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Psychological Safety: The History, Renaissance, and Future of an Interpersonal Construct

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Abstract

Psychological safety describes people's perceptions of the consequences of taking interpersonal risks in a particular context such as a workplace. First explored by pioneering organizational scholars in the 1960s, psychological safety experienced a renaissance starting in the 1990s and continuing to the present. Organizational research has identified psychological safety as a critical factor in understanding phenomena such as voice, teamwork, team learning, and organizational learning. A growing body of conceptual and empirical work has focused on understanding the nature of psychological safety, identifying factors that contribute to it, and examining its implications for individuals, teams, and organizations. In this article, we review and integrate this literature and suggest directions for future research. We first briefly review the early history of psychological safety research and then examine contemporary research at the individual, group, and organizational levels of analysis. We assess what has been learned and discuss suggestions for future theoretical development and methodological approaches for organizational behavior research on this important interpersonal construct.

INTRODUCTION

In today's business environment, much work in organizations is accomplished collaboratively. Narrow expertise and complex work require people to work together across disciplinary and other boundaries to accomplish organizational goals. Product design, patient care, strategy development, pharmaceutical research, and rescue operations are just a few examples of activities that call for collaborative work. Organizational research has identified psychological safety as an important factor in understanding how people collaborate to achieve a shared outcome (Edmondson 1999, 2004), thus making it a critical concept for further research.

Psychological safety describes perceptions of the consequences of taking interpersonal risks in a particular context such as a workplace (e.g., Edmondson 1999). A central theme in research on psychological safety—across decades and levels of analysis—is that it facilitates the willing contribution of ideas and actions to a shared enterprise. For example, psychological safety helps to explain why employees share information and knowledge (Collins & Smith 2006, Siemsen et al. 2009), speak up with suggestions for organizational improvements (Detert & Burris 2007, Liang et al. 2012), and take initiative to develop new products and services (Baer & Frese 2003). As we describe below, extensive research suggests that psychological safety enables teams and organizations to learn (Bunderson & Boumgarden 2010, Carmeli 2007, Carmeli & Gittell 2009, Edmondson 1999, Tucker et al. 2007) and perform (Carmeli et al. 2012, Collins & Smith 2006, Schaubroeck et al. 2011).

First explored by pioneering organizational scholars in the 1960s, psychological safety research languished for years but experienced renewed interest starting in the 1990s and continuing to the present. We propose that psychological safety has become a theoretically and practically significant phenomenon in recent years in part because of the enhanced importance of learning and innovation in today's organizations. Psychological safety is fundamentally about reducing interpersonal risk, which necessarily accompanies uncertainty and change (Schein & Bennis 1965). Reflecting this premise, a rapidly growing body of conceptual and empirical research has focused on understanding the nature of psychological safety, identifying factors that contribute to this interpersonal construct, and examining its implications for employees, teams, and organizations. The aim of this article is first to review this literature and then to outline the implications of the findings, including controversies and unanswered questions, as well as directions for future research.

From a practical perspective, psychological safety is a timely topic given the growth of knowledge economies and the rise of teamwork. Both of these trends have given rise to new work relationships in which employees are expected to integrate perspectives, share information and ideas, and collaborate to achieve shared goals.

Our article unfolds as follows. We begin by briefly reviewing the early history of psychological safety research and then describe our search methods. Next, we identify and examine contemporary research at the individual, organizational, and group levels of analysis; assess what has been learned from this body of work; and devote particular attention to controversies and gaps in the literature. Then we identify unanswered questions and new directions to be explored in future research. Finally, we briefly suggest managerial implications of this body of research and conclude with the hope that our article will motivate other scholars to pursue new lines of inquiry to advance knowledge about creating and managing psychological safety at work.

HISTORY

In the organizational research literature, the construct of psychological safety finds its roots in early discussions of what it takes to produce organizational change. In 1965, MIT professors Edgar Schein and Warren Bennis argued that psychological safety was essential for making people

feel secure and capable of changing their behavior in response to shifting organizational challenges. Schein (1993) later argued that psychological safety helps people overcome the defensiveness, or learning anxiety, that occurs when they are presented with data that contradict their expectations or hopes. With psychological safety, he reasoned, individuals are free to focus on collective goals and problem prevention rather than on self-protection.

Since that time, several other researchers have explored psychological safety in work settings. In an influential paper, William Kahn (1990) rejuvenated research on psychological safety with thoughtful qualitative studies of summer camp counselors and members of an architecture firm that showed how psychological safety enables personal engagement at work. He proposed that psychological safety affects individuals' willingness to "employ or express themselves physically, cognitively, and emotionally during role performances," rather than disengage or "withdraw and defend their personal selves" (p. 694). Further, Kahn argued that people are more likely to believe they will be given the benefit of the doubt—a defining characteristic of psychological safety—when relationships within a given group are characterized by trust and respect. Using descriptive statistics from summer camp counselors and members of an architecture firm, he also showed a quantitative relationship between personal engagement and psychological safety in both contexts.

METHODS

We identified theoretical and empirical papers for our review through several approaches, including keyword searches in databases (e.g., Business Source Complete, ISI Web of Science, and PsycInfo) and manually checking our reference list against recent meta-analyses (B. Sanner & B. Bunderson, unpublished manuscript) and review articles (e.g., Edmondson 2004, Edmondson et al. 2007). Given the breadth of topics related to psychological safety, including those covered extensively in literatures on interpersonal trust, organizational climate, and team learning, we chose to limit our focus to articles that explicitly used the terms psychological safety or psychological safety climate. Considering the target audience and space constraints, we included articles published in leading management-research journals, a few current unpublished studies that came to our attention, and one study from an edited volume owing to its unusually comprehensive data set. We emphasized empirical studies—those that analyzed quantitative or qualitative data collected in different settings (e.g., field, classroom, or laboratory)—and we describe methods and findings in sufficient detail to allow readers to critically evaluate a study's conclusions. We acknowledge that we may have overlooked articles that qualified for inclusion in our review; moreover, we necessarily confronted trade-offs between completeness and depth of coverage of each study.

Our review organizes research on psychological safety into three streams, based on level of analysis. First, we begin with studies that conceptualize psychological safety as an individual-level phenomenon, with data on experiences and outcomes attributable to individuals. Second, we describe research on psychological safety conceptualized as an organizational-level phenomenon and measured as an average of interpersonal-climate experiences within an organization. Third, we review work that conceptualizes and measures psychological safety at the group level of analysis, which is the largest and most active of the three streams.

PSYCHOLOGICAL SAFETY AT THREE LEVELS OF ANALYSIS

Individual-Level Research

In general, this work studies relationships between individual experiences of psychological safety and outcomes including job engagement, organizational commitment, quality internal auditing,

learning from failure, and creative work involvement. A summary of these relationships is depicted in **Figure 1**. Some studies examine employee adherence to expected (or in-role) behaviors, conceptualizing employees as reactive respondents to managerial actions, rewards, or other organizational factors. Others give employees a more active, agentic role, examining relationships between psychological safety and discretionary improvement behaviors including speaking up (e.g., Detert & Burris 2007).

