

**The Selection, Detection and Correction of Organizational Errors:
The Role of Communication**

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“Every company needs people who have made mistakes and then made the most of them.” – Bill Gates

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Comedians revel in our shortcomings, foibles and day-to-day mishaps. Satirizing idiosyncrasies, laughing at mistakes and stumbling over syntax provide the performance-to-performance material of our humorists. But one comedian was not the least bit amused by a mistake that befell him. It was a simple error that almost had fatal consequences (Nordenberg, 2000). His heart surgeon performed bypass on the wrong artery – one of his good ones. He had to endure two bypass surgeries; one life-saving, another unnecessary. He was in no mood for joking when he slapped a lawsuit on the surgeon. Who would be?

Errors, mistakes and mishaps are, of course, inevitable but they have different consequences. After all, Dana Carvey made a pretty good living skewering politicians, celebrities, and religious leaders. That’s relatively harmless stuff. But operating on the wrong artery, well, that’s on the complete other end of the spectrum. In fact, data from studies during the 1990’s indicated that tens of thousands of people died each year due to medical errors in U.S. hospitals (Chiang, 2001). Of course, it’s not just medical institutions that are susceptible to errors; this problem occurs in every organization. Unfortunately, “most organizations do a poor job of learning from failures, large and small.” (Cannon & Edmondson, 2005, p. 300)

The study of how organizations manage errors should be a central concern of communication scholars. Why? Because to properly manage errors, organizations must seek out feedback, interpret it properly, and act on it. These are all essentially communicative activities. Unfortunately, our literature devotes little bandwidth to this issue. There are notable exceptions

such as the Tomkins study of the Space Shuttle Challenger and Columbia disasters (Tompkins, 1993, 2005). However, for the most part, study of error management has been the province of other disciplines. Therefore, the purpose of this exploratory research was to direct some much needed attention to the issue from our discipline's unique perspective.

Background

The English word "error" originated from the Latin word "errare," which meant "to stray". Today the word retains shades of that meaning because we use the word "error" to designate when something strays from the intended or expected path. In short, an error occurs when there is a gap between what is expected and what actually happens. Dana Carvey and the hospital expected the damaged artery to receive the bypass surgery. Zhao and Olivera (2006) argue that errors differ from "decisions or acts that lead to suboptimal results" (p.1013). In short, the results may disappoint but in some circumstances, it could be difficult to point to a particular error in the decision-making process.

The Value of Error Management

The literature underscores the importance of learning from errors. Indeed, long before the concept of the "learning organization" became a buzz phrase, Chris Argyris and Donald Schön published a book titled *Organizational Learning* (1978). In fact, Argyris noted that his publisher asked him at the time, "... do you think this topic will ever be of interest to the business community?" (Crossan, 2003, p. 40). He explained that learning was fundamental to organizational performance because it involved the "detection and correction of error." Indeed it is hard to see how any organization could heed the advice of the latest business gurus without properly learning from error. If a company wants to go from "Good to Great," then it will need to

rectify errors. If a company wants to train a cadre of “Six-Sigma Blackbelts,” then it better start focusing on error management. Indeed, tool kits designed to assess an organization’s learning capability place considerable weight on the ability to analyze and share lessons learned (Garvin, Edmondson, & Gino, 2008).

Moreover, highly effective companies often attempt to front-load errors for prevention and innovation purposes. For example, engineers use programs such as Autodesk to catch mistakes early in the design process for products ranging from escalators to mountain bikes. This often results in significant time and dollars savings (Johnson, 2007). Likewise, innovation often emerges from careful experimentation designed to test hidden assumptions. For example, Bell Labs made a “deliberate mistake” by offering “no deposit” services to 100,000 high-risk consumers. Why? They wanted to test the assumptions of their financial models, which stipulated that those customers should pay a substantial deposit. It turned out the models were flawed and the company learned something significant. Indeed, these “high-risk” customers ended up adding “on average, \$137 million to the Bell System’s bottom line every year for the next decade.” (Schoemaker & Gunther, 2006, p. 110) In short, they intentionally committed an error to test the assumptions in their business model.

