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Going Through the Motions: An Empirical Test of Management Involvement in Process
Improvement

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Abstract: Managers play a critical role in process improvement. However, research has found that many improvement efforts fail due to insufficient management involvement. Less is known, however, about mechanisms to foster managers' involvement and their impact on organizational climate, which predicts successful outcomes. We addressed this gap with a field experiment suggested by Toyota's problem-solving process. We tested three related process improvement activities: (1) interacting with workers to learn about problems, (2) ensuring that action is taken to address the problems, and (3) communicating about actions taken. Sixty-nine randomly selected hospitals, 20 of which were randomly selected to engage in the three activities for 18-months, participated in the experiment. Survey results showed that identifying problems had a negative impact on organizational climate while taking action had a positive impact. Results suggest that solving problems as they arise (e.g. Toyota's approach) with intense and substantive actions is more productive than gathering information about large numbers of potential problems

to solve (e.g. incident reporting systems). Providing feedback about actions taken negatively impacted frontline workers' perceptions. Qualitative results suggest that communication can backfire when managers go through the motions of process improvement activities without making a sincere effort to resolve staff concerns.

Key words: process improvement, hospitals, Toyota Production System, management, field experiment, safety

Introduction

Organizations can achieve excellent performance through improvement initiatives (Loch et al. 2003). Process improvement is the application of scientific approaches to improving work processes with the goal of achieving high levels of performance on some dimension, such as quality, efficiency, flexibility or responsiveness (Anderson et al. 1994, Blumenthal and Kilo 1998, Shortell et al. 1998). By improving work processes—the linked chains of activities through which organizations produce products and services—managers can enhance performance to have a competitive advantage over other firms in their industry (Garvin 1998). Toyota is a quintessential example of a firm that achieved competitive advantage through process improvement (Liker 2004).

Unfortunately, despite their importance, process improvement efforts frequently fail (Hackman and Wageman 1995). Research suggests that insufficient management involvement causes such failures (Berwick 2005, Hackman and Wageman 1995, Westphal et al. 1997, Zbaracki 1998). Managers' actions are important not only because of their direct effects but also because they shape the organizational climate for improvement. Organizational climate refers to workers' perceptions of shared beliefs about what behaviors are desirable and rewarded within the organization (Zohar 1980).

Improvement efforts are more successful when the organizational climate supports improvement (Choo et al. 2007, Detert et al. 2000, Ferlie and Shortell 2001, Garvin 2000, McFadden et al. 2009, Naveh et al. 2005, Vogus and Sutcliffe 2007). Organizational climate is an important determinant of improvement success for two reasons. First, it influences how much effort employees put into achieving improvement goals (McFadden et al. 2009). When employees perceive that managers do not value efforts to improve work processes, they are

reluctant to engage in these discretionary behaviors (Vogus and Sutcliffe 2007). For example, some organizations are characterized by a firefighting climate, where workers believe that managers care about short-term performance instead of long-term improvement. In these organizations, problems are “patched” rather than eliminated through removal of underlying causes (Bohn 2000). In contrast, when workers believe that management is committed to improvement, workers are more likely to adopt behaviors necessary for successful improvement, such as compliance with new safety procedures (Zohar 2002). Research has shown a strong link between organizational climate and workers’ behaviors, which in turn leads to reduced accidents (Zohar 2002). Thus, climate predicts objective outcomes. Second, managers can create a climate where workers feel safe engaging in risky behaviors—such as speaking up about problems and experimenting with new processes—that are necessary for creating new knowledge that drives improvement (Choo et al. 2007, Edmondson 1999, Terwiesch and Bohn 2001). In summary, an organizational climate of improvement can encourage workers to engage in the discretionary, risky behaviors necessary for learning in addition to their production tasks (Terwiesch and Bohn 2001). For these reasons climate for improvement is a key outcome measure for improvement efforts.

Despite consensus that a supportive climate is a necessary lever for improvement efforts, scant longitudinal research tests the impact of specific managerial activities on organizational climate for improvement. This is a critical gap in knowledge because it leaves managers and scholars with little information about what specific actions managers could take to strengthen a poor climate for improvement. Furthermore, evidence about operational mechanisms that transform a poor climate into an improvement-oriented climate would inform theory about causal links between actions and outcomes.

Our paper addresses this gap. We use data from a field experiment with control and treatment organizations to test the impact of a set of three senior manager activities on organizational climate for improvement. We demonstrate that resolving a small number of problems is preferable to collecting data about many problems. Qualitative data from our study lends insight into the relationship between the activities and changes in organizational climate. We highlight a potential missing variable: the extent to which managers “go through the motions” while conducting the activities rather than sincerely engaging in them as a mechanism for learning and improvement.

The set of three activities of management involvement with process improvement were (1) increasing senior manager awareness of existing problems through observations and conversations with frontline workers; (2) ensuring that the organization takes action to resolve these problems; and (3) communicating to frontline workers about actions taken. While each activity is undertaken separately, the three activities represent a sequential set because the second (and third) are only possible if the first (and second) are conducted. For brevity we refer to these activities as identifying problems, taking action, and communicating feedback. The choice of this set of activities was informed by Toyota’s emphasis on managers going to the production line to help employees identify and resolve problems in context (Liker 2004, Masaaki 1996), as well as prior process improvement research which found that the context in which problems occur contains valuable information about the problems’ impact, causes, and solutions (Shannon et al. 2007, Tyre and von Hippel 1997).

We tested the impact of these activities on organizational climate in hospitals. Despite the need for process improvement in this industry, hospitals have been slow to adopt improvement techniques and when they do, improvement efforts often fail to achieve expected results

(Blumenthal and Kilo 1998, Shortell et al. 1998, Westphal et al. 1997). We randomly selected a large group of hospitals, from which we drew a second, smaller random sample of hospitals. These “treatment” hospitals engaged in the three activities for 18 months. The hospitals not selected from the first sample served as “control” hospitals.

In contrast to our hypothesis, we found that higher numbers of identified problems *negatively* impacted organizational climate. As expected, higher percentages of problems with actions taken to resolve them positively impacted organizational climate. These results suggest that Toyota’s problem solving approach of finding a problem and fixing it is likely to be more successful at improving organizational climate than the common approach of gathering large numbers of problems with incident reporting systems and resolving a small percentage of them based on analysis of trends. Finally, in contrast to our hypothesis, we found that higher percentages of problems with communication feedback about actions taken were associated with lowered climate. We interpret this counterintuitive result to mean that feedback about actions taken can worsen staff perceptions of climate for improvement if the actions were superficial or punitive. In other words, managers do not fool frontline workers by going through the motions of process improvement.

This paper makes several contributions. First, we contribute to the process improvement literature by empirically testing the impact of three activities of management involvement with process improvement. Most prior papers have considered a supportive climate as a necessary starting point for process improvement efforts (Choo et al. 2007, Westphal et al. 1997), but few studies have examined *how* process improvement efforts impact climate. (Naveh and Erez 2004 is a notable exception). Second, our results shed new insights about why real-time problem solving techniques, such as those used by Toyota, that emphasize action over data collection,

analysis, and feedback might be successful. Third, for practitioners, our paper provides guidance about which manager actions would have the greatest impact on climate for process improvement. We provide support for one common process improvement technique and disconfirming evidence for two others, moving the field of process improvement toward evidence-based management (Pfeffer and Sutton 2006). Finally, our study provides deeper insights into why embarking on an improvement initiative can backfire if managers are merely going through the motions.