In-role behavior. This research examines relationships between individuals' perceived psychological safety and engagement in their work. Kahn (1990) effectively launched this stream with his qualitative studies, noted above, of conditions enabling people to personally engage or disengage at work. More recently, Kark & Carmeli (2009) examined the affective components of psychological safety and argued that psychological safety induces feelings of vitality, which impact an individual's involvement in creative work. Their sample included 128 employed adults who were part-time graduate students at a large university in Israel and were asked to complete two surveys, a week apart. Psychological safety predicted involvement in creative work, and the relationship was partially mediated by vitality.

Gong et al. (2012) studied relationships among psychological safety, individual creativity, employee proactivity, and information exchange. They proposed that proactive employees seek information in exchanges with others; information exchange, in turn, fosters trusting relationships that provide psychological safety for employee creative endeavors. Data from 190 matched employee–manager pairs in a Taiwanese retail chain, collected in three time-lagged waves, supported the argument that proactive employees engage in more information exchange and that the relationship between information exchange and creativity is fully mediated by trust. Note that this study drew from the psychological safety literature to motivate its hypotheses related to trust and employee creativity, but it did not measure psychological safety directly.

Siemsen et al. (2009) examined the effects of psychological safety on knowledge sharing among coworkers in both manufacturing and service operations. Siemsen and his coauthors investigated whether psychological safety motivated employees to share knowledge, and argued that the level of confidence individuals have in the knowledge to be shared would moderate this relationship. Their results, obtained from survey data collected in four companies, showed that greater confidence indeed reduced the strength of the relationship between psychological safety and knowledge
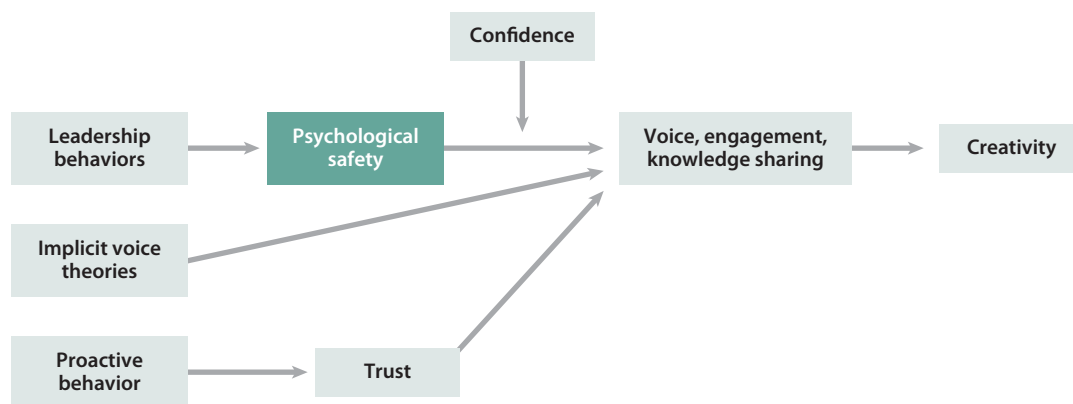

Figure 1

Relationships examined in individual-level research on psychological safety.

sharing. This thoughtful study suggests a need for further research on the boundary conditions of psychological safety's effects, a theme we revisit later in this article.

Speaking up and voice. Whereas the studies discussed above focused on employee performance in expected behaviors for their roles, a growing stream of research examines psychological safety's relationship to extra-role behaviors such as speaking up. Speaking up, or voice, is defined as upward-directed, promotive verbal communication (Premeaux & Bedeian 2003, Van Dyne & LePine 1998). Challenging the status quo and offering ideas to improve process can be a vital force in helping organizations learn. However, considerable research has shown that individuals often do not work in environments where they feel safe to speak up (Detert & Edmondson 2011, Milliken et al. 2003, Ryan & Oestreich 1998). A number of studies therefore examine proactive behavior, especially that related to challenging the status quo or improving organizational functioning (see Grant & Ashford 2008 for a review).

Several studies, spanning multiple industries, have found that psychological safety mediates between antecedent variables and employee voice behavior (e.g., Ashford et al. 1998, Miceli & Near 1992). For example, Detert & Burris (2007) investigated two types of change-oriented leadership—transformational leadership and managerial openness—as antecedents of improvement-oriented voice. Analyzing data from 3,149 employees and 223 managers in a restaurant chain in the United States, they found that subordinate perceptions of psychological safety mediated the leadership–voice relationship. Similarly, Walumbwa & Schaubroeck (2009) used a multilevel model in a study of 894 employees and their 222 immediate supervisors in a major US financial institution and found that ethical leadership influenced follower voice behavior, a relationship that was partially mediated by followers' perceptions of psychological safety.

Other recent research focuses on psychological mechanisms that encourage or inhibit improvement-oriented voice. For example, Liang et al. (2012) identified two types of voice: First, promotive voice is the expression of ways to improve work practices and procedures to benefit an organization (Van Dyne & LePine 1998). Second, prohibitive voice describes employee expressions of concern about existing or impending practices, incidents, or behaviors that may harm their organizations. Liang and colleagues (2012) examined psychological safety, felt obligation for constructive change, and organization-based self-esteem as three unique, interacting variables to predict supervisory reports of promotive and prohibitive voice. Using data from a sample of 239 Chinese retail employees in a two-wave panel design, the researchers found psychological safety to be strongly related to prohibitive voice. Further, although felt obligation strengthened the positive effect of psychological safety on both forms of voice, organization-based self-esteem weakened the effect for promotive voice. The study thus pointed to a promising avenue for future research in exploring differing antecedents and interpersonal consequences associated with voice. In a similar vein, Burris et al. (2008) examined attachment and detachment as psychological mechanisms that influence improvement-oriented voice, in a study of 499 managers in a US restaurant chain. Leadership antecedents and psychological attachment variables were the central focus of this study; psychological safety was included as a control variable. Nonetheless, the results showed a direct positive effect of psychological safety on voice.

Through a series of studies designed to shed light on lack of employee voice, Detert & Edmondson (2011) argued that implicit theories about voice—specific beliefs about when and why speaking up at work is risky—explain significant variance in speaking-up behavior. They tested the effects of five implicit voice theories (IVTs) in four sequential studies. In general, psychological safety was negatively correlated with the strength of IVTs. The authors proposed that IVTs supplement psychological safety in explaining variance in voice behavior. The fourth study in the series used survey data from several hundred adults with diverse work experiences to test

relationships between psychological safety and individual voice. The results supported the argument that psychological safety supplements, but does not mediate, the independent significant effects of IVTs on employee voice. Detert and Edmondson concluded that, in addition to contextual effects such as psychological safety, IVTs about speaking up (derived from socially reinforced motives of self-protection in hierarchies) exert an independent effect on voice behavior (e.g., Edmondson 1999).

