Psychological Safety, Trust, and Learning in Organizations: A Group-level Lens

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Abstract

This paper discusses psychological safety and distinguishes it from the related construct of interpersonal trust. Trust is the expectation that others' future actions will be favorable to one's interests; psychological safety refers to a climate in which people are comfortable being (and expressing) themselves. Although both constructs involve a willingness to be vulnerable to others' actions, they are conceptually and theoretically distinct. In particular, psychological safety is centrally tied to learning behavior, while trust lowers transactions costs and reduces the need to monitor behavior. This paper proposes a model of antecedents and consequences of psychological safety in work teams and emphasizes the centrality of psychological safety for learning behavior. Drawing from field research in a variety of organizational settings, I describe different approaches to studying and measuring psychological safety in teams. I conclude with implications of this work including limitations of psychological safety in practice and suggestions areas for future research.

There's much greater openness on this team—it's intangible.
- *Marketing member, new product development team, manufacturing company*

[In this team] people are put down for being different...
- *Accountant, publications team, manufacturing company*

Mistakes [in this unit] are serious, because of the toxicity of the drugs—so you're never afraid to tell the nurse manager.
- *Nurse, Team A, Memorial Hospital*

[The team leader] treats you as guilty if you make a mistake... I was called into her office and made to feel like a two-year old... You get put on trial...
- *Nurse, Team B, Memorial Hospital*

Introduction

Much work in today's organizations is accomplished collaboratively—involving sharing information and ideas, integrating perspectives, and coordinating tasks. Teams provide a structural mechanism through which this collaboration often occurs. A defining characteristic of teams is the need for different individuals to work together to achieve a shared outcome (Hackman, 1987). Both the research literature and anecdotal experiences of people who have worked on teams suggest that working interdependently with others is not always easy. Put simply, some teams work – members collaborate well – and others don't (Hackman, 1990). What allows people to openly share ideas and contribute a part of themselves to a collaborative undertaking? This paper argues that understanding how people perceive the interpersonal climate in the teams in which they work is an important part of the larger question of understanding both teamwork and learning in organizations. Trust, the unifying theme of this volume, is a critical input to this interpersonal climate, as is mutual respect. In this chapter I show that such a climate, which I refer to as one of psychological safety, enables the willing contribution of oneself – of one's ideas and actions – to collective work.

A recent increase in research on trust in organizations suggests a growing interest in intrapsychic states that affect performance and other organizational outcomes (Kramer, 1999). Most research on trust has focused on either the experiences of individuals or on organizations as

entities and how trust can facilitate inter-organizational relationships, such as with suppliers or customers. This paper examines *psychological safety* an intrapsychic state that is especially salient at the group level of analysis. Below I suggest that psychological safety has particular salience for small groups, in the same way that trust is particularly relevant for the dyadic relationship.

To describe psychological safety and how it differs from trust, I call the reader's attention to the words of four team members at the opening of this chapter. These data are selected to represent hundreds of similar quotes, in which team members almost immediately volunteer descriptions that reveal the presence or absence of psychological safety in their teams in response to an open-ended question such as, "What is it like to work in this team?" Despite the important relationship of psychological safety to trust, trust does not accurately capture a particular dimension of interpersonal experience conveyed in these descriptions – that of how valued and comfortable an employee feels in that work setting. This paper presents evidence from recent studies of operating room, nursing, new product development, management, service, and production teams to illustrate how the construct of psychological safety differs from the related construct of trust and to propose antecedents and consequences of psychological safety in work teams. I also examine implications of team psychological safety for organizational learning, limitations of the construct, and areas for future research.

Psychological Safety and Trust

As psychological safety and trust both describe intrapsychic states related to interpersonal experience, it is important to clarify conceptual differences between these related constructs, as well as to establish empirical evidence of the existence and value of psychological safety – the less familiar of the two. I highlight psychological safety as a distinct, complementary

phenomenon that, like trust, can affect various behavioral and organizational outcomes. This section thus distinguishes psychological safety from trust and illustrates this difference drawing from my own and others' research.

Psychological safety defined

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. In this tacit process, one weighs the potential action against the particular interpersonal climate, as in, "If I do 'X' 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.

Others have defined psychological safety similarly. Kahn (1990: 708) described it as "feeling able to show and employ one's self without fear of negative consequences to self-image, status, or career." In a qualitative field study, Kahn (1990: 703) found that psychological safety was one of three psychological conditions that "shaped how people inhabited their roles [in the organization]." Recent empirical research shows that psychological safety promotes work engagement (May, Gilson, & Harter, forthcoming). Similarly, in classic research on organizational change, Schein and Bennis (1965) proposed that a work environment characterized by psychological safety is necessary for individuals to feel secure and thus capable of changing their behavior.

More recently, Schein (1985: 298-299) 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. 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. Rather, it describes a climate in which the focus can be on productive discussion that enables early prevention of problems and accomplishment of shared goals, because people are less likely to focus on self-protection. For this reason, particular attention has been paid to psychological safety in the clinical psychology literature, as an important element of the therapeutic context (Rappoport, 1997; Swift & Copeland, 1996; Waks, 1988).

Unlike most research on psychological safety, my work has focused specifically on the experience of people in organizational work teams. Work teams are groups within the context of a larger organization, with clearly defined membership and shared responsibility for a team product or service (Alderfer, 1987; Hackman, 1987); such teams range in size but often comprise between five and twenty people. I posit *team psychological safety* as a group-level construct, meaning that the construct characterizes the team as a unit rather than individual team members. Consistent with this, I argue that perceptions of psychological safety tend to be highly similar among people who work closely together, such as members of an intact team, both because team members are subject to the same set of contextual influences and because these perceptions develop out of salient shared experiences (Edmondson, 1999a). For example, most members of a team will conclude that making a mistake does not lead to rejection when they have had team experiences in which appreciation and interest are expressed in response to discussion of their own and others' mistakes. The similarity of beliefs in social systems such as organizations or

work groups is the subject of much inquiry (see reviews by Klimoski & Mohammed, 1994; Walsh, 1995).

Definitions of trust

Although a concise and universally accepted definition of trust has remained elusive (Creed & Miles, 1995; Kramer, 1999), most definitions include an aspect of perceived risk of vulnerability—also an element of psychological safety as noted above. As discussed below, however, the nature of this vulnerability is more narrowly defined for psychological safety than for trust. Mayer, Davis and Schoorman (1995: 712) conceptualize trust as "the willingness of a party to be vulnerable to the actions of another party, based on the expectation that the other will perform a particular action important to the truster, irrespective of the ability to monitor or control the other party." Similarly, Jones and George (1998: 531-2) maintain that trust is "an expression of confidence between the parties in an exchange of some kind—confidence that they will not be harmed or put at risk by the actions of the other party or confidence that no party to the exchange will exploit the other's vulnerability." These authors argue that "trust leads to a set of behavioral expectations among people, allowing them to manage the uncertainty or risk associated with their interactions so that they can jointly optimize the gains that will result from cooperative behavior" (1998: 532).