The Counter Forces

Given the potential benefits of learning from error, it would seem reasonable that organizations would readily embrace error detection and correction. Most do not. Why? There are very strong personal and organizational forces pushing against proper error management.

The natural human tendency to “save face” often inhibits employees from acknowledging mistakes or errors. A host of well documented “defensive behaviors,” such as making overly evaluative comments, showing expressions of superiority, and creating appearances of certainty,

serve to protect fragile egos (Rothwell, 2007). As Cannon and Edmondson (2005) put it, "... honest acknowledgment of one's failures is not only unpleasant, it also can strike a blow to one's self-esteem, self-image, and identity." (p. 7). When most people are given a choice between preserving their self-esteem and admitting they made an error, most will opt for self-esteem. Many people equate admitting error with admitting failure. As a result, they end up deceiving themselves and placing blame elsewhere. This keeps their self-confidence intact at the expense of a sober analysis of the situation.

In fact, the vast majority of employees actively avoid admitting error in any form. And this is not a silent majority; it is often quite vocal. Consider a situation in which someone forgets to place contact information on a brochure sent to potential clients. A week later, after thousands were mailed to consumers, one astute executive, not involved in the decision, notices the omission. Now what? Think of the blame-shifting possibilities:

- It's not my job. Someone else was supposed to check out the final edition.
- We sent it to a copy editor who was supposed to check this.
- We outsourced the brochure; they should have checked it over.
- The decision was made by a committee.
- This was just an image campaign; we purposely avoided that information.

These statements have one thing in common: no one takes responsibility for the error. They all preserve the ego of those involved in the decision.

The "confirmation bias" amplifies all of these tendencies (Mlodinow, 2008; Ariely, 2008). That is, humans actively seek out information that confirms pre-existing opinions. Rather than acting like a respectable scientist most people fail to seek out counterevidence. So, those

employees who view themselves as competent will actively avoid any evidence that hints at a counter view.

Organizational cultures further augment the forces arrayed against a sober and helpful view of errors. There are, for instance, costs associated with reporting errors or potential errors. Some of the regulators, for example, who tried to warn members of Congress about the potential financial troubles of Fannie Mae and Freddie Mac were ridiculed and denounced. These types of organizational practices and reactions can lead to widespread suppression of error reporting. Employees will naturally engage in a cost-benefit analysis before discussing an error. They will weigh the benefits of reporting against the material costs, effort costs, and damage to personal reputation (Zhao & Olivera, 2006). Often, they will choose silence and pass on those high costs to the organization, or others—including taxpayers (Perlow & Williams, 2003).

Error reporting and analysis tends to diminish when an organization fails to create a shared problem-solving climate and the proper psychological safety for employees (Tjosvold, Yu, Hui, 2004). On the flip-side, a cooperative problem-solving climate helps change employees' cost-benefit analysis. For example, the U.S Air Force will not penalize pilots for reporting errors within 24 hours (Ron, Lipshitz & Popper, 2006). Likewise, the U.S. Army encourages open, candid discussion of mission errors by conducting *After Action Reviews*. These discussions pose a special challenge because a supervisor might still be tempted to punish those who admit errors. Therefore, any effort to de-personalize the error detection could be useful. Technological devices, such as seat-belt warning devices can perform that function because they highlight error cues in a fairly non-threatening and depersonalizing manner.

In short, while the literature reports an array of strong personal and organizational forces aligned against proper error management, there are some effective countermeasures available.

Yet, for organizations to put these measures to use, they need a solid understanding of the challenge they face. That is the issue we address in the next section.

Error Management Framework

A thermostat provides a useful view of error correction processes. How does it work?

