments. *Organizational Behavior and Human Decision Processes*, 57, 2 (1994), 167-184.
56. Miceli, M.P., and Near, J.P. The relationships among beliefs, organizational position, and whistle-blowing status: A discriminant analysis. *Academy of Management Journal*, 27, 4 (1984), 687-705.

57. Miceli, M.P., and Near, J.P. Characteristics of organizational climate and perceived wrongdoing associated with whistle-blowing decisions. *Personnel Psychology*, 38, 3 (1985), 525-544.
58. Miceli, M.P., and Near, J.P. *Blowing the Whistle: The Organizational & Legal Implications for Companies and Employees*. New York: Lexington Books, 1992.
59. Miceli, M.P.; Dozier, J.B.; and Near, J.P. Blowing the whistle on data fudging: A controlled field experiment. *Journal of Applied Social Psychology*, 21, 4 (1991), 271-295.
60. MSPB. *Whistleblowing and the Federal Employee*. Washington, DC: U.S. Merit Systems Protection Board, October 1981.
61. MSPB. *Whistleblowing in the Federal Government: An Update*. Washington, DC: U.S. Merit Systems Protection Board, October 1993.
62. Near, J.P., and Jensen, T.C. The whistle-blowing process: Retaliation and perceived effectiveness. *Work and Occupations*, 10, 1 (1983), 3-28.
63. Near, J.P., and Miceli, M.P. Retaliation against whistle blowers: Predictors and effects. *Journal of Applied Psychology*, 71, 1 (1986), 137-145.
64. Nunnally, J.C. *Psychometric Theory*. New York: McGraw-Hill, 1967.
65. 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), 39-47.
66. Oz, E. When professional standards are lax: The CONFIRM failure and its lessons. *Communications of the ACM*, 37, 10 (1994), 29-36.
67. Reidenbach, R.E., and Robin, D.P. Toward the development of a multidimensional scale for improving evaluations of business ethics. *Journal of Business Ethics*, 9, 8 (1990), 639-653.
68. Remus, W. Graduate students as surrogates for managers in experiments on business decision making. *Journal of Business Research*, 14, 1 (1986), 19-25.
69. Rest, J. *Defining Issues Test*. University of Minnesota-Minneapolis, Center for the Study of Ethical Development, 2000.
70. Rosen, S., and Tesser, A. On reluctance to communicate undesirable information: The mum effect. *Sociometry*, 33, 3 (1970), 253-263.
71. Rosen, S., and Tesser, A. Fear of negative evaluation and the reluctance to transmit bad news. *Journal of Communication*, 22, 2 (1972), 124-141.
72. Rotter, J.B. Generalized expectancies for internal vs. external control of reinforcement. *Psychological Monographs*, 80, 1 (1966), 1-28.
73. Schneider, S.L., and Lopes, L.L. Reflection in preferences under risk: Who and when may suggest why. *Journal of Experimental Psychology: Human Perception and Performance*, 12, 4 (1986), 535-548.
74. Seeman, M. Alienation and anomie. In J.P. Robinson, P.R. Shaver, and L.S. Wrightsman (eds.), *Measures of Personality and Social Psychological Attitudes*, vol. 1. San Diego: Academic Press, 1991, pp. 291-371.
75. Sitkin, S.B., and Pablo, A.L. Reconceptualizing the determinants of risk behavior. *Academy of Management Review*, 17, 1 (1992), 9-38.
76. 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), 1573-1592.
77. Smith, H.J., and Keil, M. The reluctance to report bad news on troubled software projects: Toward a theoretical model. *Proceedings of Academy of Management Meeting*. Chicago: OCIS, 1999, pp. B1-B6.
78. Standish Group International, Inc. CHAOS: A recipe for success. Research report, ordering information available at www.standishgroup.com, 1999.
79. Tan, B.C.Y.; Wei, K.K.; Watson, R.T.; Clapper, D.L.; and McLean, E.R. Computer-mediated communication and majority influence: Assessing the impact in an individualistic and a collectivistic culture. *Management Science*, 44, 9 (1998), 1263-1278.
80. Tesser, A., and Rosen, S. Similarity of objective fate as a determinant of the reluctance to transmit unpleasant information: The mum effect. *Journal of Personality and Social Psychology*, 23, 1 (1972), 46-53.
81. Tesser, A., and Rosen, S. The reluctance to transmit bad news. In L. Berkowitz, *Advances in Experimental Social Psychology*, vol. 8. New York: Academic Press, 1975, pp. 193-232.