Trust is often conceptualized in terms of choice—that is, in terms of the truster's decision-making process. Kramer (1999) identifies two approaches in the trust literature, rational and relational models of choice. Although psychological safety also involves an element of choice—generally a tacit choice—its definition is easily distinguished from definitions of trust within the rational model, in which individuals are presumed to make efficient choices based on risk-evaluation by maximizing expected gains or minimizing expected losses. In this model,

people choose to trust when it is rational to do so. Such rational choices are made through "conscious calculation of advantages, a calculation that in turn is based on an explicit and internally consistent value system" (Schelling, 1960: 4; ref in Kramer, 1999). This includes evaluating the incentives of the other person to honor that trust (Hardin, 1992; as ref in Kramer, 1999). The relational model, in contrast, takes into consideration social aspects, conceptualizing trust "not only as a calculative orientation toward risk, but also a social orientation toward other people and towards society as a whole" (Kramer, 1999: 573); in this model, choices are more affective and intuitive than calculative.

Psychological safety versus trust

As noted above, the concepts of psychological safety and trust have much in common; they both describe psychological 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 clarifies the distinction between the two constructs, to propose that they are complementary but distinct interpersonal beliefs. Three elements of psychological safety are described to distinguish it from trust—the object of focus, timeframe, and level of analysis.

Focus on "self" versus "other." People often equate trust with giving others the benefit of the doubt—indicating a focus on *others'* potential actions or trustworthiness. In discussing psychological safety, the question is instead whether others will give *you* the benefit of the doubt when, for instance, you have made a mistake. To illustrate, at the heading of this chapter, two nurses describe the interpersonal context in which they work; one reports that she is "never afraid" to tell her team's manager about mistakes, while the other reports being "made to feel like a two-year-old" by the manager in her team. Although it might be the case that the first nurse

trusts her manager and the second does not, the meaning of these descriptions is not captured by the construct of trust. Instead, they depict an interpersonal belief that pertains to feelings of safety in interpersonal interactions. The nurse who reports being made to feel like a two year old is likely to monitor her *own* actions to protect herself, rather than trying to protect herself by monitoring *others'* actions.

Narrow temporal bounds. The tacit calculus inherent in 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 questionable medication dosage may be so focused on the potential immediate consequences of this question, such as being scolded or humiliated for being uninformed, 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 irrational, I have heard countless similar stories across markedly different organizational settings. The experience of the second nurse highlights this point. After embarrassing past encounters with her manager, she was inclined to avoid speaking up about errors for fear of getting "put on trial," thereby unwittingly discounting the longer-term consequences for patients and for the team of her silence. The construct of trust, in contrast, pertains to anticipated consequences across a wide temporal range, including the relatively distant future.

Group-level analysis. As noted above, team psychological safety is proposed to characterize groups, rather than describing individual or temperamental differences. It is conceptualized as an emergent property of the collective, that describes the level of interpersonal safety experienced by people in a particular group. Members of work teams tend to hold similar perceptions about this—that is, about "the way things are around here"—because they are

subject to the same influences (for example, by having a common manager) and because many of their beliefs develop out of shared experiences. Thus, team members of the nurse who reported being "made to feel like a two year old" 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 this team, reporting mistakes was interpersonally penalized. In summary, the presence or absence of psychological safety tends to be experienced at the group level of analysis (Edmondson, 1999a), unlike trust, which pertains primarily to a dyadic relationship –whether between individuals or collectives such as firms (as in supplier relationships).

Studying and Measuring Psychological Safety

Recent Research on Psychological Safety in Work Teams

In this section I describe field research in four distinct organizational settings that has explored the nature and role of psychological safety in work groups. Each has taken a slightly different approach to measuring psychological safety, in part driven by ongoing refinement of the construct and in part driven by constraints inherent in a given research site or situation. To clarify how psychological safety can be measured I summarize these projects below.

Medication error study. In a study designed to investigate the effects of team structure on the rate of medication errors, an unexpected result suggested the possibility of differences in psychological safety across eight nursing teams in two hospitals. The highest performing of these teams, with the most skilled nurse managers, had higher detected error rates than teams lower on these dimensions. Using interview, observation and archival data, I found significant differences in members' beliefs about the social consequences of reporting medication errors

(Edmondson, 1996). These beliefs could be characterized as tacit; they were automatic, taken-for-granted assessments of the "way things are around here," as illustrated in the two nurses' quotes discussed above. These beliefs varied markedly across the teams; in some teams, members saw it as self-evident that speaking up is natural and necessary and, in others, speaking up was viewed as a last resort. The level of psychological safety thus could be inferred from members' spontaneous reports about what it was like to work in their team and how they viewed the reporting of errors. These inferences, made by a research assistant unaware of my hypotheses, were highly correlated with detected error rates. Finally, the study included a single survey item, "if you make a mistake in this team, it is held against you," which also provided a rough index of team psychological safety.

Change program study. Edmondson and Woolley (2003) used interviews and a survey to study an organization-wide change program in a large manufacturing company, and found that psychological safety was associated with the acceptance and perceived usefulness of the program. First, in interviews, we noticed that people who supported the new program were more likely to report a sense of psychological safety; for example, one subordinate successfully using the program's guidelines with his manager explained, "I could be myself, I don't have to put on an act of anything, worry about saying the wrong thing because something [bad] may happen if I do." In contrast, a manager in a dyad in which the program was regarded cynically reported, "I've been stepped on a few times for being too straightforward…I'm not real comfortable that there wouldn't be repercussions [for speaking up about problems]." Drawing from the interview data, we developed a six-item survey variable (see Table 1) to assess psychological safety. This measure had adequate psychometric properties and was a significant predictor of program acceptance and success, also measured by the survey. The focus in this study was on dyadic

relationships, and psychological safety was measured at the individual level of analysis, with several items focusing specifically on the manager relationship.

Manufacturing company study. In a study of 51 teams of different types (including management, new product development, sales and production teams), I developed and tested a new seven-item survey measure of team psychological safety, shown in Table 1 (Edmondson, 1999a; 2002). This measure displayed internal consistency reliability and discriminant validity, and predicted team learning behavior and team performance—as rated by independent observers. Other survey variables (from Hackman, 1990) assessing team characteristics were included in the study, allowing me to examine the relationship between psychological safety and well-designed teams. The study included extensive observation of and interviews with subsets of the teams to establish the correspondence between qualitative and quantitative data assessing psychological safety and other variables. Analysis of the individual-level survey data (n=427) demonstrated the convergence of team members' perceptions of psychological safety, using the intraclass correlation coefficient. These results supported aggregation to a group level data set (N=51), with which substantive relationships were tested.

