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Shared rewards and goal interdependence for psychological safety among departments in China

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Abstract Psychological safety has been shown to facilitate learning from experience that can help organizations adapt to the changing marketplace. Shared rewards and cooperative, but not competitive and independent, goals may help department members feel supported and able to discuss open-mindedly their experiences, including mistakes, and learn from them. One hundred and twenty five CEOs and 436 executives from 125 companies in China completed measures of psychological safety, goal interdependence, and shared rewards. The results of two structural equation analyses suggest that shared rewards can convince departments that their goals are cooperative and that this conclusion in turn leads to psychological safety. These results were interpreted as suggesting that shared rewards and cooperative goals are important foundations for organizational psychological safety in China and perhaps other countries as well.

Keywords Psychological safety · Goal interdependence · Shared rewards · China

Developing the relationships among departments so that they work together has long been considered both critical for helping organizations adapt effectively to the rapidly changing marketplace and a difficult challenge for top management teams

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(Carmeli & Gittell, 2009; Perez-Nordtvedt, Kedia, Datta, & Rasheed, 2008; Van Knippenberg, 2003; Van Wijk, Jansen, & Lyles, 2008). Recently, researchers have argued that the links between departments are especially useful to the extent that they can help organizations reflect and learn from their experiences and apply their insights to improving organizational performance (Carter & West, 1998; Pak & Snell, 2003; Pegels, Song, & Yang, 2000; Pettus, 2001; West, 1996). But this kind of learning is especially challenging as it requires departments to reflect on their practice, develop their competence, and adapt their behaviors so that their organization performs effectively (Bunderson & Sutcliffe, 2003). Although little research has identified conditions under which departments can engage in reflective learning, studies have found that teams that develop a climate of psychological safety where members believe they can express their ideas as well as feel valued are able to reflect on their experiences effectively and learn (Cannon & Edmondson, 2001; Edmondson, 1996, 1999; Karik & Carmeli, 2009). However, there are few studies that have documented the conditions that promote psychological safety or examine psychological safety at the organizational level. Arguing that productive relationships among departments very much contributes to psychological safety, this study uses the theory of cooperation and competition to identify the kind of relationships among departments that promotes psychological safety. It tests a model that shared tangible and intangible rewards among departments strengthen their cooperative goals that in turn result in psychological safety.

This study makes several contributions to the literature. It tests the recent theorizing on the importance of relationships on organizational performance by examining their role on psychological safety (Gersick, Bartunek, & Dutton, 2000; Kostova & Roth, 2003; Lewicki & Wiethoff, 2000; Perez-Nordtvedt et al., 2008; Reis, Collins, & Berscheid, 2000; Rousseau, Sitkin, Burt, & Camerer, 1998). It empirically links the theory of cooperation and competition with the literature on psychological safety by suggesting that cooperative goals promote the relationship dynamics that help people feel safe to express their views. Studies have focused on the consequences of goal interdependence but understanding when people, especially from different departments, develop cooperative goals is an important theoretical and practical issue. This study shows how the sharing of tangible and intangible rewards is convincing evidence to department members that their goals are cooperative. More generally, this study demonstrates that the concepts of psychological safety, goal interdependence, and shared rewards developed largely on teams in the West are also relevant for understanding the dynamics between departments in Chinese organizations (Ahlstrom, 2010; Fang, 2010).

Psychological safety for organizational learning

Learning, especially the complex skills of coordination among departments, is complex and difficult to accomplish (Pak & Snell, 2003). Experiences, including mistakes and errors, can be valuable stimulates for learning (Nonaka & Takeuchi, 1995; Starkey, 1998). Reflecting on experiences may reveal insights that correct misunderstandings of the situation and identification of shortcomings that frustrate effective action (Edmondson, 1996, 1999; Van Dyck, Frese, Baer, & Sonnentag,

2005; West, 1996). However, considerable research suggests that people are tempted to defend and continue their present course of action despite clear evidence that this action is misguided (Bazerman, 1997; Edmondson, 1999; Staw, 1981). To learn from mistakes and other experiences, organizational members must recognize and challenge the limitations of their present thinking, openly consider feedback, create new ways of working, and take the risks to implement them in a circle of continuous improvement (Garvin, 1993).

