Managing the risk of learning: Psychological safety in work teams

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Abstract

This social psychological analysis explores themes of trust and collective learning in teams. I describe interpersonal risks that can inhibit collective learning, distinguish psychological safety from trust, and explain why psychological safety mitigates interpersonal risks and facilitates a structured learning process in teams. Examples from field studies in several organizational settings are used to support a new theoretical model and show how leaders can help their teams manage the risks of learning.

Introduction

This paper explores how members of organizational work teams can overcome the interpersonal risks they face every day at work, to help themselves, their teams and their organizations to learn. Over the past few years I have been developing a model of learning in the work group setting that stems from the underlying premise that people are (both conscious and unconscious) impression managers – reluctant to engage in behaviors that could threaten the image others hold of them. Although few of us are without concern about others' impressions, our immediate social context can mitigate – or exacerbate – the reluctance to relax our guard. In field studies in several organizational contexts, I have found enormous differences across teams in people's willingness to engage in behavior for which the outcomes are both uncertain and potentially harmful to their image.

An extensive literature on organizational culture examines how norms, values and beliefs arise in organizations to reduce the anxiety people feel confronting ambiguity and uncertainty (Schein 1985). In times of significant organizational or environmental change the potential for anxiety is increased because people must take action without knowing whether things will work out as expected. Organizational culture, for all its complexity, cannot fully mitigate the anxiety and uncertainty that accompany novel behaviors or activities. For example, a team launching a new product targeted for unfamiliar customers faces considerable technical and business risk. This can provoke feelings of anxiety in the team, but these risks can be minimized by formal risk assessment methods and explicit discussion. At the same time, all individuals in organizations constantly face more subtle interpersonal risks that provoke anxiety and yet tend to remain tacit and undiscussed.

Some years ago I became intrigued by the small risks people face every day at work,

when interacting with others and facing change, uncertainty, or ambiguity. To take action in such situations involves learning behavior, including asking questions, seeking help, experimenting with unproven actions, or seeking feedback. Although these activities are associated with such desired outcomes as innovation and performance, (e.g., Edmondson 1999; West 2000), engaging in them carries a risk for the individual of being seen as ignorant, incompetent, or perhaps just disruptive. Most people feel a need to manage this risk to minimize harm to their image, especially in the workplace and especially in the presence of those who formally evaluate them. This is both instrumental (promotions and other valued rewards may be dependent on impressions held by bosses and others) and socio-emotional (we prefer others' approval than disapproval). One solution to minimizing risk to one's image is simply to avoid engaging in interpersonal behaviors for which outcomes are uncertain. The problem with this solution is that it precludes learning. Another solution—to create conditions in which perceived interpersonal risk is reasonably low—is explored in this paper.

Most people in organizations are being evaluated—whether frequently or infrequently, overtly or implicitly—in an ongoing way. The presence of others with more power or status makes the threat of evaluation especially salient, but it by no means disappears in the presence of peers and subordinates. This salience of evaluation in organizations intensifies the problem of image risk that people also confront in every day lives (Snyder 1974; de Cremer, Snyder et al. 2001; Turnley and Bolino 2001). Here I posit four specific risks to image that people face at work: being seen as ignorant, incompetent, negative, or disruptive. Each is triggered by particular behaviors through which individuals and groups learn.

First, when individuals ask questions or seek information, they run the risk of being seen as ignorant. Most of us can think of a time when we hesitated to ask a question because it

seemed that no one else was asking, or perhaps we believed that the information was something we were expected to know already.

Second, when admitting (or simply calling attention to) mistakes, asking for help, or accepting the high probability of failure that comes with experimenting, people risk being seen as incompetent, whether in a narrow, particular domain, or more broadly. Reluctance to take *interpersonal* risk can create *physical* risks in high-risk industries such as nuclear power, where admitting mistakes and asking for help may be essential for avoiding catastrophe (Weick and Roberts 1993; Carroll 1998). Similarly, this phenomenon is particularly troubling in organizations where lives are at stake, such as in hospitals. Reluctance to report mistakes in the health care setting is widely reported (e.g., Leape et al. 1991). Although this silence limits the ability of hospitals as organizations to improve through collective learning from mistakes, a goal most health care professionals would heartily endorse, the perceived need for impression management to protect one's professional image is extremely high in medicine.

Third, to learn and improve – as individuals and collectives – it is essential to reflect critically on current and past performance. The risk of being seen as negative often stops people from delivering critical assessments of a group or individual's performance, which limits the thoroughness and accuracy of collective reflection (Edmondson 2002). Moreover, people strive to maintain their own and others' face, a tendency that inhibits sharing negative feedback. It is well known that bad news rarely travels well *up* the hierarchy, such that in the presence of supervisors and bosses, the risk of being seen as negative has been shown to be more acute than it might otherwise be (Reed 1962).

Fourth, to avoid disrupting or imposing upon others' time and good will, people will avoid seeking feedback, information or help (Brown 1990). In particular, individuals are often

reluctant to seek feedback about their performance. Despite the gains that can be obtained from feedback (Ashford and Cummings 1983), many fail to take advantage of the opportunity. Although this can be driven by avoidance of the possibility of hearing something we don't want to hear, it also stems from a wish not to be seen as lacking in self-sufficiency, or as intrusive.