Cardiac surgery team study. Edmondson, Bohmer and Pisano (2000; 2001) studied cardiac surgery operating room teams in sixteen hospitals to explore the role of psychological safety in interdisciplinary teams learning to use a radical new technology, in this case, for minimally invasive cardiac surgery.[1] We used a structured interview protocol and a few open ended questions to interview 165 informants, including all members of each operating room

[1] Minimally invasive cardiac surgery differed from traditional cardiac surgery in two ways. First, it promised shorter and less painful recovery for patients (rather than cutting open the patient's chest and splitting the breastbone the surgeon accessed the heart through a tiny incision between the ribs). Second, the small incision transformed a routine procedure with well-established roles and tasks into one that required communication and coordination among members of the operating room team. Direct tactile and visual data previously available to surgeons was replaced by information displayed on monitors that had to be communicated to the surgeon by others. The OR team thus had to learn a new work routine that altered the surgeon's role as sole authority with privileged access to data.

team, as well as others in each hospital who might provide additional information or perspective about the implementation of the new technology. Both because of the small number of teams and because of the busy schedule of surgeons and other operating room team members, it was impractical to use a team survey in this setting.

Instead, we developed two independent quantitative measures of psychological safety by coding qualitative data as follows. First, notes from informants' responses to several questions about the team, including what they would do if faced with a certain potential complication, were rated by the interviewers using a three-point scale: "the atmosphere and interaction in this team is characterized by (3) open reciprocal communication (very free and effortless), (2) respectful but guarded communication (picking the right moment to speak, pronounced awareness of status differences), and (1) communication that is quite limited, with some members extremely hesitant to speak up (low status members walk on eggshells)." Second, we asked two research assistants to rate 168 quotes previously coded as relevant to psychological safety on a three-point scale from high (easy to speak up about anything on one's mind) to low (people appear to be very uncomfortable speaking up and only do with extreme difficulty), using anchors we developed together in a preparatory training session. One-way ANOVA showed highly significant differences in ratings across teams, and these data were aggregated to produce a group-level measure that was significantly correlated with the interviewers' ratings (Edmondson, forthcoming).

These four studies have investigated and measured psychological safety using both quantitative and qualitative data, and the resulting data have consistently supported aggregation to the group level of analysis. Findings and examples from these studies are used throughout this paper to illustrate several new theoretical propositions.

Other measures of psychological safety

In a qualitative field study in an architecture firm and a summer camp, Kahn (1990) used a series of open-ended questions to measure the constructs of psychological safety, meaningfulness and availability. The study examined the effect of psychological safety on team members' willingness to *engage*, that is, "employ or express themselves physically, cognitively, and emotionally during role performances," versus *disengage*, that is, "withdraw and defend their personal selves" (1990: 694).

West (1990: 311) investigated a related construct, "participative safety," in work teams—defining it as "a construct in which the contingencies are such that involvement in decision-making is motivated and reinforced while occurring in an environment which is perceived as interpersonally non-threatening." Anderson and West (1994b) developed a survey instrument, the Team Climate Inventory (TCI), to measure participative safety and three other "team climate" factors.[2] Team climate refers to "the norms, atmosphere, practices, interpersonal relationships, enacted rituals and ways of working developed by a team" (Anderson & West, 1994a: 81). The TCI's participative safety scale includes such issues as influence over decision making, information sharing, interaction frequency and safety (Anderson & West, 1994a). (See Table 1.) Versions of the instrument have been used by several researchers in settings including health care, community psychiatric care, social service, and industrial management (Kivimaki, Kuk, Elovainio, Thomson, & al, 1997; Schippers, 2003).

Antecedents of Psychological Safety

[2] The others are vision, task orientation, and support for innovation. The TCI can be obtained from the Institute of Work Psychology at Sheffield University, Sheffield, England.

A central challenge in organizational research on both trust and psychological safety is how to create these positive states.[3] This section proposes antecedent conditions likely to give rise to psychological safety in work teams. Some of these propositions are supported by past research; others will require future work to support arguments presented here. Five factors that may increase the chances of intact work groups having psychological safety are presented below. Although I draw upon others research on individuals' experiences, these propositions focus on the work group or team context.

Leader behavior

There can be little doubt that formal power relations affect perceptions of interpersonal risk in the workplace. The research literature has demonstrated this in numerous ways, showing for example that bad news is rarely transmitted "up" the hierarchy (Lee, 1993) and that subordinates are less likely to ask for help from bosses than from peers or others (Lee, 1997). In a related vein, supportive managerial behavior has been shown to have a positive effect on creativity (e.g. Amabile, Conti, Coon, Lazenby, & Herron, 1996, Deci, Connell, & Ryan, 1989). Creativity, a form of free self-expression, is likely to involve some degree of psychological safety in an organizational setting.

Research has also shown that team members are particularly aware of the behavior of the leader (Tyler & Lind, 1992), such that his or her responses to events and behaviors are likely to influence other members' perceptions of appropriate and safe behavior. One implication of the finding that leader behavior is especially influential is that leaders of work groups may have to

[3] Kramer (1999: 575-581) identified individual and organizational factors that affect trust. These include (1) the truster's disposition – that is, their generalized attitude toward people, based on past experiences with trust in general (2) the past history or cumulative interaction between the truster and the trustee, or a combination of the truster's expectations and the extent to which they are validated over time, (3) the input of third parties, (4) the category or role of the trustee, for example, successful role occupation signals trust in competence, and (5) explicit and tacit organizational rules and norms which filter down to the micro-level, such as "open-door" policies.

go out of their way to be open and coaching oriented to create an atmosphere of psychological safety. A benefit of this effort for the leaders is that they are more likely to learn what people are really thinking and feeling, if psychological safety is present (see discussion of consequences, below). In short, leader behavior sets a salient example for how to behave, and beliefs about how leaders will use their power is likely to affect psychological safety. At the group level of analysis, the behaviors that directly influence members' perceptions are generally not those of the organizations' chief executive or senior managers but are instead those of team leaders, middle managers, and front line supervisors, who interact face to face with team members. I speculate that three aspects of leader behavior in particular will promote psychological safety: (1) being available and approachable, (2) explicitly inviting input and feedback and (3) modeling openness and fallibility.

Accessibility. By making themselves available and approachable, leaders may reduce perceived barriers that prohibit discussion. In contrast, if leaders assume authoritative stances or act in punitive ways, team members are likely to feel that their opinions are not welcomed or valued (Edmondson, 1996). In our study of operating room (OR) teams, we found that surgeon accessibility varied significantly and that this was associated with differences in team members' perceptions of psychological safety. An OR nurse at Suburban Hospital[4] implicitly makes this association, 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 another team requested that non-physician team members go through his residents rather than speak to him directly. Through this behavior, these two surgeons conveyed vastly different messages to their respective teams. The first surgeon increased the likelihood that people would come to him with questions

or problems, while the second surgeon closed off potential discussion by making it difficult to reach him. Overall, our measures of psychological safety showed that teams with accessible, coaching oriented surgeons were more likely to perceive the team environment as safe.