Organizational-Level Research

Research in this stream identifies relationships between psychological safety, commitment-based human resources (HR) practices, social capital, high-quality relationships, climate for initiative, and firm performance, each measured at the organizational level of analysis. In general, measures are derived from the average of survey responses from multiple people working in each of a number of firms in the study. In some studies, psychological safety serves as a mediator, and in others as a moderator of relationships between organizational antecedents and outcomes. We organize this section according to the two main outcome variables in this stream: performance and learning.

Organizational performance. Collins & Smith (2006) tested a model predicting that commitment-based HR practices lead to a social climate of trust, which supports knowledge exchange and combination and, ultimately, promotes better firm performance. The authors argued that HR practices and high-investment employer–employee relationships motivate employees and provide the flexibility needed to have innovative and dynamic work environments. Their 10-month longitudinal field study included data from HR managers, core knowledge workers, and CEOs in 136 high-technology companies; they measured commitment-based HR practices, social climate, cooperation, shared codes and language, and knowledge exchange using surveys and assessed firm performance with a measure combining revenue and sales growth. The findings suggest that climates of trust, cooperation, and shared codes were all significantly related to firm performance, and these relationships were partially mediated by the level of exchanges and combination of ideas and knowledge among knowledge workers. Note that this study measured social climate of trust—rather than the highly similar construct of psychological safety, which comprises an interpersonal climate of trust and respect.

In a survey study of 165 employees from 47 midsized German companies, Baer & Frese (2003) linked psychological safety to firm performance, with process innovations as a mediating variable. They measured process innovations, climate for initiative, psychological safety, and firm performance. Both climates for initiative and for psychological safety positively correlated with firm performance, moderating the relationship between process innovations and firm performance.

Organizational learning. Other studies examine relationships between psychological safety and outcomes related to organizational learning. These include firm-level behavioral tendencies ranging from critical thinking to encountering problems, preoccupation with failures, and error management, all of which can be argued to enable company dynamism and competitive advantage. For example, Carmeli et al. (2009) studied the association between learning from failure, psychological safety, and high-quality work relationships by conducting survey research on 212 part-time students in a variety of industries (e.g., electronics, energy). The survey measured learning behaviors, psychological safety, and five components of high-quality relationships: emotional carrying capacity, tensility, connectivity, positive regard, and mutuality. Each component of high-quality relationships was correlated with psychological safety, which mediated the

outcome of learning behaviors, providing further support that positive subjective experiences of work relationships are key to psychological safety and thus to organizational learning.

Carmeli (2007) and Carmeli & Gittell (2009) focused more narrowly on psychological safety and learning from failure. Carmeli & Gittell (2009) tested a model predicting that high-quality relationships give rise to psychological safety, which in turn would predict failure-based learning. The authors used a survey to measure failure-based learning behaviors, psychological safety, and high-quality relationships among two populations: (a) employees of three organizations in software, electronics, and financial industries in Israel and (b) graduate students with jobs in banking, insurance, telecommunications, electronics, food and beverages, pharmaceuticals, and medical equipment. The study results supported the model, showing that psychological safety mediated the relationship between failure-based learning and high-quality relationships. Carmeli (2007) studied organization-level psychological safety; external, internal, and neutral social capital; and failure-based learning. External social capital was defined as specific relationships an employee sustains with others, whereas internal social capital involves the relationships among employees within a network, and neutral social capital integrates the two. He assessed these three variables by surveying 137 members of 33 organizations in Israel in both industrial and government sectors. Both internal and external social capital were positively associated with psychological safety, which therefore enabled failure-based learning.

One organization-level study examined psychological safety's implications for culture change: Cataldo et al. (2009) related organizational context and psychological safety to organizational change, arguing that autonomy and structure must be balanced during a change process to enable flexibility while maintaining employee cohesion. Their single-case study analyzed data from conversations, interviews, and archives from a large financial services firm implementing cultural change related to career development. The findings suggest that employees must feel their psychological status is assured throughout change processes for changes to take hold. **Figure 2** summarizes the relationships described in this stream.

Group-Level Research

Next, we review research at the group level of analysis, which includes studies of direct, mediating, and moderating roles for psychological safety in team learning, innovation, and performance (see **Figure 3**). The study of psychological safety at the group level of analysis originated with research by Edmondson (1996, 1999), which found significant differences in the interpersonal climate of psychological safety between groups within the same organizations. Even within strong shared
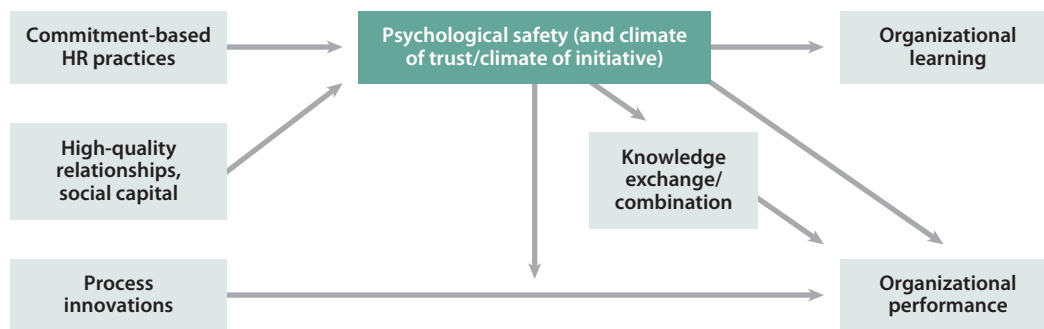