I have used the term psychological safety (Edmondson 1999; 2002) to capture the degree to which people perceive their work environment as conducive to taking these interpersonal risks. In psychologically safe environments, people believe that if they make a mistake others will not penalize or think less of them for it. They also believe that others will not resent or penalize them for asking for help, information or feedback. This belief fosters the confidence to take the risks described above and thereby to gain from the associated benefits of learning.

I argue that creating conditions of psychological safety is essential to laying a foundation for effective learning in organizations. I further propose that structuring a collective learning process at the team or group level is a second critical element for effective organizational learning, and that a compelling goal is necessary for motivating this collective learning process. Although human beings are endowed with both desire and ability for learning, collections of interdependent individuals, whether small groups or large organizations, do not learn automatically. Not only does interpersonal risk inhibit some of the necessary behaviors, but organizational routines tend to endure and have a permanence of their own, independent of the actors who engage in them (Levitt and March 1988; Gersick and Hackman 1990). Moreover, traditions and beliefs about the appropriateness of the status quo inhibit learning and change (Levitt and March 1988). Thus, an important aim of this paper is to describe a collective learning process I observed taking place in similar ways across different contexts in a number of organizational work teams I have studied over the past few years. Teams are defined as work

groups that exist within the context of a larger organization, have clearly defined membership, and share responsibility for a team product or service (Alderfer 1987; Hackman 1987).

In what follows, I describe the construct of psychological safety, the process of team learning, the role of the team leader, and how these constructs are related – drawing from my own and others' research. I first discuss psychological safety and how it differs from the related notion of interpersonal trust, and then describe team learning as an iterative process of action and reflection. I argue that compelling goals are necessary to motivate this deliberate, effortful process, and that psychological safety enhances the power of such goals. Without a goal, there is no clear direction to drive toward and no motivation to do so. However, without psychological safety, the risks of engaging wholeheartedly in this learning process are simply too great. The team leader can shape and strengthen the collective learning process both directly and indirectly by fostering psychological safety, and, in turn, setting goals. This paper thus introduces a new theoretical model, depicted in figure 1, in which psychological safety moderates the positive relationship between learning goals and effortful learning behavior to accomplish them. I conclude with implications for future research and practice.

Insert Figure 1 about here

Psychological Safety: A Cognitive Group-level Construct

Psychological safety describes individuals' perceptions about the consequences of interpersonal risks in their work environment. It consists of taken-for-granted beliefs about how others will respond when one puts oneself on the line, such as by asking a question, seeking feedback, reporting a mistake, or proposing a new idea. I argue that individuals engage in a kind of tacit calculus at micro-behavioral decision points, in which they assess the interpersonal risk associated with a given behavior (Edmondson 1999). In this tacit process, one weighs the

potential action against the particular interpersonal climate, as in, "If I do this here, will I be hurt, embarrassed or criticized?" A negative answer to this tacit question allows the actor to proceed. In this way, an action that might be unthinkable in one work group can be readily taken in another, due to different beliefs about probable interpersonal consequences.

The construct of psychological safety has roots in early research on organizational change, in which Schein and Bennis (1965) discussed the need to create psychological safety for individuals if they are to feel secure and capable of changing. More recently, Schein (1985) argued that psychological safety helps people overcome the defensiveness, or "learning anxiety," that occurs when people are presented with data that disconfirm their expectations or hopes, which can thwart productive learning behavior. However necessary the need for a comfortable learning environment, psychological safety does not imply a cozy environment in which people are necessarily close friends, nor does it suggest an absence of pressure or problems. Team psychological safety is distinct from group cohesiveness, as research has shown that cohesiveness can reduce willingness to disagree and challenge others' views, such as in the phenomenon of groupthink (Janis 1982)—implying a lack of interpersonal risk-taking. Psychological safety describes a climate in which the focus can be on productive discussion that enables early prevention of problems and the accomplishment of shared goals because people are less likely to focus on self-protection.

Psychological safety versus trust

The importance of trust in groups and organizations has long been noted by researchers (Kramer 1999). Trust, defined as the expectation that others' future actions will be favorable to one's interests, makes one willing to be vulnerable to those actions (Mayer, Davis et al. 1995; Robinson 1996). The nature of this vulnerability is more narrowly defined for psychological

safety than for trust. The concepts of psychological safety and trust have much in common; they both describe intrapsychic states involving perceptions of risk or vulnerability, as well as making choices to minimize negative consequences, and, as explored below, both have potential positive consequences for work groups and organizations. This section describes conceptual differences between these related constructs, to argue that they are complementary but distinct interpersonal beliefs. Three elements of psychological safety are described to distinguish it from trust—the timeframe, the object of focus, and level of analysis.

Temporal immediacy. The tacit calculus inherent in perceptions of psychological safety considers the very short-term interpersonal consequences one expects from engaging in a specific action. For example, a nurse facing the decision of whether to ask a physician in the unit about a medication dosage she suspects is erroneous may be so focused on the potential immediate consequences of asking this question, such as being scolded and humiliated for being ignorant, that she temporarily discounts the longer-term consequence of *not* speaking up—that is, the harm that may be caused to a patient. Although the differential weighting of consequences in this example is clearly not rational, I have heard countless similar stories in field studies in markedly different organizational contexts. For example, nurses in one of several hospital teams in a study of medication error, after embarrassing past encounters with the nurse manager, were inclined to avoid speaking up about mistakes for fear of getting "put on trial," thereby unwittingly discounting the longer-term consequences of silence for patients and for the team (Edmondson 1996). The construct of trust, in contrast, pertains to anticipated consequences across a wide temporal range, including the relatively distant future.