Inviting input. Similarly, leaders who explicitly ask for team members' input are likely to encourage team psychological safety**.** Soliciting feedback suggests to others that their opinion is respected; it may also contribute to as norm of active participation. At the other end of the spectrum, when leaders discourage input or discussion, verbally or otherwise, team members are less likely to express their opinions, fearing potential negative consequences. The extent to which surgeons encouraged input and feedback from OR team members varied greatly across the 16 hospitals we studied. To illustrate, the OR technician who runs the heart-lung bypass machine (the "perfusionist") at Suburban Hospital recalled:

> [The surgeon] gave us a talk about what minimally invasive surgery is about—the kind of communication he wanted in the OR, what results he expected, and told us to immediately let him know—let us know if anything is out of place.

In contrast, the surgeon at Decorum Hospital, described by several team members as "the commander of the ship," did not actively encourage discussion from his team. This team's perfusionist commented:

> He's a tough man. He doesn't openly invite input from my point of view. He may get it elsewhere, but there is no open forum. For example, sitting in a room and talking about [the device] and what we can do to make it better and keep it going; no there is none of that communication at all.

Modeling openness and fallibility. How team leaders behave is likely to set an implicit model of acceptable behavior in the team, because of the implications of power in organizations. Team members are thus likely to mimic the behavior of leaders, such that if leaders are taciturn and their behavior indicates that certain matters are best not discussed, others will follow their example. Explicitly demonstrating fallibility or vulnerability can help reduce counterproductive

[4] All hospital names are pseudonyms.

barriers created by status differences. Team members who hear their leader admit to the group that he or she made a mistake are likely to remember this the next time they make mistakes and feel more comfortable bringing this up. To illustrate, a perfusionist in the OR team at Eastern Medical Center reported: "[The surgeon] has created an atmosphere where that happens. He models the behavior. He'll say 'I screwed up. My judgment was bad in this case.'" By admitting mistakes himself, this surgeon signaled to the team that errors and concerns could be discussed without fear of punishment (Edmondson et al., 2001). In sum, team members are likely to conclude that their team environment is safe if the leader is coaching-oriented, invites questions and feedback, and has non-defensive responses to questions and challenges.

Proposition 1: The actions of team leaders—including being accessible, inviting input and modeling openness—promote team psychological safety.

Trusting and respectful interpersonal relationships

Much research examines the cognitive and affective bases for interpersonal trust (e.g. McAlister, 1995; Zucker, 1986). Others have studied the role of interpersonal trust with respect to psychological safety; for example, a recent study (May, Gilson & Harter, forthcoming) showed that co-worker trust had a significant positive effect on psychological safety. Kahn (1990) concluded that: "interpersonal relationships [in the architecture firm] 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 (Kahn, 1990). 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 (Moingeon & Edmondson, 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.

Proposition 2: Trust and respect in horizontal group relationships promote team psychological safety.

"Practice fields"

"Practice fields," a term introduced by Senge (1990), describes forums deliberately set up to practice rather than take action and to reflect upon the results. Senge (1990) points out that it is difficult for managers to learn because they lack the practice or rehearsal settings used by other kinds of teams, such as professional sport teams, orchestras, or cockpit crews; instead, management teams typically must learn in the real playing field, where the stakes are high. As a former hospital chief commented about airplane pilots, "Nobody says [to pilots], 'Well, you read the book on the 727, now take it up.'"[5] Cockpit crews in training use simulations to help them learn in a safe environment—to see which strategies work, what they will require of each member, where the weak links are, and to practice responding to unexpected events—prior to their first flight.

In contrast, managers and most physicians must make decisions in the "real" playing field, without the benefit of a practice field in which to try out different strategies and learn from failure. Therefore, managers who set up a kind of practice field environment, off line, can deliberately try to cultivate psychological safety in that environment such that participants understand that harmful consequences of mistakes and failures are removed or suspended. These practice fields can take the form of trial ("dry") runs, off site or off-line meetings, and multiple

[5] Ellen Goodman, "Getting it right in the O.R.," The Boston Globe, Jan 13, 2000, p. A19.

kinds of simulations. (See Isaacs & Senge, 1992 and Sterman, 1989 for descriptions of the use of management simulation exercises to promote learning.)

Practice fields are likely to contribute to psychological safety not only because real financial or medical consequences are removed but also 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. Discussing and experiencing aspects of the team task off line highlights potential problems that may occur, and because there are no material consequences of errors individuals are likely to speak up about them. This use of practice fields is related to leader behavior in that leaders are most often in a position to suggest and implement them.

Across the cardiac surgery teams, we found striking differences in the use of "dry run" sessions, in which the team ran through the operation without a patient present, following formal training and in advance of the first real case. Some teams conducted thorough dry runs with all team members present, running through all of the steps of the procedure, as if it were happening, and even discussing how they wished to communicate with each other as a team in the real operation. Other teams conducted practice sessions without the high status, potentially intimidating surgeons present; some reviewed only technical aspects of the equipment, rather including communication, and finally some teams reported only reading the manual to prepare. A particularly thorough dry run was carried out by an OR team at Suburban Hospital, which also had a high level of psychological safety. This team went through the entire procedure, step-by-step, while talking about how they would communicate with each other differently than in conventional cases. As reported by the perfusionist:

> [First] we had a couple of talks in advance, and [then] the night before [the first case] we walked through the process step by step. Took two and half or three hours to do it. We communicated with each other as if it were happening, i.e., the balloon is going in, and so on. The surgeon gave us a talk about what [the new technology] is about. The kind of communication he wanted in the

> OR, what results he expected, and told us to immediately let him know—let us know if anything is out of place.

In striking contrast, at another hospital, the team that conducted the first operation included none of the members who had attended training, other than the surgeon; in fact, the operation was the first time many of them had seen any of the equipment. The extent to which a team engaged in a thorough dry run was significantly correlated with team psychological safety across all 16 teams.[6] Surgeons who conducted such practice fields signaled to other team members that mistakes were inevitable and that input and communication were required for success. This allowed other team members to perceive their environment as safe to discuss mistakes and offer observations.

Proposition 3: The use of "practice fields" promotes team psychological safety.

Organizational context support

Past research has shown that structural features of team design, including context support, increase team effectiveness (Hackman, 1987; Wageman, 1998). The extent of context support experienced by a team is proposed to foster team psychological safety as well, because access to resources and information is likely to reduce insecurity and defensiveness in a team, such as caused by concerns about unequal distribution of resources within or between an organization's teams.

