Slacking Off in Comfort: A Dual-Pathway Model for Psychological Safety Climate

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ABSTRACT

Research on psychological safety climate has primarily focused on its salutary effects on group risk-taking behaviors. We developed a group-level dual-pathway model in which psychological safety climate also exerts a simultaneous negative effect on risk-taking behaviors by diminishing group average work motivation. In a field survey, we found that psychological safety climate was positively related to group learning behavior and voice through a reduction in group average fear of failure but negatively related to them through a reduction in group average work motivation. This dual-pathway model and its mechanisms were conceptually replicated in a laboratory experiment with group creativity as a different risk-taking behavior. In this experiment, we examined the moderating effects of group individualism/collectivism and found that psychological safety climate increased the originality and flexibility dimensions of group creativity through a reduction in group average fear of failure only in groups with a collectivistic orientation and reduced the fluency dimension of and time spent on creativity through a reduction in group average work motivation only in individualistic groups.

SLACKING OFF IN COMFORT: A DUAL-PATHWAY MODEL FOR PSYCHOLOGICAL SAFETY CLIMATE

Edmondson's (1999) seminal work on psychological safety climate[1] as a shared belief in the safety of the group environment has stimulated extensive research on its effects on behavioral outcomes bearing some degree of risk. Functioning as a cushion for failure in groups (Edmondson, 2003a), psychological safety climate promotes such positive risk-taking behaviors as group voice (Liang, Farh, & Farh, 2012), group learning behavior (e.g., Carmeli & Gittell, 2009), and creative performance (e.g., Kark & Carmeli, 2009). These behaviors are regarded as risky because "people must take action without knowing whether things will work out as expected" (Edmondson, 2003a: 255). This uncertainty introduces a possibility of failure that is potentially harmful for their social image (Edmondson, 2003a) and thus provokes feelings of anxiety and fear in a group (i.e., fear of failure; an anticipated negative affect induced by a possible failure outcome; Hagtvet and Benson, 1997). The facilitative role of psychological safety climate in reducing such fear of failure within groups is widely recognized, and many studies have recommended that managers establish a psychologically safe climate (e.g., Carmeli & Gittell, 2009; Garvin, Edmondson, & Gino, 2008).

Although the benefits of a psychologically safe climate in which people are comfortable being themselves (Edmondson, 2004) are widely recognized, researchers have reported its nonsignificant effects on learning behavior (e.g., Choo, Linderman, & Schroeder, 2007), improvement from failure or change (e.g., Wilkens & London, 2006), and other types of performance (e.g., Faraj & Yan, 2009). There may be multiple reasons for these null findings. One interesting possibility is that psychological safety climate may not be entirely beneficial and that a concomitant negative effect may offset its positive effect. Edmondson (2004: 264) alluded to this when she noted that "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" and that psychological safety climate may dampen the level of overall work motivation in groups because individual members may lack the

edge to drive themselves forward. Bstieler and Hemmert (2010) speculated that psychological safety climate, as a comfortable work environment, may cause procrastination. Thus, the processes underlying the effects of psychological safety may be more complicated than previously assumed, and a negative effect may operate in parallel to its positive influence on risk-taking behaviors. This intriguing possibility has not been systematically examined, a gap that limits the development of psychological safety theory and its effective application in the real world.

Drawing from an accountability perspective (Lerner & Tetlock, 1999), the present research develops a dual-pathway model of psychological safety climate in which a negative mechanism operates side by side with the well-known positive mechanism. This perspective suggests that when people are aware that their behavior may be evaluated, judged, or criticized, they tend to be more cautious and risk averse because they fear that a failure will hurt their self-esteem and social image (Schlenker, 1986; Weigold & Schlenker, 1991). In line with this logic, psychological safety climate tends to alleviate "excessive concerns about others' reactions to actions that have the potential for embarrassment or threat" (Edmondson, 1999: 355) and shield members from "socially penalizing failure" (Edmondson, 2003a: 266). However, we propose that such a comfortable socio-emotional group context is likely to engender two opposite mechanisms that influence group outcomes. First, psychological safety climate reduces group members' fear of the negative consequences associated with a possible failure and thus promotes collective risk-taking behaviors. Second, it also reduces members' work motivation because people tend to exert less effort when they do not feel accountable or that they are being monitored by others (Latane, Williams, & Harkin, 1979; Mero & Motowidlo, 1995), thereby impairing risk-taking performance (Wallace, Johnson, Mathe, & Paul, 2011).

Although work motivation and fear of failure largely arise from differences between individuals in the baselines of conscientiousness and fear (Colquitt & Simmering, 1998; Lerner & Keltner, 2001), psychological safety climate should, on the basis of the above theoretical reasoning, be able to impact individuals' preexisting levels of these characteristics and, in their summation, the

average levels at which individuals within a group feel motivated and fearful of failure. Therefore, we suggest that the *group-level averages* of both work motivation and fear of failure are critical mechanisms that underlie the positive and negative effects of psychological safety climate on group risk-taking behaviors, respectively. Like other important behaviors, organizationally desired risk-taking behaviors (e.g., voice, learning, and innovation) entail both willingness to perform and perseverance (cf. Vancouver, Weinhardt, & Schmidt, 2010).

This dual-pathway perspective on psychological safety climate raises a question of significant theoretical and practical importance: under what circumstances is each mechanism operative? Following the accountability perspective, we argue that factors that increase a group's need for a psychologically safe environment should accentuate the positive pathway because such a climate has a stronger appeal to group members. By contrast, factors that reduce members' obligations to their group should exacerbate the negative pathway because commitment to striving for group goals is further dampened. One theoretical framework that captures both types of moderating effects is a group's individualism/collectivism orientation (e.g., Chatman, Polzer, Barsade, & Neale, 1998; Dierdorff, Bell, & Belohlav, 2011) because this construct involves both worry about negative interpersonal dynamics among group members and felt obligations to the group (Earley, 1989; Erez & Somech, 1996). An examination of the moderating effects of group individualism/collectivism provides a simple but compelling demonstration of the distinctiveness of the two opposite pathways for psychological safety climate and validates the proposed mechanisms (cf. Spencer, Zanna, & Fong, 2005). The conceptual model for the current research is depicted in Figure 1.

Insert Figure 1 about here

Our research makes important contributions to the literature. First, our work provides a fuller understanding of the effects of psychological safety by going beyond the traditional view that it is always desirable. Demonstrating both positive and negative consequences, the current paper advances a novel, integrated view of psychological safety theory, showing the complexity of this

construct that has hitherto not been delineated. Second, by adopting the accountability perspective, we contribute to theory by identifying fear of failure and work motivation as two mechanisms that explain the differential effects of psychological safety climate. Third, our research responds to Edmondson's (2004) call for research investigating the boundary conditions of psychological safety climate and demonstrating the specific conditions in which its positive impact is enhanced and its detrimental effect reduced. A psychological safety theory that takes into account underlying processes and situational contingencies is especially important for real-world applications, providing important insights into *how* and *under what circumstances* managers can effectively use this group climate.

OVERVIEW OF STUDIES AND CONTEXTS

We follow Kozlowski and Bell (2003) and broadly define work groups as sets of two or more people who share responsibility for common outcomes and interact with various levels of interdependence (Sundstrom, De Meuse, & Futrell, 1990). With a focus on work groups as the unit of analysis, we tested our model in two group-level studies that complemented each other. In Study 1, we conducted a field survey with real work groups to establish the basic dual-pathway model of psychological safety climate by casting group average fear of failure and work motivation as opposing mediators for its effects on such risk-taking behaviors as group learning behavior and group voice. In Study 2, we conducted a laboratory experiment with student groups to conceptually replicate Study 1 with group creativity as a different risk-taking behavior. We also examined the moderating effects of group individualism/collectivism on the two pathways of psychological safety climate. Both studies provided suitable contexts for testing the dual-pathway effects of psychological safety climate because, as Edmondson stated, "the core of the [psychological safety] model concerns people taking action *in the presence of others*, and the salience of interpersonal threat should hold across settings" (1999: 357). Our research design satisfied this core condition because the groups in both studies were expected to work with others for a common goal, thus raising concerns about

others' reactions to a possible failure and driving psychological safety to function (Edmondson, 1999). Due to the differences in the nature of tasks, goals, and outcome allocation, interdependence may vary across work groups (e.g., Gully, Incalcaterra, Joshi, & Beaubien, 2002; Katz-Navon & Erez, 2005; Van der Vegt, Emans, & Van de Vliert, 2001). The work groups in our research, particularly in the experiment, might have been less interdependent than others, but our findings should still be pertinent because the proposed functioning mechanism is not closely tied to high levels of interdependence.