Focus on "self" versus "other." Trust involves giving others the benefit of the doubt – indicating a focus on *others'* potential actions or trustworthiness. In contrast, in discussing

psychological safety, the question is whether others will give *you* the benefit of the doubt when, for instance, you have made a mistake or asked an apparently stupid question. For example, a member of a production team I studied in a manufacturing company, reported, "I don't have to wear a mask in this team…it's easy to be myself." When people describe their situation at work in this way, they are revealing a sense of psychological safety, a sense of comfort expressing their true selves. The focus is internal, in contrast to the focus on others' future actions implicit in the construct of trust.

Levels of analysis. An individual's sense of psychological safety in the workplace is likely to be shaped by ongoing interpersonal interactions among close coworkers. Although words and actions of top management may contribute to perceptions of psychological safety (e.g, Detert 2002), as might individual differences in temperament (Tynan, 1999), the most salient influence is the perceptions of those individuals with whom an individual works most closely. Because psychological safety describes beliefs about interpersonal interaction, those interactions that are best situated to affect these beliefs are contained within a local work group or team. Moreover, members of teams tend to hold similar perceptions about psychological safety—that is, about "the way things are around here"—because they are subject to the same set of objective influences (for example, in having a common manager or a similar level of access to organizational resources), as well as because many of their beliefs develop out of shared experiences. Thus, team members of a nurse who reported being "made to feel like a two year old" when reporting a drug error independently reported similar feelings of discomfort about speaking up, for example commenting that "nurses are blamed for mistakes" and "[if you make a mistake here,] doctors bite your head off." These nurses, either from personal or vicarious experience, came to the conclusion that, on their team, reporting mistakes was interpersonally

penalized. Consistent with this line of reasoning, in two studies, I have found significant variance in psychological safety at the group level of analysis (Edmondson 1996, 1999).. In contrast, trust pertains primarily to a dyadic relationship, even if that dyad is sometimes conceptualized as consisting of large entities.

Others have studied both interpersonal trust and psychological safety; for example, in a recent study, May and Gilson (1999) showed that co-worker trust had a significant positive effect on psychological safety. Kahn (1990) found that "interpersonal relationships [in an architecture firm he studied] promoted psychological safety when they were supportive and trusting." Informants in his study felt free to share ideas and concepts about designs when they believed that any criticism would be constructive rather than destructive. The belief that others see one as competent (an aspect of respect) is particularly salient in this context; those who feel that their capability is in question are more likely to feel judged or monitored and thus may keep their opinions to themselves for fear of harming their reputation (Edmondson and Moingeon 1998). In sum, if relationships within a group are characterized by trust and respect, individuals are likely to believe they will be given the benefit of the doubt—a defining characteristic of psychological safety.

Outcomes of psychological safety

Psychological safety can increase the chances of effortful, interpersonally risky, learning behavior, such as help seeking, experimentation and discussion of error. Empirical support for this was found in the manufacturing company study, referenced earlier, in which I collected both qualitative and quantitative data on 51 teams of four types (management, new product development, staff services, and production) (Edmondson 1999). These data were analyzed to show that psychological safety promoted team learning, which in turn facilitated team

performance in teams throughout the organizational hierarchy.

In a more recent field study of 16 operating room teams learning to use an innovative (and extremely challenging) new technology for minimally invasive cardiac surgery, Edmondson, Bohmer, and Pisano (2000) found that psychological safety allowed non-surgeons to speak up – despite facing longstanding status barriers – with observations, questions or concerns about the new technology. Established hierarchical roles and routines in the operating were renegotiated to allow the technology to be implemented successfully (Edmondson, Bohmer and Pisano, 2001). Rather than only waiting for the chief surgeon to issue commands, all team members (nurses, perfusionists, and anesthesiologists) had to speak up about and act upon crucial information from each other. Teams that were able to establish a degree of psychological safety were better able to renegotiate the ingrained hierarchy within the surgical team, and speaking up was a predictor of successful implementation of the technology. One of the successful implementers, for example, reported team members speaking up, even if it meant correcting a superior. One scrub nurse volunteered a story about her own error and how her junior, a circulating nurse, pointed it out to her.

> We all have to share the knowledge. For example, in the last case, we needed to reinsert a guidewire and I grabbed the wrong wire and I didn't recognize it at first. And my circulating nurse said, 'Sue, you grabbed the wrong wire.' This shows how much the different roles don't matter. We all have to know about everything. You have to work as a team.

In contrast, unsuccessful implementers reported great difficulty in doing this. For example, a nurse in one hospital explained that it was difficult to speak up when she suspected that something might be wrong,

I'd tell the adjunct. Or, I might whisper to the anesthesiologist, "does it look like [the clamp] migrated?" In fact I've seen that happen. It drives me crazy. They are talking about it—the adjunct is whispering to the anesthesiologist, "It looks like it moved" or "There is a leak in the ASD" or something, and I'm saying "You've got to tell him! Why don't you tell him?'" But they're not used to saying anything. They are afraid to speak out. But for this procedure you have to say stuff.

Research has also found that psychological safety can stimulate innovation. For example, West and Anderson (1996) studied top management teams in British hospitals and found that organizational support for innovation enabled both "participative safety" and participation, which led to proposing more innovations. In other studies, participative safety allowed teams both to generate and integrate innovations into practice (D'Andrea-O'Brien and Buono 1996). Similarly, in the study of cardiac surgery teams, teams with greater psychological safety were also more likely to engage in process innovation – another factor associated with successful implementation of the technology in their hospitals (Edmondson et al, 2001, 2000).