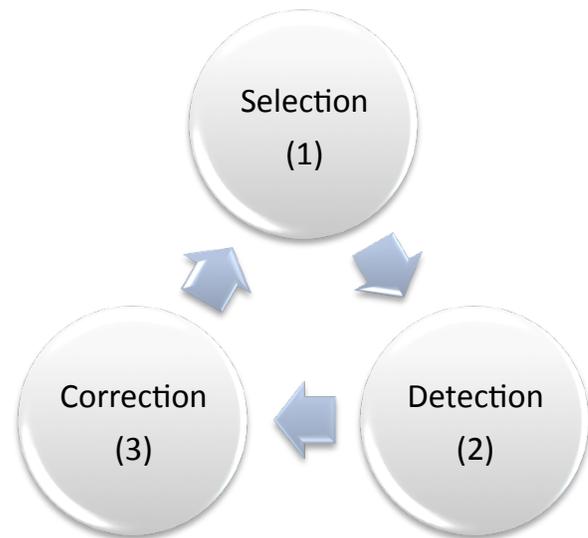
Step one: you set the thermostat to the desired temperature. Step two: the thermostat detects any deviation from the desired temperature. Step three: the thermostat engages either the furnace or air conditioner to work until the desired temperature is reached. The steps are simple: selection, detection, and correction. Often though, commentators

use the imagery of the thermostat to focus only on the detection and correction of error. But that only highlights part of the process; it leaves out the vital component of the selection.

The selection component underscores the human element and suggests that the entire system could be recalibrated based on human input. If, for example, all your houseplants died at a set temperature, one option would be to re-set the thermostat. Or you might discover that an entirely different kind of thermostat is needed, such as one that calibrates for humidity levels. In essence, the notion of *selection* underscores *what you choose to pay attention to*.

We used this simple model to guide our exploratory research on the role of communication in organizational error management practices. At the macro-level we were intrigued by the

Figure 1
Error Management Model



communication practices associated with error management. On a more specific level, we were interested in the types of errors that organizations selected to pay attention to and communicate about. Likewise, we wanted to look at the relationship between selection, detection, and correction. In order to provide even further insight, we examined our results from a management verses non-management viewpoint. We also gleaned perspective by comparing well-led and not well-led organizations. In particular, we posed the following research questions:

RQ1. *How do employees perceive their organization communicating about organizational errors?*

RQ2. *What types of errors do employees perceive their organization recognizing most and least often?*

RQ3. *What types of errors do employees perceive their organization learning from most and least often?*

RQ4. *What types of errors are recognized and learned from, and which types of errors are recognized but least likely to be learned from?*

RQ5. *Do managers perceive organizational errors differently from non-management employees?*

RQ6. *Do employees who perceive their organization as well-led view organizational errors differently from those in not well-led organizations?*

Method

Measurement Instrument

To answer the research questions, a questionnaire was created to identify and assess employees' perceptions of organizational errors. In a pilot study, 26 employees from a variety of service and manufacturing organizations were asked to list organizational errors they had experienced in their work life. We also discovered in these interviews that the distinction between selection and detection was meaningful conceptually but difficult to assess on a practical level. So we decided to merge the concepts for our empirical work. In addition,

scholarly articles were reviewed to locate errors typically identified in the literature (Rybowiak, Garst, Frese, & Batinic, 1999; Zhao & Olivera, 2006). A total of 47 types of errors were collected. After eliminating duplicate or similar terms, 17 types of organizational errors were selected for inclusion on the questionnaire.

Several researchers make a distinction between the recognition of errors and whether organizations learn from errors (Tjosvold, Yu, Hui, 2004; Argyris, 2003). Based on this precedence, respondents were asked to indicate for each of the 17 types of errors how likely their organization is to *recognize* mistakes in these areas. Then they were asked how likely their organization is to *learn from* these mistakes. A 7-point “highly unlikely” (1) to “highly likely” (7) scale was used to measure all items.

Following a review of existent research on organizational errors, we created 12 items designed to measure how much an organization talks about or communicates on issues related to errors or mistakes in the organization. A 7-point “strongly disagree” (1) to “strongly agree” (7) scale was used to determine employees’ perceptions.

The questionnaire concluded by asking a variety of demographic questions.