Management Involvement with Process Improvement Efforts

Prior research suggests that an organizational climate for improvement contributes to successful process improvement (Adler et al. 2003, Anderson et al. 1994, McFadden et al. 2006). Managers' behaviors shape organizational climate, which in turn influences workers' discretionary behaviors necessary for improvement (Detert et al. 2000, MacDuffie 1997). Managers influence the organizational climate for improvement through the policies and practices they initiate, and through their actions and communications (Naveh et al. 2005, Zbaracki 1998, MacDuffie, 1997). Managerial actions can have differential impacts on climate for improvement. For example, Naveh and Erez (2004) found that senior manager coaching and communication about quality improvement had no impact on organizational climate while setting quality goals had a positive impact. Therefore, we separately test the impact of the three sequential, yet distinct, improvement activities in our study—identifying problems, taking action, and communicating feedback about actions taken. Below, we develop three hypotheses, one for each of the three activities' impact on organizational climate. We then develop three hypotheses

about the moderating impact of management level (frontline worker versus senior manager) on the relationship between the activities and climate.

Manager actions that are visible to workers powerfully influence organizational climate (Naveh et al. 2005, Zohar 2002). Spending time on the frontlines of organizations is a particularly visible activity. For example, managers who spend time speaking with employees about employees' safety concerns (rather than about productivity) convey that management understands the difficulty of completing tasks safely (Zohar 2002). Managers' presence on the front lines can heighten their own awareness of problems that occur at the point of use (Tyre and von Hippel 1997). Similarly, the high reliability literature recognizes that frontline workers possess more information about technical problems than do senior personnel (Roberts et al. 1994, Vaughan 1996). Thus, managers become more informed about problems by interacting with frontline workers (Frankel et al. 2005). Such interactions may positively influence the organizational climate for improvement because as managers learn about problems faced by frontline workers, managers gain a more realistic understanding of the organization's challenges and a heightened commitment to resolving them. Thus,

Hypothesis 1: Identifying more problems will improve organizational climate for improvement.

In addition to going to the frontlines to learn about problems, observing problems in context can aid problem resolution. Going to the location where problems occur can yield helpful information about the problem's significance, causes, and possible solutions (Liker 2004, von Hippel 1994). A deeper understanding of underlying causes and potential solutions can enable managers to more effectively prioritize problems and allocate problem solving resources (Bohn

2000, Lapre and Van Wassenhove 2001). A study of quality improvement projects found that projects were most successful when the organization developed insight about why problems occurred, why solutions worked, and how to implement the solutions (Lapre et al. 2000, Lapre and Van Wassenhove 2001). Ultimately, removal of underlying causes of problems improves organizational climate (Bohn 2000). When managers ensure that the organization takes action on problems that workers believe are important, managers promote a climate that supports learning and change (Lukas et al. 2007, McFadden et al. 2006). Repeated iterations of management action to resolve problems can cause climate to transform over time (Frankel et al. 2008). We predict,

Hypothesis 2: Taking action on a higher percentage of identified problems will improve organizational climate for improvement.

Communication from managers about which identified problems were resolved may improve workers' perceptions regarding the organizational climate for improvement. Feedback can convey managers' support for process improvement and inspire employees to work hard to ensure that their improvement goals are achieved (McFadden et al. 2009). Limited resources require managers to be thoughtful in choosing among multiple improvement options (Carrillo and Gaimon 2000). Therefore, managers might consider resolving an identified frontline problem, but wisely decide not to invest in solution efforts at that time because other issues are more pressing (Li and Rajagopalan 1998). Unless managers communicate their decision process, however, workers will not know that managers took their problems seriously. In the absence of such feedback, a lack of action may be interpreted as a lack of commitment for improvement, discouraging future problem identification (MacDuffie 1997). Furthermore, even if managers do take action, the changes might not be transparent to employees (Gandhi et al. 2005). For these

reasons, communicating with frontline workers about managerial response to identified problems can be helpful for changing organizational climate. Thus,

Hypothesis 3: Communicating feedback about actions taken to address identified problems will improve organizational climate for improvement.

We develop a second set of three hypotheses below that examine the moderating role of management level on the relationship between the three process improvement activities described above and organizational climate. Prior research has found that people's level within their organization's management hierarchy can influence their perception of organizational climate, with senior managers having more positive perceptions than frontline workers (Nembhard and Edmondson 2008). Management level also impacts people's awareness of problems and process improvement activity (Roberto 2009). As a result, we hypothesize below that the three process improvement activities—identifying problems, taking action, and communicating feedback about actions taken—may have different impacts on employees' perceptions of organizational climate, depending on whether the employee is a frontline worker or a senior manager.

Senior managers are less aware of frontline problems than are workers who interact with these systems every day (Roberts et al. 1994, Tyre and von Hippel 1997, Vaughan 1996). Even when managers are aware of problems that frontline workers' experience, they may not fully appreciate their significance until they observe them first hand (MacDuffie 1997). As a result, senior managers' observations on the frontlines will raise their awareness of weaknesses in the organization. Thus, we expect that identification of frontline problems will negatively impact senior managers' perceptions of the organizational climate for improvement opportunities.

Conversely, frontline workers, who likely already know about the problems, might be relieved that senior managers are finally aware of problems and appear committed to resolving them. Problem identification may even positively impact frontline workers' perceptions of organizational climate. Therefore:

Hypothesis 4: Identifying problems will more negatively impact senior managers than frontline workers' perceptions of organizational climate for improvement.

In contrast to their deficit of information about frontline problems, senior managers typically have more information about resolution efforts than frontline workers because managers authorize solutions necessary for resolving problems (MacDuffie 1997). Furthermore, after authorizing action, senior managers may assume that prescribed actions will be implemented as planned and that they will have the intended effect. In practice, however, anticipated benefits often fail to materialize, and change can introduce unanticipated problems elsewhere, particularly in complex systems like hospitals (Senge 1990). For these reasons, we expect that when actions are taken in response to problems, senior managers' perceptions of organizational climate for improvement will increase more than frontline workers' perceptions. Thus,

Hypothesis 5: Taking action on problems will more positively impact senior managers' than frontline workers' perceptions of organizational climate for improvement.

Finally, we anticipate that feedback about actions taken to resolve problems will be more important for frontline workers than for senior managers. This is because, as argued above, senior managers likely participated in the decision-making about which problems were and were

not going to be addressed (Carrillo and Gaimon 2000, Li and Rajagopalan 1998). Thus, feedback will provide new information for frontline workers, while simply reinforcing what senior managers already know. Therefore:

Hypothesis 6: Communicating feedback about problems will more positively impact frontline workers' than senior managers' perceptions of organizational climate for improvement.

Figure 1 summarizes our model and our hypotheses.

Insert Figure 1 about here

Methods

Setting: US hospitals

Safety-related problems in hospitals are an appropriate context for our study. Hospitals have fallen under criticism for poor quality of care (Institute of Medicine 2001). In the U.S. for example, medical errors are the 8th leading cause of death (Institute of Medicine 2001), and hospitals fail to provide recommended treatments about a quarter of the time (Landon et al. 2006). Hospitals in other countries have also reported similar levels of medical errors (de Vries et al. 2008).