Survey measures of team psychological safety and context support[7] were highly correlated in the manufacturing company study; however, this association was a rule with some striking exceptions. Some teams with notably high psychological safety in this sample faced substantial organizational barriers, such as having members frequently pulled away to work on

[6] Both variables were measured by structured interview scales; the correlation was $r=50$, $p<.05$.
[7] Context support items include "this team gets all the information it needs to do our work and plan our schedule," and "good work is rewarded in this organization." The correlation was $r=.70$, $p<.01$, for $n=51$ teams.

other tasks, yet continued to have a sense of openness and cohesion that may have been strengthened by the shared experience of surmounting hurdles (Edmondson, 1999a). In sum, this study suggested that context support may be helpful but not essential in promoting psychological safety.

Proposition 4: A supportive organizational context promotes team psychological safety.

Emergent group dynamics

In addition to the effects of formal power and leadership behavior discussed above, informal, emergent dynamics in a team are also likely to affect psychological safety. The notion of emergent group dynamics describes the interplay of roles and "characters" that people assume or are assigned in typical work relationships (Kahn, 1990; Bales & Strodtbeck, 1951). Kahn proposes that team members assume roles and unacknowledged characters in the unconscious plays that develop in organizations, such as those dealing with authority, competition and sexuality. These roles are often formed independently of formal assignments. He further proposes that the psychological safety experienced by a group member will depend on where their "character" stands in the informal group play.

In Kahn's (1990) study of an architecture firm, the firm's president was viewed as the "father figure," with other members taking supporting roles such as "mother" or "son." Each of these "family members" experienced different degrees of safety to express themselves based on their relationship to the father. The "mother" felt that her role "lets me interact with him [the president] and with others pretty much as I want to, within limits" (1990: 710). Similarly, a "favored son" claimed "I tend to be seen as the next generation of designers that he lays out. My designs aren't questioned as much as those of others, and I think it's because I'm seen as following his tradition, but in my own way" (1990: 710). In contrast, the team member who took

on the persona of the "bad son" wore earrings, cracked jokes, dyed his hair red…and felt "frustrated" because he felt that he was seldom able to engage. This study showed that differences in psychological safety can emerge as a consequence of group interactions.

Proposition 5: Team psychological safety is influenced by informal dynamics in the team.

Consequences of Psychological safety

As noted earlier, the level of psychological safety in a team is likely to affect the way members interact with each other. In particular, psychological safety is likely to affect behaviors related to learning and improvement (Edmondson, 1999a; 1999b). Below, I discuss five specific learning-oriented behaviors that may be enabled by team psychological safety.

Help-seeking

Each member of a team can look to other members to provide information or perspective to help them solve a challenging problem. Help seeking can increase others' awareness of opportunities for cooperative behavior (Anderson & Williams, 1996). Yet power dynamics often cause people in organizations to avoid seeking the help they need. Using an experimental paradigm, Lee (1997) showed that co-worker power (whether confederates were labeled bosses or subordinates) affected participants' help-seeking behavior. In the presence of a high power colleague, participants confronted with a difficult problem-solving task were significantly less likely to ask for help than if the colleague had low power—despite the fact that help was essential for task completion. As this result suggests, seeking help from those in a position to judge your performance or ability involves interpersonal risk. Asking for help brings a potential risk of appearing incompetent, and—as psychological safety alleviates excessive concern about others' reactions—it is likely to promote help seeking in teams.

To illustrate this association, I found substantial differences in self-reported help seeking behavior across teams in the manufacturing company. Members of a factory production team, for example, volunteered reports of seeking help to assess their product; for example, "if we have a quality issue—we're not sure about something we've just done—we'll bring others in without telling them what the issue is to ask them if they see a problem with this part." This team stood in striking contrast to another production team in the same company, whose members, according to an internal consultant, didn't ask for help because they "don't want to look like brown-nosers." And a local supervisor noted, "If there's a technical problem, they don't ask the engineers for help," and similarly "they were having problems with the glue, but they didn't get help; they just sit and don't work, then they get overtime on Saturday." The survey measure of team psychological safety was significantly correlated with responses to a single survey item measuring help-seeking behavior[8] filled out by two or three independent observers of each team ($r=.37$, $p<.01$), supporting the following proposition.

Proposition 6: Psychological safety promotes help-seeking behavior in work teams.

Feedback-seeking

Attention to feedback has been shown to promote learning (Schön, 1983) and enhance performance of individual managers (Ashford & Tsui, 1991) and teams (Ancona & Caldwell, 1992). Like help-seeking, feedback-seeking is often essential to successful task completion, and carries similar interpersonal risk. Requests for feedback from other team members or other groups place the seekers in a vulnerable situation, where they are poised to hear negative criticism. This may cause them "learning anxiety," driven by the fear of losing "effectiveness

[8] The item was, "This team asks for help from others in the company when something comes up that team members don't know how to handle." The response alternatives were "Never, Infrequently, Sometimes, Often, or Always," and observer' mean responses provided a group-level measure.

and self-esteem" (Schein, 1995). Team psychological safety, which diminishes the concern that others will respond in a way that is cruel or humiliating, is likely to encourage feedback-seeking.

Two new product development teams in the manufacturing company represented extremes of feedback-seeking behavior. The "Sidekick" team actively sought feedback from more experienced people in the company. A senior manager noted that "[Sidekick's leader] asks me to come [to some meetings]; she wants my view, my industry experience and how Sidekick fits with [the company's] systems strategy." In contrast, a team working on a similar project, the "Radar" team, remained strikingly insular. Members reported spending considerable time developing details of a new product design before soliciting customer input, only to discover that customers were not interested in the product idea in the first place. Members of this team also did not feel comfortable offering ideas or bringing up problems in the team, and one explained "[the team leader] doesn't want to hear it." Another member noted that the leader of the team "would be afraid to tell [the senior manager] when things weren't going well—so we didn't always get his [the senior manager's] feedback."

A team's ability to seek feedback can have a significant effect on their performance. Because Radar received little external input, the team was less able to notice and fix what they were doing wrong. One team member noted "We did make changes, but too slowly […] we found ourselves going in circles a lot. Sometimes this took a lot of time." Another member explained "…[there were a lot of] blind alleys…We had a preconceived notion of what was important that prevented us from seeing [the solution we finally developed]." Sidekick had greater team psychological safety than Radar, and overall, team psychological safety was

correlated with observer's ratings of team feedback-seeking behavior (a three-item scale)[9] (r=.51, p<.001).

Proposition 7: Psychological safety facilitates feedback-seeking behavior in and by a team.

Speaking up about errors and concerns

In both the management and medical literatures, noted scholars have advocated discussion of concerns and failures in organizations (Kohn, Corrigan, & Donaldson, 2000; Leonard-Barton, 1995; Michael, 1976; Schein, 1993; Sitkin, 1992), but less attention has been paid to the social psychological factors enabling people to do this. Psychological safety is proposed to allow team members to speak up about concerns and problems directly, by alleviating concerns about repercussions. Psychological safety makes it possible for people to believe that the benefits of speaking up outweigh the costs (e.g., the potential embarrassment) for the speaker.