Subjects

Full-time employees in a variety of types of organizations were the subjects in this study. The questionnaire was administered to some in a group setting, while others completed the questionnaire individually and returned it to the researchers. Most finished the survey in less than 10 minutes.

A total of 212 employees completed the questionnaire, with 41.8% males and 58.2% females. Nine percent (9%) were in top management, 27.1% were in management, 59.6% were non-managerial employees, and 4.3% were other. The average age was 37.5 years, with

employees ranging from 19 to 69 years old. In terms of the highest level of education, 4.3% had a high school diploma, 11.4% had a technical college degree or professional certification, 26.7% had some college work, 38.6% had an undergraduate college degree, and 19% had a graduate degree. While many different types of organizations were represented, the largest percentage was from governmental entities (16.2%). Other types of organizations included education/training (12.4%), retail (6.7%), manufacturing operations (5.7%), sales (5.7%), and advertising/public relations (5.2%).

Results

RQ1 asked how employees perceive their organization communicating about organizational errors. To answer this question, the 12 items measuring how much an organization talks about or communicates on issues related to errors/mistakes in the organization were analyzed. Factor analyses (with orthogonal varimax rotation) of the 12 items revealed two dominant factors with eigenvalues of 1.0 or higher (see Table 1). Guidelines prescribed by McCroskey and Young (1979) were used to select factors. Items were eliminated or considered for inclusion depending on their factor loading, item-whole correlation, and the number of items loading on a factor (i.e., minimum of 3). The first factor explained 35.6% of the variance, was named the “Organization Wide Errors” factor, and contained 6 items. These items addressed issues such as whether the organization recognizes the benefits of openly discussing mistakes, and whether top management encourages employees to talk candidly about errors. The second factor explained 29.1% of the variance, was named the “Work Group Errors” factor, and contained 3 items. Items loading on this factor related to whether the employees’ work group openly discussed mistakes and errors, and the degree of comfort talking to their supervisor about mistakes.

An analysis of the “Organization Wide Errors” factor in Table 1 indicates respondents are relatively neutral on the following items: “My organization uses mistakes to find innovative solutions”, “When a mistake occurs, my organization analyzes it thoroughly”, and “Top management uses errors as learning opportunities.” They were somewhat more inclined to believe their organization recognizes the benefits of openly discussing mistakes and that top management encourages employees to talk candidly about their errors. On the “Work Group Errors” factor (see Table 1), employees were slightly more inclined to agree that they were comfortable talking to their supervisor about their mistakes, that they openly discussed mistakes and errors in their work group, and that their work group used mistakes to find innovative solutions. Overall, these findings reveal that when it comes to communicating about errors, employees are neutral on how they perceive their organization communicating about errors but perceive a higher level of communication in their work group.

RQ2 asked what types of errors employees perceive their organization recognizing most and least often. Table 2 indicates that customer service errors are most likely to be recognized (62.1% perceive as likely) followed by quality of product or service errors (57.1%). Both of these types of errors are outcomes of an organization and typically have the greatest degree of consumer visibility. The least likely to be recognized are errors related to management of information, management of change, personnel promotions, employee communications, management of employee performance, and purchasing decisions. Only about 30% of employees perceived these internal organizational errors as being recognized.

RQ3 asked what types of errors employees perceive their organization learning from most and least often. Table 3 reveals that customer service errors and quality of product or service errors are most likely to be learned from (59.4% and 53.1% likely to learn from,

respectively). The least likely errors to be learned from are management of change (24.9%), employee communications (22.9%), management of employee performance, (27.0%) personnel promotions (28.8%), marketing (30.2%), and management of information (31.7%).

RQ4 asked what types of errors are recognized and learned from, and which types of errors are recognized but least likely to be learned from. To answer this question, dependent t-tests were computed to determine if there was a significant difference between recognized errors and learned from errors for each of the 17 types of errors. The results of that analysis are in Table 4. For customer service errors as well as quality of product or service errors, there was no significant difference between recognized and learned from errors. Since these types of errors are more highly recognized and since there is a comparable amount of learning, these results are viewed as positive. Three items (i.e., employee communications, management of employee performance, and management of change) produced significant differences at $p < .001$. This indicates that for these three items employees perceive them as areas where errors are recognized (to some degree) but where there is significantly less learning. Other items with significant differences are personnel promotions ($p < .01$), training ($p < .01$), hiring decisions ($p < .04$) and scheduling ($p < .05$). In all cases, the mean for learned from errors was significantly lower than the mean for recognized errors.