Although patient safety is an important objective for hospitals, medical accidents and near misses manifest on the frontlines of care, making it difficult for senior managers to be fully aware of safety concerns (Cook and Woods 1994). Failure to achieve improvement in safety process and outcomes in healthcare has been attributed in large part to a lack of awareness and

commitment among senior managers (Berwick 2005, Institute of Medicine 2001). In response, there have been calls to develop interventions to increase managers' capacity to positively affect safety climate in hospitals (Leape and Berwick 2005). By going to the frontlines of care, managers could improve their understanding of safety issues (Frankel et al. 2005, Pronovost et al. 2004). Furthermore, safety problems often cross intra-organizational boundaries, making it difficult for frontline workers to improve safety without involvement of managers (McFadden et al. 2009, Naveh et al. 2005). Therefore, improving safety requires interaction between frontline workers and managers, making it an appropriate context for testing our hypotheses.

Recommended Set of Process Improvement Activities: Leveraging Frontline Expertise

We refer to the set of improvement activities described in this paper collectively as Leveraging Frontline Expertise (LFLE). The hospitals that completed these activities are “treatment hospitals” and the non-participating hospitals are “control hospitals.” LFLE was designed to expose the senior management team—typically the Chief Executive Officer, Chief Operating Officer, Chief Nursing Officer, and Chief Medical Officer—to the frontline work context. Its purpose was to improve organizational climate by providing a systematic process for managers to learn about and address safety-related problems. It also identified aspects of the system that were working well to ensure patient safety. The problems were highlighted by workers; they included operational problems of all magnitudes, under the assumption that even minor safety-related problems can be important because they have the potential to align and cause harm (Cook and Woods 1994).

Interactions with workers to identify problems took two forms: work system visits and safety forums. In work system visits, managers would spend up to one hour visiting a particular

work area to observe a frontline worker or patient while work was being performed. The four senior managers would each observe a separate person, such as a nurse, physician, patient, and respiratory therapist, to shed cross-disciplinary insight into the work done in the area. The purpose was to build understanding of the context and gather real-time, grounded information from frontline workers about their perceptions of safety problems and strengths (Frankel et al. 2005). The visits could be done on the same day, or on different days depending on the senior managers' schedules. In addition to work system visits, managers also facilitated a special meeting, called a safety forum, in the same work area. The safety forums were designed to enable a larger group of frontline workers from the work area to tell senior managers about their safety concerns and points of pride (Sobo and Sadler 2002). By supplementing work system visits with safety forums, the program addressed research suggesting that interaction of senior managers with more people may increase the impact of a safety intervention (Thomas et al. 2005).

Planning and executing actions began with a debrief meeting, which served to organize, prioritize, and develop an action plan in response to the problems identified from the visits and forums. Representatives from multiple disciplines and levels of the management hierarchy participated. They listed the safety problems and strengths that they had identified through the visits and forum. For each problem the attendees decided next steps to resolve the problems, including suggesting possible solutions and assigning responsibility for addressing the problems. The information from the debrief meetings was entered into a spreadsheet, and actions taken were tracked. Hospitals sent this spreadsheet to our research team for analysis.

Finally, managers were encouraged to follow-up with workers about each problem, describing what changes, if any, were made as a result of the problem being identified. Hospitals

also informed us about which problems they communicated feedback to workers. Each round of these three components constituted one *LFLE cycle*.

Each LFLE cycle focused on a specific work area of the hospital and took approximately three months to complete, approximately equivalent to the length of time reportedly required for quality improvement teams to solve a specific problem (Evans and Dean 2003). This pace was deliberately less intense than prior, similar safety improvement programs because the more intense pace proved difficult to sustain (Frankel et al. 2008). After completing a cycle, the management team would move to a different work area for the next cycle. Senior management teams determined which work areas to visit based on their hospital's needs. LFLE cycles continued over the 18-month implementation. On average, hospitals conducted LFLE cycles in 4.1 out of 5 work areas (the operating room or post anesthesia care unit (OR/PACU), intensive care unit (ICU), emergency department (ED), medical/surgical ward (Ward), and "other" work areas).

Sample/ Recruitment

Our study employed a quasi-experimental design, including a pretest and posttest of treatment and control hospitals. We drew a stratified, random sample of 92 US acute-care hospitals to participate in a research study on patient safety. The sample was stratified by size and geographic region. All 92 hospitals were aware that they may be invited to participate in a program to improve safety climate, but details regarding LFLE were withheld to prevent contamination of the control hospitals. We then drew a second, stratified, random sample of 24 treatment hospitals from the larger random sample of 92. We sought 24 treatment hospitals because this was the maximum number of hospitals our funding could support and we could

oversee. Thus, we had a sample of 24 treatment hospitals and 68 control hospitals. There was no difference between the treatment and control hospitals on our outcome variable measured in 2004 ($F=0.54$, p -value = 0.46; mean = 3.73, $SD = 0.18$ for control hospitals, mean = 3.76 $SD = 0.17$ for treatment hospitals). Respondents at treatment hospitals also did not differ significantly from respondents in control hospitals with respect to individual or job characteristics including age, length of time at the institution, professional discipline, and urban location.

LFLE was launched in participating hospitals in January 2005. Twenty of the 24 treatment hospitals completed the improvement program and are included in our analyses.¹ During the 18-month program period, senior managers in the 20 treatment hospitals visited 138 different work areas, with 64 of those visits to EDs, ICUs, OR/PACUs, and Wards. The other locations included places such as the pharmacy, laboratory, dietary, radiology, labor and delivery, and endoscopy.

Only 49 of the original 68 control hospital completed the posttest survey in 2006. Thus, our final sample contains a total of 69 hospitals: 20 treatment hospitals and 49 control hospitals.² None of the hospitals or individuals received compensation for their role in this study. All activities were approved by the Institutional Review Boards at participating institutions.

Data on our outcome measure were collected through surveys before implementation of process improvement activities (2004) and again after the implementation was completed (2006).

¹ The four that did not complete the treatment dropped out because one went out of business, one was purchased by another organization, and two experienced significant senior management turnover during the 18-month period. As a result, they were unable to complete more than one cycle of activities and did not provide data on problems, actions taken, feedback provided to frontline workers, or the posttest survey. We thus excluded these hospitals from our analysis. There were no differences between the four hospitals that dropped out of the treatment and the 20 that didn't on our 2004 outcome measures of organizational climate for improvement. (One way ANOVA, $F = 0.20$, $p = .66$.)

² There was no difference on pretest survey measures between the 19 control hospitals that dropped out of the 2006 survey and the remaining hospitals ($F=.70$, $p=.40$; dropped hospitals had a mean of 3.70, $SD = .15$ while retained hospitals' mean was 3.74, $SD = .19$).

At each hospital, we surveyed 100% of senior managers (department heads and above) and a random sample of 10% of frontline workers as directed by participating hospitals. Workers were randomized using the last digit of individuals' social security numbers. We were required to survey different frontline workers in 2004 and 2006 because the hospitals were concerned about burdening frontline workers with multiple surveys. The baseline (2004) response rate was 52%; the follow-up (2006) response rate was 39%. The 2004 dataset from hospitals that also completed the 2006 survey included 15,352 individuals: 2,754 senior managers, 2,299 supervisors, 9,489 frontline workers, and 810 people who did not designate a job level. In 2006, 13,410 individuals completed the survey, including 2,189 senior managers, 1,996 supervisors, 8,134 frontline workers, and 1,091 people who did not designate their job level.