Figure 2

Relationships examined in organizational-level research on psychological safety. Abbreviation: HR, human resources.
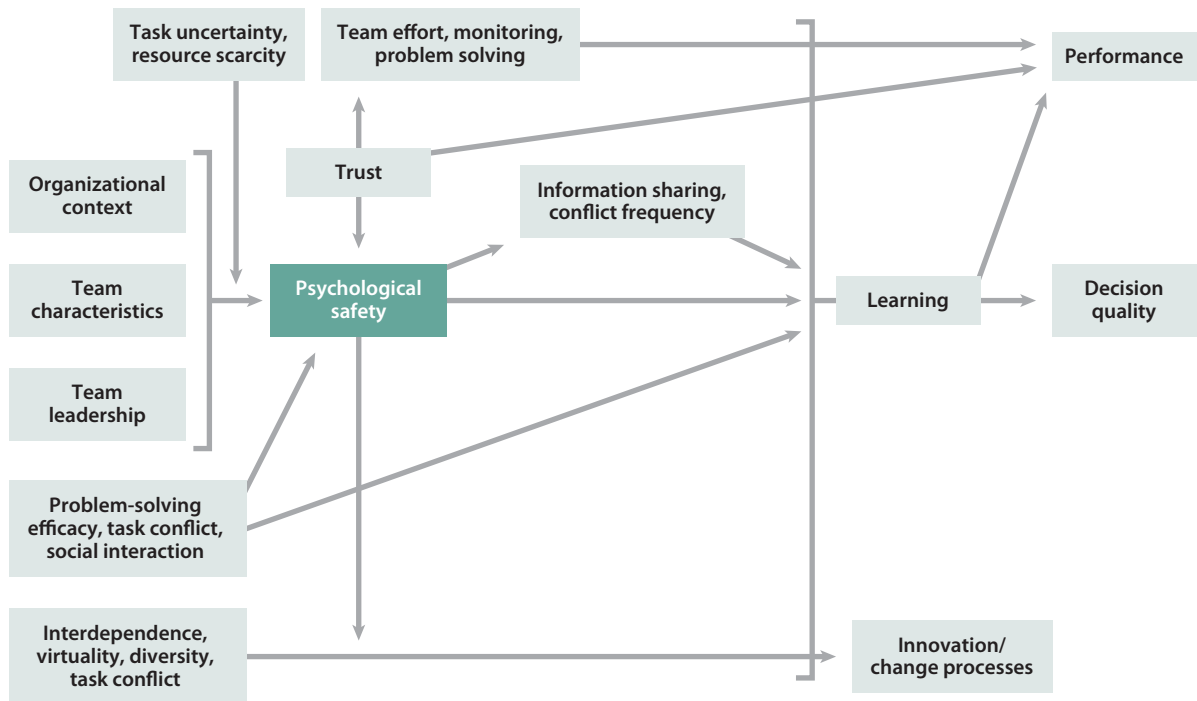
Figure 3

Relationships examined in group-level research on psychological safety.

organizational cultures, the groups studied varied significantly in beliefs related to interpersonal risk (Edmondson 2002, 2003). These findings suggest that psychological safety is essentially a group-level phenomenon. Some of this variance can be attributed to local manager or supervisor behaviors, which convey varying messages about the consequences of taking the interpersonal risks associated with behaviors such as admitting error, asking for help, or speaking up with ideas (e.g., see Edmondson 1996, 2002, 2003).

Psychological safety as an antecedent. At the group level, psychological safety has been shown to correlate with performance, with team learning behaviors usually mediating the relationship (e.g., see Edmondson 1999, a multimethod study discussed below in our review of research presenting psychological safety as a mediator). Four recent studies have explored psychological safety's effects on learning practices in teams. Huang et al. (2008) proposed a model in which psychological safety leads to team performance through team learning. These researchers surveyed 100 members of 60 research and development (R&D) teams of the Industrial Technology Research Institute in Taiwan, measuring psychological safety, team learning, and team performance. Their findings suggest that psychological safety promotes team performance, with team learning mediating the relationship. They also support the conclusion that the ability to communicate openly through experimentation, discussion, and decision making is a determinant of successful team performance.

Tucker et al. (2007) examined psychological safety as a predictor of best practice implementation, examining two types of learning as mediators: learning what and learning how. They studied 23 neonatal intensive care units in 23 hospitals, each seeking to implement improved

patient-care practices. Methods included observations, interviews, and surveys. The survey measured psychological safety, perceived implementation success, level of evidence, and learning activities (learn-what and learn-how) and further inquired about the details of specific projects. The results showed that psychological safety was associated with learn-how, which mediated a relationship between psychological safety and implementation success. In short, psychological safety enabled learning, experimenting, and new practice production. Subsequent research found that those intensive care units with more extensive learning behaviors had lower risk-adjusted mortality rates after two and three years of observation (Nembhard & Tucker 2011).

Choo et al. (2007) studied two suggested pathways through which psychological safety might influence learning and knowledge creation, and therefore performance. Using a web-based questionnaire distributed to 951 team members and total quality management (TQM) so-called "black belt" specialists in 206 projects in a manufacturing firm, the researchers found that psychological safety influenced knowledge created but not learning behaviors, in turn affecting quality improvement. In sum, a psychologically safe environment enables divergent thinking, creativity, and risk taking and motivates engagement in exploratory and exploitative learning, thereby promoting team performance.

A few studies investigated how psychological safety interacts with other predictors of performance. Tucker (2007) studied the prevention of operational failure, predicting that psychological safety, problem solving, and felt responsibility influence frontline system improvement. She surveyed 37 employees from 14 hospital nursing units to measure psychological safety, system improvement, problem-solving efficacy, felt responsibility, and number of operational failures on the prior work shift. In this study, operational failures, such as missing equipment or information, were surprisingly common, and both psychological safety and problem-solving efficacy were associated with improvement behaviors aimed at reducing such failures. In contrast to predicted results, felt responsibility was negatively associated with frontline system improvement. Mu & Gnyawali (2003) similarly studied enablers of team effectiveness, measured as a function of effective communication and the development of knowledge and skills. They examined psychological safety, task conflict, and social interactions as antecedents; the outcomes were synergistic knowledge development and perceived group performance. The study involved 132 senior-level undergraduate business students in a business policy and strategy course in an eastern US school, who completed two group tasks: (a) in-depth analysis and presentation of a business case and (b) a critique of the analysis (conducted by another group). Survey results showed that task conflict negatively affected synergistic knowledge development and that psychological safety moderated these negative effects. That is, when psychological safety was higher, student perceptions of group performance were greater, mitigating the negative effects of conflict on performance. Mu and Gnyawali drew from these results to propose that psychological safety helps students to manage team assignments effectively.

Finally, we include a few recent studies of trust and cooperation as predictors of team learning and effectiveness that explicitly cited and built on psychological safety and research. For example, Tjosvold et al. (2004) studied group learning, cooperation, and problem solving, in a survey of 107 teams from multiple organizations in China. The findings suggest that cooperation within a team promotes a problem-solving orientation, which in turn allows team members and leaders to discuss errors and learn from mistakes. Other related studies investigated climate of trust or interpersonal trust at the group level and found a similar pattern. Although these studies did not use the term psychological safety, the psychological mechanisms underlying the effects of a climate of trust on team learning are likely similar to those proposed for psychological safety. Butler (1999), for example, examined expectations, climate of trust, information exchange, and negotiation effectiveness and efficiency in a survey study of 108 triads (groups of three) comprising

324 practicing managers enrolled in 14 sections of a course in organizational behavior at a university in the southeastern United States. The results showed that information sharing partially mediated a relationship between expectations of trust and climate of trust. Additionally, as trust increased, inefficiency (an outcome) decreased. Climate of trust and information quantity both contributed to negotiating effectiveness. De Jong & Elfring (2010) similarly focused on how trust influences team performance, with a web-based survey measuring trust, team effort, team monitoring, team reflexivity, team effectiveness, and team efficiency from 565 members of 73 teams. The teams were in a tax department of a consultancy firm in the Netherlands. The results showed that trust positively influenced team effort and team monitoring, leading to team effectiveness.