But how can the important, but challenging outcome of learning be fostered? Theorists have proposed that collaboration and interaction among individuals, groups, and organizations are the bases for experiential learning (Bartol, Liu, Zheng, & Wu, 2009; Carmeli & Gittell, 2009; Fisher & White, 2000; Senge, 1990). Interaction among organizational members appears to be critical for their ability to reflect on their experiences and learn from mistakes (Kale, Singh, & Perlmutter, 2000). However, interaction itself is unlikely to facilitate learning uniformly. Interaction can reinforce biases and defensiveness rather than openness and learning (Houghton, Simon, & Goldberg, 2000; Schwenk, 1984; Van Knippenberg, Van Knippenberg, & Van Dijk, 2000). Organizational members may join together to make excuses for their behavior, blame shortcomings on other members, and believe that they have little to learn, convinced that others should change their ways. They join together to protect their interests at the expense of the organization's (Chen & Chen, 2009).

Researchers have begun to develop frameworks for identifying the climate and interaction that support learning. Argyris and Schon (1978, 1996) distinguished between the interactions that promote and frustrate learning. Model I values of avoiding emotionally laded discussions, exercising unilateral control, and winning have been found to result in closed-mindedness and a rigid commitment to one's current practices. However, Model II values of openness, joint responsibility, and mutual influence, when genuinely applied, facilitate the communication and acceptance of information and feedback, which in turn result in learning. Unfortunately, Argyris and Schon have found that Model I values are highly dominant among managers and that helping managers operate according to Model II values requires considerable skill and effort.

Edmondson (1996, 1999) has identified psychological safety as a vital condition that fosters learning. Psychological safety provides members with the supportive, accepting climate so that they can engage in reflection and innovate (Carmeli & Gittell, 2009; Karik & Carmeli, 2009). They feel their own abilities and personalities are appreciated, believe they are free to ask for help and take risks, have few fears that they will be blamed, and believe that others will not undermine their efforts.

Teams with a high level of psychological safety help members appreciate that their performance can be improved and to recognize that unexpected, undesired effects have occurred (Cannon & Edmondson, 2001). Then the teams reflect on these experiences so that they can better understand the factors that hindered effective action. Team members help each other express their ideas, then combine them to create new solutions that will guide the team to be more successful in the future (Edmondson, 1996, 1999; West, 1996). Studies have documented the value of psychological safety for teams, but research is needed to identify its antecedents as well as to suggest the usefulness of psychological safety for understanding learning at the organizational level (Carmeli & Gittell, 2009; Karik & Carmeli, 2009). This

study uses the theory of cooperation and competition to document when organizational members feel psychologically safe.

Theory of cooperation and competition

Although competition and independent work can be useful under certain conditions, research suggests that people who have cooperative, compared to competitive and independent, goals develop the relationships and interaction dynamics that promote productivity and innovation (Chen & Tjosvold, 2002; Johnson & Johnson, 2005; Tjosvold, Tang, & West, 2004). This study argues specifically that cooperative goals help organizational members develop psychological safety.

Deutsch (1973) assumed that individuals work to further their self-interests by developing and striving to reach their goals. However, the pursuit of self-interests does not preclude the development of effective collaboration and relationships. Deutsch argued that it is the way goals are perceived to be structured that determines how people interact and these interaction patterns in turn determine outcomes (Deutsch, 1973; Johnson & Johnson, 2005; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Stanne, Johnson, & Johnson, 1999).

Goals may be considered cooperatively, competitively, or independently related. In cooperation, people consider their goal achievements positively correlated; they believe that they can reach their goals if and only if the others also reach their goals. In competition, people believe their goal achievements are negatively correlated; each perceives that the achievement of one prohibits or at least makes it less likely that others will achieve their goals. With independent goals, achievements are thought to be unrelated.

Whether people understand that their own goals are related cooperatively or competitively critically affects their expectations, interaction, and outcomes. With cooperative goals, people believe that as one moves toward goal attainment, others move toward reaching their goals. They understand that others' goal attainment helps them; they can be successful together. As a consequence, people want each other to perform effectively for such competence helps each person be successful. They expect each other to use their abilities to work for mutual benefit (Lewicki, McAllister, & Bies, 1998). They engage in promotive interaction designed to encourage each other to act effectively to reach goals.