STUDY 1

THEORY AND HYPOTHESES DEVELOPMENT

The Positive Pathway through Reduced Group Average Fear of Failure

The group environment may sensitize members to the interpersonal cost of failure, discouraging them from behaviors that harm their social image (Edmondson, 2003a). This concern leads them to weigh the consequences of failure or mistakes before engaging in a certain course of action (Schein, 1996a; 1996b). This reasoning is consistent with the tenet of the accountability perspective that social pressure arising from anticipated scrutiny, judgment, and sanction evokes a self-protection tendency (Weigold & Schlenker, 1991). People tend to be cautious, conforming, and defensive when they feel that their behavior may be evaluated and judged by others (Schlenker, 1986; Tetlock, 1983) because they fear that any failure by them may lead to open criticism and punishment. This fear of failure triggered by potential social evaluation from other group members causes people to refrain from taking risks in a group. Psychological safety climate, however, provides reassurance that mistakes and failed attempts have minor or no consequences on social image (Edmondson, 2004), thus reducing fear of failure. A climate of psychological safety reduces the overall evaluative pressure from group members and hence the average level of fear of failure within the group. To set the stage for hypothesizing the positive pathway, we propose the following:

Hypothesis 1: Psychological safety climate is negatively related to group average fear of failure.

As an avoidance motive, fear of failure is a fundamental barrier to change behavior (Schein, 1996a) and discourages risk-taking endeavors that may damage social image (Hagtvet & Benson, 1997). We focus on two group risk-taking behaviors as outcome variables in this study, namely group voice and group learning behavior. Group voice is a collective risk-taking behavior from group members to challenge the status quo with the intent of improving a situation (Detert & Burris, 2007). Group learning behavior consists of activities carried out by group members in order to obtain and process data that allow the group to adapt and improve (Edmondson, 1999: 351). Although both types of behaviors are change oriented and share some similarity (Edmondson, 2004; LePine & Van Dyne, 2001), voice primarily focuses on speaking up whereas learning behavior emphasizes absorbing new knowledge and detecting new opportunities to adapt. We attempt to cross-validate our model by using two interrelated outcomes.

As a change-oriented initiative, voice in a group may later prove to be wrong, and then the voicers may be considered incompetent and disruptive. Research has suggested that self-censorship of voice is likely when fear of failure is salient (Detert & Edmondson, 2007) and that only when group members are free of such fear are the costs of speaking up minimized and the willingness to voice increased (Liang et al., 2012). When overall fear of failure is low in a group, the benefits of voice outweigh the costs, leading to more voice behavior from group members. Similarly, group average fear of failure inhibits group learning behavior. Learning behavior involves seeking help, admitting mistakes, and the probability of failures, all of which can hurt social image (Edmondson, 2003a). Furthermore, a salient feature of group learning behavior is that it consumes time without the assurance of success (Edmondson, 1999). It may be viewed as a waste of time by others and become a source of negative evaluation and threat for learners. The removal of such fear from group members is therefore crucial for group learning behavior to take place. All in all, we establish that

psychological safety climate reduces group average fear of failure and that the reduction in such fear among members encourages group voice and learning behavior. Group average fear of failure thus serves as an intermediate variable that mediates the effects of psychological safety climate on these two outcome variables. While this mediated path has been mentioned in the literature, it has yet to be empirically demonstrated (Edmondson, 1999; Schein, 1996a). We include this pathway in our model to corroborate this account and to provide a contrast with the more novel negative pathway.

Hypothesis 2: Psychological safety climate is indirectly and positively related to (a) group voice and (b) group learning behavior through group average fear of failure.

The Novel Negative Pathway through Reduced Group Average Work Motivation

Intuitively, it is not obvious why the presence of psychological safety climate may thwart work motivation in groups. The accountability perspective points to exactly such an intriguing postulation, namely that psychological safety climate induces slacking off among group members. The accountability literature has clearly shown that evaluation by a salient audience and the likelihood of sanction are critical to the sustenance of effort in goal striving; a lack of evaluative pressure, by contrast, is a major cause of effort loss in a group (Hall et al., 2006; Latane et al., 1979). Group members are less likely to exert effort to contribute to the group when they feel free of social monitoring (Karau & Williams, 1993). However, when group members are held responsible for their effort and anticipate being judged and sanctioned for low performance, motivation loss disappears (Comer, 1995), a phenomenon that has been consistently demonstrated in the literature (e.g., Lerner & Tetlock, 1999; Schlenker, 1986; Weldon & Gargano, 1988).

In a group context, social evaluation and monitoring by group members constitute a source of accountability that motivates effort exertion (Weldon & Gargano, 1988). The construct definition of psychological safety climate suggests a reduced concern for performance outcomes because of the perceived tolerance of mistakes and failures (Edmondson, 1999). When group members do not feel held accountable for their performance, they may experience less social pressure to work hard (Green,

Visser, & Tetlock, 2000). As a result, individual members in groups are likely to slack off in pursuit of group success and be less motivated as a unit to accomplish common goals. Consistent with our theorizing, Langfred (2004) found that groups with a high level of trust show low performance because of less monitoring among group members. Trust is an important facilitator of psychological safety climate (Edmondson, 2004), and the same process may explain why psychological safety climate also suppresses group effort exertion. In addition, psychological safety climate is characterized by easy access to help, which encourages the tendency to shirk responsibility. Motivation loss in a group task occurs when individuals share responsibility with others (Comer, 1995; Petty, Harkins, & Williams, 1980). Indeed, group members have been found to reduce their effort and depend on others when there is easy access to backup (Barnes et al., 2008; Geller & Bamberger, 2011). When members within a group, on average, have such shirking tendencies, it is difficult to convert individual efforts into group collaborative energy and resources, thus aggravating the loss of motivation in the group as a whole (Geen, 1999; Karau & Williams, 1993). In short, the supportive and forgiving nature of psychological safety climate shields group members from social evaluation and weakens members' overall work motivation. Therefore, we argue that psychological safety climate is likely to cause lower average level work motivation in groups.

Hypothesis 3: Psychological safety climate is negatively related to group average work motivation.

A major indicator of group average work motivation is the collective amount of time and effort that group members put into their tasks (Barling, Kelloway, & Cheung, 1996); this is our approach in the present study. Task achievement depends on the time and energy invested (Blau, 1993; Geller & Bamberger, 2011), and group risk-taking behaviors are no exception. In fact, risk-taking behaviors in organizations are effortful and necessitate persistence and perseverance, as manifested in the time and effort spent on them. Specifically, group voice can entail considerable contemplation and effort from group members as they have to reflect on the status quo, scan or

search the environment for information, and integrate different ideas to come up with comments and suggestions. Researchers have started to recognize the importance of effort for speaking up in a group. For example, Edmondson (2003b) argued that to encourage speaking up, a compelling rationale is important because it motivates strenuous effort indispensable for this group behavior. Similarly, group learning behavior also requires effort. Many processes of group learning behavior require significant effort from members (Edmondson, 2004), such as reflecting on problems, detecting and analyzing failures, discussing with group members, searching for information, and practicing for skill acquisition and retention. To summarize, both group voice and learning behavior require a significant investment of effort from all members, and they are less likely to be enacted in groups with a lower average level of work motivation.

We establish the negative relationship between psychological safety climate and group average work motivation and the positive associations of group average work motivation with group voice and learning behavior. Taken together, we propose that group average work motivation mediates the negative effects of psychological safety climate on these two risk-taking behaviors. This negative pathway is novel and represents a major theoretical contribution of our research.

Hypothesis 4. Psychological safety climate is indirectly and negatively related to (a) group voice and (b) group learning behavior through group average work motivation.

METHOD

Participants and Procedures

The data for Study 1 consisted of two samples. In the first sample, data were collected on the basis of a convenience sampling approach. We recruited participants by posting advertisements entitled “Participants needed for group survey” in several alumni networks of a large university in Beijing, China. The alumni who contacted us and volunteered to participate in the study were recruited to serve as liaisons to distribute survey packets to their peer groups (employees and their immediate supervisors) within their organizations. These liaisons were instructed to give a unique

code to surveys from the same group. In order to ensure that the quality of the data could match the group-level theorization and analyses, the recruited groups had to meet several requirements which were included in the advertisement and communicated to each liaison: (1) participating work groups had to have a supervisor and two or more group members (i.e., direct subordinates) who shared common objectives, performed interdependent tasks, and were jointly accountable for collective outcomes (Kozlowski & Bell, 2003); (2) all group members were required to complete the questionnaires; (3) all the participants had to be full-time employees. Completed questionnaires were returned directly to the liaisons. Three sets of questionnaires with a large number of missing values were deleted. The final dataset in the first sample contained 67 work groups with 297 employees.

In the second sample, data were collected from 69 employees who worked in groups at a private publishing company located in the northwestern region of China. With the full cooperation of senior management, questionnaires were distributed to different groups and coded by the human resources department. Participation was voluntary and confidential. On the basis of the same group recruitment requirements, 13 groups with 50 employees participated in the survey, resulting in a response rate of 72%. All of the questionnaires from these employees were included in the analyses.