Psychological safety as a mediator. Numerous studies view psychological safety as a mediator of relationships between antecedents, including organizational context, team characteristics, and team leadership, and outcomes of innovation, performance, learning, and improvement in or by a team (e.g., Edmondson 1999). One recent study suggested a more complex picture: Faraj & Yan (2009) proposed that boundary work (boundary spanning, boundary buffering, and boundary reinforcement) predicts psychological safety, which promotes better performance, with the relationship between psychological safety and performance moderated by task uncertainty and resource scarcity. They measured team performance, boundary work, task uncertainty, resource scarcity, and psychological safety using a survey of 290 individuals in 64 software development teams. The results showed that boundary work was positively linked to team psychological safety, and task uncertainty and resource scarcity indeed both moderated this effect. The relationship between boundary work and team psychological safety was positive only under conditions of high task uncertainty and resource scarcity.

Other studies clearly show psychological safety as a mediator between antecedent conditions and outcomes. Team structural features often serve as antecedents of psychological safety's mediating role. Edmondson (1999) proposed a model of team learning in which supportive team structures enable psychological safety, leading to team learning behaviors and team performance. She conducted a multimethod field study of 51 work teams and 496 individuals in a manufacturing company, involving three phases of data collection, including interviews, observations, and surveys, to assess organizational context support, psychological safety, learning, and performance, all at the team level of analysis. The results support the idea that psychological safety mediates between organizational factors and team learning. Further, team learning was associated with team performance, assessed both through team member self-reports and manager and customer ratings. A later qualitative study elaborated the interpersonal processes through which psychological safety enables learning behaviors involving both reflection and action in teams with tasks ranging from strategy formulation to sales to product manufacturing (Edmondson 2002). Nembhard & Edmondson (2006) used survey data to show that role-based status in health-care teams was positively associated with psychological safety, which in turn predicted involvement in learning and quality improvement activities in 23 intensive care units. They further showed that leadership inclusiveness (on the part of ICU leaders) moderated (reduced) the effect of status on psychological safety.

Several recent studies build on these findings. Bunderson & Boumgarden (2010) surveyed 11 production teams along with shift supervisors and engineers from a Fortune 100 high-technology firm and found a significant relationship between team structure and team learning, with psychological safety mediating the relationship. Information sharing and conflict frequency also mediated the significant relationship between psychological safety and learning. Bresman & Zellmer-Bruhn (2012) hypothesized organizational and team structure as an enabler of team learning. They obtained data from 62 self-managed team members and managers in 13 pharmaceutical R&D

units using interviews and surveys to assess internal and external learning, team structure, organizational structure, task autonomy, and psychological safety. As predicted, team structure encouraged internal and external team learning behavior by promoting psychological safety; team structure also moderated the relationship between organizational structure and autonomy, when enabling learning.

Chandrasekaran & Mishra (2012) explored psychological safety and team autonomy as antecedents of team performance. They conducted a web-based survey of 34 R&D groups in 28 high-technology organizations, inviting project leaders and team members to assess project performance, team turnover, psychological safety, team autonomy, relative exploration, exploitation, and project-organization metric alignment. Project-organization metric alignment referred to the alignment of a project's measures to broader organizational goals and measures. The results showed that greater team autonomy was associated with greater psychological safety, when relative exploration (defined as the extent to which exploration goals were emphasized over exploitation goals in a project) and project-organization metric alignment were both low. Most notably, an increase in psychological safety lowered team turnover and improved performance in the R&D groups.

In addition to analyzing organizational and team characteristics, some studies investigate leadership as an important antecedent of trust or psychological safety's mediating effects on learning or performance. For example, Carmeli et al. (2012) proposed that relational leadership improves decision quality, with psychological safety and learning from failures as mediators. They surveyed 237 members of top management teams in Israel from multiple industry sectors, measuring trust, learning from failure, strategic-decision quality, and relational leadership. The findings showed that trust mediated a relationship between CEO relational leadership and team learning from failures. Additionally, learning from failures mediated the relationship between trust and decision quality.

Hirak et al. (2012) investigated leader inclusiveness, psychological safety, and employee learning from failures. Data from three surveys of 55 unit leaders and 224 unit members at a large hospital showed that leader inclusiveness enabled performance, with psychological safety mediating the relationship. Psychological safety also promoted learning from failures, which in turn predicted unit performance. A similar study by Schaubroeck et al. (2011) found that leader behavior influenced trust, leading to potency, psychological safety, and team performance. This study involved 191 employees of Hong Kong and US financial services companies, including bank tellers, relationship managers, salespersons, and loan managers who responded to a survey measuring affect-based trust, cognition-based trust, team potency, psychological safety, transformational leadership, servant leadership, and team performance. The findings suggest that servant leadership influences affect-based trust, which gives rise to psychological safety, and that transformational leadership influences cognition-based trust, leading to team potency. Each pathway also had indirect effects on the other, and each contributed to team performance.

Edmondson et al. (2001) proposed a process model for helping teams learn new routines that alter the interpersonal dynamics in the team. Their qualitative field study included semistructured interviews of 165 operating room team members in 16 hospitals implementing a new minimally invasive cardiac surgery technology, along with patient-level clinical data. The study is unusual in assessing psychological safety through coding of qualitative data, rather than through surveys. Interviewees were asked about their behaviors in real and hypothetical operating room situations, and the researchers ascertained the levels of psychological safety from these responses. Implementation success (determined by the number of new cases conducted, the percentage of cardiac operations in the department using the new approach during the study period, and the trend toward increased, versus decreased, use of the new approach) was associated with a leadership

approach that motivated team members to fully engage in the learning process and to conduct thoughtful practice sessions and early trials to build psychological safety and encourage sharing of insights and concerns through reflection. The authors proposed that psychological safety is important in establishing new routines, particularly those that disrupt status relationships, as may occur in new technology implementation.

Finally, Roussin (2008) investigated effects of leadership, quality of relationships, and a psychologically safe environment on team-performance improvement. Using comparative case-based analysis involving interviews of members of the corporate HR team at a media and publishing company and members of an urban-music rock band, Roussin argued that leaders' use of what he called "dyadic discovery methods" (exploratory discussion sessions among team members and leaders) promoted trust, psychological safety, and team performance (p. 225).

Psychological safety as an outcome. Edmondson & Mogelof (2005) investigated antecedents of psychological safety at three levels of analysis (organizational resources, team member and leader interactions, team goal clarity, and personality differences) with an unusually comprehensive data set. With longitudinal survey data collected from 26 innovation teams in seven companies, the authors found that psychological safety differed significantly across teams within the same organization and also differed across organizations. The only personality variable associated with psychological safety was neuroticism; individuals with higher neuroticism reported lower psychological safety.