Cooperative goals and experiences may convince people that they can express their feelings and doubts to help them consider their experiences openly within a supportive, psychologically safe climate. As their goals are positively related, they are confident that people want each other to perform effectively and, specifically, to learn from their experiences (Johnson, Johnson, & Tjosvold, 2006). They not only fully reflect on their experiences, including mistakes and misgivings, but feel confident that they will combine their ideas to develop more effective ways of operating in the future (Tjosvold, 1998).

However, in competition, people expect each other to work for their own goals at the expense of others. They are suspicious that if they identify issues and mistakes that others may use this knowledge against them to obstruct the goal progress so that they can "win" (Deutsch, 1973; Johnson & Johnson, 1989; Johnson et al., 1981;

Stanne et al., 1999). They doubt that they will combine their information and ideas to solve identified problems.

With independent goals, people expect that others will work for their own goals with little regard for the goals of others. Having few incentives to assist each other, they are largely indifferent to the concerns and interests of others.

Based on the above ideas and research, this study hypothesizes that:

Hypothesis 1 To the extent that departments conclude that they have cooperative goals, they develop psychological safety within the organization.

Hypothesis 2 To the extent that departments conclude that they have competitive goals, they have little psychological safety within the organization.

Hypothesis 3 To the extent that departments conclude that they have independent goals, they have little psychological safety within the organization.

Shared rewards

Although shared rewards in the form of group bonuses and company profit-sharing plans appear to be increasingly employed in organizations, few studies have actually documented their effects. Generally, researchers have found that sharing rewards improves coordination and task accomplishments (Wageman, 1995). For example, group rewards were found to be an important contributor to team performance in a field experiment on a team-building program (Pritchard, Holling, Lammers, & Clark, 2002). Profit-sharing and gain-sharing plans have also been found to have positive effects on productivity at the organizational level (Hanlon, Meyer, & Taylor, 1994; Klein, 1987; Rosen, Klein, & Young, 1986).

Yet researchers have noted that shared rewards are not always accepted and effective (Kirkman & Shapiro, 2000; Klein, 1987; Sosik, Avolio, & Khai, 1997; Wageman, 1995). The theory of cooperation and competition may help clarify the dynamics by which shared rewards affect outcomes.

Deutsch (1973) theorized that motivation orientations as well as cognitive (e.g., people see themselves as part of an interdependent group), and ethical ones (e.g., people treat each other fairly and respectfully) affect the conclusions people make about how their goals are related. He proposed that sharing tangible and intangible rewards is the motivational orientation that develops cooperative goals. In particular, people who believe that the benefits of their joint work will be distributed among all of them use this knowledge to conclude that that their goals are positively related. As they benefit to the extent that others succeed, they understand that they gain rewards to the extent that all other team members gain rewards and thereby conclude that their goals are positively aligned. However, when they do not believe these rewards are distributed to all, such as when they are distributed to individuals based on their individual performance, they are apt to believe that their goals are negatively related and independent. Experimental tests support this reasoning (Deutsch, 1973).

In contrast to the considerable research that has documented that the conclusions people make about how their goals are related very much affect their dynamics and

outcomes, few studies have explored the motivational and other antecedents that affect conclusions about goal interdependence, especially in organizations (Beehr, Glazer, Fischer, Linton, & Hansen, 2009; Johnson & Johnson, 1998). This study directly tests the idea that sharing tangible and intangible rewards among departments contributes to their conclusions that their goals are positively related.

Based on the above research and reasoning, it is hypothesized that:

Hypothesis 4 To the extent that departments share rewards, they conclude that they have cooperative goals.

Hypothesis 5 To the extent that departments do not share rewards, they conclude that they have competitive goals.

Hypothesis 6 To the extent that departments do not share rewards, they conclude that they have independent goals.

This study tests a model linking reward distribution and goal interdependence with psychological safety (Figure 1). Specifically, sharing rewards is expected to develop cooperative goals that in turn result in psychological safety.

This study makes methodological contributions to previous research in that it allowed independent measures of reward distribution, goal interdependence, and psychological safety. Both the CEO and department leaders provided these measures allowing testing the model with data from two sources and in two ways.