Across the two samples, data were collected from both group members and their direct supervisors to reduce common method bias (Podsakoff, MacKenzie, Jeong-Yeon, & Podsakoff, 2003). Employees reported on psychological safety, fear of failure, work motivation, and the control variables. Group voice and learning behavior were evaluated at the group level by supervisors. Combining the two samples, the final dataset contained 80 groups comprising 347 employees. The average group size was 4.34, ranging from 2 to 13 members per group (not including the supervisor). The participants were relatively young (96.3% between 20 and 39), and more than half of them were female (59.1%). Most of them (91.0%) had an associate degree or above, and the majority of them (68.6%) had worked in their groups for more than 3 years. Of these participants, 28.8% were from the finance and trading industry, 32.0% from education and public administration, 5.5% from

manufacturing, and 33.7% from medicine and health care. These groups with diverse industrial backgrounds and various levels of interdependence provided meaningful interpersonal contexts for studying psychological safety and thus could be considered suitable to test our hypotheses.

Measures

All the scales were originally developed in English, and they were translated into Chinese using a back-translation procedure (Brislin, 1986). We conceptualized psychological safety climate and the two mediators (i.e., fear of failure and work motivation) as group-level constructs captured through aggregated members' ratings. The processes by which they emerge, however, are theoretically different. Guided by Chan (1998), we adopted different aggregation models to reflect their distinct natures, a practice frequently used in previous studies (e.g., Bradley, Klotz, Postlethwaite, & Brown, 2013; Chen et al., 2002; Kearney, Gebert, & Voelpel, 2009; Pearsall & Ellis, 2011).

Psychological safety climate. The seven-item scale developed by Edmondson (1999) was used to measure psychological safety climate. Participants were instructed to rate each item using a scale ranging from 1 (*very inaccurate*) to 7 (*very accurate*). Sample items included "If you make a mistake in this group, it is often held against you" and "It is difficult to ask other members of this group for help." Following previous research, we constructed psychological safety climate as an emergent, group-level construct reflecting members' shared belief (Edmondson, 1999; Faraj & Yan, 2009; Pearsall & Ellis, 2011). Because members of a group work are subject to the same set of structural influences (Nembhard & Edmondson, 2006) through mutual interactions, common experiences, and mechanisms of socialization (Klein, Dansereau, & Hall, 1994; Morgeson & Hofmann, 1999), all members should develop a shared understanding about the degree to which the group environment allows people to feel safe to take risks. We therefore adopted Chan's (1998) consensus model and expected considerable similarity across the psychological safety perceptions of individual members to justify the aggregation of this construct (Kozlowski & Klein, 2000).

Following the recommendation of LeBreton and Senter (2008), we examined the value of r_{wg} with different null distributions, namely, slight skew, triangular, and rectangular distributions. The median r_{wg} (James, Demaree, & Wolf, 1993) values of psychological safety were as follows: .86 for slight skew distribution, .84 for triangular distribution, and .91 for rectangular distribution[2]. They were statistically significant ($p \leq .05$) compared to the corresponding critical r_{wg} values for the five- and ten-item scales (e.g., Smith-Crowe, Burke, Cohen, & Doveh, 2014). Furthermore, the ICC1 was .29 and the ICC2 was .64. The values of these indices supported the aggregation (James, 1982). The Cronbach's alpha was .64 at the individual level and .78 at the group level. The group level reliability was sufficient, suggesting that the results of group-level analyses were unlikely to be biased despite less than optimal reliability at the individual level.

Group average fear of failure and work motivation. We measured fear of failure by a six-item scale (Hagtvet & Benson, 1997). A 7-point scale (1 = *never*, 7 = *always*) was used, and sample items included "In this group, just thinking about working on new, somewhat difficult tasks makes me feel uneasy" and "In this group, I am afraid of failing when I am given a task which I am uncertain that I can solve." The Cronbach's alpha was .80 at the individual level and .81 at the group level. We measured work motivation using the five-item Time Commitment Scale (Brown & Leigh, 1996) because the amount of time and effort spent on tasks is considered a direct manifestation of motivation (Naylor, Pritchard, & Ilgen, 1980). This scale captures employees' tendencies to work long and hard to achieve goals (Brown & Leigh, 1996). This is consistent with our conceptualization that psychological safety climate may be associated with slacking off. A 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*) was used, and sample items included "I put in more hours throughout the year than most of my coworkers do" and "Among my coworkers, I'm always the first to arrive and the last to leave." The Cronbach's alpha was .84 at the individual level and .86 at the group level.

Although the majority of studies on fear of failure and work motivation have focused on individual-level analysis (e.g., Brown & Leigh, 1996; Elliot & McGregor, 2001), scholars have also

examined the relationship between the aggregated level of psychological attributes among members and group-level outcomes (e.g., Chen et al., 2002). In our study, we aggregated fear of failure and work motivation on the basis of an additive approach for two reasons (Chan, 1998). First, theoretically, the core argumentation for these two group-level mediators follows the nature of the additive model—the attributes of fear or motivation of members in a group will, when combined, form a configural property of the group as a whole which determines group behavior (cf. LePine, Hollenbeck, Ilgen, & Hedlund, 1997; LePine, 2005). Given that fear of failure and work motivation differ across individuals and psychological safety climate may exert its influence on different baselines, a high degree of within-group similarity may not occur. Second, empirically, a large number of studies have adopted this additive approach to investigate similar constructs such as group achievement motivation (e.g., Bhave, Kramer, & Glomb, 2010; Bradley et al., 2013; Chen et al., 2002; Fisher, Bell, Dierdorff, & Belohlav, 2012). Consistent with previous research, we propose that group average fear of failure and work motivation reflect an additive composition model (Chan, 1998) in that the average of the summation of members' scores for these two constructs are meaningful group-level variables irrespective of individual members' rating consistency[3].

Group voice behavior. Six items developed by Van Dyne and LePine (1998) were adapted to measure group voice behavior by replacing "this particular coworker" with "group members." Supervisors rated the items on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Sample items included "Group members develop and make recommendations concerning issues that affect this work group" and "Group members speak up in this group with ideas for new projects or changes in procedures." The Cronbach's alpha was .82.

Group learning behavior. We measured group learning behavior with the seven-item scale developed by Edmondson (1999). Supervisors were instructed to rate each item using a scale ranging from 1 (*not at all*) to 7 (*all the time*). Sample items included "This group regularly takes time to figure out ways to improve its work processes" and "Group members go out and get all the

information they possibly can from others, such as customers, or other parts of the organization" The Cronbach's alpha was .77.

Control variables. Group size and group members' average tenure were included as control variables as previous research has suggested that they may have some impact on voice or learning (Edmondson, 1999; Liang et al., 2012). We also controlled for the industry that employees came from because groups' task interdependence may vary across different industries. Furthermore, we considered the potential influences of demographic diversity in gender (Blau, 1977) and age (Kunze, Böhm, & Bruch, 2011). As shown in Table 1, none of these variables was significantly correlated with group voice or learning behavior in the data. Following Becker's (2005) recommendations, we omitted these variables when testing the hypotheses. However, we noted that controlling for these variables did not change the significance level of our results and the interpretation of the hypotheses tests. Because our data were from two sources, we included which sample a participant was from as a control variable in the analyses.

RESULTS OF STUDY 1

Descriptive Statistics and Confirmatory Factor Analyses

Table 1 presents the means, standard deviations, and correlations for the variables at the group level. Before testing our hypotheses, we evaluated the factor structure of the variables at the group level through confirmatory factor analyses. Since the subject-to-item ratio fell below the recommended ratio (10:1) and even below the minimum acceptable lower limit (5:1), we randomly formed three item parcels for each construct (Bandalos, 2002). Because all variables were unidimensional, the risk of obtaining biased parameter estimates was low (Bandalos, 2002). The analysis of the hypothesized five-factor model yielded an acceptable fit (χ^2 = 107.34, p < .05, df = 80, CFI = .95, SRMR = .068), and this model was significantly better than a four-factor model combining group average fear of failure and work motivation into one factor ($\triangle\chi^2$ = 141.38, $\triangle$df = 4, p < .01), a four-factor model combining group voice and group learning behavior ($\triangle\chi^2$ = 25.16,

$\triangle$df = 4, $p < .01$), a four-factor model combining psychological safety climate and group average fear of failure ($\triangle\chi^2 = 72.28$, $\triangle$df = 4, $p < .01$), and a two-factor model combining variables reported by employees and supervisors, respectively ($\triangle\chi^2 = 183.56$, $\triangle$df = 9, $p < .01$).