82. 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), 88-103.
83. Tesser, A.; Rosen, S.; and Batchelor, T. Some message variables and the MUM effect. *Journal of Communication*, 22, 3 (1972), 239-256.
84. Tesser, A.; Rosen, S.; and Conlee, M.C. News valence and available recipient as determinants of news transmission. *Sociometry*, 35, 4 (1972), 619-628.
85. Tesser, A.; Rosen, S.; and Waranch, E. Communicator mood and the reluctance to transmit undesirable messages (The MUM Effect). *Journal of Communication*, 23, 3 (1973), 266-283.
86. Thompson, R.L.; Higgins, C.A.; and Howell, J.M. Personal computing: Toward a conceptual model of utilization. *MIS Quarterly*, 15, 1 (1991), 125-143.
87. Tuttle, B.; Harrell, A.; and Harrison, P. Moral hazard, ethical considerations, and the decision to implement an information system. *Journal of Management Information Systems*, 13, 4 (Spring 1997), 7-27.
88. Victor, B., and Cullen, J.B. The organizational bases of ethical work climates. *Administrative Science Quarterly*, 33, 1 (1988), 101-125.
89. Vlek, C., and Stallen, P.J. Rational and personal aspects of risk. *Acta Psychologica*, 45, 3 (1980), 273-300.
90. Wilbern, J.A. Personal communication, 1992.
91. Wimbush, J.C., and Shepard, J.M. Toward an understanding of ethical climate: Its relationship to ethical behavior and supervisory influence. *Journal of Business Ethics*, 13, 8 (1994), 637-647.
92. Zmud, R.W. Management of large software efforts. *MIS Quarterly*, 4, 2 (1980), 45-55.

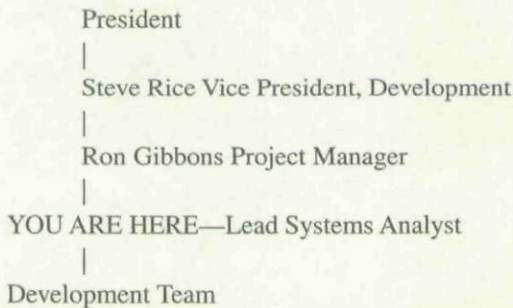
Appendix 1: Experimental Scenario and Instructions Given to Subjects

Case 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.

Computer Diagnostics Corporation

You work for Computer Diagnostics Corporation (CDC), a computer software company. At any time, CDC has several state-of-the-art development projects in progress.

You are the lead systems analyst on one such project, CAPS—a project that has been underway for eight months and which is scheduled to be completed four months from now. Your direct supervisor is the project manager, Ron Gibbons. Ron is fully responsible for both task and personnel management on the project, and in turn, reports to the vice president of development for the company, Steve Rice. A partial organization chart below shows the reporting relationships and where you fit within the hierarchy.



Next week, CDC must make a financial investment in new hardware specifically for this project. Because of this, Steve Rice has asked for a status report. In preparation, you and Ron met for three hours yesterday. During that time, it became apparent that the project is in deep trouble on two critical dimensions:

1. Because the CAPS project has pushed the technological boundaries more than the typical project, there have been many unexpected technical glitches. Thus, when you and Ron took a careful look at the progress on all the tasks, you realized that the programmers had fallen badly behind schedule on several critical items.
2. A recent meeting with some potential customers convinced you that the user requirements had been partially misunderstood. Therefore, it is unclear whether the product that is currently being developed will be successful in the marketplace.

You and Ron performed a crude risk assessment of the project and concluded it had a 65 percent probability of failure given all the risk factors. You were both unpleasantly

surprised and wished that you had examined the situation in greater depth at an earlier date.

You both know that the investment in CAPS so far represents 90 percent of the overall development budget for the current year, and that the project is critically important to the company. Should this project fail, it would have a significant negative effect on the company's financial position, forcing it to lay off half its employees and to file for bankruptcy.

You both know that the project is potentially in jeopardy. You asked Ron how he planned to handle the situation with Steve Rice, and he replied "We can't let Steve know anything about this, even if it means lying about the status and the risk. He'll clean our clocks. Our position is that 'everything is coming along fine at this point.' Don't say anything negative to anybody, and shred all these papers we have scattered around the room."

You remain quite concerned about the project and are wondering what to do, if anything, about bringing your concerns to others, either within or outside of CDC.

The above scenario represents the treatment used to manipulate *high impact* and *high wrongdoing*. The treatment for *low impact* and *high wrongdoing* was identical except that the following paragraph was substituted for the third from the last paragraph in the scenario:

You both know that the investment in CAPS so far has been much less than 1% of the overall development budget for the current year. You also know that the project is not strategically important to the company. In fact, should this project fail, it would have no effect on the company's financial position.

The treatments for *low wrongdoing* were identical to the above scenarios except that the following paragraph was substituted for the next to the last paragraph in the scenario:

You both know that the project is potentially in jeopardy. You asked Ron how he planned to handle the situation with Steve Rice, and he replied "I've never lied to Steve before, and I won't start now. I'm going to call him immediately to report that we may not be on track. I'll give him a copy of the task status analysis that we did."