Psychological safety as a moderator. As described above, psychological safety has frequently been conceptualized in the literature as having a main or mediating effect in explaining team outcomes; yet, the construct may turn out to play a more important role as a moderator (B. Sanner & B. Bunderson, unpublished manuscript). First, recent studies show mixed support for the effects of psychological safety on team learning and innovation, suggesting the need for attention to potential boundary conditions of these relationships (Edmondson 2004). Psychological safety may moderate relationships between antecedents such as goal clarity or need for learning, and learning or performance outcomes (Burke et al. 2006, Edmondson 2004; B. Sanner & B. Bunderson, unpublished manuscript). Second, recent research emphasizes the moderation effects of psychological safety (e.g., Bradley et al. 2012, Caruso & Woolley 2008, Gibson & Gibbs 2006, Kirkman et al. 2013, Leroy et al. 2012). This work investigates how psychological safety moderates the relationship between (*a*) team diversity and (*b*) team innovation and performance, by making it easier for teams to leverage the benefits of diversity through more open conversations and more respectful, engaged interactions. Caruso & Woolley (2008), for example, developed a conceptual model outlining how structural interdependence and emergent interdependence influence collaboration and effective performance, emphasizing psychological safety as a climate conducive to recognizing and utilizing interdependence within the team.

In two studies investigating virtuality in geographically dispersed teams, Gibson & Gibbs (2006) examined the role of a psychologically safe communication climate in teams with geographic dispersion, electronic dependence, dynamic structure, and national diversity. They conducted interviews with 177 members of 14 teams from different organizations, functional areas, industries, and nations; their qualitative analysis of these data revealed negative main effects of geographic dispersion, electronic dependence, and national diversity on innovation and showed that a psychologically safe communication climate can mitigate these negative effects. Gibson and Gibbs then tested their hypotheses in a follow-up online survey with 266 individuals in 56 engineering project teams designing state-of-the-art military aircraft. Results confirmed the negative main effects of the four virtuality dimensions on team innovation and the moderating effects of psychological safety with respect to these negative relationships.

Martins et al. (2013) examined moderating roles of team psychological safety and of re-lationship conflict to explain the conflicting effects of two forms of cognitive diversity—expertise diversity (akin to breadth of expertise) and expertness diversity (akin to depth of expertise)—on team performance. Analysis of survey data collected from 736 students in 196 teams in an in-formation technology course at a large French university showed that, when team psychological safety was low, the relationship between expertise diversity and team performance was negative, suggesting a harmful effect of lower psychological safety with high expertise diversity. By contrast, the relationship between expertness diversity and team performance was positive when team psychological safety was high. The researchers proposed that psychological safety might have different effects depending on the type of diversity or the nature of the task.

Interested in exploring contingency factors that might alter the strength of the relationship between national diversity and performance for groups called organizational communities of practice (OCoPs), Kirkman and colleagues (2013) investigated psychological safety and communication media richness. The authors collected survey data from over 200 members of 30 global OCoPs in a Fortune 100 multinational mining and minerals processing firm with over 300 facilities in 44 countries that had implemented formal global OCoPs. The results showed a curvilinear relationship between national diversity and OCoP performance, which was moderated by psychological safety and use of rich communication media. Psychological safety strengthened the positive relationship between nationality diversity and performance for OCoPs with higher national diversity but weakened the negative relationship between the two variables at lower levels of diversity.

Leroy and colleagues (2012) investigated the challenge of leaders enforcing safety protocols while encouraging employee error reporting. They used a two-stage survey study with 54 nursing teams consisting of 580 individuals in four Belgian hospitals. Their analysis suggested that a team priority of safety and team psychological safety both mediated the relationship between reported treatment errors and leader behavioral integrity related to safety. The relationship between team priority of safety and number of errors was stronger for higher levels of team psychological safety, suggesting that adherence to safety procedures reflect a genuine concern for safety, when employees feel safe to speak up about errors.

Using undergraduate student teams at a Midwestern university in the United States, Bradley et al. (2012) examined team psychological safety as a condition under which task conflict will improve team performance. The researchers collected survey data from 561 undergraduate students randomly assigned to 117 five-person teams, measuring psychological safety, task conflicts, and team performance. Analysis showed that a climate of psychological safety helps exploit task conflict to improve team performance, enabling creative ideas and critical discussion, without embarrassment or excessive personal conflict between team members. Together, these studies emphasize the enabling effects of psychological safety on learning, innovation, and performance and strongly support the need to develop a better understanding of the moderating role played by psychological safety in teams.

Boundary conditions of psychological safety. The studies of psychological safety as a moderator in explaining team learning and performance suggest potential boundary conditions for when psychological safety is particularly helpful. For example, Edmondson (2004) suggested that psychological safety may vary based on team contextual characteristics such as size, virtuality, and complexity. Moreover, psychological safety may not help teams learn when certain conditions supporting teamwork, such as task interdependence, are missing. A particularly systematic review examined conditions that enable or hinder psychological safety's positive effects in a meta-analysis of 39 studies (36 papers) that quantitatively measured psychological safety, team learning, and performance, involving 14,139 people on 2,915 teams (B. Sanner & B. Bunderson, unpublished

manuscript). The authors found that, whereas the relationship between psychological safety and learning was mostly positive in the literature (consistent with a main-effects model), the magnitude of that relationship varied across studies. Moreover, the direct relationship between safety and learning and the indirect relationship between safety and performance (mediated by learning) were stronger in studies conducted in environments that more strongly motivated learning. Kostopoulos & Bozionelos (2011) studied two kinds of learning behaviors—exploration and exploitation—to support a model in which task conflict moderates the relationship between (*a*) psychological safety and (*b*) team learning and team performance. They surveyed over 600 members of 142 innovation project teams in the information technology and pharmaceutical sectors. The results showed that psychological safety promoted exploratory and exploitative learning and team performance, an effect that was enhanced by task conflict.

As this recent work emphasizes, psychological safety alone may not lead to team learning and performance but rather requires the presence of conditions that call for learning and communication. **Figure 3** summarizes the key findings in the group-level stream.

DISCUSSION

In this section, we reflect on the implications of our review of the psychological safety literature, highlighting both cumulative knowledge and opportunities for further research. In particular, we identify dominant consistent relationships in the empirical research, especially those that transcend levels of analysis; discuss limitations of the current literature; and propose directions for future research.

Consistent Relationships Across Studies

Psychological safety has been a topic of considerable interest and activity over the past two decades in the fields of management, organizational behavior, social psychology, and health-care management. Evidence from empirical studies conducted in diverse organizational and industrial contexts, across multiple countries and regions (e.g., the United States, Israel, Taiwan), supports the idea that psychological safety matters greatly for workplace effectiveness, and suggests a surprising level of generalizability of the research findings. Overall, our review of this work has given rise to at least three key insights.