Research on the theory of cooperation and competition and on psychological safety has been conducted largely in the West; these ideas cannot be assumed to apply in collectivist China (Anderson, De Dreu, & Nijstad, 2004; Hofstede, 1993). This study tests the utility of these concepts in China. It may be thought that Chinese people, as collectivists who value interpersonal relationships, have a high degree of interdepartmental coordination (Leung, 1997; Triandis, 1990; Triandis, McCusker, & Hui, 1990). However, Chinese people as collectivist are thought to be particularly

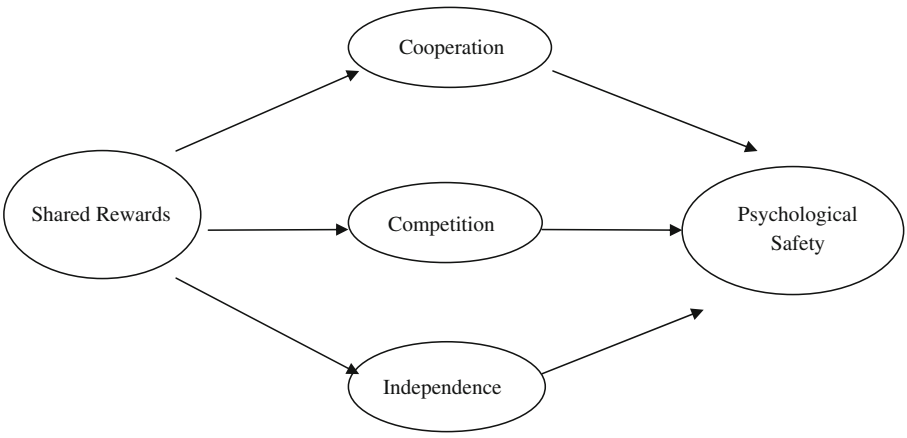


Figure 1 Hypothesized model

oriented toward their in-groups and bias against out-groups. Chen, Peng, and Saparito (2002) have proposed that Chinese people and other collectivists exploit out-group members more than individualists. As the theory of cooperation and competition and the concept of psychological safety were developed in the West, they cannot be assumed to apply in China. This study provides a direct test of the utility of these ideas to the collectivist culture of China.

Method

Participants

The China Entrepreneurs Survey System includes 600,000 firms; companies in this data collection system tend to be large but are expected to be approximately representative of the industries and regions in China. For this study, 1,000 companies were randomly selected and sent sets of questionnaires. CEOs and top management team members are thought to be knowledgeable about the dynamics between departments (Lubatkin, Simsek, Ling, & Veiga, 2006). Therefore, each set of questionnaires included one CEO questionnaire and 3-5 executive questionnaires. In regard to response rate, 204 firms (20.4%) returned the questionnaires within the required time period. However, 79 sets of questionnaires were incomplete in that they did not have completed questions from the CEO and at least two executives and 125 sets (12.5%) of questionnaires were used in the analyses. In these 125 sets of questionnaires, 125 surveys were completed by CEOs (22.3%) and 436 by Executives (77.7%).

Among the 125 firms, 32 firms were state-owned enterprises (25.6%), and 93 non-state-owned (74.4%). Regarding industry, 69 firms were in manufacturing (55.2%) and 56 in non-manufacturing (44.8%). In terms of region, 74 firms were from East China (59.2%), 29 from Central China (23.2%), and 22 from West China (17.6%).

Average number of employees in these firms was 1,297. The average age of the CEOs and executives was 45.3 years old and 84.49% of them were males. Among them, 37.28% had a bachelor's degree, 12.90% a master's degree, and 49.82% less than a bachelor's degree. The average work tenure of the participants for the firms was 17.5 years.

Measures

Both the CEO and executives were required to rate on the specific scales developed to measure the shared rewards, goal interdependence, and psychological safety among departments (see Appendix). All measures used a 7-point Likert scale (from 1 = little to 7 = a great deal) with higher marks indicating more agreement.

Shared rewards Four items were used to measure the profit sharing among departments within each organization. This scale indicated to what extent different departments shared their rewards and benefited from each other's success. A sample item is "In our company, other departments will share material (such as money) reward for their contributions if one department achieves good performance and profit." The reliability of this scale is .83.