We also visited each treatment hospital to observe prescribed improvement activities, such as a work site visit or a safety forum. While at the hospital, the authors conducted interviews with frontline staff, department managers and the CEO. Interview questions addressed the nature of process improvement in the hospital in general and as it related to the implementing the recommended process improvement activities. With respect to LFLE activities, we asked senior managers how the activities were going for them, what challenges they had experienced, and what they viewed as the benefits of the improvement program. At each site we discussed and observed specific examples of changes implemented in response to problems identified through work site visits or safety forums. We also asked about non-LFLE improvement efforts to understand managers' improvement style more generally. For example, we asked senior managers, "Thinking about the most recent major organizational change related to patient safety, can you describe the change, your decision-making process, and its implementation?" We similarly asked frontline staff and middle managers to recall a recent major change initiative

related to patient care processes and to describe how this change was introduced in their unit. We also asked subjects to describe the investigation process into some adverse event and what changes had resulted. Interviews were recording and transcribed. In addition, after each visit, investigators documented their impressions based on notes taken throughout the day. Notes from the hospital visit and interviews were combined into transcripts, which provided qualitative data on the nature of the hospital's improvement process.

Variables

Dependent variable.

We measured *organizational climate for improvement* with a set of survey items tailored to patient safety, which was the focus of the improvement efforts in our treatment. We used the mean response of six survey items that were used in previous research (reference blinded for review, 2003) (listed in the Appendix). Using a 5-level Likert response scale ranging from 1=strongly disagree to 5=strongly agree, we asked respondents the extent to which they agreed with items such as “Senior management has a clear picture of the risks associated with patient care” and “Senior management has a good idea of the kinds of mistakes that actually occur in this facility.” Agreement with these items indicated that respondents thought senior management understood the hospital's safety issues and supported safety-related process improvement efforts. All items were positively worded. The scale exhibited high reliability, with a Cronbach's alpha of .87 (Nunnally 1967). Dropping any of the six items would have reduced the reliability of the scale. We included the 2004 hospital averages for perceived understanding as control variables. Thus, our dependent variable reflects changes in perceptions over the implementation time period.

Independent variables. We used two groups of independent variables. The first group included the three process improvement activities: (1) a continuous variable designating the number of problems identified; (2) the percent of problems for which action was taken; and (3) the percent of problems for which managers communicated feedback to frontline workers about actions taken. Our measures of action and feedback relied on percentages rather than simple counts to recognize the importance of addressing problems identified (Gandhi et al. 2005). Data about activity level used to create these variables were provided by treatment hospitals. In the second group of independent variables, we created interaction terms by multiplying the three measures of process improvement activity with dummy variables indicating whether the respondent was a frontline worker or a senior manager.

Control variables. We gathered data on a variety of respondent and hospital characteristics that might also affect perceptions of management understanding including the following: whether the respondent was a senior manager or frontline worker, the respondent's age and gender; whether the respondent had worked at the hospital for more than one year; whether respondents worked in the ED, ICU, OR/PACU, and Ward; and whether the respondent's professional discipline was physician, resident, nurse, other clinician, or non-clinician. We also included hospital-level control data such as whether the respondent's hospital was a member of the Council of Teaching Hospitals (a "major" teaching hospital), a minor teaching hospital (had some medical residents), or a non-teaching hospital; its tax status (for-profit, non-profit, or government); its US census region; location (urban or non-urban); the average nurse-staffing ratio (full-time equivalent RN hours to patient days); a categorical variable corresponding to the hospital's 2004 commercial credit class, a prediction of the likelihood of delinquent payment during the next 12 months (credit class scores were classified

by quintile, with 1= highest and 5= lowest); and the hospitals' weighted average of the 2004 baseline measure of the dependent variable. A hospital's credit class was derived from the 2004 Dun and Bradstreet Commercial Credit Scoring Report. Data on other hospital characteristics came from the 2004 American Hospital Association Annual Survey of Hospitals. Data on characteristics of survey respondents came from responses to demographic items in the post-test survey.

Analysis

To test our hypotheses, we analyzed individual survey responses using Tobit analysis, with standard errors clustered by hospital work area to account for intragroup correlation among individuals from the same work area in the same hospital. We used Tobit because the data was not normally distributed, but instead was right censored with an upper limit of 5 (Cohen and Levinthal 1990). However, results were robust to model specification.³

We performed two separate regressions to examine the impact of process improvement activities (Hypotheses 1 – 3), and differences in the impact of improvement activities depending on the respondent's management level (Hypotheses 4-6). All analyses were performed using Stata version 10.

To develop a deeper understanding of our statistical results, we identified hospitals for which change in frontline staffs' perceptions of organizational climate for improvement was one standard deviation above or below the average of treatment hospitals and provided details about the implementation of process improvement activities at these individual hospitals. We then used

³ Using OLS regression, clustered by work area within hospitals, results were the same. Similarly, using hierarchical modeling, results are the same, with the exception that the significance level for the main effect of "taking action" drops from < .05 significant to < .10.

data from interviews and site visits in two hospitals, one that experienced substantial improvement in staff perceptions and one for which staff perceptions declined, to identify salient differences in the nature of management involvement in process improvement. Building on distinctions identified, we used qualitative data from multiple treatment hospitals to develop profiles of the contrasting approaches to process improvement: one that illustrates sincere management engagement and the other which suggests managers are simply going through the motions of recommended process improvement activities.

Results

The 20 treatment hospitals identified a total of 1,732 safety-related problems. The problems were related to categories such as facility design and maintenance, equipment/supplies, communication, staffing, and medication issues. On average, hospitals identified 86 problems during the course of the program implementation, took action on 67% of them and provided feedback on 24.5%. Survey means, standard deviations (SD), and correlations are shown in Table 1.

Insert Table 1 about here

Results of our hypothesis tests are provided in Table 2. The first model, Model 1 tested the impact of the three components of the LFLE program. Hypothesis 1, which predicted that identifying more problems would positively impact the organizational climate for improvement, was significant, but opposite of our predicted direction. Identifying more problems reduced the outcome variable ($\beta = -0.0013$, $p < .001$). The effect size was small (Cohen 1988). Holding

everything else constant, a one SD increase in the number of problems identified (63.5 more problems identified) was associated with a 2.2% decrease in the organizational climate for improvement. (The outcome variable would decrease from an average of 3.8 to 3.72).⁴

Hypothesis 2, which tested whether taking action on a higher percentage of problems would positively impact our outcome measure, was supported. Taking action on a higher percentage of problems significantly positively impacted the organizational climate for improvement, albeit with small effect ($\beta=.09$, $p<.05$). A one SD increase in the percentage of problems acted upon (36%) was associated with a 1% increase in perceived the outcome variable (from 3.8 to 3.83).⁵

Finally, there was no support for Hypothesis 3, which tested whether a higher percentage of problems with feedback to staff about what actions were taken would positively impact our outcome measure. Feedback was not related to perceived management understanding ($\beta=-0.03$, $p=0.68$).