RQ5 asked if managers perceive organizational errors differently from non-management employees. To answer this question, those in top management and management positions were identified as “management” ($n=76$; 38%), and subjects in non-managerial positions were identified as “non-management” ($n=125$; 62%). These were the two levels of the independent variable of “job position.” Independent t-tests were computed for each of the 17 recognized types of errors as well as the 17 learned from types of errors.

Results of the analysis for the 17 recognized types of errors revealed 15 were not significant. The only significant differences were for recognizing purchasing decision errors ($t=2.21$, $p<.03$, $df=164$, $M=4.96$ management, $M=4.42$ non-management) and recognizing employee performance errors ($t=1.94$, $p<.05$, $df=194$, $M=4.89$ management, $M=4.40$ non-management). Results for the 17 learned from types of errors were not significant except for one item. Learning from performance errors was significantly different ($t=2.43$, $p<.02$, $df=193$, $M=4.49$ management, $M=3.81$ non-management). Overall, these findings indicate that for most types of errors there are no significant differences between management and non-management in recognizing or learning from errors. The main difference was in errors related to employee performance. Management, more than non-management, recognized and learned from this type of error.

RQ6 asked if employees who perceive their organization as well-led view organizational errors differently from those in not well-led organizations. Two items on the questionnaire addressed employees' perceptions of how well-led their organization was. One was "my organization is well-led" and the other was "my organization is well-managed." These items were highly correlated ($r=.85$, $df=193$). Subjects' scores from these two items were summed, thus producing a score ranging from 2 to 14, with a neutral score of 8. Respondents with a score from 2 to 9 (44.3%) were placed in the "not well-led" category, and those with a score from 10 to 14 (56%) were placed in the "well-led" category. Independent t-tests were then computed for each of the 17 recognized types of errors as well as the 17 learned from types of errors.

In terms of the 17 recognized types of errors, employees in well-led organizations had significantly higher recognition of errors for 14 items. The three items that were not significantly different were customer service, scheduling, and purchasing decisions. For the 17 learned from

types of errors, employees in well-led organizations were significantly higher in learning from errors for all 17 items (see Table 5). Overall, these findings reveal that those in well-led organizations are much more inclined to recognize organizational errors as well as learn from those errors compared to employees in not well-led organizations.

Discussion

The purpose of this research was to explore the role of communication in the management of organizational errors. Conceptually we distinguished between the selection of errors that receive the attention, the detection of those errors, and the subsequent correction of the errors. Organizations that systematically and continuously address all three issues can be deemed learning organizations (Argyris, 1982, 2003; Senge, 1990). The research suggests that selection, detection, and correction are intimately connected. If an organization selects certain errors to pay attention to, then in all likelihood it will detect and possibly correct those errors (see Table 4). In essence it will create learning around those issues. There are some notable exceptions to that rule in the areas of training, employee communications, personnel promotions, change management and employee performance. Errors in these areas may well be recognized but learning emerges to a lesser extent. That's the *not* so surprising big picture. The more intriguing findings emerged from deeper analyses. In particular, we make note of four observations:

First, work group dynamics appear to exert a different type of influence on error management norms than do organization-wide norms. As seen in Table 1, the factor analysis revealed a relatively clear distinction between organization-wide and group-specific error management practices. It makes sense that work group norms may or may not support organization-wide efforts to effectively manage errors. And it seems logically that a particular

work group could effectively communicate about mistakes and productively manage errors even if organization-wide efforts are less supportive.