Goal interdependence Scales for cooperative and competitive goal interdependence were developed from a previous questionnaire study conducted in North America (Alper, Tjosvold, & Law, 1998). The five cooperative goal items measured the emphasis on mutual goals and common tasks. A sample item for the cooperative goal scale is "Departments seek compatible goals." The five competitive goal items measured the emphasis on incompatible goals and rewards. A sample item is "Departments have a win-lose relationship." The independent goal scale had five items with similar anchors to measure the emphasis on unrelated goals and rewards. A sample item is "The success of one department is unrelated to others' success." The scales all demonstrated acceptable reliability. The coefficient alphas for the cooperative, competitive, and independent goal scales were .92, .86, and .92 respectively.

Psychological safety Seven items adapted from Edmondson (1999) were used to measure the psychological safety felt by the members in each department. The scale indicates the extent that the departments feel safe to make mistakes, propose different ideas, get support from other members, and value others' unique skills and talents. A sample item is "It is safe to for department to take a risk during cooperation with other departments." The scale had a coefficient alpha of .86.

Two members of the research team who are native Chinese translated the questionnaires originally written in English into Chinese. To ensure conceptual consistency, two other members back translated the questionnaires into English to check for possible deviation (Brislin, 1970). The questionnaires were pre-tested to make sure that respondents clearly understood every phrase, concept, and question. To prevent and eliminate potential concern for being involved in evaluating others, participants were assured that their responses would be held totally confidential.

Analysis

Data aggregation The CEOs provided the ratings of their organization. We aggregated the ratings of the executives on the five variables to the organizational level in the analyses. The fundamental reason was that the hypotheses identified the unit of analysis as the organization. The mean of the executives' ratings should be the best estimator of the dynamics of the organization from the executives' perspective.

However, the aggregation required that the perceptions of executives within each organization were reasonably homogeneous. We used James, Demaree, and Wolf's (1984) procedure to estimate the inter-rater reliability of people within each organization for each of the five individual-level variables. James et al.'s (1984) $r_{WG(J)}$ index was used as an estimate of inter-rater reliability because each of the five variables were measured by multiple items. Two indicators showed that the ratings among members in each group were quite homogeneous. First, the median $r_{WG(J)}$ for the five variables across the 125 teams were .96, .98, .94, .97, and .96 respectively. Second, George and Bettenhausen (1990) argued that $r_{WG(J)}$ which was greater than or equal to .70 could be considered as indicators of good agreement within group. Out of the 125 organizations, the proportions of organizations with $r_{WG(J)}$ greater

than or equal to .70 across the five variables were .94, 1.00, .90, .91, and .96 respectively. We therefore concluded that the within-organization ratings were homogeneous enough to be aggregated to the organization level.

Executives' ratings were aggregated to the organization level and the data merged with CEO ratings. This merged data was later divided into two data files. In the first data file (Data I), the exogenous variable of shared rewards and the mediating variables of goal interdependence were rated by executives, and the outcome variable of psychological safety was rated by CEOs. Resources were exchanged in the second data file (Data II) (i.e., the exogenous and mediating variables were rated by CEOs and the outcome variable was rated by the executives). The final sample size of each merged data file was 125.

Scale validation We carried out a series of confirmatory factor analyses using EQS for Windows (Bentler & Wu, 1995), to establish whether the respondents' ratings would load on shared rewards, cooperative goal, competitive goal, independent goal, and psychological safety, as distinct factors. In order to reduce the number of parameters estimated and to develop parallel test forms (Nunnally, 1978), we further simplified the structural model by reducing the number of indicators for the multi-item constructs. Specifically, we combined those items with the highest and lowest loadings by averaging until this yielded three indicators for each construct. This is a common approach in the literature of structural equation analysis (Mathieu & Farr, 1991; Mathieu, Hofmann, & Farr, 1993). With 5 latent constructs, and a sample size of 125, the indicators to sample size ratio was favorable.

Results of the confirmatory factor analyses are shown in Table 1. With fit indexes (NFI, NNFI, CFI) all above .90, it indicates a good fit between our proposed 5-factor measurement model (M0) and the data. The 5-factor measurement model was then compared to two different 4-factor models (M1, M2), a 3-factor model (M3), and the one-factor solution model (M4). These four alternative models were selected on the basis of the logical possibility that each pair of adjacent variables in the model might not be conceptually distinct, and that instead of a causal relationship, there might be a single factor.