Insert Table 1 about here

Tests of Hypotheses

We tested the hypotheses with path analysis in Mplus using the composite scores of the variables. We tested the indirect effects using Selig and Preacher's (2008) Monte Carlo approach which assesses mediation based on unstandardized regression coefficients. This method is considered superior to traditional approaches (e.g., the Sobel test) in examining indirect associations (Preacher, Zyphur, & Zhang, 2010). We used 95% confidence intervals (CI) to indicate the significance of an effect. The mediation model fitted the data well ($\chi^2 = 2.71$, $p > .05$, df = 1, CFI = .98, SRMR = .046). The results are presented in Table 2. The association of psychological safety climate with group average fear of failure was negative and significant ($B = -.33$, $p < .01$), supporting Hypothesis 1. In turn, group average fear of failure was significantly and negatively related to both group voice ($B = -.54$, $p < .01$) and group learning behavior ($B = -.48$, $p < .01$) after the direct effects of psychological safety climate on these outcomes were considered. In support of Hypothesis 2a, the indirect effect of psychological safety climate on voice through group average fear of failure was positive and significant with the CI not including zero (indirect effect = .18, CI = [.04, .37]). The indirect effect of psychological safety climate on learning behavior through group average fear of failure was also significant and positive (indirect effect = .16, CI = [.03, .34]), supporting Hypothesis 2b. Moreover, psychological safety climate was negatively and significantly related to group average work motivation ($B = -.42$, $p < .01$), which in turn was positively and significantly related to both group voice ($B = .34$, $p < .05$) and group learning behavior ($B = .52$, $p < .01$). The indirect effect of psychological safety climate on voice through group average work motivation was significant

(indirect effect = -.14, CI = [-.30, -.03]). Its indirect effect via group average work motivation on learning behavior was also significant (indirect effect = -.22, CI = [-.43, -.06]). The novel negative pathway described in Hypotheses 3, 4a, and 4b received support.

Insert Table 2 about here

DISCUSSION OF STUDY 1

The results support group average fear of failure as a mediator for the positive effect of psychological safety climate and more importantly group average work motivation as a mediator for its negative effect. Study 1 established the dual-pathway model in which psychological safety climate exerts opposing influences on risk-taking behaviors (i.e., group voice and learning behavior). In Study 2, we sought to provide further evidence for the two pathways by investigating a moderator that differentially influences the relative salience of each pathway. Another objective of Study 2 was to address some limitations of Study 1 and serve as a conceptual replication. First, Study 1 was based on cross-sectional data and provided no evidence for the direction of causality. Study 2 employed an experimental design to obtain causal evidence for our theorizing. Second, uncertainty remained about whether the dual-pathway model could be generalized to different group settings and to risk-taking behaviors other than group voice and learning behavior. Therefore, in Study 2, we examined the boundary condition for these two pathways (i.e., individualism/collectivism) and group creativity as a different risk-taking behavior, which is frequently studied in the psychological safety literature. Finally, implicit in our theorization of the dual pathways of risk-taking behaviors is the idea that risk-taking behaviors not only have a "risky" component but also an "effortful" component: for example, learning behavior requires both risk-taking and persistence. In Study 1, the operationalization of learning behavior and voice did not allow us to differentiate between these two components. To more precisely test the two proposed pathways, in Study 2, using creativity as our dependent variable, we operationalized this risk-taking behavior in terms of its risky components and effortful components.

In so doing, we tested whether the two pathways contribute to their respective components of creativity, thus leading to a more robust examination of our model.

STUDY 2

The Moderating Role of Group Individualism/Collectivism

Given that psychological safety exerts opposing influences through two pathways, an important question arises: when is psychological safety climate more/less likely to reduce fear of failure/work motivation, resulting in a stronger positive impact on group risk-taking behaviors? A framework that can help to address this question and is particularly related to both processes is individualism/collectivism, which guides people to construe their relationships with their groups in a particular way (Hofstede, 2001). Although the individualism/collectivism framework is often studied as societal values, it has been found to be relevant at the organizational and group levels (Chatman & Barsade, 1995; Earley, 1993). A work group's emphasis on individualism or collectivism largely shapes group members' orientations and priorities in interactions with others (Chatman et al., 1998). According to Triandis (1995), group collectivism determines the extent to which members of a collective view their group's goals as superordinate to their own needs and orients them toward maintaining strong connections with others in the group (Markus & Kitayama, 1991). By contrast, a group emphasizing individualistic values encourages members to pursue personal goals and achievements and places less importance on interpersonal harmony among group members (Triandis, 1995). In other words, the norm of a collectivistic group places more emphasis on harmonious relationships with group members, and thus its members are interpersonally sensitive, whereas the norm of an individualistic group emphasizes individual interests more, even at the expense of interpersonal harmony, and its members are primarily concerned about their own well-being. Because of these differences, it is well established that individualistic/collectivistic group culture directly influences the need for a safe environment and perceived accountability in a group context (Earley, 1989; Triandis, 1995), making this group construct relevant for both pathways. In the

current research, we follow previous experiment-based research (e.g., He, Sebanz, Sui, & Humphreys, 2014; Hornsey, Jetten, McAuliffe, & Hogg, 2006) and operationalize individualism and collectivism as two opposite ends of one continuum, which well serves the important purpose of testing the salience of the dual-pathway model of psychological safety climate.

Underpinning the positive pathway of psychological safety climate is the propensity for psychological safety to reduce excessive social evaluative pressure and thus concern about failure. Collectivistic groups socialize members toward maintaining positive relationships and valuing members' contributions and worthiness (Chatman et al., 1998; Leung, 1988; Leung & Bond, 1984). This culture creates a desire to be seen as worthy members and draws attention to events that may harm social image, increasing sensitivity to the negative social consequences of mistakes, failures, and uncertainty (Brewer & Chen, 2007; Lee, Aaker, & Gardner, 2000). As such, in groups with a stronger collectivistic culture, psychological safety may play a more important role in reducing the members' interpersonal evaluative pressure and their concern about failure. On the contrary, members of more individualistic groups are aware that their group norm does not emphasize harmonious social relations with others, and as a result, they are less concerned about how they are viewed by their group members (Chatman et al., 1998; Triandis, 1995). When a group's members are generally less concerned about negative interpersonal consequences associated with failure and mistakes, this group does not need a security mechanism such as psychological safety to be encouraged to take interpersonal risks. Following this theorizing, the benefits of psychological safety climate should be less salient in reducing overall fear of failure among individualistic groups.

Hypothesis 5: There is a two-way interaction between psychological safety climate and group individualism/collectivism in predicting group average fear of failure such that psychological safety climate is more effective in reducing group average fear of failure among collectivistic groups.

The negative pathway posits that psychological safety climate suppresses group average work motivation because of low pressure from social evaluation and sanction. We further argue that this

negative pathway is likely to be exacerbated if the group has a stronger individualistic culture. As members in groups with an individualistic culture tend to place more emphasis on individual interests rather than group interests, a higher level of psychological safety may further reduce the members' sense of accountability. As a result, a psychologically safe climate is more likely to drive these individualistic members to reduce their effort and motivation to contribute to the group. By contrast, this negative linkage between psychological safety climate and group average motivation may become less salient in groups with a stronger collective culture. In groups with a strong collectivistic culture, psychological safety climate is less likely to liberate the members' accountability for the group interests because the collectivistic values among the group members form a strong normative pressure that motivate the members to contribute to the group.

Hypothesis 6. There is a two-way interaction between psychological safety climate and group individualism/collectivism in predicting group average work motivation such that psychological safety climate is more detrimental to group average work motivation among individualistic groups.

Creativity as a Risk-taking Behavior

Creativity is a frequently studied risk-taking behavior in the psychological safety literature (e.g., Carmeli, Reiter-Palmon, & Ziv, 2010; Kark & Carmeli, 2009). It is defined as the generation of ideas, insights, or solutions that are new and useful (Amabile, 1983; Paulus & Nijstad, 2003). We chose creativity as a conceptual replication of the two group behaviors in Study 1 because it is generally considered to be a risky and effortful undertaking in organizations (George & Zhou, 2007). Creativity, by definition, entails departure from the status quo and often involves "going out on a limb and running the risk of social ridicule" (Mayer & Mussweiler, 2011: 1262). Effort is also important for creativity, especially in organizational settings, where creativity typically entails hard work and persistence (Shalley, Zhou, & Oldham, 2004). Because of these characteristics, creativity falls into the same category as voice and learning behavior as effortful risk-taking behaviors.