Model 2 in Table 2 tested the interaction hypotheses. Identifying problems had a less negative impact on frontline workers' than senior managers' perceptions of management understanding, supporting Hypothesis 4 ($\beta=.001$, $p=.009$; Wald test is significant, $p<.001$). The interaction between percentage of action taken and management level was not significant. Therefore Hypothesis 5 was not supported. Finally, in contrast to our prediction, communicating about actions taken had a negative impact on frontline workers' perception of the organizational

⁴ The effect size is the percentage change in the outcome variable that would result from a one SD increase in the independent variable. The equation is the coefficient of problems identified * SD of problems identified/ mean predicted value of the outcome variable. The SD was calculated using only those data points retained in the estimating sample, which resulted in a slightly different SD than is shown in Table 1. $(.0013*63.5) = .08$ decrease in climate. $-.0635/3.8 = -2.2\%$

⁵ Coefficient of % of problems acted upon * SD of % problems acted upon = $.09 * .36 = .03$ increase in climate. $.03/3.8 = 1\%$ increase.

climate for improvement ($\beta=-.30$, $p=.013$, Wald test $p=.06$). Results were in the opposite direction than predicted; thus, Hypothesis 6 was not supported.

Insert Table 2 about here

Details about implementation of LFLE activities at the hospital level are shown in Tables 3 and 4. As Table 3 shows, two hospitals had roughly a one standard deviation improvement in frontline staffs' perception of organizational climate for improvement, while three hospitals had a one standard deviation decrease in the same measure. An ANOVA test of the change in organizational climate from 2004 and 2006 between these two groups was significant ($F = 11.17$, $p\text{-value} = .04$). The remaining hospitals fell within plus or minus one standard deviation, with seven positive changes, and eight negative. Of the three poorly performing hospitals, two engaged in relatively low levels of activity, acting on 5% and 17% of problems identified.

Poor performance of the third hospital in this category, Pondview Hospital (Hospital #100), was puzzling because, unlike the other poorly performing hospitals their poor performance was not due to lack of activity. During the implementation, Pondview managers reported identifying 66 safety-related problems, investigating or taking action on 91% of these problems, and providing feedback on 83% of them. Thus, Pondview hospital's result suggested that the manner in which the managers conducted the activities might influence results.

Insert Table 3 about here

To begin to understand how the activities could have a negative impact on organizational climate, we examined our qualitative data for Pondview Hospital and compared it to that of a high performing hospital. Our interview and observational data suggested that managers in hospitals that improved during the course of implementation were sincerely engaged in trying to understand and address staff concerns, while managers in the poorly performing hospitals conducted the treatment activities without the aim of learning and improvement. Instead, these managers used the prescribed improvement activities to “audit” frontline workers and did not fully resolve workers’ concerns. If managers were merely “going through the motions” when conducting the activities, it might explain the lack of positive impact on organizational climate measures.

Randolph Regional (Hospital #34) was one of the hospitals that improved the most. During the implementation period, the 210-bed, rural hospital identified 85 problems, took action on 31% of them and reported not communicating any feedback about problems and solutions to frontline workers. They took highly visible action on problems that were raised by staff during safety forums. For example, OR staff mentioned that equipment, such as monitors for anesthesia during surgery, was old and not working properly. The response was to purchase six new monitors. Although this solution was not verbally communicated to the staff, it was likely visible to those working in the OR and therefore verbal communication was unnecessary.

In contrast, the poor performance at Pondview Hospital, a 48-bed, rural hospital, seemed to stem from (1) limited engagement by senior managers, (2) the use of the activities to identify what managers perceived as problems rather than eliciting staff concerns, and (3) limited or punitive action taking. As a result, it is likely that feedback provided to staff about “solutions” did not make frontline workers believe that the hospital had a climate of improvement.

As evidence of the limited engagement, the CNO conducted the majority of work system visits, with the Director of Safety joining for just one visit to the Pharmacy. The CEO only facilitated safety forums in the ER, Ward, and the OR. He did not participate in the work system visits. During one of the forums, staff complained that the “CEO was not visible on a consistent basis.”

Secondly, most of the safety problems identified appeared to be the CNO’s concerns or audits rather than staff members’ concerns. For example, one problem identified by the CNO during her ICU site visit was that patients’ family members were waiting in the hallway (because the ICU didn’t have a waiting room), which blocked the emergency exit.

Thirdly, “resolutions” to the problems frequently took the form of staff and patient education. In the mentioned “blocking the exit” problem, the CNO’s solution to the problem was to tell the family to move to the waiting room, which was at the far end of the building far removed from the ICU. Another example is the CNO’s observation that the nurse being observed left the medication administration record (MAR) book open while in the patient’s room. The CNO recorded this as a problem because the patient might have been able to see other patients’ medication lists, which would be a violation of federal statute that protects the privacy of personal health information. The CNO solved this problem by educating the nurse about the law. Some issues raised by staff were addressed, such as pharmacy workers requesting and receiving fire extinguishers for their unit. However, they stated that they had communicated this request before and no action had been taken. Therefore, it is possible that staff did not “credit” managers for taking action because they had to be told repeatedly before the extinguishers were finally purchased.

Fourthly, substantial issues raised by staff during the forums were brought to the attention of the involved department managers, but effort seemed to stop after that. For example, nurses communicated that “the computerized MAR was difficult to read.” In response, senior managers stated that it was difficult to change because the information system vendor would only change if multiple hospitals requested the change. The Director of Information Systems planned on communicating the request at an upcoming conference. However, in the meantime no interim solutions were investigated, such as contacting other hospitals to see if they had the same concern, or purchasing magnifying glasses for nurses. In summary, although on paper Pondview seemed to identify and resolve many problems, they did so in a superficial and punitive manner, and therefore communicating these “solutions” to workers likely exacerbated their dissatisfaction with the climate for improvement.

To create a more comprehensive profile of the contrasting approaches to process improvement identified above, we developed Table 4 by drawing on data from multiple treatment hospitals. It describes how the improvement processes looked in organizations in which managers demonstrate sincere engagement versus how it looked in those in which managers went through the motions. Hospitals with engaged managers were characterized by a history of systems-oriented rather than production-oriented action on problems. The senior managers implemented prescribed activities with the aim of learning and improvement. This contrasted sharply other hospitals in which managers instead enacted the prescribed activities, but used them as a way to audit frontline workers’ behaviors or to prepare them with the proper response to the inspectors of upcoming Joint Commission for the Accreditation of Healthcare Organizations (Joint Commission) inspections. Engaged managers acknowledged the magnitude and complexity of changes that needed to be made, while unengaged managers avoided

discussing their hospital's shortcomings. Engaged managers used feedback communication to convey prioritization among the identified problems while unengaged managers used feedback to educate staff about the right way to perform work. Finally, engaged managers recognized that changing organizational climate for improvement required building interaction with frontline workers into their regular work routines, while managers who were going through the motions allowed their organizations to be derailed by external forces, such as Joint Commission inspections.

Insert Table 4 about here

To test our explanation that “sincere engagement” had a positive impact on organizational climate, while “going through the motions” was more likely to have a negative impact, we conducted a post-hoc analysis. We created two new variables by recoding existing data. “Intensity of solution efforts” was the number of problems with actions taken divided by the number of hospital beds. We surmised that intensity mattered for creating sincere engagement. That is, in larger hospitals sincere engagement would require taking action on more problems in comparison to smaller hospitals, even if the percentages of problems with action taken were the same. The second variable was “Buy/change percentage.” This variable was the percentage of actions taken that involved buying new equipment or changing procedures. We coded each problem as a 1 if the hospital bought equipment or changed procedures; and with a zero otherwise. Our rationale was that sincere engagement would be demonstrated through financial outlay or changed procedures, while going through the motions would consist of more superficial actions such as education or denying the importance of the problem. We reran our

regression analysis with those two variables as the independent variables. We were unable to include the three original variables because of multicollinearity with percentage of problems with action taken and percentage of problems with feedback. The results supported our “going through the motions” explanation (results not shown). Intensity of solution efforts was significant and in the anticipated direction (coefficient = .195, robust standard error 0.062, p-value = .002). Buy/change percentage was marginally significant and in the anticipated direction (coefficient = .311, robust standard error 0.178, p-value = .08).