First, in the numerous studies that have investigated the relationship, psychological safety has consistently been shown to play a role in enabling performance. We note that this relationship between psychological safety and effective performance is theoretically logical, particularly when there is uncertainty and a need for either creativity or collaboration to accomplish the work. Without elements of uncertainty or collaboration, the need to confront and overcome interpersonal risk is simply less salient, and thus the presence of psychological safety should have less theoretical weight. This logic leads naturally to our second insight.

Second, psychological safety is particularly relevant for understanding organizational learning—a statement that holds true across levels of analysis (individual, group, and organization), as elaborated below. Much learning in today's organizations takes place in the interpersonal interactions between highly interdependent members (Edmondson 2004), and learning behaviors can be limited by individual concerns about interpersonal risks or consequences, including a fear of not achieving one's goals and learning anxiety created by feelings of incompetence that occur during learning (Schein 1996). Overall, the research provides considerable support for the idea that a climate of psychological safety can mitigate the interpersonal risks inherent in learning in hierarchies. People are more likely to offer ideas, admit mistakes, ask for help, or provide feedback if they believe it is safe to do so. With growing numbers of collaborative relationships and complex

interdependencies in the workplace, psychological safety is likely to remain an important factor for learning and performance well into the future. Indeed, the common findings across the large set of studies reviewed (especially at the group level) consistently support a relationship between psychological safety and learning. A recent meta-analysis on the relationship between psychological safety and team learning provides additional support for this claim (B. Sanner & B. Bunderson, unpublished manuscript).

Third, studies show that individuals who experience greater psychological safety are more likely to speak up at work. Upward communication can be a vital force in helping contemporary organizations learn and succeed; by speaking up to those who occupy positions to authorize actions, employees can help challenge the status quo, identify problems or opportunities for improvement, and offer ideas to improve their organizations' well-being. Yet, extensive research has shown that voice in such situations can feel risky (e.g., Burris et al. 2008, Nembhard & Edmondson 2006). The research on psychological safety thus suggests that mitigating this risk is possible.

Similarities and Differences Across Levels of Analysis

Overall, the similarities in essential findings across levels of analysis are striking. Most notably, psychological safety is associated with learning—at all three levels. The interpersonal experience of psychological safety is argued to be foundational for enabling behaviors essential to learning and change, whether the entity that needs to change is a person, a team, or a company. Indeed, this relationship is at the very core of why the construct has maintained a high level of research attention over the years; it's because of the importance of learning in a complex and fast-changing world. Another consistency across levels is attention to performance as a dependent variable. In addition to the individual-level research just noted, both the organizational- and group-level areas of research identify clear and significant relationships between psychological safety and performance, using aggregated response data. Both also emphasize conceptual and empirical connections to collective learning processes.

One difference in emphasis at the individual level, compared with the other two, is a focus on outcomes related to growth and satisfaction (i.e., job engagement and organizational commitment) in addition to performance (e.g., quality internal auditing and creative work involvement). Moreover, only individual-level research makes a distinction between in-role and extra-role behaviors—those activities that are expected in a job but not always delivered consistently versus those that are contributed voluntarily by people for the good of the collective. This is a distinction that is not a part of the discussion of psychological safety at the collective levels of analysis.

Finally, despite the predominance of similarities across levels, only the group-level research explicitly argues that the group is the appropriate level of analysis at which to conceptualize and measure psychological safety. Starting with Edmondson (1999), studies have found statistically significant variance in psychological safety between groups within organizations; that is, people working closely together tend to have similar perceptions of psychological safety, which vary across groups within the same organization. This body of work thereby supports the idea that psychological safety in organizational life can best be considered a phenomenon that lives at the group level.

Directions for Future Research

Although existing research has shed light on the challenges and opportunities underlying collaboration and innovation in organizations, additional research is needed to expand our understanding of how psychological safety works. We propose several theoretical and methodological issues for further attention.

We believe that the field will benefit from pursuing a dynamic view of psychological safety. Contemporary work arrangements are linked to external and internal contexts that set the pace of dynamic cycles of performance activities that often must change over time. This dynamic view of work has important implications for the study of psychological safety, which also may evolve and shift over time. Much of the literature on psychological safety provides relatively little insight regarding how psychological safety unfolds and builds, or lessens, or even is destroyed. It seems reasonable to assert the likelihood of an asymmetry, in which psychological safety takes time to build, through familiarity and positive responses to displays of vulnerability and other interpersonally risky actions, but can be destroyed in an instant through a negative response to an act of vulnerability. Researchers may wish to examine the dynamic nature of and influences on psychological safety in future work.

Future research should also test potential boundary conditions for the effects of psychological safety. Although psychological safety has often been presented as a predictor of learning outcomes, it also interacts with other variables to alter predicted relationships. A particularly noteworthy example is found in Siemsen et al.'s (2009) study, in which psychological safety's impact on knowledge sharing was lower when individuals had more confidence in the knowledge to be shared. Another group convincingly showed that the relationship between psychological safety and learning (and also performance) was stronger when the work was more uncertain and more dependent on learning (B. Sanner & B. Bunderson, unpublished manuscript). Additionally, consideration of other salient factors related to team learning suggests potential boundary conditions. For example, fluid groupings of 200 or more people collaborating in shifting subgroups on a large-scale project will have different needs for and norms related to psychological safety than will a stable small team of five with a relatively predictable task. Similarly, the role of psychological safety in multinational, distributed, or virtual teams may be different than that in the more bounded and local surgery, nursing, and new-product-development teams typically studied in the articles we reviewed.

In a related vein, cross-cultural comparisons, across both countries and industries, of the effects of psychological safety on performance outcomes, as well as of underlying mechanisms explaining these effects, warrant future research. Employees in certain cultures may be particularly hesitant to ask questions, provide feedback, or openly disagree with superiors, because these behaviors are considered impolite or to cause a loss of face. We suggest that work on the boundary conditions of psychological safety remains underdeveloped and that a contingent model of psychological safety may be worth pursuing for understanding the essential collaborative and innovative activities that fuel today's fast-paced organizations.

Methodologically, further research is needed to enhance the credibility and generalization of current findings. Establishing agreement about the most consistent and accurate measures of psychological safety may be an important starting point. By far, the most commonly used measure is a seven-item scale originally developed by Edmondson (1999). In general, that scale demonstrates good psychometric properties; however, some organizational researchers have used different measurement approaches (e.g., Gibson & Gibbs 2006, Liang et al. 2012). Some of the measures in these studies are inconsistent with the most common definition of psychological safety (e.g., that found in Edmondson 1999), which raises concerns about content validity. Additionally, although a number of researchers have begun to investigate psychological safety in non-English speaking countries (e.g., Taiwan and Germany), most current studies are conducted in English-speaking countries. We may be able to further validate the construct of psychological safety on samples that include more than one type of team, more than one type of organization, and/or more than one country.