Creativity is a multifaceted construct and involves the dimensions of fluency, originality, and flexibility (Torrance, 1966). Fluency refers to the number of ideas generated. Originality is considered a defining characteristic of creativity and refers to the uncommonness or infrequency of the ideas generated (Amabile, 1983; Paulus & Nijstad, 2003; Torrance, 1966). Flexibility is concerned with the use of different cognitive categories and perspectives (Amabile, 1983; Mednick, 1962). In addition, time on task directly captures the persistence involved in creative performance and has been used as a proximal indicator of effort (e.g., De Dreu et al., 2008). Therefore, we also consider the amount of time spent on a creative activity as an outcome in the current research. This multidimensionality of creativity permits the disentangling of the risk and effort components of risk-taking behavior that is not possible with group voice and learning behavior. On the basis of previous research (Nijstad, De Dreu, Rietzschel, & Baas, 2010), we refer to originality and flexibility as risk components and fluency and time on task as effort components of creativity.

When fear of failure in groups is low, group members are, on average, less intimidated by the negative consequences of failed creative attempts and more willing to take risks and think out of the box, resulting in higher group originality and flexibility (De Dreu et al., 2008). We therefore suggest that reduction of group average fear of failure should promote flexibility and originality. People in groups with high work motivation tend to work hard and persevere in a creative task. Such highly motivated groups will obviously generate more ideas (i.e., exhibit higher group creative fluency and more time on task; De Dreu et al., 2008). In contrast, the effort and perseverance of motivated groups are less likely to lead to higher flexibility and originality because these two aspects of creativity are more determined by cognitive flexibility (De Dreu et al., 2008). Therefore, group average work motivation is expected to promote fluency and time on task. Taken together, the arguments outlined before suggest that group individualism/collectivism distinctly moderates the effects of psychological safety climate on the average level of fear of failure and work motivation, which in turn affect dimensions of creativity differently. Consequently, it is likely that the effects of

psychological safety climate on creativity via fear of failure and work motivation will hinge on the level of group individualism/collectivism.

Hypothesis 7. The positive indirect effect of psychological safety climate on (a) originality and (b) flexibility via group average fear of failure is contingent on group individualism/collectivism such that this indirect effect exists only for collectivistic groups.

Hypothesis 8. The negative indirect effect of psychological safety climate on (a) fluency and (b) time on task via group average work motivation is contingent on group individualism/collectivism such that this indirect effect exists only for individualistic groups.

METHOD

Participants and Experimental Design

The participants were 288 undergraduate students (163 females) from two universities in China (156 and 132, respectively), forming a total of 96 groups in Study 2. Participants were recruited through an advertisement placed in classrooms and the universities' online forums, and they received about US$5 for their participation. To examine the interactive influence of psychological safety climate and individualism/collectivism on the two pathways, the experimental design was a 2 (psychological safety: high vs. low) × 2 (group culture: collectivism vs. individualism) factorial design with creative performance as the dependent variable.

The participants were randomly assigned to three-person groups. A three-person group design is frequently used in group-level experimental research (e.g., Knight, Durham, & Locke, 2001; Marks, Sabella, Burke, & Zaccaro, 2002; Weisband, Schneider, & Connolly, 1995). It satisfies the minimum number of members required to form a group (Kozlowski & Bell, 2003) and reduces the difficulty in participant recruitment. Random assignment makes sure that group attributes across different conditions are roughly equivalent and that significant effects are attributable to the manipulation and not to some characteristics of the individuals in the groups. In Study 2, the groups completed the experiment one at a time. The experiment consisted of three parts. The first part was

the manipulation of psychological safety climate and collectivism/individualism. In the second part, participants were asked to brainstorm on ways to improve teaching in their university, a creative task frequently used in previous studies with good validity (e.g., Bechtoldt, De Dreu, Nijstad, & Choi, 2010; De Dreu et al., 2008). Finally, participants rated (a) their fear of failure and work motivation specifically in relation to the experimental task and (b) the manipulation checks for psychological safety and individualism/collectivism. These constructs were measured after the creative task to avoid sensitizing participants to the purpose of the experiment (e.g., Wan & Agrawal, 2011).

Experimental manipulation. Participants were instructed to assume that they were members of a group from a consulting firm hired by a university for a project. We manipulated psychological safety climate and individualism/collectivism by providing different descriptions about the group and the firm, respectively. The descriptions for manipulating psychological safety climate followed the approach of Chatman et al. (1998), but the content was based on the core characteristics of psychological safety. The description for high/low psychological safety was as follows:

> This firm always organizes work by groups. It promotes a group climate of doing things *with an adventurous spirit/[accurately]*. Group members *appreciate/[monitor]* each other's efforts. *No negative comments/[Negative comments]* are made about those who make mistakes. Group members can *easily/[hardly]* ask others for help in the face of difficulties. In addition, groups value *working in a trial and error fashion/[consistency within a group]* and encourage *speaking out freely/[looking before leaping]*. Group members are therefore *comfortable/[uncomfortable]* with immature ideas and views.

To ensure adequate comprehension, participants were instructed to discuss the characteristics of the group climate with their group members after reading the description for their particular experimental condition. To strengthen the manipulation, participants were further told that before they started to work on the project, they had to do two tasks as a practice. In the high psychological safety condition, group members discussed the merits and problems after the first task so that they

could perform better on the second task. In the low psychological safety condition, group members were instructed to select the worst performer after the first task, criticize him/her, and ask him/her to leave the group temporarily so that the group could perform better on the second task.

The description for manipulating individualism/collectivism was directly adapted from Chatman et al. (1998):

> The president and founder of this firm is the driving force of the firm's corporate and group culture. He and the founding senior managers are proud of the firm's reputation in the industry as a *group-based/[individualistic]* organization. In this firm, *cooperation and groupwork/[individual effort and initiative]* are highly valued and rewarded, and *cooperation/[competition]* among group members is considered to be the best road toward success. Both employees and outsiders categorize the firm and its work groups as having a very *collectivistic/[individualistic]* culture.

Participants were also instructed to discuss the characteristics of the group culture with their group members after reading the description to enhance comprehension.

Creative task and dependent measures. Upon completion of the manipulations, participants were asked to work as a group and brainstorm about possible ways to improve the quality of teaching in their university. They were instructed to describe their ideas to their group members and then write them down on a piece of paper.

The ideas and suggestions generated by all the members of a group were scored to capture creativity. The number of ideas generated by the three group members was directly counted and averaged to tap fluency. A research assistant and the first author assessed originality and flexibility for the 52 groups from University A. Experimental conditions and other information that might bias the judgment of the coders were excluded from the coding file so that the coders were blind to which condition a participant was in. Following the construct definition of originality, they assessed how often an idea was mentioned in the idea pool and assigned a frequency score to each idea (e.g.,

Rietzschel, De Dreu, & Nijstad 2007). The more frequently an idea was mentioned by participants, the less original it was. Following previous research, the frequencies of all the ideas generated by the three members of a group were averaged to capture group-level originality, which also controlled for the influence of possible differences in fluency (Bechtoldt et al., 2010). We assessed interrater reliability by intraclass consistency ICC[3, 2] (Shrout & Fleiss, 1979), and the value of .77 indicated good interrater agreement. The frequency numbers were subtracted from 77, the highest frequency number among the idea pool, to capture originality. To assess flexibility, the number of categories covered by the ideas generated by each group was counted. Each idea was assigned to one of the seven categories developed by De Dreu et al. (2008) for the same task. The more categories identified, the greater the flexibility (Nijstad, Stroebe, & Lodewijkx, 2002). ICC[3, 2] was .94, indicating good interrater agreement. Using the exact same procedures, the originality and flexibility of the ideas generated by the 44 groups from University B were coded by two research assistants who were not involved in the experiment. ICC[3, 2] for these two measures were .93 and .84, respectively. Since the scores were rated by two sets of raters, they were standardized within their own sample to reduce potential biases. In addition, time on task (i.e., how many minutes a group spent on the task) was directly recorded during the experiment.

Measures

All the items were originally developed in English, and they were translated into Chinese following a back-translation procedure (Brislin, 1986).

Manipulation checks. We used the psychological safety scale from Study 1 to check the effectiveness of the manipulation. To further demonstrate the emergent nature of psychological safety climate as a group-level construct, we checked the agreement indexes of this measure and reported as follows: ICC1 = .27, ICC2 = .53, and rectangular median r_{wg} = .94. Participants responded to four questions developed by Chatman et al. (1998) to evaluate the effectiveness of the

individualism/collectivism manipulation on a 7-point scale ranging from 1 (*extremely uncharacteristic*) to 7 (*extremely characteristic*).

Mediators. Mirroring Study 1, we used Hagtvet and Benson's (1997) scale to capture fear of failure. On the basis of face validity and the experimental context, we adapted two items (i.e., "I was afraid of failing in situations where the outcome is uncertain" and "I feared making mistakes in this group"). The second item was rephrased slightly so as to better reflect the consequence of psychological safety climate in the manipulation. The Cronbach's alpha was .70 at the individual level and .81 at the group level. To measure the participants' level of work motivation for the experimental task, we adapted the four items developed by Minbashian, Wood, and Beckmann (2010) to assess individuals' level of motivation in response to a specific task, which made it an appropriate measure of work motivation in the current experiment. Participants responded to the items on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Sample items included "I was very focused on this task" and "I was working hard on this task." The Cronbach's alpha of this scale was .76 at the individual level and .75 at the group level. As in Study 1, the additive model of Chan (1998) was adopted to aggregate the individual-level reports to the group level[4].