Discussion

This study found that the benefits of senior managers’ involvement with frontline process improvement efforts depended on the specific activities performed by the managers and the mindset with which the activities were performed. We found that identifying problems had a negative impact while taking informed action on a higher percentage of identified problems improved perceptions. Furthermore, communicating feedback to frontline workers about more of the actions taken worsened perceptions of an organizational climate for improvement among frontline workers.

Our findings serve as a cautionary tale for managerial interventions that seek to uncover large numbers of problems without providing resources to resolve the majority of them. Our results suggest that managers might benefit by identifying a smaller number of problems and resolving them fully based on frontline information about the problem’s significance, causes, and possible solutions. This conclusion is consistent with Bohn’s (2000) recommended antidote for a firefighting climate as well as Toyota’s approach of solving problems as they occur (Liker 2004, Spear and Bowen 1999). Eliciting problems appears to raise expectations for action, which if

unmet may provoke a negative sentiment. This result contradicts common improvement approaches, such as incident reporting systems, that seek to increase the number of problems reported (Evans et al. 2007). Our study would instead advise managers to resolve the problems that are already known before searching for new ones. Additionally, demonstrating sincere engagement may require actions of sufficient intensity relative to the size of the organization and substantive change.

We also found that communication feedback to frontline workers about the actions taken or not taken in response to identified problems had a differential impact on senior managers and frontline workers. Such communication lowered frontline workers' perceptions of an organizational climate for improvement, but had no impact on senior managers. This result was the opposite of what we predicted. We suspect that workers may be more skeptical of the quality of problem resolution than senior managers. By conveying enthusiasm or pride regarding what might appear to frontline workers to be superficial patches, senior managers could actually undermine workers' evaluation of an organizational climate for improvement. Managers fool only themselves by going through the motions of process improvement, if they do so without a real intent to learn from and resolve problems identified. Also, actions taken to resolve problems, such as blaming workers for problems and then "fixing" the problems by reminding them to follow procedures, may create negative feelings.

Contributions to the Literature

Our paper makes several contributions to the literatures on process improvement and problem solving. First, our research builds on studies that investigated differential impacts of process improvement activities (Choo et al. 2007, Lapre et al. 2000, Naveh and Erez 2004). We

found that implementing process improvement activities did not necessarily improve staff perceptions. This finding resonates with Naveh and Erez's (2004) research, which found that senior managers' involvement in quality improvement through coaching and communication had no impact on organizational climate while other activities (for example, goal setting) did. We also found that the nature of managers' involvement mattered, with resolution-focused behaviors resulting in positive change. This result aligns with Vogus and Sutcliffe's (2007) finding that safety organizing—targeted, resolution-focused behaviors, such as resolving problems and discussing what could have prevented errors—in combination with a high level of trust in managers was associated with lower error rates. Our study suggests that informed, resolution-focused behaviors may be a moderating variable that explains whether manager involvement in improvement will lead to improved climate.

Second, we provide additional insight about proposed problem-solving strategies. This paper suggests an explanation for Toyota's successful real-time problem solving tool, the andon cord, which workers use to summon managers when they need help (Liker 2004, Spear and Bowen 1999). Problems are solved one-at-a-time when they arise, which avoids the negative effect we found from accumulating large numbers of problems before solution efforts begin. Similarly, our findings reflect the negative dynamic of Bohn's firefighting syndrome, which states that as problems accumulate in a queue, organizational climate worsens. Our empirical results also align with his hypothesis that removing problems from the queue by solving them shifts the climate from a negative firefighting mode to a more positive climate. Our paper extends his theory by suggesting that managers who go through the motions not only inadequately resolve the underlying problem, but also reinforce the firefighting syndrome.

Contributions to Managerial Practice

Our study provides insight for managers who want to improve their organization's climate for process improvement. First, our findings suggest that taking action on known problems in specific work areas on at least a quarterly basis may improve the organizational climate for improvement. This is important because prior research suggests that more frequent management interaction can be effective, but is difficult to sustain (Frankel et al. 2008). In contrast, participating hospitals conducted LFLE process improvement activities relatively independently over an 18-month implementation period.

Second, our study indicates that managers would be well advised to take action—preferably substantive and intense action—in response to frontline workers' communications about problems. Taking action was more important than communicating about actions taken. Contrary to literature which highlights the importance of feedback (Gandhi et al. 2005), we found that communication was insufficient to convince frontline workers that senior management supported improvement opportunities. This finding suggests that managers should take care in providing feedback not to overstate the actions taken and to acknowledge areas of continued concern. It also suggests that identifying and resolving a smaller number of problems may be more effective at climate change than surfacing many problems and resolving relatively few based on analysis of trends. The risk of surfacing a large number of problems is twofold: identifying many problems simultaneously may overwhelm people with a new awareness of the full extent of problems within the organization, complicating and slowing decision processes and spreading already-stretched resources, and it may reinforce cynicism among frontline workers that managers are uncommitted to improving the organizations' work systems. Thus, managers

may be more likely to transform their organizations by initiating smaller scale but authentic efforts to remove barriers to frontline work processes.

Limitations and Future Research

As with any study, this paper has limitations. Our study examined the impact of a process improvement initiative on organizational climate, which we argued is an important relationship. Unfortunately, due to concerns about legal liability, we were unable to obtain objective measures of safety performance from the hospitals.⁶ A second limitation is that we did not explicitly measure managers' involvement with frontline safety efforts before and after the initiative. This prevented us from being able to test whether the process improvement activities increased managers' involvement. We were concerned that the managers would find the treatment activities burdensome and therefore did not ask them for additional data, such as detailed reporting of how they spent their time. Future studies might attempt to gather objective measures of involvement, such as financial and human resources devoted to safety before and after an intervention. Third, though significant, the effect on organizational climate of taking action was small. Our qualitative and post-hoc analyses demonstrated variation in actions that suggests reasons for this result: actions that constitute going through the motions are insufficient to promote change in organizational climate. A fourth limitation was our inability to fully evaluate the quality of the problems and actions taken in response to the problems. This limitation made it difficult for us to determine why feedback had a detrimental effect on frontline workers'

⁶ We obtained 2008 data from the Hospital Consumer Assessment of Health Providers and Systems (HCAHPS) survey on patients' evaluation of their hospital experience, which included questions such as "I would recommend this hospital to others." www.hospitalcompare.hhs.gov. Results were not significant, which perhaps is due to the two year time lapse between the intervention and the HCAHPS data or the lack of specificity of the HCAHPS survey items.

perception of climate. Future studies should explicitly try to test whether feedback that exaggerates the positive benefits of neutral or negative actions has a negative impact on organizational climate. A fifth limitation was that although the intervention was inspired by Toyota's problem solving process, it was not an exact replica of their system. In Toyota, the frontline workers' immediate supervisor would respond to calls about system problems, whereas our intervention had the senior managers going to the frontlines. Future studies could test the impact of having immediate supervisors and middle managers more directly involved in the problem solving process. Such a process is likely more sustainable than the intervention tested in this paper. Finally, although we had intended for Chief Financial Officers to participate, most did not. Thus, we leave to future research to determine the impact that CFO involvement has on improvement efforts.