The role of psychological safety was particularly salient in the cardiac surgery and nursing team studies. Healthcare provides a good context in which to draw examples of speaking up—especially given recent public attention to the widespread problem of error in hospitals (Pear, 1999; Zuger, 1999). Remaining silent about a questionable medication order in a nursing team could lead to serious patient injury. Similarly, in an OR team, not speaking up about a potential problem can critically affect clinical outcomes. Yet, in some of the OR teams we studied, speaking up about potentially life threatening problems was often seen as difficult or impossible to do, such that team members would first wait to see if someone else might notice the same concern and speak up instead.

[9] A representative item is "This team asks its internal customers (those who receive or use its work) for feedback on its performance." Cronbach's alpha for this scale, created for this paper, is .79.

In the cardiac surgery study, psychological safety was assessed in part using team members' reports of how easy or difficult it was to speak up, such our measures of psychological safety and speaking up are confounded. However, these data shed light on *how* perceptions related to the interpersonal context affect people's willingness to speak up and also show that the willingness to speak up can vary across otherwise highly similar teams. The homogeneity of OR teams in cardiac surgery—in terms of structural features such as composition, task, or goal—highlights the role of interpersonal and intrapsychic factors in explaining observed behavioral differences across teams. To illustrate, members of the OR team at Decorum reported being uncomfortable mentioning potential problems they observed during the minimally invasive operation; as a nurse explained,

> [If I noticed that the balloon pressure was a little low], I'd tell the adjunct. Or I might whisper to the anesthesiologist, 'Does it look like it 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 are not used to saying anything. They are afraid to speak out. But for this procedure you have to say stuff.

Similarly, the perfusionist at Decorum described an interaction with the surgeon after he had noticed and mentioned having some trouble with the venous return:

> The surgeon said, 'Jack, is that you?' I said 'yes'. He said, 'Are you 'doing' this case?' I said, 'No, I'm assisting.' 'Well in the future, if you are not doing this case I don't want to hear from you.' It is a very structured communication.

Other members of this team reported that they would only speak up if they had caused the problem, not if it was someone else's mistake. This can be contrasted with other teams in the sample. For example, an anesthesiologist at Saints Hospital noted that everyone in the OR team was very comfortable speaking up:

> We speak up easily. At the beginning, we spoke up about everything; after a while, we realized what was really important. No one is intimidated by the surgeons or the situation. I think the surgeons make it so. They make it easy to speak up…. It is not a problem even for an RN to speak up.

And in another team, a perfusionist explained, "You have to level with these guys. I feel comfortable when admitting a mistake." (Memorial Hospital). At Urban Hospital, a senior OR nurse reported an incident in which a junior nurse pointed out the senior's mistake:

> ...in the last case, we needed to reinsert a guide wire and I grabbed the wrong wire and I didn't recognize it at first. My circulating nurse said, 'Sue, you've 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.

Her ease in sharing this story about an error being pointed out by a subordinate in an interview itself suggests a high level of comfort admitting mistakes in her team.

These examples show how a sense of psychological safety can make it easier to speak up across status and role boundaries. Like many work settings, the hospital environment is highly structured, including having well defined status differences within the OR team. Some surgeons recognized a need to work to reduce these kinds of barriers to be able to learn to carry out minimally invasive surgery. An anesthesiologist at Eastern Medical Center highlighted this point:

> The perception that the surgeon has to know everything has to change... Each person has an important job. For minimally invasive surgery you can't ever stop talking. For [minimally invasive surgery], I have to be able to tell the surgeon to stop. This is very new. I would never had dared to say anything like that before, nothing was that important. So you have to develop a way to deal with communication in advance, such as anesthesia can be telling the surgeon what to do. It has got to be legitimate. This is really important.

Speaking up, especially in ways that can reflect on others' performance, means crossing the lines that delineate roles. In particularly stratified work environments, this can require courage on the part of the speaker; however, psychological safety can reduce concerns about interpersonal sanctions from crossing status lines.

Finally, evidence of this relationship is provided by the nursing team study in which the reverse-scored survey item ("If you make a mistake in this team, it is held against you") was correlated with errors made that were actually intercepted by other team members before

reaching patients (Edmondson, 1996). Some teams thus reported being comfortable speaking up about errors ("People feel more willing to admit errors here because [the nurse manager] goes to bat for you." (Team C, Memorial Hospital), in contrast to others ("people are nervous about being called into the principal's office..." and "people don't advertise errors here; if there's no adverse event, then don't report it." (Team D, Memorial Hospital)

Proposition 8: Team psychological safety promotes speaking up about errors and concerns.

Innovative Behavior and Innovation

Innovative behavior can be defined as doing novel or different things intelligently, to produce useful outcomes. West (1990) argued that "participative safety" in teams encourages the freedom to offer new ideas and experiment with different behaviors without fear of looking stupid or being embarrassed. Innovative behavior has much in common with "voice," defined by Van Dyne and LePine (1998: 109) as being comfortable "making innovative suggestions for change and recommending modifications to standard procedures even when others disagree."

West (1990: 320) theorizes that "participative safety is a necessary but not sufficient condition for high levels of innovation. He draws from developmental and clinical psychology to show a basis for this relationship, noting that research on child development shows that children with secure bonds with their parents are more likely to explore new situations sooner than children whose bonds are less secure (Ainsworth & Bell, 1974; in West, 1990). Similarly, research indicates that patients whose therapeutic alliances are characterized by interpersonal safety, lack of judgement, and consistency of support are more likely to explore the most threatening aspects of their experiences (West, 1990; Rogers, 1961). West argues similarly that innovation will occur more frequently if people feel safe. Psychological safety, by enabling risk-

taking and the willingness to suggest new ideas without fear of embarrassment, may support innovative behavior and innovation in teams.

Other research has shown that participation leads to less resistance to change (Wall & Lischeron, 1977; in West, 1990), and that the more frequently people participate in decision-making, the more likely they are to offer ideas for new and improved ways of working (West & Wallace, 1988). This increased interaction leads to cross-fertilization of ideas (Mumford & Gostafson, 1988; in West, 1990) which is important to creativity and innovation. Similarly, if psychological safety promotes information sharing, this gives individuals more knowledge with which to develop new ideas.

West argues that participative safety influences quality of innovation as well as quantity. For example, the cross-fertilization of ideas can increase an innovation's significance or novelty. Moreover, innovations developed in this way are likely be implemented because high levels of participation lead to less resistance to change (Wall & Lischeron, 1977) and because thorough discussion may surface potential weaknesses or errors in advance, preventing later problems, in the process of producing an innovation.