Second, the data revealed what types of errors are on the “radar screen” of most organizations and what escapes notice. Customer service and quality errors were the most likely to be selected and detected in organizations. On the other hand, information management, change management, personnel promotions, and employee communications were the least likely errors to be on the radar screen of organizations. In essence, the issues most visible to customers receive the most attention, while others fall by the wayside. For example, only 30% of organizations are likely to recognize information or change management errors. However, that number rises to 62% for customer service errors. This is a bit surprising since information or change management errors could have a direct impact on customer service levels.

Third, the data suggest that the demographic variables provide little explanatory power. Specifically, gender, age and education level proved of little value in discerning differences in the data set. Males and females did not differ significantly in their responses to the 17 items for recognized or learned from errors. In like manner, education level was not related to the 17 items for recognized or learned from errors. Furthermore, the only recognized or learned from item related to age was “quality of product or service.” Older employees tended to recognize and learn from the quality of product or service errors more than younger employees. These findings were not particularly surprising.

However, it might be reasonable to expect that one’s position in the organization might prove useful. After all, managers often have a very different view of organizational practices than their employees. But that was not the case; managerial and non-managerial employees shared similar views on their organizations’ ability to detect and learn from errors. There was

one notable exception – the management of employee performance. Those in managerial positions were more confident about detecting and learning from employee performance errors than their counterparts in the non-managerial ranks. This is not terribly surprising. After all, managers have responsibility for managing employee performance and are subject to the confirmation bias (Mlodinow, 2008; Ariely, 2008). What may be surprising is the degree of agreement on all the other issues. This suggests that error management practices, protocols, and communication may transcend the traditionally strong influence of manager-employee relationships. In other words, other organizational forces are at work in shaping the error management practices of an organization. What are these forces? This research cannot answer that questions but the researchers working on high performance organizations may well provide further insight (Weick & Sutcliffe, 2001).

Fourth, the data clearly suggest that well-led organizations have a wide, multi-dimensional “radar screen.” Well-led organizations select significantly more issues to monitor for errors than their less well-led counterparts. In particular, Figure 2 compares the radar screens of well-led organizations to their counterparts. Note that the well-led organization paid attention to 12 issues; their counterparts only matched their concerns on two issues. Perhaps well-led organizations recognize the interrelationships of the top issues with all the others. For example, the quick detection and correction of scheduling errors can clearly decrease the likelihood of major customer service errors. This finding parallels the research of Cannon and Edmondson (2005) that indicates the importance of proactively and doggedly addressing “small errors” in order to prevent larger ones.

Figure 2
Error “Radar Screens”



Implications and Future Directions

The research suggests a number of important implications. First, researchers should continue examining what types of team environments cultivate norms for learning from errors. The work of Tjosvold, Yu, and Hui (2004) provides a fascinating glimpse into the specific attributes of teams that operate under such norms. In particular, they argue that leaders need to cultivate norms that promote cooperative goals and a problem-solving orientation. This increases the likelihood of learning from errors, since it shifts the cost/benefit ratio in a more positive direction. Moving from these ideas into the realm of actionable advice should be a high priority of scholars and practitioners.

Second, the research suggests that organizational leaders should increase the types of errors they select to pay attention to. Most organizations select customer service and quality issues to monitor for error. Consequently, they often detect, correct and learn from those errors. Well-led organizations do something more; they tend to pay attention to more errors. They recognize that vigilance in regard to small errors directly relates to the ones they deem most important. Vigorously attacking small errors creates more learning opportunities. Not only will this help prevent larger errors, it will also create opportunities to teach about proper error management.

Third, the study suggests some important venues for future research. For example, we are fascinated by the role of leadership in cultivating more effective error management practices. How do leaders encourage employees to talk candidly about errors? How do they utilize failure as learning opportunities? How do effective leaders view the relationship between the “small errors” (e.g., information management and communication practices) and the big issues like customer service? Additionally, we would like to find better ways to understand the relationship between the selection, detection and correction elements. Why, for example, would an error be detected but not corrected? Or, why would a problem be corrected but consistently re-occur? Could an organization correct a problem without learning? If so, why would this occur? These are the questions that need to be pursued in future research.