In conclusion, this study suggests that senior managers can improve their organization's climate for process improvement by ensuring that problems that are brought to their attention are resolved. We found that managers must go beyond superficial interactions with frontline staff to ensure that the organization engages in valid process improvement efforts as a result of these interactions. This news should be heartening to senior managers. It is possible to improve an organizational climate, and our study suggests that it does not require an elaborate program, but rather a focused, action-oriented approach to working together with frontline staff to improve the organization's work systems.

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Figure 1. Model of Senior Manager Involvement with Frontline Process Improvement Efforts.

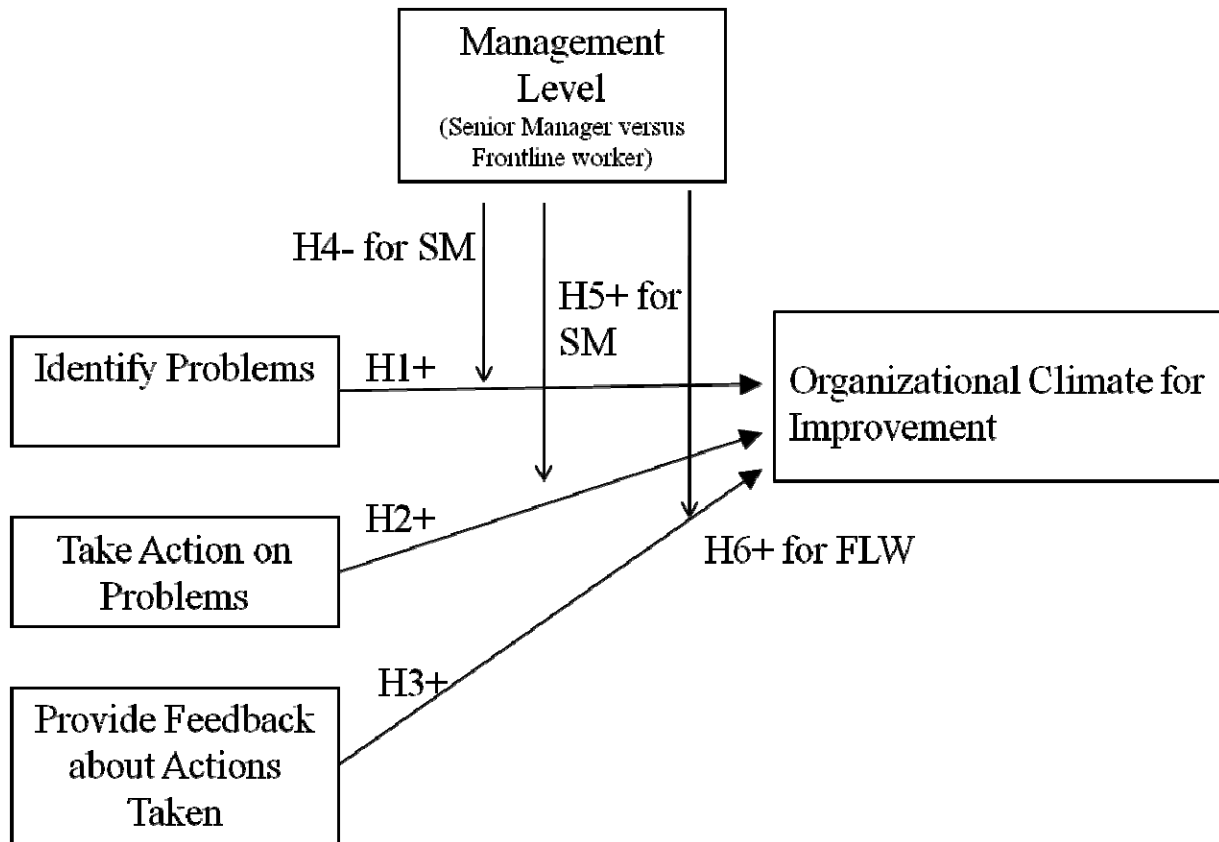


Table 1. Means, Standard Deviations (SD), and Correlations (N=13,410 Individuals)

Variable	Mean (SD)	Min- Max	1	2	3	4	5
1. Climate for Improvement (Post LFLE implementation)	3.78 (.82)	1-5					
2. Climate for Improvement (Pre)	3.84 (.82)	1-5	.19*				
3. Treatment Hospital	.26 (.44)	0 - 1	-.03*	-.05*			
4. No. Problems Identified	86.25 (63.1)	15-208	-.06*	-.14*	.81*		
5. % Problems acted on	67% (30%)	5% - 97%	.002	.06*	.92*	.70*	
6. % Problems with feedback	24.5% (33%)	0 – 92%	.03	.21*	-	-.05*	.18*

* = p<0.05

Table 2. Impact of LFLE on post-implementation organizational climate for improvement⁷

Category (Omitted Variable)	Variable	Model 1 Coefficient	Robust Std error	Model 2 Coefficient	Robust Std error
Hypothesis 1	No. problems identified	-0.001***	(0.00)	-0.002***	(0.00)
Hypothesis 2	% Problems acted on	0.09*	(0.05)	0.10	(0.08)
Hypothesis 3	% Problems w/ feedback	-0.03	(0.07)	0.17	(0.13)
Hypothesis 4	Worker X No. problems identified			0.001**	(0.00)
	Manager X No. problems identified			0.00	(0.00)
Hypothesis 5	Worker X % problems acted on			0.004	(0.08)
	Manager X % problems acted on			-0.03	(0.12)
Hypothesis 6	Worker X % problems w/ feedback			-0.30*	(0.12)
	Manager X % problems w/ feedback			-0.03	(0.16)
Age (18-25)	26-30 yrs	-0.05	(0.06)	-0.05	(0.06)
	31-40	-0.00	(0.04)	-0.01	(0.05)
	41-50	0.00	(0.04)	0.00	(0.04)
	51-60	0.05	(0.05)	0.05	(0.05)
	>60 yrs	0.17**	(0.06)	0.17**	(0.06)
Tenure (<1 year)	Worked >1 yr	-0.17***	(0.03)	-0.17***	(0.03)
Gender (female)	Male	-0.01	(0.02)	-0.01	(0.02)
Professional	Resident	0.38***	(0.06)	0.37***	(0.06)
Discipline	Nurse	-0.01	(0.04)	-0.01	(0.04)
(Physician)	Other (Non MD)	0.13**	(0.04)	0.12**	(0.04)
	Non clinician	0.14***	(0.03)	0.14***	(0.03)
Work area	ICU	-0.06	(0.04)	-0.06	(0.04)
(OR/PACU)	ED	-0.08	(0.05)	-0.07	(0.05)
	Ward	0.03	(0.04)	0.03	(0.04)
	Other	0.12***	(0.03)	0.12***	(0.03)
Teaching Status	Non-major	-0.17***	(0.04)	-0.16***	(0.04)

⁷ Using Tobit analysis, clustered by hospital work areas and right censored with upper limit of 5 (N=284 hospital work areas, 9649 individuals)