As shown in Table 1, the model Chi-squares of four alternative models (M1, M2, M3, and M4) using both data sets were significantly greater than that of the proposed 5-factor model (M0) and the fit index scores of the four models were also lower than .90. Therefore, comparisons suggest that the 5 factors in the proposed model (M0) were distinct measures of the constructs in our study.

Hypotheses testing Correlation analyses were used as an initial test of the hypotheses. Correlations among the variables at the organization level are shown in Table 2.

To test the theory more vigorously, structural equation analyses were used to test the proposed model that goal interdependence mediates the relationship between shared rewards and the outcome of psychological safety (Bentler & Wu, 1995). This analysis involved only the structural model, not the measurement model.

A nested model test commonly adopted in causal model analysis was used where two alternative models, the partially mediated model (full model) and the non-mediated model, were adopted to compare with the hypothesized model. The

Table 1 Confirmatory factor analyses (N=125).

	d.f.	Model χ^2	$\Delta\chi^2$	Δd.f.	NFI	NNFI	CFI
Data I*							
Baseline 5-factor model (M0)[a]	80	127.10			.93	.97	.97
Combined shared rewards and cooperative goals (M1)	84	347.18	220.08	4	.82	.82	.86
Combined cooperative goals and psychological safety (M2)	84	278.09	150.99	4	.86	.87	.89
3-factor Model (M3)[b]	87	280.51	153.41	7	.77	.79	.83
One factor solution (M4)	90	1178.14	1051.04	10	.39	.30	.40
Data II*							
Baseline 5-factor model (M0)[a]	80	127.10			.93	.97	.97
Combined shared rewards and cooperative goals (M1)	84	347.18		4	.82	.82	.86
Combined cooperative goals and psychological safety (M2)	84	278.09		4	.86	.87	.89
3-factor Model (M3)[b]	87	310.96		7	.76	.82	.84
One factor solution (M4)	90	492.39		10	.62	.65	.69

* In Data I, Rewards and Goals rated by VPs and Psychological Safety rated by CEOs; in Data II, Rewards and Goals rated by CEOs and Psychological Safety rated by VPs.

[a] 5-factor Model (M0) includes shared rewards, cooperation, competition, independence, and psychological safety.

[b] In 3-factor Model (M6), cooperation, competition, and independence were combined to one factor.

partially mediated model suggested that shared rewards affected goal interdependence and the outcome of psychological safety directly, and goal interdependence also had causal influence on the outcome. In the non-mediated model, shared rewards caused goal interdependence and the outcome directly, but no causal relationship between goal interdependence and psychological safety.

Results

Zero-order correlations provide an initial examination of the hypotheses linking shared rewards, goal interdependence, and psychological safety (Table 2). Results support our first three hypotheses. Cooperative goals positively and significantly correlated with psychological safety (.37, $p < .01$; .29, $p < .01$); competitive goals and interdependent goals negatively and significantly correlated with psychological safety (-.28, $p < .01$; -.36, $p < .01$; -.17, $p < .10$; -.19, $p < .05$). Results also largely support the last three hypotheses. Shared rewards positively and significantly correlated with cooperative goals (.49, $p < .01$; .42, $p < .01$) and negatively though not always significantly correlated with competitive goals and independent goals.

The hypothesized model was tested through EQS to explore the relationship between rewards, goal interdependence, and outcomes. As showed in Table 3, the fit

Table 2 Results of correlation analyses (N=125).

	Mean	Std. D.	Rewards	Coop	Comp	Indep	PsySafe
Data I							
Shared Rewards	5.02	0.76	(.86)				
Cooperation	5.64	0.63	.49**	(.90)			
Competition	3.06	0.87	-0.12	-.42**	(.96)		
Independence	2.74	0.88	-0.14	-.46**	.87**	(.95)	
Psychological Safety	5.08	0.77	.23**	.37**	-.28**	-.36**	(.85)
Data II							
Shared Rewards	5.02	0.87	(.77)				
Cooperation	5.66	0.68	.42**	(.89)			
Competition	3.00	0.99	-.10	-.42**	(.83)		
Independence	2.51	0.88	-.18*	-.42**	.76**	(.87)	
Psychological Safety	5.11	0.64	.23*	.29**	-.17	-.19*	(.90)

Values in brackets are reliability (coefficient alpha) estimates.