Limitations

Like all studies, this one has limitations. In particular, we relied on self-reports about error management practices. Perceptions may or may not match reality. We relied on those perceptions to classify the organizations as well-led or not well-led. More objective measures such as a business’s return on investment or return on shareholder equity might be in order.

Additionally, the sample included some senior executives, but perhaps not enough to draw definitive conclusions about their views of error management. Despite these concerns, the research provides some initial observations to help leaders better manage the error selection, detection, and correction process. Moreover, the study suggests some new directions for future research that can deepen our understanding of this important organizational issue.

Conclusion

When sports broadcasters introduced instant replay and slow-motion to U.S. football fans, they ushered in something unexpected. Not only could the highlights be endlessly replayed and analyzed, so could the obvious errors by officials. Most were inconsequential; others were game-changers. What happened after this innovation? At first, nothing much. In fact, there was even resistance to using the tool as a hedge against officiating errors. The arguments against using instant replay were plentiful as well as persuasive: 1) it would slow down the game, 2) it would undermine the credibility of officials, and 3) it would destroy fan confidence in the integrity of the game. Today, of course, coaches and officials in the booth rely on instant replay to correct important errors on the spot.

The story of instant replay is instructive because it serves as a reminder of the resistance to and the potential benefits of error management. Managers often resist discussing errors for fear of undermining their credibility or even slowing down production. Our research suggests that, on the contrary, well-led organizations monitor many potential error sources and learn the relevant lessons. This can only happen within the framework of effective communication practices between the error selectors, detectors, and correctors. Such an approach improved the quality of the officials in the NFL and enhanced player safety without undermining the integrity of the game. This study suggests that 1) other organizations would benefit from such an

approach, and that 2) researchers could further enhance our understanding of the communication involved in selecting, detecting and correcting errors.

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Table 1
Communicating About Errors: Items and Factor Loadings

Item	Factor 1 (Organiza- tion-Wide Errors)	Factor 2 (Work Group Errors)
1. My organization recognizes the benefits of openly discussing mistakes. (Mean=4.28)*	.74	
2. Top management in my organization encourages employees to talk candidly about their errors. (Mean=4.26)	.75	
3. Top management uses errors as learning opportunities. (Mean=4.19)	.79	
4. When a mistake occurs, my organization analyzes it thoroughly. (Mean=4.13)	.67	
5. My organization uses mistakes to find innovative solutions. (Mean=4.07)	.70	
6. Top management is willing to admit mistakes. (Mean=3.73)	.79	
7. I'm comfortable talking to my supervisor about my mistakes. (Mean=5.29)		.72
8. We openly discuss mistakes and errors in my work group. (Mean=4.84)		.82
9. My work group uses mistakes to find innovative solutions. (Mean=4.70)		.82

* the scale ranged from 1 “strongly disagree” to 7 “strongly agree” with 4 being “neutral”

Table 2
Rank Order of Recognizes Errors

Type of Recognized Error	Rank	Mean	% Likely to Recognize*
Customer service	1	5.53	62.1%
Quality of produce or service	2	5.27	57.1%
Hiring Decisions	3	5.00	46.3%
Production	4	4.96	43.2%
Management of crises	5.5	4.94	45.5%
Public relations	5.5	4.94	42.6%
Training	7	4.91	45.1%
Scheduling	8	4.88	40.0%
Use of technology	9	4.83	43.9%
Marketing	10	4.63	33.6%
Strategic direction	11.5	4.62	35.7%
Purchasing decisions	11.5	4.62	31.2%
Management of employee performance	13	4.55	31.7%
Employee communications	14	4.51	31.7%
Personnel promotions	15	4.45	30.1%
Management of change	16	4.36	30.4%
Management of information	17	4.29	31.2%

* collapsed highly likely (7) and moderately likely (6) to create “likely to recognize errors”