A second methodological concern is that most of the research on psychological safety has been based on cross-sectional survey studies, which preclude confident conclusions about causality.

Although several studies collected survey data in multiple waves (e.g., Carmeli & Gittell 2009, Edmondson & Mogelof 2005, Walumbwa & Schaubroeck 2009), allowing greater confidence in causal claims, few studies examine psychological safety dynamics over time. Overall, more longitudinal research will allow a better assessment of cause and effect and also permit an examination of changes in psychological safety. In this way, we can begin to gain a more dynamic perspective of the phenomena related to this important interpersonal construct. For example, it is likely that the consequences of sufficient psychological safety at one point in time promote learning at that time only. It is also possible that the effects of psychological safety become less pronounced over time as people become too comfortable with each other and spend inappropriate amounts of time in casual conversations, rather than emphasizing the work and engaging in learning to drive performance forward.

We also propose that multilevel and cross-level research is needed to systematically understand psychological safety. Although prior research encompasses multiple levels of analysis, studies have not attempted to understand how phenomena at different levels of analysis interact (Hackman 2003). Recent work (e.g., Walumbwa & Schaubroeck 2009) has shown that individual- and group-level factors combine to impact psychological safety and learning behaviors (e.g., voice). Therefore, a focus on just one level is likely to provide an incomplete, or even inaccurate, understanding. Accordingly, we encourage researchers to consider how individual-level and contextual (i.e., group- or organization-level) predictors work in concert to create the conditions leading to and inhibiting psychological safety and learning in organizations.

Finally, we recommend hybrid methods that mix qualitative and quantitative data from both field studies and laboratory research and thereby shed light on experiences and causal relationships simultaneously (e.g., Edmondson 1999). Field observations capture complexity and relevance of social phenomena such as psychological safety, but they lack precision and control in inferring causality. Laboratory studies can create control and thus provide general predictions, but they offer a limited approximation of real-world conditions. These complementary strengths and weakness thus recommend the use of multiple methods to triangulate across different assessments in future psychological safety research (Edmondson & McManus 2007).

Implications for Practice

Working collaboratively is an integral part of organization life, but it often proves more interpersonally difficult than anticipated. One of the most fundamental challenges organizations face is how to manage the interpersonal threats inherent in employees admitting ignorance or uncertainty, voicing concerns and opinions, or simply being different. These threats are subtle but powerful, and they inhibit organizational learning. For people to feel comfortable speaking up with ideas or questions—an essential aspect of organizational learning—without fear of ridicule or punishment, managers must work to create a climate of psychological safety. Otherwise, interpersonal risk is a powerful force that makes effective collaboration less likely to occur, particularly when the work is characterized by uncertainty and complexity.

One practical takeaway from the literature on psychological safety is that this positive interpersonal climate, which is conducive to learning and performance under uncertainty, does not emerge naturally. Even when employees are embedded in an organization with a strong culture, their perceptions of feeling safe to speak up, ask for help, or provide feedback tend to vary from department to department, and team to team (Edmondson 2003). Some of this variance can be attributed to the behaviors of local managers and supervisors, whose different styles and behaviors convey very different messages about the consequences of taking the interpersonal risks associated with willingly contributing (e.g., see Edmondson 1996, 2003). Although departments and teams

may benefit from the variety of manager personality and styles, savvy managers should not underestimate the extent of congruent communication and intentional intervention required for psychological safety to be consistently effective.

The burden of collaborating and learning does not lie solely with managers. Employees can help by taking specific actions that differ in important ways from conventional wisdom about ideal employee behavior. For example, most managers would naturally value an employee who fixes problems she encounters without bothering managers or colleagues, that is, without speaking up, asking for help, or questioning how and why the problem occurred in the first place. Tucker & Edmondson (2003) called this first-order learning behavior, noting that it allows the work to continue but precludes organizational learning. They argued that, from an organizational learning perspective, this valued behavior is potentially more harmful than helpful. First, the problem may have a cause that lies in another part of the organization, and only through communication and collaboration can that cause be identified and altered. Second, the employee's colleagues may face similar problems, and the employee's self-sufficient, independent actions preclude their learning from her experience and hence inhibit the organization's learning. By contrast, organizations in which managers value the employee who speaks up, questions existing practices, and suggests new ideas are better able to improve and learn. Because these behaviors are interpersonally risky, psychological safety is needed to enable them.

Of course, psychological safety is not a panacea for addressing all of the challenges of organizational collaboration and learning. Rather, an interpersonal climate of safety must be combined with other essential ingredients (e.g., strategy, vision, goals, supportive leadership, and so on) to best enable learning and performance. Moreover, despite its consistent positive influence, psychological safety may have negative effects as well. Excessive psychological safety may send

Table 1 Summary of future research directions and implications for practice

	Summary
Theoretical opportunities	A dynamic view of psychological safety to provide insights about how psychological safety unfolds and builds, or weakens, or is destroyed.
	Research to investigate the potential boundary conditions for effects of psychological safety on group and organizational outcomes.
	Cross-cultural comparisons of relationships between psychological safety and performance outcomes, as well as comparisons of underlying mechanisms.
Methodological challenges	Consistent and accurate measures of the construct of psychological safety.
	Longitudinal research that allows both a better assessment of cause and effect and an examination of changes in psychological safety over time.
	Multilevel and cross-level research on psychological safety.
	Hybrid methods that mix qualitative and quantitative data, as well as studies that blend field and laboratory research to illuminate the phenomena and assess causality simultaneously.
Practical implications	Managers must create a climate of psychological safety to mitigate interpersonal risks and make collaboration more likely, particularly in face of uncertainty, complexity, and interdependence.
	Managers should not underestimate the importance of congruent communication and deliberate interventions to build and maintain psychological safety, and they should allow it to facilitate performance.
	Employees can help through their willingness to speak up and challenge the status quo. At the same time, managers must learn to value employees who engage in such behaviors, even though they may instinctively prefer employee silence and agreement with the status quo.
	An interpersonal climate of safety, combined with other essential ingredients (e.g., strategy, vision, goals, supportive leadership, and so on), enables learning and performance.

people down a path of wasting valuable time on unimportant things or a path of losing the motivation to really learn. Managers need to work to achieve a balance of encouraging open communication related to the task at hand and providing constructive feedback to limit irrelevant questions, comments, or discussions. Organizations may fare well when managers set high standards and send the right message about these standards and the nature of the work. **Table 1** summarizes our key points about future research and practical implications.

CONCLUSION

Over the past six decades, organizational behavior research has generated an informative body of studies that establish the vital role of psychological safety in organizational life. Spanning levels of analysis, industries, and nations, these studies shed light on the human need to feel safe at work in order to grow, learn, contribute, and perform effectively in a rapidly changing world. Nonetheless, important questions remain, and it is our hope that this article will help researchers pursue exciting and useful avenues of investigation within this topic for years to come.

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