I found substantial differences in innovation across cardiac surgery teams learning to use a new technology. As an administrator at University Hospital reported "Our surgeons are very creative. They see something that works well here and they see it will apply elsewhere." In contrast, an anesthesiologist at State University Hospital commented: "It is best not to stick your neck out. Innovation is tolerated at best." Consistent with this argument, a quantitative measure

of innovation from the structured interview protocol (Edmondson, forthcoming) was correlated with measures of psychological safety ($r=0.51$, $p<0.05$).[10]

Proposition 9: Team psychological safety promotes innovative behavior and innovation.

Boundary spanning

Boundary-spanning behavior describes external communication with other groups, such as needed to coordinate objectives, schedules or resources. Boundary spanning can also involve interpersonal risk, including asking for help or resources, seeking feedback and delivering bad news such as delays or design problems. It is through such activities that teams can clarify performance requirements, obtain information and resources, and coordinate their tasks with other groups. Past research has shown that boundary spanning promotes effective team performance (Ancona, 1990; Ancona & Caldwell, 1992). However, these benefits will be unrealized if team members are unwilling to incur the risks involved, for example, because they wish to avoid appearing to have problems. Thus, I argue that team psychological safety is likely to foster boundary spanning behavior, because team members who are accustomed to taking interpersonal risks within the team may be able to transfer that behavior to other, external interactions (Edmondson, 1999c).

The operating room teams I studied varied considerably in boundary-spanning activities. Some surgeons spoke informally on a daily basis with or attended frequent meetings with other groups. Other members of the same OR teams also tended to have a high level of boundary spanning, as illustrated in the following description; "It is informal at my level; there are no formal meetings, just informal networking with the catheter lab and the SICU… I try to put my face out there and let them know we're available." In contrast, in another team, a perfusionist

[10] Team innovation was measured as the sum of three correlated variables: (1) innovative modification of surgical procedures, (2) novel application of the procedure (used to something previously considered impossible), and (3)

reported, "In this hospital everyone acts independently and assumes everyone is doing their job. There are not meetings to see how stuff is going. It just doesn't happen. It has the feel of a factory sometimes. The key players talk team but it is not practice." Furthermore, quantitative measures of team boundary-spanning as measured with a structured interview protocol were highly correlated with team psychological safety[11] (Edmondson, forthcoming). Similarly, in the manufacturing study team psychological safety and boundary spanning, measured in two surveys, were significantly correlated both for self-reported[12] and observer-rated boundary spanning behavior[13] (Edmondson, 1999c).

Proposition 10: Psychological safety encourages team members to engage in boundary spanning.

Implications and Issues

Psychological safety and organizational learning

The behavioral consequences of psychological safety discussed above and shown in Figure 1 fall under the broad rubric of activities through which learning occurs in organizations. Research on trust has identified numerous benefits of trusting attitudes and behaviors in organizations—for example (as discussed in Kramer, 1999) trusting environments reduce transaction costs within an organization (Uzzi, 1997; Williamson, 1993), increase spontaneous sociability among organization members (Fukuyama, 1995; Messick et al., 1983), and facilitate appropriate forms of deference to organizational authorities (Arrow, 1974; Gabarro, 1978; Miller, 1992; Tyler, 1994; Tyler & Lind, 1992). A unifying theme is trust research envisions

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expansion of patient eligibility criteria due to reflection on accumulated experiences.

[11] r=.70, p<.01, N=16

[12] r=.78, p<.01, N=51

[13] r=.48, p<.01, N=51

trust as a substitute for control (Handy); unlike research on psychological safety, the theme of learning has not played a central role in this work.

An extensive literature on organizational learning has paid less attention to the behaviors at the level of work teams that allow organizations to learn, with notable exceptions (e.g., Edmondson, 2002; Kasl, Marsick, & Dechant, 1993; Senge, 1990). Much essential learning in organizations takes place in the interpersonal interactions between members of work groups (Edmondson, 2002), yet learning behaviors are limited when individuals have concerns about interpersonal consequences. Argyris (1990) suggested that when people experience interpersonal threat, they utilize "defensive routines" that thwart their own and their organization's learning. Similarly, Schein (1995) proposes that the "learning anxiety" created by the fear of confronting disconfirming data increases "in direct proportion to the amount of disconfirmation, leading to the maintenance of the equilibrium by defensive avoidance of the disconfirming information." The anxiety associated with not learning must be greater than the anxiety associated with the risk of looking or feeling incompetent for individuals to engage in learning behavior.

One implication of research on psychological safety is that interpersonal threat in an organization is neither objective nor homogenous. The studies discussed in this paper indicate that interpersonal beliefs vary from team to team, even within strong organizational cultures and contexts. Thus, the interpersonal risk inherent in learning in organizational settings can be mitigated by a climate of psychological safety among colleagues or coworkers. A face-to-face work team can provide a safety net for learning, or, in contrast, be a place where the risk of learning behavior is magnified. Some teams are therefore likely to learn faster than others. The phenomenon of organizational learning may be better described as a patchwork quilt than as a uniform fabric, such that a single organization does not learn (or fail to learn) as an entity but

rather encompasses varying pockets of learning (Edmondson, 2002). One implication of this for practice is that managers must focus on creating psychological safety in face-to-face work units throughout the organization. Attempts to enhance organizational learning through top-down, uniform approaches are likely to have limited effectiveness without attention to the way interpersonal climate can vary across groups (Edmondson & Woolley, 2003).

Limits of Psychological Safety

If psychological safety promotes learning behavior in work groups, does this suggest that more psychological safety is always good? First, the size of the teams examined in the above studies presents a potential boundary condition for this proposition. The surgery, nursing, new product development, production and management teams studied were all relatively small, ranging from five to 20 or, infrequently to as many as 30 members. Yet, in some organizational environments, such as in the automotive or semiconductor industries, groups of 200 or more people often share responsibility for designing, developing or bringing a new product to market. Given the reduced salience of face-to-face interaction in planning and executing work in a team of 200 as compared to a team of five, psychological safety may not play a critical a role in the learning of such a team, and further research is needed to investigate this. Moreover, the increased number of relationships and complex interdependencies in a very large group may diminish the amount of repeated interaction between any subset of members and thereby reduce the degree to which consistent perceptions of psychological safety take shape. Finally, the role of psychological safety in dispersed, or "virtual teams" (Leonard, Brands, Edmondson, & Fenwick, 1998; Sole & Edmondson, 2002) may be very different from in the teams discussed in this paper.