RESULTS OF STUDY 2

Manipulation Checks

As expected, an ANOVA revealed that participants in the high psychological safety condition reported higher psychological safety than participants in the low psychological safety condition: M = 5.40 vs. M = 4.88, $F(1, 94) = 19.34$, $p < .01$. Participants reported higher collectivism in the collectivism condition than in the individualism condition (M = 5.30 vs. M = 4.74, $F(1, 94) = 12.69$, $p < .01$) and higher individualism in the individualism condition than in the collectivism condition (M = 4.12 vs. M = 3.56, $F(1, 94) = 10.19$, $p < .01$). Both manipulations were effective.

Descriptive Statistics and Confirmatory Factor Analyses

Table 3 presents the means, standard deviations, and correlations for the variables at the group level. We performed confirmatory factor analyses for the two measured variables (group average fear of failure and work motivation). The results showed that the two-factor model fitted the data significantly better (χ^2 = 22.45, df = 8, p < .05, CFI = .91, SRMR = .077) than the one-factor model combining the two variables ($\triangle\chi^2$ = 59.56, $\triangle$df = 1, p < .01).

Insert Table 3 about here

Hypotheses Testing

As shown in Table 4, the 2 × 2 ANOVA showed a significant interaction between psychological safety climate and individualism/collectivism on group average fear of failure: F(1, 92) = 6.21, p < .05. For groups with a collectivistic culture, group average fear of failure was lower in the high psychological safety condition than in the low psychological safety condition (M = 2.91 vs. M = 3.90, F(1, 92) = 17.00, p < .01). For groups with an individualistic culture, however, group average fear of failure was not significantly different across the high and the low psychological safety conditions (M = 3.43 vs. M = 3.54, F(1, 92) = .19, ns). In support of Hypothesis 5, psychological safety climate reduced group average fear of failure only among groups with a collectivistic culture. The interaction is plotted in Figure 2a.

Hypothesis 6 predicted that individualism/collectivism will moderate the effect of psychological safety climate on group average work motivation. The 2 × 2 ANOVA showed a significant interaction (F(1, 92) = 4.18, p < .05), thus supporting the hypothesis. When group culture was characterized by individualism, high psychological safety resulted in significantly lower group average work motivation than low psychological safety (M = 4.90 vs. M = 5.20, F(1, 92) = 5.15, p < .05). On the contrary, when group culture was characterized by collectivism, group average work motivation did not differ across the high and low psychological safety conditions (M = 5.15 vs. M = 5.08, F(1, 92) = .32, ns). In other words, psychological safety climate reduced group average work motivation only in groups with an individualistic culture. The interaction is plotted in Figure 2b.

Insert Table 4, Figures 2a and 2b about here

Next, we performed path analysis using Mplus to test the overall moderated mediation hypotheses (Hypothesis 7 and Hypothesis 8). Individualism/collectivism was operationalized using a dummy variable (1 = collectivism; 2 = individualism). It was multiplied by psychological safety climate (1 = low psychological safety; 2 = high psychological safety) to create the interaction term. The results are presented in Table 5. The overall model fitted the data well (χ^2 = 16.88, df = 9, p = .05, CFI = .92, SRMR = .041). Consistent with the ANOVA results, there was a significant and positive interaction between psychological safety climate and group culture on group average fear of failure (B = .88, p < .05), and this interaction was negative on group average work motivation (B = -.37, p < .05). As expected, the results showed that group average fear of failure was negatively related to originality (B = -.28, p < .05) and flexibility (B = -.31, p < .01). Moreover, group average work motivation was positively related to fluency (B = 1.11, p < .05) and time on task (B = 2.35, p < .01).

Insert Table 5 about here

As in Study 1, the Monte Carlo method of Selig and Preacher (2008) was used to test the conditional indirect effects of psychological safety climate on group creativity. The conditional indirect effect of psychological safety climate on originality through fear of failure was significant in the collectivism condition (B = .28, CI = [.06, .57]) and not significant in the individualism condition (B = -.03, CI = [-.12, .20]). Thus, Hypothesis 7a was supported. Moreover, the moderated mediation hypothesis regarding flexibility (Hypothesis 7b) was supported: The conditional indirect effect of psychological safety climate on flexibility through fear of failure was significant in the collectivism condition (B = .31, CI = [.08, .61]) but not in the individualism condition (B = .03, CI = [-.13, .22]).

Similarly, the indirect effect of psychological safety climate on fluency through work motivation was moderated by individualism/collectivism such that this effect was significant in the individualism condition (B = -.33, CI = [-.85, -.01]) but not significant in the collectivism condition

(B = .08, CI = [-.19, .41]). Thus, Hypothesis 8a received support. In support of Hypothesis 8b, the conditional indirect effect of psychological safety climate on time on task through work motivation varied across different cultural conditions, as reflected in a significant effect in the individualism condition (B = -.66, CI = [-147, -.09]) but not in the collectivism condition (B = .16, CI = [-.37, .75]).

We also tested whether the main effects of psychological safety climate found in Study 1 were replicated in Study 2. Consistent with Study 1, psychological safety climate was negatively related to group average fear of failure (B = -.58, $p < .01$). However, its association with group average work motivation was negative but not significant (B = -.11, *ns.*).

DISCUSSION OF STUDY 2

With an experimental design, this study provides causal evidence for the dual-pathway model of psychological safety climate and a conceptual replication of Study 1 with different measures. The positive pathway was more salient for collectivistic groups, while the negative pathway was more salient for individualistic groups. All hypothesized effects received full support. We noted that the relationship between psychological safety climate and group average work motivation was not significant in Study 2, which was inconsistent with the finding in Study 1. While the main effect of psychological safety climate on group average work motivation was not replicated in the experiment, it was found to significantly reduce work motivation in an individualistic group culture but not in a collectivistic group culture. This suggests that the negative pathway of psychological safety may be more subject to situational contingencies.

GENERAL DISCUSSION

Organizations are advised to create a psychologically safe group environment to promote important behaviors with some degree of risk. Our research provides a clear demonstration that this advice is oversimplistic. Psychological safety climate shows two concomitant, opposite effects on positive risk-taking behaviors via fear of failure and work motivation. The proclivity of psychological safety climate to reduce fear of failure exists only among collectivistic groups, and its

effect on loss of work motivation is significant only among individualistic groups. These findings as a whole support the dual-pathway model of psychological safety climate and suggest that the overall effect of psychological safety climate depends on the relative salience of each pathway.

Theoretical Implications

Psychological safety climate. Researchers have traditionally focused on the salutary effect of psychological safety climate and posited the reduction of fear of failure as the underlying mechanism. Our research provides empirical evidence for this postulation and, perhaps more importantly, extends the literature significantly by establishing a second pathway that channels its negative effects. We confirm the intriguing prediction that psychological safety climate reduces desirable risk-taking behaviors, including group voice, learning behavior, and creativity, through a reduction in work motivation, especially among individualistic groups. In support of Edmondson's (2004) speculation that psychological safety climate may sometimes be counterproductive, we provide the theoretical basis and empirical support for this negative mechanism. Our research demonstrated that two opposing pathways cancel out each other's influence, resulting in nonsignificant total (indirect) effects of psychological safety on risk-taking behaviors. Hence, the dual-pathway model may provide an account of the disparate findings in the literature. For example, Choo et al. (2007) found a nonsignificant relationship between psychological safety climate and learning behavior. A plausible account based on our model is that in their research context, the positive and negative pathways may be similar in strength, thus offsetting each other and giving rise to a nonsignificant relationship.

Edmondson (2004) called for research studying the "limits" of psychological safety climate, and Edmondson and Lei (2014: 38) noted that "work on the boundary conditions of psychological safety climate remains underdeveloped and that a contingent model of psychological safety climate may be worth pursuing". Our research pushes this direction forward by demonstrating that group individualism/collectivism affects the salience of both pathways such that group collectivism heightens the positive effect of psychological safety climate and group individualism accentuates its

negative effect. These moderation effects have some interesting and important implications. Low psychological safety climate coupled with a strong emphasis on cordial relationships among group members (a collectivistic group culture) may produce a "zone of wariness" in a group where members are unwilling to take interpersonal risks because of the worry of negative social evaluation. High psychological safety climate reduces this tendency and encourages group members to propose unconventional ideas and minority views and engage in actions that may put them in a negative light. By contrast, high psychological safety climate coupled with a strong individualistic group culture may create a "zone of egocentrism" where motivation for group success is reduced. An intriguing conclusion is that in groups with an individualistic culture, low psychological safety climate is actually desirable for maintaining work motivation for group tasks.