Removing the fear of speaking up can promote innovation by freeing people up to suggest novel or unorthodox ideas. For example, in one of the cardiac surgery teams we studied, where unobtrusive measures revealed the presence of psychological safety (see Edmondson et al., 2001), a nurse spontaneously suggested solving a particular problem experienced in the new technology by using a long-forgotten piece of equipment – a clamp nicknamed the "iron intern." The nurse's brainstorm ultimately became a part of that team's routine. This kind of creative innovation can be contrasted with the views of members of other teams. For example, an anesthesiologist in an operating room team lacking psychological safety told the researchers that, although team members saw opportunities for change and experimentation, "It is best not to stick

your neck out. Innovation is tolerated at best." The latter team ranked among the least successful implementers of the new technology, while the former was one of the best.

The Collective Learning Process in Teams

Mitigating the inherent risks of speaking up through psychological safety is only part of enabling teams to learn. Learning as a team also requires coordination and some degree of structure, to ensure that insights are gained from members' collective experience and also used to guide subsequent action. Individual learning is thought of as an iterative process in which actions are taken, reflected upon, and modified in an ongoing way (Kolb 1984; Schön 1984). This iterative process does not happen automatically in a team (West, 2000; Edmondson, Bohmer and Pisano, 2001). This section describes the somewhat structured process through which teams learn and then discusses factors that contribute to this process, again drawing from three field studies to illustrate these factors.

Collective learning as an iterative process

First, organizational learning researchers have described the need for reflection-in-action, or "double-loop learning" (Argyris and Schön 1978), for effective organizational adaptation. Reflection-in-action is the critical examination of a process, such that it can be subsequently adjusted according to new data and knowledge. One component of reflection-in-action is analogic thinking (Hargadon 1998). Analogic thinking—merging diverse pools of knowledge and integrating past and present experiences—is a learning strategy particularly relevant to new product development teams and others that are confronted with a learning challenge.

The team learning process consists of iterative cycles of action, reflection, and adjustment. What is being learned, made more effective, or disseminated are routines for conducting work that accomplishes goals. Although some organizational routines are simple and

carried out by one person, most require coordinated action from multiple people. The knowledge needed to carry out these routines is stored in many different forms and locations, including procedure manuals, physical equipment and layout, and individual minds. Through repeated action and reflection, teams access this knowledge and learn how to best use it. In developing this conceptualization of team learning, I draw both from the literature (e.g., West 2000) and from empirical evidence. In particular in studying cardiac surgery teams, those that successfully implemented a new technology in their hospitals tended to engage in a qualitatively different process—one characterized by iterative trial and reflection—than unsuccessful teams (Edmondson, Bohmer and Pisano, 2001).

West (2000) states that reflexive learning teams possess self-awareness and the *agency* to enable change. Periods of reflection are structured around these questions: "What are we learning? What can we do better? What should we change?" and are followed by planning and implementation, or action. Some teams engage in reflection on a daily basis; others reflect at a natural break in the project, such as at "half-time" for sports teams (Katz 2001); still others reflect when a project is completed, as in the "after action reviews" conducted by the US Army following military exercises (Garvin 2000). The chronological midpoint of a project is a crucial time for reflection and change; anticipating "half-time" allows team members to work towards mini-deadlines and makes long-term projects approachable (Gersick 1988). Furthermore, resolution is more easily obtained if occurs "in the moment" because fidelity to data is likely to be greater.

Team reflection does not necessarily indicate extensive sessions to thoroughly analyze team process or performance, but instead can be quick and pragmatic. For example, a production team responsible for technical support in the manufacturing company included short daily

meetings to check on team progress. Observing one of these meetings, I was struck by the quick task-focused updates, in which members described problems or solutions that had arisen within the past day or two, and others asked questions and offered suggestions. For example, after one member described "printer problems with those labels" and asked, "Who can we ask for help?" another member, responded, "How about asking the vendors who make the labels? They probably know how to fix it," and the team leader offered to make a phone call—closing the loop and dealing with the problem before it escalated in magnitude. Knowing that they would have a chance to reflect on triumphs and worries, the daily check-in contributed to this team's success within the organization.

For other teams it may be more appropriate to wait for outcomes to be available before reflecting on the team process. In a study of design firm teams, for example, Busby (1999) found that periods of collective retrospection after project completion produced cognitive and (to a lesser extent) behavioral learning. Increases in shared understanding (cognitive learning) were the most trenchant outcomes of these more extensive reflective sessions, and this shared understanding allowed team members to act and reflect in a coordinated manner.

Summary of the team learning process

Across varying forms of team reflection (which differ in the frequency at which it occurs, at what point(s) in the project it happens, and what its outcomes might be) are some common themes: collaborating, making changes (whether mid-course or for subsequent projects), and expecting to encounter problems and make appropriate changes. Reflection-in-action can lead to increased success in new technology implementation (Edmondson et al., 2001) and in product development. Reporting on a study of learning in new product development teams, Lynn, Mazzuca, Morone, and Paulson (1998: 8) concluded, "The key to developing really new products

successfully is the degree to which teams are able to learn from prior steps—frequently in unpredictable ways—and act on that information."