(Major teaching)	Non teaching	-0.15***	(0.04)	-0.14***	(0.04)
Tax Status	Government	-0.15^	(0.08)	-0.14^	(0.08)
(For profit)	Not-for-Profit	-0.04	(0.07)	-0.04	(0.07)
US Census Region	Region: East	-0.06	(0.04)	-0.05	(0.04)
(Midwest)	Region: South	-0.01	(0.04)	-0.01	(0.04)
	Region: West	-0.00	(0.04)	0.00	(0.04)
Nurse staffing ratio	Nurse hrs/patient day	0.00	(0.00)	0.00	(0.00)
Location (non-urban)	Urban Location	-0.03	(0.04)	-0.03	(0.04)
	2004 Climate	0.80***	(0.08)	0.81***	(0.08)
Management Level	Dummy variable for senior manager	0.24***	(0.03)	0.22***	(0.04)
	Dummy variable for Frontline worker	-0.14***	(0.02)	-0.16***	(0.03)
Financial Status	Credit Class 2004	-0.01	(0.01)	-0.01	(0.01)
	Constant	1.07***	(0.32)	1.07***	(0.32)
	Sigma	0.81***	(0.01)	0.81***	(0.01)
Test of model fit	Log restricted-likelihood	-11616		-11611	
	Pseudo r ²	.0432		.0437	

*** p<0.001, ** p<0.01, * p<0.05, ^ p<0.10

Table 3. Change in Organizational Climate and Implementation Details by Hospital

ID	Hospital Name	Change in Org. Climate 2006-2004 (Worker)	# problems identified	% problems with action	% problems with feedback	Details about Hospital's history and process improvement
Most Improved						
55	Gerlos Hospital	0.25	17	0.71	0.00	The staff was pleased to have managers visit the frontlines to understand problems. Managers prioritized problems and communicated which ones were being addressed.
34	Randolph Regional Hospital	0.21	85	0.31	0.00	Management took problems seriously and made process changes. Organization was focused on root cause problem solving.
Least Improved						
129	Birdsong Hospital	-0.21	55	0.05	0.00	Hospital took little action to address problems. Used site visits as a way to prepare the staff for the upcoming Joint Commission inspection.
100	Pondview Hospital	-0.22	66	0.91	0.83	Most actions were educating staff or informing involved departments about problems.
131	Hillside Regional Hospital	-0.30	24	0.17	0.92	Feedback was used to educate staff and as the solution to issues identified.
	Mean (SD) from Treatment	-0.05	86.7 (63)	.76 (.30)	.24 (.33)	

Hospitals

Mean (SD)

*from
Control
Hospitals*

-0.06

No data

No data

No data

No data

Table 4 Details about the Improvement Processes in Which Managers are Sincerely Engaged Versus Going Through the Motions

Category	Sincere Management Engagement	Going Through the Motions
Improvement Process		
Purpose	<i>Focus on Learning and Improvement</i>	<i>Focus on Auditing or Preparing for Joint Commission Inspection</i>
	<p>For me, it is talking to them and using it as an educational opportunity. How did it occur? What happened? How can we prevent it in the future? Thank you for bringing it forward so that we can all learn from it, H34, Telemetry Manager</p>	<p>Patient Safety Officer told the researcher that during the worksite visit she was looking to see if care providers were washing their hands before and after patient contact, wearing name badges, controlling the medication cart, and not displaying patient information. H100</p> <p>Nine out of twelve "helps" during a meeting were suggested by senior leaders. The Patient Safety Officer informed the researcher that they were using the meeting as a way to reinforce what they wanted staff to say if asked about patient safety during their upcoming Joint Commission inspection. H129</p>
Framing about Problems	<i>Acknowledge Challenge of Addressing Problems</i>	<i>Accentuate the Positive and Avoid Identifying Problems</i>
	<p>The single biggest thing I have as a manager is that I have a bunch of things I am supposed to be working on. I write it down, but if for some reason a step falls off the page, then suddenly the whole project isn't triggered anymore. You look back and say, 'What happened to that?'... Just keeping the steps straight is difficult. H55, CMO</p>	<p>As CEO, I assume that the people in the organization know what they are doing, but when you actually go out there and visit with them, it just confirms all that, it makes you feel really good. To realize that your folks know what's going on and know what you are doing and speak really in a very intelligent way about their jobs and their responsibilities and how they carry them out. It's a great comfort. I've never really gone out to have these kinds of conversations with my staff before. H129, CEO</p>
Taking Action	<i>Respect for the Complexity of Resolving Problems</i>	<i>Lack of Follow Up to Identified Problems</i>
	<p>I think they [managers] always listen. I think that sometimes they look at it from a different perspective than we do. They are looking at financials as well as process, and what other impact will it have if we do this one project... Sometimes I think they aren't receptive because they look at it from a global view and say 'Who else is affected and where else does it</p>	<p>I don't have any problems speaking up. We have a pretty open department. I do feel that, sometimes it is talked about in the department that the follow-through is not there to complete the task. If we identify an issue, it goes to the director, and I think sometimes it</p>

	<p>have to go?" H34, Manager of Labor and Delivery</p> <p>Most of our projects are set up for failure at least in the near term. For example, one of the things that Obstetrics said is, "We would really like to not have to be answering the phone for all the patients' personal calls because that is 100 times a day. If we could have the calls go straight to the patients' rooms and we only answer the medical calls that would cut our jobs in half." Somebody said, 'Gosh that is interesting. We will work on that, it sounds like an easy fix.' But it's not an easy fix at all. So, we listened, and we are trying to respond. But it is not obvious why it is not an easy fix. So we can set ourselves up for a failure. H55, CMO</p>	<p>kind of stops there, there is no solution. H129, Jessica, ED Nurse</p> <p>We've got nurses taking care of however many patients who shouldn't be taking care of that many patients. And when they tell their supervisor, the supervisor says, "Hey, you are just going to have to do it." H131, Edward, ED nurse.</p>
Feedback	<i>Feedback as Communicating Priorities</i>	<i>Feedback as [Remedial] Education of staff</i>
	<p>Our Finance Vice-President is very good at explaining to the staff, 'Here are the priorities. We'd love to do this one, but it is going to cost us \$X. We have to plan for this first.' H55, Patient Safety Officer</p>	<p>I am a very thorough person when it comes to my follow up. ... And then we get back to the staff members involved and we sit down and say, this is something that we need to address. Please remember that when you do such and such, you need to do such and such, whatever the situation might be. H129, Manager Surgical Services</p>
Sustaining Improvement Processes	<i>Build into Continuing Work Routines</i>	<i>Disrupted due to Joint Commission inspection</i>
	<p>What do we do when the study is over to keep it going? To really change the way people think about the culture of patient safety we need to handbrake these types of things and discussions into our normal rounding routine. H34, VP of Medical Affairs</p>	<p>We started out gung-ho. Our first visit was in the ED. We had great participation. The staff was just more than willing to be a part of it. Then we had a couple of things that sort of slowed us down. One is that we had a Joint Commission survey at the end of October. Our focus, our gears, switched drastically for about two months in preparation for Joint Commission. H131, Patient safety officer</p>

APPENDIX

Organizational Climate for Improvement in Patient Safety ($\alpha=0.87$)

1. Senior management has a clear picture of the risks associated with patient care.
2. Senior management has a good idea of the kinds of mistakes that actually occur in this facility.
3. Senior management supports a climate that promotes patient safety.
4. Senior management considers patient safety when program changes are discussed.
5. Patient safety decisions are made by the most qualified people, regardless of rank or hierarchy.
6. Good communication flow exists up and down the chain of command regarding patient safety issues.