An important generalization of the moderating effect of group collectivism is that in group contexts where people are averse to interpersonal risk, such as in the case of collectivistic groups, psychological safety climate is particularly effective in reducing fear of failure. This argument is consistent with the finding that the positive effect of psychological safety climate on knowledge sharing is stronger when individuals are less confident about the knowledge they share (Siemsen, Roth, Balasubramanian, & Anand, 2009), primarily because such a context heightens the importance of an interpersonally safe environment. Future research may uncover other contextual variables that are associated with a heightened sense of fear of failure and can accentuate the propensity of psychological safety climate to reduce fear of failure. Following the same logic, the moderating effect of group individualism may be generalized to group contexts in which members have little concern for group goal performance. Psychological safety climate is likely to lead to a significant loss of work motivation when group members are lukewarm about group success. In summary, our research suggests a sophisticated model of psychological safety climate with dualistic effects shaped by contextual factors. To further develop this model, an important future research direction is to examine other moderators of the two pathways and their underlying mechanisms.

Group risk-taking behaviors. Our dual-pathway model sheds new light on extending the unitary perspective of risk-taking behaviors in the psychological safety literature. Psychological safety climate research has primarily focused on the benefit of reducing fear to encourage risk-taking behaviors (e.g., Edmondson, 1999; Edmondson & Roloff, 2009) and generally ignored the fact that these behaviors may require people's motivation of persistence and perseverance. Although previous work in other fields has started to emphasize the importance of motivation for risk-taking behaviors such as voice (e.g., Detert & Burris, 2007), our research is among the first to demonstrate motivation to be negatively associated with psychological safety and positively associated with group risk-taking behaviors. Our dual-path view suggests that risking-taking behaviors may, via two distinct mechanisms, differentially associate with their antecedents (as in our case for psychological safety). We suggest that future research should identify factors that reduce risk and promote motivation to better understand how to encourage such organizationally desired group behaviors.

Practical Implications

This paper has important implications for organizational practice. Psychological safety climate may suppress risk-taking behaviors through reducing work motivation, echoing Edmondson's (2004) warning that viewing psychological safety climate as the only thing that learning behavior requires is counterproductive. It is important to alert managers to this potential pitfall of psychological safety climate. When managers employ psychological safety climate as a management tool, they need to simultaneously take measures to maintain a certain level of group accountability (a key element of collectivism; Earley, 1993) to counteract the comfort zone created by psychological safety climate. Our findings show that this concern is especially important for groups with an individualistic orientation. If managers want to promote psychological safety climate in such groups, they need to find ways to increase perceived accountability for group performance and emphasize group interest. Effective strategies include emphasizing the indispensable role of each group member in group performance and collective success (Comer, 1995).

Another practical implication of our research is that to promote positive risking behaviors, in addition to the removal of fear of failure, our research suggests a second pathway, namely, the promotion of work motivation. Individual decisions on how much effort should be exerted are influenced by prior reward experiences (Eisenberger, 1992). Managers, however, can promote groups' work motivation by taking into account not only individual outcomes but also collective outcomes that are contributed by the effort of all group members. Such a collective reward practice can promote cooperation among group members and enhance members' attachment to their groups (Johnson & Johnson, 1989). From a social identity perspective, a different strategy involves raising group commitment based on internalization and identification, which is known to promote effort investment in group tasks (O'Reilly & Chatman, 1986). Managers may increase members' identification with a group by encouraging positive group-member exchanges (Seers, 1989) and team-building exercises (Liebowitz & De Meuse, 1982).

Limitations and Future Research Directions

The dual-pathway model of psychological safety climate is confirmed in our two studies. The findings of the field survey have high external validity, and the experimental study provides causal evidence for the two different effects of psychological safety climate. Despite these strengths, there are limitations that should be addressed. First, the postulation of the negative influence of psychological safety climate is based on the accountability perspective. The argument is supported by strong theoretical and empirical justifications and by the moderating effect of group individualism on work motivation. Examining moderators that shape the proposed mechanism underlying an effect is valuable in establishing the validity of the mechanism (Spencer et al., 2005). However, it is important to examine explicitly the role of accountability in future research.

Second, in the present research, we focused on group voice, learning behavior, and creativity, which are frequently examined in psychological safety climate research. Other important behaviors that bear interpersonal risk should be examined in future research to establish the generalizability of

the dual-pathway model. One possibility is knowledge sharing (Srivastava, Bartol, & Locke, 2006). Sharing knowledge with others is risky because it may lower the competitiveness of knowledge contributors and lead to reputational damage if the shared knowledge proves to be useless or wrong (Cabrera & Cabrera, 2002). Future research should ascertain whether the predictions of the dual-pathway model can hold with this important outcome variable. The dual-pathway model developed in the current research implies that psychological safety climate may have positive and negative effects simultaneously. However, this conclusion may only hold when outcomes are risk-taking behaviors that are dual faceted (e.g., group learning behavior). It may not apply to outcomes, such as group satisfaction and intent to leave, that do not have such a nature. Therefore, we recommend that future research include these outcomes when replicating our model.

Third, we acknowledge that the groups in Study 1 may have varied in terms of the degree of interdependence among members across different job types and industries, while the groups in Study 2 were ad hoc and tended to have a relatively low level of interdependence. These two samples, however, provided a diverse context to allow us to test the idea that regardless of the degree of interdependence within a work group, the presence of others in the same work group is sufficient to activate the complex effects of psychological safety. Notwithstanding this point, we recognize that task interdependence in work groups (Van der Vegt et al., 2001) may shape both the positive and negative mechanisms of psychological safety climate because on the one hand, it heightens the importance of a safe environment in reducing fear of failure, and on the other hand, it imposes a certain level of accountability to prevent effort withdrawal. Therefore, it would be a logical next step for future research to examine the role of interdependence, thus contributing to a more nuanced understanding of the dual-pathway model of psychological safety. Moreover, the experimental study involved a relatively simple group environment with no prior interaction history. Although the results are consistent with those of the survey study, it would be useful to replicate our findings with real work groups in field experiments.

Finally, like most studies, our research is based on data collected from a single country, China in our case. Because the dual-pathway model is predicated on theoretical arguments not tied to any cultural processes, our findings should generalize to other cultural contexts. Nonetheless, it is important to replicate our findings in other nations.

To conclude, we propose and confirm a dual-pathway model of psychological safety climate and provide evidence for boundary conditions for each pathway. The dual-pathway model represents a significant and novel extension of the theorizing about psychological safety climate and points to several productive directions for future research.

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FOOTNOTES

[1] The definition of "psychological safety climate" used in the current research is distinct from the definition used in the occupational safety literature, namely "individual perceptions of safety-related policies, practices, and procedures pertaining to safety matters that affect personal well-being at work" (Christian, Bradley, Wallace, & Burke, 2009: 1106).

[2] Based on a rectangular distribution, 7 teams out of 80 had an r_{wg} value lower than .70. Given that the median r_{wg} values were satisfactory using different distributions and the other aggregation indexes were acceptable, we included all teams in the analysis to maintain statistical power. However, it is noteworthy that the results remained virtually identical if these teams were deleted.

[3]We reported the agreement indexes for these two constructs to provide full information: for fear of failure, ICC1 = .12, ICC2 = .37, rectangular median r_{wg} = .83; for work motivation, ICC1 = .15, ICC2 = .43, rectangular median r_{wg} = .89.

[4]As in Study 1, we reported the agreement indexes of these two variables: for fear of failure, ICC1 = .19, ICC2 = .41, median r_{wg} = .65; for work motivation, ICC1 = .02, ICC2 = .06, median r_{wg} = .91.

Table 1

Means, Standard Deviations, and Correlations (Study 1)

Variable	*Mean*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Psychological safety climate	5.04	0.54	-												
2. Group average fear of failure	3.52	0.62	-.24*	-											
3. Group average work motivation	3.40	0.68	-.32**	.28*	-										
4. Group voice	5.48	0.82	.03	-.28*	.18	-									
5. Group learning behavior	4.75	0.94	.10	-.18	.27*	.58**	-								
6. Gender diversity	0.32	0.20	.02	.19	.15	.04	.19	-							
7. Age diversity	0.35	0.32	-.15	.09	.26*	.09	.02	.11	-						
8. Tenure	2.11	0.76	-.12	.11	.19	.16	.21	.25*	.51**	-					
9. Group size	4.34	1.77	-.10	.02	.03	.22	.13	.20	-.01	.18	-				
10. Industry-dummy 1[a]	0.29	0.46	-.36**	.22	.07	-.15	.01	.02	.15	.16	.00	-			
11. Industry-dummy 2[b]	0.28	0.46	-.12	-.19	-.15	-.19	-.13	-.24*	-.18	-.25*	.18	-.40**	-		
12. Industry-dummy 3[c]	0.06	0.24	.00	-.05	-.16	.15	.12	.17	-.12	.05	-.08	-.16	-.16	-	
13. Sample[d]	0.16	0.37	-.13	-.33**	-.11	-.05	-.14	-.35**	-.09	-.28*	-.12	-.28*	.69**	-.11	-

Note. * $p < .05$; ** $p < .01$

[a]1 = finance and trading industry, and 0 = others; [b]1 = education and public administration, and 0 = others; [c]1 = manufacturing, and 0 = others. [d]1 = sample 2, and 0 = sample 1.