**$p < .01$, *$p < .05$, two-tailed.

indices for the hypothesized model using both data were acceptable, $\chi 2$ (d.f. = 1) = .95, NFI = .997, CFI = 1.00; $\chi 2$ (d.f. = 1) = .1.85, NFI = .99, CFI = 1.00.

The path coefficients of the accepted model help to explore the findings more specifically. Results (Figures 2 and 3) indicate that shared rewards had significantly positive effects on cooperative goals (β = .49, $p < .01$; β = .26, $p < .01$), and cooperative goal significantly affected psychological safety (β = .26, $p < .01$; β = .26, $p < .01$). Hypotheses 1 and 4 were supported. Though not all significant, the path coefficients from shared rewards to competitive and independent goals are all negative, partly supporting Hypotheses 2 and 3. Unexpectedly, the path coefficient from competitive goals to psychological safety is positive though not significantly.

The partially mediated, fully mediated (i.e., the hypothesized model), and the non-mediated models were compared. Table 4 shows the fit indices for the three competing models. In Data I, the partially mediated models provided significantly better fit to data than the non-mediated model, χ^2 difference (3) = 20.81, $p < .01$, indicating the omission of parameters for goal interdependence's mediating effect on outcomes significantly damages the model fit to data. However, the inclusion of the parameters for the direct effect from exogenous variables to outcomes did not improve the model fit significantly (i.e., the partially mediated model did not outperform the fully mediated model in the data fit), χ^2 difference (1) = 0.95, ns. Therefore, based on the consideration of parsimony principle, the fully mediated model was accepted.

In Data II, the fit indices in the both non-mediated and the fully mediated model were not significantly inferior to the partially mediated model, χ^2 difference (3) = 6.94, ns; χ^2 difference (1) = 1.85, indicating the both models are favorable based on the parsimony principle. However, judged by the Chi-square, NFI, and CFI (See

Table 3 Parameter estimates of the hypothesized structural model.

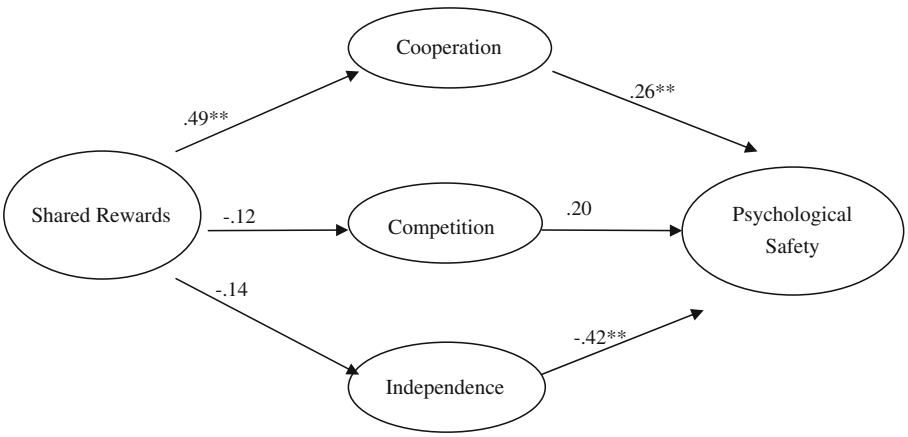
Data I			Data II		
Path from	Path to	Path Coefficient	Path from	Path to	Path Coefficient
Rewards	Cooperation	.49**	Rewards	Cooperation	.42**
Rewards	Competition	-.12	Rewards	Competition	-.10
Rewards	Independence	-.14	Rewards	Independence	-.18*
Cooperation	Psych-Safety	.26**	Cooperation	Psych-Safety	.26*
Competition	Psych-Safety	.20	Competition	Psych-Safety	-.002
Independence	Psych-Safety	-.42**	Independence	Psych-Safety	-.08
Model χ^2	.95		Model χ^2	1.85	
d.f.	1		d.f.	1	
NFI	.997		NFI	.989	
CFI	1.00		CFI	.995	

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

Table 4), the fully mediated model did provide a little better fit to data than the non-mediated model, giving preference to the fully mediated model.