Learning Goals

Learning behavior is effortful. Something must motivate individuals to exert the effort to engage in learning behavior and drive groups to adopt the discipline to enact a collective learning process. A compelling shared goal motivates teams by establishing positive pressure or stress. A compelling goal for learning is one that is both meaningful (achieving it would in some way help the team or the organization accomplish something of generally agreed upon value) and sufficiently challenging to incur some doubt about its feasibility—but not so much doubt as to evoke feelings of helplessness (Csikszentmihalyi 1994; Locke 2001). For example, surgeon leaders of the more successful teams presented the new technology as an opportunity to help patients (by dramatically reducing the size of the surgical wound) and also stressed the difficulty of the challenge, explaining that it would require everyone on the team's active participation to pull it off. This emphasis on the goal and on the outcomes of their effort helped the team go through the arduous learning process.

The motivational power of goals is well established in the literature (Locke 2001). Research also has shown that goal interdependence enables efficiency in group problem-solving (Tjosvold 1990), a kind of learning behavior. Other research (Frink and Ferris 1998) suggests that goal setting and the effort invested in reaching goals is positively correlated to perceptions of accountability and performance evaluation. Goals also keep a team "on track" by establishing a benchmark against which its members can measure progress.

The role of shared goals in team learning

Goals must be reasonably well defined and understood by all team members to foster

reflection-in-action. For example, in a study of geographically dispersed product development teams (Sole and Edmondson 2002), one team was working to develop a radical new material for a large Asian manufacturer. Distant team members had had no direct contact with this customer yet needed to understand its market strategy to estimate the longer-term commitment required for the team and its company. Other team members were located near the customer site and seemed to be in a good position to have the necessary information. After waiting for some time for the requested information, the distant team members' frustrations escalated:

> "[We thought] our colleagues weren't putting priority and effort into it, when actually [we later learned] there was a void with the customer being able to articulate that themselves."

An intermediary familiar with both companies became involved and through his probing discovered that the customer itself had not yet established sales, marketing, or distribution plans, nor identified people responsible for these activities. A research scientist on the dispersed development team described this realization as an "ah-ha" moment:

> "That was probably one of the biggest issues, because the customer themselves, for the longest time, didn't have their own strategy clear and *we didn't know it*."

The distant team members had made two assumptions: first that a *shared* team goal existed and second that the team members in contact with the customer had data relevant to achieving that goal. From these assumptions came attributions of non-compliance, leading to negative emotions within the team. Through better articulation of the team's shared goals (which would begin to suggest strategies for obtaining the information needed to achieve them), this miscommunication would have been less likely to happen. In fact, the act of goal setting can be as or more important than the goal itself, because it creates shared understanding of the team's

task and suggests implications for how to work together.

Psychological safety as a moderator

Social psychologists have investigated relationships between objective goals and intrapsychic and interpersonal states in a group. For example, Dirks (1999) showed that trust moderates the relationship between goals and performance: when there is a low level of trust in a group, contributions of group members were limited to achieving personal rather than cooperative goals. This can inhibit group-level learning and get in the way of accomplishing a desired organizational change (Edmondson and Woolley forthcoming). Similarly, in this paper I propose that psychological safety moderates the positive relationship between a compelling goal and team learning. When psychological safety is high, this relationship is likely to be strong; when it is low, the motivating effects of goals are inhibited, as despite the desire to learn, interpersonal risk may inhibit the necessary behavior. This hypothesis is consistent with existing theories of task motivation which maintain that behavior and performance are driven by needs, goals and rewards (Dirks, 1999; Kanfer 1990). Consistent with this, figure 1 presented learning as motivated by goals, not by psychological safety itself. Psychological safety, when present, can enhance the motivating effects of goals on behavior, just as trust has been shown to moderate the effects of task (cognitive) conflict on relationship (affective) conflict (Simons and Peterson 2000). In this study, trust reduced the likelihood of relationship conflict in top management teams, such that task conflict (productive disagreement over the content of one's decisions and ideas that deepen cognitive understanding of the problem) was able to help the team produce better solutions. Termed "creative abrasion" by Leonard-Barton (1995), task conflict thus may have to exist within a cushion of psychological safety to enable a learning climate of discussion, innovation, and productive group thinking. Otherwise such conflict is destructive –

characterized by aggression, harsh language, and the threat of humiliation in front of others. Similarly, Barsade and her colleagues (2001) found that psychological safety moderates the effect of conflict on anger. Psychological safety allows groups to set high goals and work towards them through cycles of learning and collaboration.

In this way, psychological safety allows the interpersonal risks of learning to be mitigated. It has very real consequences for the way learning occurs—or fails to occur—in work teams of all kinds, and thus organizations. As depicted in Figure 1, team leader actions are predicted to influence goals, psychological safety, and the team learning process, while psychological safety moderates the relationship between a compelling team goal and a team learning process—enhancing or inhibiting the effect of goals on team learning.

The Role of Team Leaders in Psychological Safety, Learning Process, and Goals

Factors that shape the team learning process include power relationships and how team leaders manage them. Above, I argued that psychological safety facilitates freedom and openness to engage in the interpersonally risky behaviors needed for learning, and also, perhaps paradoxically, that an effective team learning process is structured and guided, through deliberate action (West 2000). Managing this apparent tension is the job of a team leader. Further, team leaders help to articulate or highlight a shared goal for the team.