Table 3
Rank Order of Learning From Errors

Type of Learned From Error	Rank	Mean	% Likely to Learn From*
Customer service	1	5.38	59.4%
Quality of produce or service	2	5.19	53.1%
Management of crises	3	4.95	45.9%
Use of technology	4	4.87	44.1%
Public relations	5	4.86	37.4%
Production	6	4.85	46.1%
Hiring Decisions	7	4.76	41.8%
Scheduling	8	4.69	38.5%
Purchasing decisions	9	4.65	34.7%
Training	10	4.58	40.0%
Strategic direction	11	4.57	34.9%
Marketing	12	4.51	30.2%
Management of information	13	4.26	31.7%
Personnel promotions	14	4.14	28.8%
Management of employee performance	15	4.03	27.0%
Employee communications	16	4.01	22.9%
Management of change	17	4.00	24.9%

* collapsed highly likely (7) and moderately likely (6) to create “likely to learn from errors”

Table 4
Differences Between Recognized Errors and Learned From Errors

Type of Error	Recognized Mean*	Learned From Mean*	Significant Difference
Customer service	5.53	5.38	nsd
Quality of produce or service	5.27	5.19	nsd
Hiring Decisions	5.00	4.76	t= 2.11 p<.04
Production	4.96	4.85	nsd
Management of crises	4.94	4.95	nsd
Public relations	4.94	4.86	nsd
Training	4.91	4.58	t= 2.86 p<.01
Scheduling	4.88	4.69	t= 1.95 p<.05
Use of technology	4.83	4.87	nsd
Marketing	4.63	4.51	nsd
Strategic direction	4.62	4.57	nsd
Purchasing decisions	4.62	4.65	nsd
Management of employee performance	4.55	4.03	t= 4.68 p<.001
Employee communications	4.51	4.01	t= 5.05 p<.001
Personnel promotions	4.45	4.14	t= 2.80 p<.01
Management of change	4.36	4.00	t= 3.53 p<.001
Management of information	4.29	4.26	nsd

* the scale ranged from 1 “highly unlikely” to 7 “highly likely” with 4 being “neutral”

Table 5
Differences Between Well-Led and Not Well-Led Organizations
for Learned From Errors

Type of Error	Well-Led Organizations	Not Well-Led Organizations	Significant Difference
Customer service	5.87* (72.6%)**	4.75 (42.7%)	t= 4.93 p<.001
Quality of produce or service	5.74 (71.3%)	4.52 (30.7%)	t= 5.50 p<.001
Management of crises	5.73 (63.6%)	3.95 (23.2%)	t= 7.94 p<.001
Use of technology	5.47 (55.3%)	4.11 (30.0%)	t= 5.67 p<.001
Production	5.40 (62.5%)	4.13 (24.6%)	t= 4.61 p<.001
Public relations	5.40 (48.5%)	4.15 (22.8%)	t= 5.68 p<.001
Strategic direction	5.35 (50.5%)	3.61 (15.8%)	t= 7.68 p<.001
Hiring Decisions	5.32 (55.8%)	4.03 (23.8%)	t= 5.38 p<.001
Training	5.21 (53.6%)	3.79 (23.1%)	t= 5.79 p<.001
Scheduling	5.19 (47.1%)	4.10 (28.4%)	t= 4.39 p<.001
Purchasing decisions	5.13 (40.4%)	4.09 (27.9%)	t= 4.22 p<.001
Management of information	5.10 (49.6%)	3.20 (9.0%)	t= 8.46 p<.001
Marketing	4.98 (38.3%)	3.90 (19.4%)	t= 4.31 p<.001
Management of change	4.84 (35.8%)	2.95 (11.3%)	t= 8.66 p<.001
Employee communications	4.82 (34.8%)	3.04 (8.7%)	t= 8.00 p<.001
Management of employee performance	4.74 (35.7%)	3.16 (16.3%)	t= 6.58 p<.001
Personnel promotions	4.68 (39.6%)	3.46 (15.3%)	t= 4.96 p<.001

* mean for a scale ranging from 1 “highly unlikely to learn from errors” to 7 “highly likely to learn from errors” with 4 being “neutral”

** collapsed highly likely (7) and moderately likely (6) to create % “likely to learn from errors”