Table 2

Mediation Analysis (Study 1)

Variable	Mediation results			
	Group average fear of failure	Group average work motivation	Group voice	Group learning behavior
Sample[a]	-.60**(.17)	-.28 (.19)	-.32 (.24)	-.47 (.24)
Psychological safety climate	-.33* (.12)	-.42**(.13)	.01 (.17)	.21 (.19)
Group average fear of failure			-.54**(.15)	-.48* (.17)
Group average work motivation			.34* (.13)	.52**(.15)
Effects decomposition of mediation paths				
Pathway	Indirect effect [CIs]	Total indirect effect	Direct effect	Total effect
Positive pathway - *voice*	.18 [.04, .37]			
Negative pathway - *voice*	-.14 [-.30, -.03]	.04	.01	.04
Positive pathway - *learning*	.16 [.03, .34]			
Negative pathway - *learning*	-.22 [-.43, -.06]	-.05	.21	.15

Note. $^{*}p < .05$; $^{**}p < .01$

[a]1 = sample 2, and 0 = sample 1.

Table 3

Means, Standard Deviations, and Correlations (Study 2)

Variable	*Mean*	*SD*	1	2	3	4	5	6	7	8	9
1. Psychological safety climate[a]	1.52	0.50	-								
2. Group individualism/collectivism[b]	1.47	0.50	.07	-							
3. Group average fear of failure	3.44	0.93	-.31**	.03	-						
4. Group average work motivation	5.07	0.45	-.12	-.09	.02	-					
5. Creativity – fluency	4.67	2.33	.04	-.17	-.24*	.21*	-				
6. Creativity – originality (standardized)	0	0.99	-.08	.09	-.23*	.10	.51**	-			
7. Creativity – flexibility (standardized)	0	0.99	.02	.11	-.25*	.15	.30**	.41**	-		
8. Time-on-task	8.52	2.95	-.14	-.14	-.10	.36**	.16	.20*	.31**	-	
9. Manipulation check (psychological safety climate)	5.15	.63	.41**	-.03	-.60**	.23*	.09	.14	.20	.24*	-

Note. * $p < .05$; ** $p < .01$

[a]1 = low psychological safety, and 2 = high psychological safety.

[b]1 = collectivism, and 2 = individualism.

Table 4

ANOVA Results (Study 2)

Moderator	Predictor	Group average fear of failure	F value	Group average work motivation	F value
Collectivism	High psychological safety climate	2.91	17.00**	5.14	0.32
	Low psychological safety climate	3.90		5.08	
Individualism	High psychological safety climate	3.43	.19	4.90	5.15*
	Low psychological safety climate	3.54		5.20	

Note. * $p < .05$; ** $p < .01$

Table 5

Path Analysis Results of the Moderated Mediation Model (Study 2)

Predictor	Group average fear of failure	Group average work motivation	Creativity - originality	Creativity - flexibility	Creativity - fluency	Time-on-task
Psychological safety climate (PS)	-1.88(.54)**	.44(.27)	-.08 (.21)	-.31(.21)	-.07(.48)	-.86(.58)
Group individualism/collectivism (IC)	-1.25(.56) *	.49(.28)				
PS × IC	.88(.35) *	-.37(.18) *				
Group average fear of failure			-.28(.11) *	-.31(.11) **	-.62(.26) *	-.48(.31)
Group average work motivation			.33(.22)	.20(.22)	1.11(.51) *	2.25(.62)**

Note. * $p < .05$; ** $p < .01$

PS = psychological safety climate; IC = team individualism/collectivism.

Figure 1

Conceptual Model of the Current Research

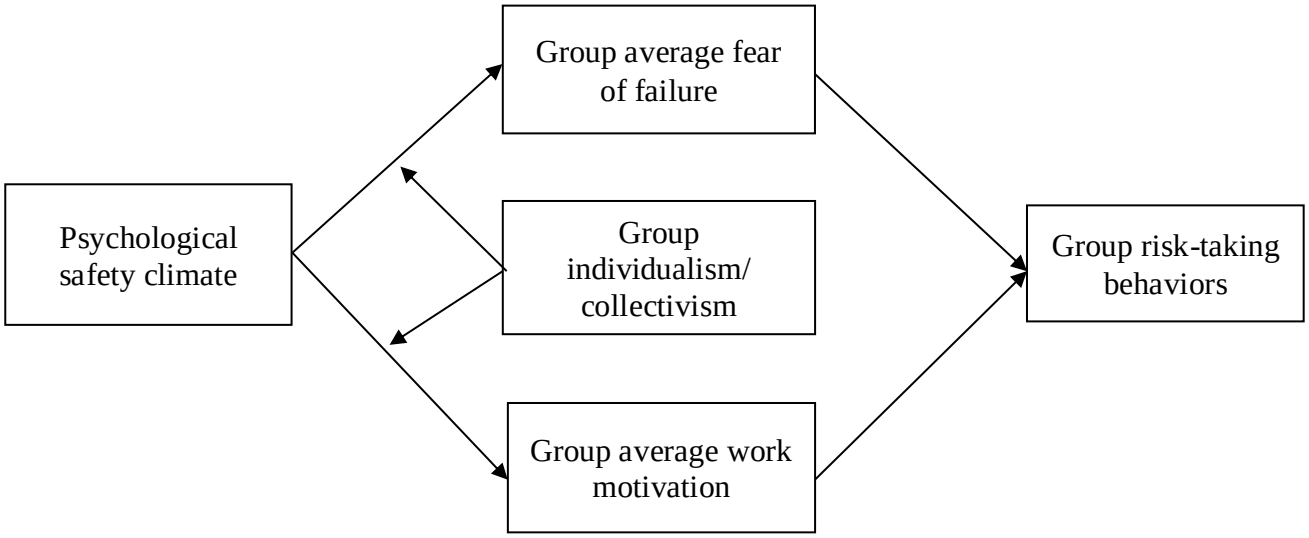
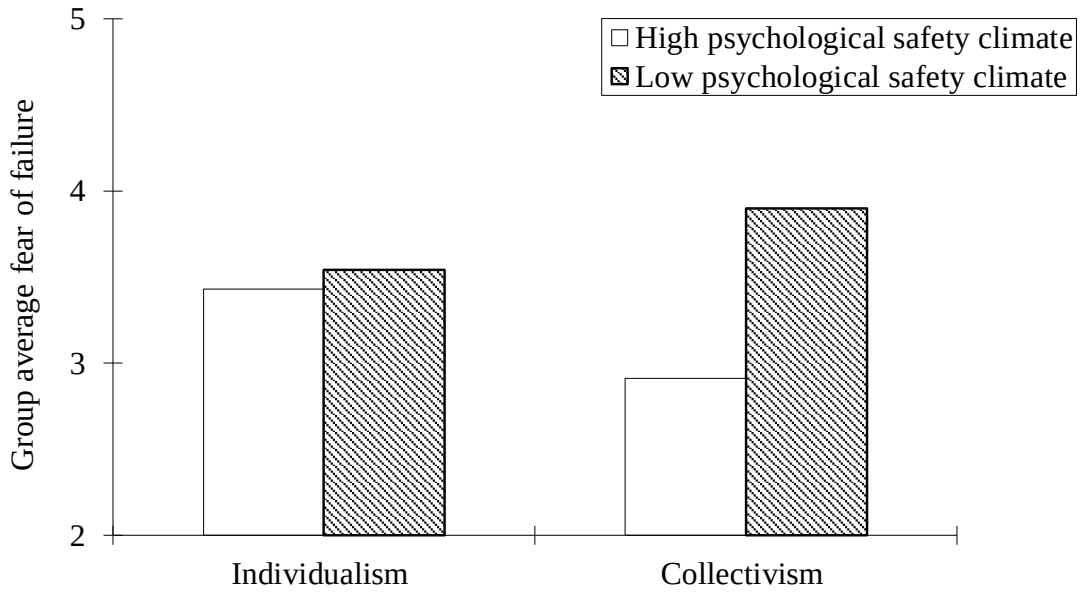


Figure 2 (Study 2)

The Moderating Effect of Group Individualism/Collectivism on Group Average Fear of Failure (a)



The Moderating Effect of Group Individualism/Collectivism on Group Average Work Motivation (b)