The actions and attitudes of the team leader are thus important determinants of the team learning process. First, team leaders are a critical influence on psychological safety; second, they can deliberately work to structure a learning process, and third, team leaders play a role in shaping, or at least communicating, the team's goal. In this section, I develop implications for team leaders related to managing all three elements of team learning.

<u>Creating psychological safety</u>.

Team leaders have a powerful effect on psychological safety. Researchers have shown that team members are particularly aware of the behavior of the leader (Tyler and Lind 1992), and leaders' responses to events and behaviors influence (in a way either beneficial or detrimental to the group) other members' perceptions of appropriate and safe behavior (Winter, Sarros et al. 1997). Leaders can create environments for learning by acting in ways that promote psychological safety. Autocratic behavior, inaccessibility, or a failure to acknowledge vulnerability all can contribute to team members' reluctance to incur the interpersonal risks of learning behavior (Edmondson 1996; Edmondson, Bohmer and Pisano, 2001). And, when team leaders are selected solely on the basis of technical expertise, such as skill and knowledge about a topic, they may lack the interpersonal skills necessary to seek others' input, invite feedback and ideas, and create an interpersonal climate in which others are willing to speak up with ideas and concerns.

Accessibility. Leaders encourage team members to learn together by being accessible and personally involved. In one of the cardiac surgery teams that promoted organizational learning (in the form of successfully implementing the challenging new technology), an operating room nurse implicitly made this association by describing the surgeon leading her team as "very accessible. He's in his office, always just two seconds away. He can always take five minutes to explain something, and he never makes you feel stupid." In striking contrast, the surgeon in one of the less successful teams team requested that non-physician team members go through his residents (junior physicians who are still in training) rather than speak to him directly. Through their behaviors, these two surgeons conveyed very different messages to their teams. The first surgeon increased the likelihood that people would come to him with questions or problems, and

more importantly, would speak up quickly and openly in the operating room, with questions and observations, while the other surgeon made this more difficult (Edmondson, Bohmer and Pisano, 2001).

Acknowledging fallibility. To create psychological safety, team leaders also can demonstrate tolerance of failure, such as by acknowledging one's own fallibility, taking interpersonal risks, and religiously avoiding punishing others for well-intentioned risks that backfire. Self-disclosure by team leaders is one way to do this (Gabarro 1987). For example, one surgeon team leader repeatedly told his team: "I need to hear from you because I'm likely to miss things." The repetition of this phrase was as important as its' meaning: people tend not to hear—or not to believe—a message that contradicts old norms when they hear it only once. Soliciting feedback suggests to others that their opinion is respected; it may also contribute to establishing a norm of active participation.

 Other vivid examples of purposefully refraining from penalizing failure exist in the management literature. For example, Brand (1998) reiterates the tale of how innovation at 3M was fostered by a culture of leaders and management tolerant of mistakes: the adhesive used in the now-ubiquitous Post-it notes was the botched version of another product development project. The motto of product-design firm IDEO is "Fail often, so you'll succeed sooner" (Katz 2001: 61). Similarly, Cannon and Edmondson (2001) describe the "Mistake of the Month" ritual at a public relations firm, in which certain meetings opened with a review of mistakes – a lighthearted way to acknowledge the learning value in mistakes, and even for building a sense of community.

Psychological safety versus accountability. In supporting a climate of psychological safety, are leaders sacrificing team member accountability? I argue that this is a false tradeoff.

First, it is inaccurate to equate psychological safety with the removal of consequences for lack of performance. My research suggests that skilled team leaders can reward excellence, sanction poor performance, and at the same time embrace the imperfection and error that are inevitable under conditions of uncertainty and change. Psychological safety is nurtured without sending the message that "anything goes." In this way, team leaders and other immediate supervisors of work must communicate clear expectations about performance and accountability, without communicating that they are closed to, or unwilling to hear, bad news. Psychological safety means no one will be punished or humiliated for errors, questions, or requests for help, in the service of reaching ambitious performance goals. To make this work, team leaders must inspire team members to embrace error and deal with failure in a productive manner. This balancing act may be difficult to enact without some natural leadership ability or training, or may require excellent interpersonal skills, and perhaps even humor (Filipowicz 2002).

Managing process.

To encourage learning, the leader must impose structure on the team to ensure that reflection follows action and that changes are both suggested and implemented accordingly (Edmondson 2002). This structured learning process will benefit from the leader's explicit request for input from the team. Team and organizational-level learning both necessarily depend on individually-held knowledge, and that there is a large body of valuable, untapped knowledge within the organization (Macdonald 1995). Leaders must seek out this internal knowledge especially from lower-status team members (such as nurses and technicians in the context of the cardiac surgery operating room) who might otherwise be reluctant to speak. Team leaders can play a role in drawing members' thoughts out by setting up reflective sessions where task and time pressures are temporarily removed. .

Power. Leaders can manage power from both directions, first by empowering those in lower-status positions to speak up and second by minimizing the domineering tendencies of high-power individuals. For example, in a qualitative study of four production teams in a manufacturing company, Brooks (1994) described one in which the leader, Dave, used his position as an engineer as an advantage over lower-status technicians in the team. Dave and another engineer dominated meetings and regularly belittled their teammates' contributions. The leader's style so swayed the group that Brooks characterized them as the "Lost team," unable to set goals or make any real efforts to achieve them. Dominant individuals like Dave can be useful in prompting team reflection but should not be allowed to dictate the form of subsequent action (Wageman and Mannix 1998). Power differences can and must be managed to enhance team learning and performance. Suppressing the input of team members reduces opportunities for learning, with such consequences as less-robust data or poorly articulated, constructed, and executed projects.