Appendix 2: Constructs and Measures

Reluctance to Report Bad News			
Variable	Mean	s.d.	Item Wording (1 = very likely; 7 = very unlikely)
INT_INDIV	3.68	1.81	How likely are you to go directly to Steve Rice <i>by yourself</i> to discuss the status of the CAPS project? (Please check the box that best represents your decision.)
INT_GROUP	3.77	2.08	How likely are you to try and persuade members of the development team to go to Steve Rice <i>as a group</i> to discuss the status of the CAPS project? (Please check the box that best represents your decision.)
INT_AUD	4.27	1.88	Suppose that CDC has an internal auditor who is responsible for ensuring that company policies and procedures are followed. This auditor reports directly to the CEO. How likely are you to tell the internal auditor about the status of the CAPS project? (Please check the box that best represents your decision.)
INT_OPNDR	3.33	1.75	Suppose that the Computer Diagnostics Corporation has an "open door" policy under which an employee can speak with any senior executive—up to and including the CEO—whenever the employee wishes to do so. How likely are you to use the "open door" policy to discuss the status of the CAPS project directly with a senior executive? (Please check the box that best represents your decision.)
EXT_ASSOC	5.47	1.53	Suppose that a professional association of software developers, of which you are a member, has instituted a "hotline" that its members can call to report incidents of "inappropriate management behavior" associated with software development projects. Since the association promises to investigate each report it receives, it is unlikely that your identity can be kept secret. How likely are you to call this hotline and discuss the status of the CAPS project? (Please check the box that best represents your decision.)

EXT_TV	6.10	1.24	Suppose that a local television station has reported that CDC has "sharply rising expenses in the software development area." One of your neighbors is the lead financial reporter for the television station and has asked you to comment. Because your relationship with the reporter is well known, it would be almost impossible to hide your identity. How likely are you to discuss the status of the CAPS project with the television reporter? (Please check the box that best represents your decision.)
EXT_CLNT	4.68	1.78	Suppose that one of CDC's major clients is placing a high level of reliance on the scheduled availability of CAPS because they plan to include it in a major new product announcement. An acquaintance of yours works for the client as a senior new product development manager on that project. How likely are you to discuss the status of the CAPS project with the client's senior new product development manager? (Please check the box that best represents your decision.)

Note: For ease of reference, items are presented by construct here. On the actual instrument, however, items were interspersed within particular sections of the survey.

(continues)

Perceived Risk of Negative Personal Consequences Associated with Reporting Alternatives

The exact wording of the "perceived risk of negative personal consequences" item is provided only for the first alternative. Parallel items were included for all other alternatives. Each "risk" item was positioned immediately below the item for the alternative.

Variable	Mean	s.d.	Item Wording (1 = very likely; 7 = very unlikely)
CONS_INDIV	3.15	1.45	If you went directly to Steve Rice <i>by yourself</i> and discussed the status of the CAPS project, how likely is it that you would suffer negative consequences?

Perception of Whether Something *Ought* to Be Reported

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
O1	4.75	1.85	I believe that something should be done to make more information about the status of the CAPS project known to others.
O2 (reversed)	2.94	1.77	I don't believe that it really matters whether more information about the status of the CAPS project is made known to others.
O3	5.04	1.83	Even if it is not me, I believe someone should tell others about the status of the CAPS project.

Perceived *Responsibility* to Report

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
RSP1	4.69	1.68	I believe that—as the lead systems analyst on the CAPS project team—I have a personal responsibility to make more information about the status of the CAPS project known to others.
RSP2 (reversed)	3.36	2.00	I believe that it is not my responsibility —as lead systems analyst—to make more information about the status of the CAPS project known to others.
RSP3	4.13	1.85	I believe that it is my personal duty as CAPS's lead systems analyst to tell others about the project's status.

Perceived Impact

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
IMP1	4.70	1.97	I believe the degree of harm that could result from the CAPS project's failure is very high
IMP2 (reversed)	2.50	1.76	In the end, I don't believe that it really matters whether the CAPS project fails or succeeds.
IMP3 (reversed)	3.13	2.02	I believe that, even if the CAPS project fails, there is little harm that could come from it.
IMP4	3.87	2.17	I believe that CDC's financial future rides on the CAPS project.

Perceived Wrongdoing

Variable	Mean	s.d.	Item Wording (1 = strongly disagree; 7 = strongly agree)
WRG1 (reversed)	3.74	2.30	I believe that Ron has managed the CAPS project in a very ethical manner.
WRG2	3.59	2.27	I believe that Ron's actions in yesterday's meeting were immoral .
WRG3 (reversed)	4.01	2.43	I believe that Ron has done the right thing in how he plans to handle Steve Rice.
WRG4 (reversed)	3.87	2.21	I believe that Ron's actions in yesterday's meeting are a good example of values-based leadership .

Perceived Project Risk

Variable	Mean	s.d.	Item Wording (1 = Anchor Left; 7 = Anchor Right)
RPRJ1	4.85	1.47	Anchor Left = Significant Opportunity How would you characterize the current status of the CAPS project at Computer Diagnostics Corporation? Anchor Right = Significant Threat
RPRJ2 (reversed)	2.79	1.49	Anchor Left = Potential for Loss How would you characterize the current status of the CAPS project at Computer Diagnostics Corporation? Anchor Right = Potential for Gain
RPRJ3	5.17	1.40	Anchor Left = Positive Situation How would you characterize the current status of the CAPS project at Computer Diagnostics Corporation? Anchor Right = Negative Situation
RPRJ4 (reversed)	3.12	1.33	Anchor Left = Very Unlikely What is the likelihood that the CAPS project will be successful? Anchor Right = Very Likely

Copyright of *Journal of Management Information Systems* is the property of M.E. Sharpe Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.