Second, psychological safety is not sufficient to ensure learning behavior. Without a clear and compelling shared goal, for example, members of a team may lack motivation to engage in learning-oriented actions, which require both effort and thought. People are more likely to offer ideas, ask for help, and seek or provide feedback if they believe that their effort makes a difference in achieving an outcome that they care about. Similarly, effective learning behavior involves effort and thought, to, for example, identify gaps that could be filled through help seeking. This line of argument suggests that a sense of safety from harmful personal consequences must be combined with a need and capacity for thoughtful, intelligent action, if effective learning behavior is to occur. Creating an environment of psychological safety could be counterproductive if managers believe that this is all that is needed to promote learning—by inadvertently removing structural supports that might be seen as blocking safety but might instead support systematic thought and action.

The results of the research discussed in this paper suggest certain consistent positive effects of team psychological safety and negative effects of an interpersonal climate that lacked safety. In these examples, the question of whether a team can have too much psychological safety has not been addressed. On the one hand, excessive psychological safety could be detrimental. If people are too comfortable with each other, they may spend an inappropriate amount of time in casual conversation at the expense of their work. A complete lack of censorship could create such a low barrier to seeking feedback and help or speaking up with concerns that valuable time is wasted on unimportant things.

On the other hand, an argument can be made that no amount of *interpersonal* fear is helpful in promoting performance. Although fear of not achieving goals, or anxiety about survival in an ever more competitive environment may motivate productive work, anxiety

triggered by interpersonal fear may not be helpful. Schein (1995) noted that learning occurs in organizations when survival anxiety exceeds anxiety about learning – and certainly fails to occur when the opposite is the case. In practice, such theoretical distinctions are likely to blur; distinguishing interpersonal and other sources of fear may be unrealistic. Envisioning the possibility of a team with excessive safety, somehow lacking an edge to drive them forward, is not difficult. Managers thus may face a tension in trying to draw a line somewhere to set high standards and prevent sloppy work—such as by discouraging questions or comments unrelated to the task at hand —without closing down communication about important issues. If they inadvertently communicate that suppression of questions and concerns is wise, they are likely to suppress learning.

A third potential limitation is that excessive team psychological safety may promote intergroup tensions in organizations. Teams that are actively engaged in exciting projects and enjoying the intense sense of camaraderie that such collaboration often implies may inadvertently communicate an impression of self-satisfaction and arrogance that other organizational groups interpret as denigrating of them. Many effective new product development teams, assigned to a strategically important project, have fallen into this trap (e.g., Wheelwright & Verlinden, 1999). Although these teams often have psychological safety and open, direct confrontation inside the team, they often have done less to encourage others in the organization to speak openly to them.

Finally, there may be situations in which the lack of an interpersonal barrier to speaking up may actually exacerbate problems rather than help them. Peterson (1999) hypothesized that group member "voice" may be more useful in groups characterized by common understanding than in those where such understanding is absent. An implication of this for teams in which

people fundamentally disagree about task-related issues is that psychological safety may open the door for getting stuck in counterproductive discussions, which they lack the interpersonal skill to resolve. This suggests the need for psychological safety to be accompanied by interpersonal competence (Argyris, 1993) for maximal learning to take place.

Future Research

The propositions presented in this paper suggest several directions for future research. First, further work is needed to develop and operationalize the construct of team psychological safety with additional kinds of teams. To develop a consistently reliable and valid measure of psychological safety, future research must continue to collect data from a variety of team and organizational settings. For example, the effect of psychological safety in culturally diverse teams warrants further research, since foreign-born workers may be hesitant to ask questions, admit a lack of understanding, or make negative statements (Thiederman, 1988). The use of multiple methods to triangulate across measures would serve to further solidify the survey measure of team psychological safety used in the studies discussed here and shown in Table 1.

Second, further research is needed to test many of the propositions in this paper. Preliminary data from many teams were offered to illustrate the viability of these arguments; however, more systematic research is clearly required. Similarly, conceptual and empirical work is warranted to explore the relationships *among* the proposed antecedents and consequences of psychological safety. For instance, the decisions and actions of the team leader are likely to have a significant effect on each of the other antecedent variables. Leaders can pay attention to informal group dynamics that arise, elicit trust and respect, implement practice fields, and make sure the team has sufficient access to resources (e.g., Hackman & Walton, 1986). Similarly, the relationship between practice fields and other antecedent factors can be explored. Do off-line

practice sessions increase the likelihood of trusting interpersonal relationships or alter informal group dynamics? Relationships among the proposed consequences of psychological safety thus may also prove fruitful avenues for further exploration.

Conclusion

At this stage of research on team psychological safety, a few preliminary conclusions can be articulated. First, the existence of psychological safety as a distinct concept with implications for organizational behavior is supported by data from a variety of organizational settings. The notion that psychological safety tends to be shared by members of face-to-face work teams has strong empirical support from several studies. Moreover, despite a lack of extensive systematic empirical research thus far, the proposition that psychological safety exists and may influence certain kinds of behaviors in organizations has considerable face validity.

Second, evidence from several types of work groups in very different organizational contexts suggests an important role for psychological safety in facilitating collaborative work, in particular when work groups face uncertainty and change and need to learn together. Thus, psychological safety may have important consequences for understanding organizational learning. The studies reviewed above point to specific actions that team leaders can take to promote psychological safety and to thereby catalyze a process of encouraging learning in an organization, work group by work group.

Neither scholarly nor lay notions of trust precisely capture the concept of psychological safety. Although interpersonal trust is likely to be an essential prerequisite for team psychological safety, this paper argues and illustrates that is not the same construct. This work thus contributes to the literature by expanding the range of salient intrapsychic experiences likely to influence organizational behavior.

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Table 1: Survey scales used to measure psychological safety

(a) Edmondson (1996)

- "If you make a mistake in this team, it is held against you."

(b) Edmondson and Wooley (2000)

- If I make a mistake in this job, it is often held against me. (R)
- It is difficult to ask others in this department for help.(R)
- My manager often encourages me to take on new tasks or to learn how to do things I have never done before
- If I was thinking about leaving this company to pursue a better job elsewhere, I would talk to my manager about it.
- If I had a problem in this company, I could depend on my manager to be my advocate.
- Often when I raise a problem with my manager, s/he does not seem very interested in helping me find a solution. (R)

(c) Edmondson (1999a)

- If you make a mistake on this team, it is often held against you.
- Members of this team are able to bring up problems and tough issues.
- People on this team sometimes reject others for being different.
- It is safe to take a risk on this team.
- It is difficult to ask other members of this team for help.
- No one on this team would deliberately act in a way that undermines my efforts.
- Working with members of this team, my unique skills and talents are valued and utilized

(d) Anderson and West (Anderson & West, 1994b; as used by Kivimaki et al., 1997)

- We share information generally in the team rather than keeping it to ourselves
- We have a "we are together" attitude.
- We all influence each other.
- People keep each other informed about work-related issues in the team.
- People feel understood and accepted by each other.
- Everyone's view is listened to, even if it is in a minority.
- There are real attempts to share information throughout the team.
- There is a lot of give and take.

Figure 1: Model of Antecedents and Consequences of Team Psychological Safety