Research on power differentials explains such scenarios as the relative presence or potency of power in a group influences willingness to participate and the type of knowledge that is produced (Brooks 1994; Dirks 1999; Lee, Edmondson, Thomke and Worline, 2001). Other research suggests that fear (on an individual or organizational level) impedes collective learning by marring what Rifkin and Fulop (1997) term a "learning space." Fear in people holding subordinate positions within the team causes concealment of one's identity, blocking "mutual self-disclosure" (Rifkin and Fulop ,1997) and hindering the process of team learning. Psychological safety, however, can counteract the debilitating forces of power.

Structuring a process. The second way that leaders contribute to structuring the learning process is by guiding the team through preparation and early, sometimes experimental, efforts.

The challenge of learning behaviors such as talking about errors, experimenting, and learning how to gather data from varied sources is affected by team composition. Knowledge differences, credentials, length of tenure, gender, and rank within the organization can threaten collective learning, yet many teams are successful learners in spite of these inequalities. Leaders can help this come about: in addition to building psychological safety, they can lead training and practice sessions, use direct, actionable language, and articulate norms for working together. Vignettes from several field studies illustrate these aspects of the team learning process.

Structure versus innovation. At first glance it may seem that leaders must sacrifice innovation by imposing the structure of a learning process. On the one hand, ensuring that action and reflection occur in a timely and productive way requires the imposition of structure, schedule and guidance. On the other hand, this process not only allows spontaneity, creativity and process innovation, it can promote it (West 2000). Enabling innovation thus may require being flexible while imposing structure, another skillful balancing act that involves prodding the team to reflect, while remaining open to what transpires in the reflection process.

Setting team goals

Imposing versus participating. The leader's role in setting team goals also involves a tension between setting direction unilaterally and allowing group participation in shaping goals. Clear, compelling goals are considered an essential prerequisite for team effectiveness (Hackman 1987), and imposing a goal from above is often considered effective practice. This imposition can come at the cost of valuable input from members who may know more about certain facets of the team's work than the leader does. One factor driving this balance is the role a given team plays in executing the organization's strategy. If a team's job is defined by organizational imperatives, its specific goals may be set by senior management but perhaps further developed

by the team leader and team members. An externally imposed goal may also be required if a team's work must be integrated with the work of other teams. This integration can either be planned in advance, when enough is known to do so, or coordinated through interaction across team boundaries throughout different teams' progress on their tasks. In this model, a network of teams in the organization shares knowledge and works cooperatively towards organizational goals, in an iterative, learning process. For most teams, team members' input is more important and more useful for figuring out how goals will be achieved rather than what the goals are – that is, input is directed into means not ends (Hackman, 1987). Finally, effective goals for learning must balance radical ("stretch") and incremental (finite, foothold) goals to measure progress along the way to achieving goals that seem ambitious if not impossible to achieve at the outset.

Implications for Theory and Practice

The model presented in this paper extends previous theory on team learning by introducing the role of a compelling goal that is both meaningful and challenging as a driver of the learning process, and by arguing that psychological safety moderates this relationship. I draw from the literature and from several field studies to illustrate and demonstrate the plausibility of relationships in the model. These examples are by no means offered as conclusive evidence of the hypothesized relationships, however, and empirical research is needed to test and extend the model depicted in figure 1.

The role of psychological safety in team learning

Field studies in various settings—health care delivery, product development, production, and management—suggest that, in situations where collaboration is critical to learning, certain conditions must be present for teams to learn and to work together effectively – especially psychological safety and (not unrelated) an open, coaching oriented team leader. The construct

and effects of psychological safety have growing support in the literature (e.g., Kahn, 1990; Edmondson, 1999; 2002; Barsade etc); however, further research is needed to build on the studies referenced above.

Implications of psychological safety as a moderator. Previously, I have discussed psychological safety as a mechanism that translates supportive inputs into outcomes (Edmondson 1999). This conceptualization makes sense, given inputs that directly help build psychological safety, but it is incomplete in that it bypasses the issue of motivation. The model presented in this paper thus may be more accurate and complete. Proposing psychological safety as a moderator is meant to help explain the differential impact of goals on outcomes and why teams learn and improve at varying rates. These propositions are offered to encourage additional work to support a new theory of work motivation in teams, with a focus on motivators and detractors.

Psychological safety's limitations. Psychological safety is an explanatory construct – a set of intangible interpersonal beliefs and predictions – rather than a managerial lever or action. There are actions leaders can take to build psychological safety, as discussed above, but it cannot be mandated are altered directly. In this sense, theory and practice related to psychological safety must be advanced by research that investigates effects of leader behavior and other organizational factors on psychological safety and on more tangible outcomes related to performance and job satisfaction.

Research on explanatory constructs like trust and psychological safety (both intrapsychic states) has a particular burden: to be relevant to practitioners the concepts must be unpacked into specific, actionable steps and they must be related to other critical variables such as goals and task design. Such research must balance the development of theoretical bodies of knowledge and the investigation of 'real world' problems (King, Keohane et al. 1994).

<u>Implications for practice</u>

A few practical suggestions can be gleaned from the ideas and studies reviewed in this paper. First, we can return to a suggestion raised by Peter Senge (1990) in his influential book on organizational learning, where he argued that managers lack, yet need, management "practice fields," where they can participate together in simulated experiences, make and learn from mistakes without actual harm to the organization, and conduct experiments.

Practice fields. Leaders of teams can orchestrate explicit sessions for off-line "practice," in which the team is able to learn from simulated experiences or from thought experiments, without risk of harming their real work. Six of the eight successful cardiac surgery teams we studied used a form of this technique, by engaging in a thorough team practice session, in the form of a dry run, while six of the eight unsuccessful teams did not engage in a dry run. In these explicit practice sessions, team members walked through the procedure in "real time," discussing what moves each person would be making if a real patient present had been present. Through this kind of off-line practice, the teams were able to anticipate technical problems that might arise during surgery and also to get comfortable in new interpersonal roles and relationships (Edmondson, Bohmer and Pisano, 2001). Similarly, other recent research found that leader briefings and team training influenced mental model accuracy and were integral to team performance in new environments (Marks et al., 2000). Practice fields also are likely to foster psychological safety, not only because real financial or medical consequences are removed, but because they convey to the members of the team that learning is important and that getting it right the first time is understood to not always be possible. Team leaders are most often in a position to suggest and implement practice fields as a tool in promoting team learning.

Direct language. In addition to setting a context for learning that encourages participation

from all members, using direct, actionable language also contributes to an effective learning process (Argyris 1993). Teams cannot afford to shirk critiques—the risk of sounding negative, criticizing the boss or making the company appear fallible. For example, management teams often face strategic decisions in which they must reflect on the company's current situation and suggest changes. The challenge in such discussions is to be objective and blunt about problems and about what is not working. In many such team discussions, however, the language is anything but direct and clear. For example, a top management teams I studied engaged in a series of meetings for the explicit purpose of developing a new strategy. In these conversations, I observed a persistent pattern of using metaphor to evade stating a critical assessment of the team's progress. To illustrate, one member commented,

> Listening to Bob talk about the ship, I'd like to explore the difference between the metaphor of the ship and how the rudder gets turned and when, in contrast to a flotilla, where there's lots of little rudders and we're trying to orchestrate the flotilla. I think this contrast is important. At one level, we talk about this ship and all the complexities of trying to determine not only its direction but also how to operationalize the ship in total to get to a certain place, versus allowing a certain degree of freedom that the flotilla analogy evokes.

Although metaphors such as this can provoke new ideas and creativity, they can also obscure the real issues and preclude direct or contentious discussion. In this team, members rarely inquired to clarify the meaning of each other's words, or to seek to identify areas of disagreement. The team continued to discuss the company and its situation abstractly in this way, avoiding disagreement and postponing resolution of the self-assessment process, and members tended not to challenge each other's abstract language. By the end of six months, little progress and no decisions

had been made. The team's abstract ruminations did not translate easily into action (Edmondson 2002).

Norms. Finally, team leaders and members can explicitly seek to define objectives and agreed upon norms for how to work towards them. For example, in the study of geographically dispersed product development teams cited above, we found that some teams establishing clear norms for working together and an explicit process for learning from each other (Sole and Edmondson forthcoming). One team held weekly 'virtual' meetings via telephone to share recently collected data. In contrast, another team had no established routine for collecting and distributing information, ultimately contributing to mistrust and frustration in the team. Another way in which the first team encouraged collective learning was by being explicit about goals and taking inventory of members' capacities and strengths—and weaknesses—what they *needed* to know. Based on the results of this informal inventory, the team exercised flexibility and brought in someone not officially on the team to fill gaps in their knowledge and expertise. Similarly, differences in technology implementation success in the cardiac surgery study could be accounted for in part by how the team leader framed the learning challenge. Successful implementers viewed technology implementation as a team learning project; unsuccessful implementers viewed it as a technical challenge. These different frames led to different norms for team member interaction, which ultimately allowed or disallowed a structured team learning process of testing, reflecting, and modifying the procedure, in an ongoing, participative way.

Conclusion

This paper has drawn from teams in many contexts to model the collective learning process in teams. One the one hand, these teams may seem too diverse to allow useful

comparisons and to develop general insights. The challenges encountered on the factory floor, in the operating room, and around the glass-topped tables in a management team's conference room differ substantively. On the other hand, all of the teams studied – whether geographically dispersed product development teams or co-located nursing teams – struggled with the need for learning and all struggled with issues of power, trust and psychological safety. In each, it appeared that team leaders were in positions to play a critical role in shaping the learning process. The model and guidelines presented above provide team leaders a supportive framework for understanding and responding to the dynamics of the collective learning process.

Team leaders can be seen to occupy an increasingly sophisticated and challenging role, especially when they lead teams that need to learn. These front-line organizational leaders must continually clarify the meaning and importance of the team's goal, make sure that goal is serving the organization's strategic aims, and remain open to input from other team members about ways in which the goal must be modified to meet new changes in the team's environment. This means setting challenging goals and specific direction without engaging in authoritarian action that stifles participation. It means allowing team members the latitude for innovation while providing the structure needed for learning. To do this, I argue, requires enough structure to ensure inclusiveness and teamwork without restricting the spontaneity and creativity that can produce unexpected synergies—structure without rigidity. It means creating a climate of psychological safety that allows people to feel safe taking risks, while also setting high standards that require enormous effort and preclude settling into a comfort zone— safety without complacency.

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Figure 1. Model of Team Learning Process

Team Leader Actions → Psychological Safety, Goal, Team Learning Process (Act → Reflect) → Organizational improvement