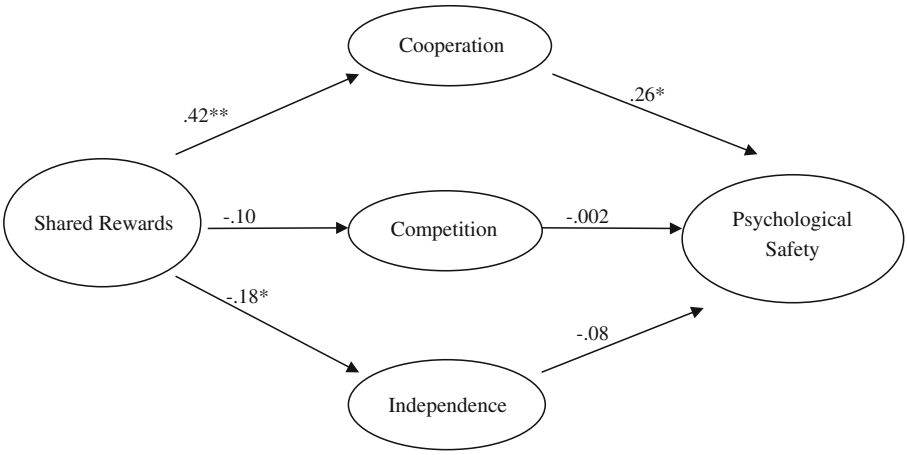
Discussion

Psychological safety has been shown to be quite useful for reflecting on experiences, solving problems, and learning, but helping people in organizations feel psychologically safe is a complex challenge (Argyris & Schon, 1996). Results, although correlational, support the model and provide direction for understanding the



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

Figure 2 Parameter estimates of the hypothesized structural model (Data I)



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

Figure 3 Parameter estimates of the hypothesized structural model (Data II)

development of psychological safety within an organization. This study suggests that strengthening cooperative goals among departments is a direct, powerful way to help them feel the openness and support of psychological safety. In addition, findings indicate that sharing tangible and intangible awards is a practical way to strengthen cooperative goals.

In addition to supporting the theorizing on the value of productive relationships (Gersick et al., 2000; Kostova & Roth, 2003; Lewicki & Wiethoff, 2000; Miles,

Table 4 Results of the nested model analyses.

	Chi-square	d.f.	NFI	NNFI	CFI	RMSEA
Data I						
1. Partially mediated	0	0	-	-	1.00	-
2. Non-mediated	20.81	3	.92	.77	.93	.061
3. Fully mediated	.95	1	.997	1.00	1.00	.052
Data II						
1. Partially mediated	0	0	-	-	1.00	-
2. Non-mediated	6.94	3	.96	.92	.98	.055
3. Fully mediated	1.85	1	.99	.95	.995	.051

1. In the partially mediated model (i.e., full model), shared rewards affected goal interdependence and the outcome directly, and goal interdependence also had causal influence on the outcome.

2. In the non-mediated model, shared rewards caused goal interdependence and the outcome directly, but no causal relationship between goal interdependence and the outcome.

3. In the fully mediated model (i.e., hypothesized model), shared rewards had no direct effect on the outcome.

IFI = Incremental Fit Index; NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation.

Snow, Mathews, Miles, & Coleman, 1997; Perez-Nordtvedt et al., 2008; Reis et al., 2000; Rousseau et al., 1998), this study used the theory of cooperation and competition to specify the nature of the relationships that promote psychological safety (Deutsch, 1973; Johnson & Johnson, 2005). Department members with cooperative goals felt psychologically safe with each other but those with competitive and independent goals reported low levels of psychological safety. With cooperative goals, department members have a vested interest in helping each other perform effectively and as a consequence expect others will want to help them as it is to their own advantage if they succeed. They then can be confident that others will respond supportively as they discuss their frustrations and misgivings as well as their successes. Competitive and independent goals, on the other hand, were negatively related to psychological safety, although they were not statistically significantly negative contributors in the path analysis. Overall, it appears that competitive and independent goals do not provide organizational members many experiences in relying upon each other and working together so that they do not feel psychologically safe.

Research has concentrated on documenting the effects of cooperative and competitive goal interdependence. This study supports Deutsch's (1973) argument that the motivation to achieve shared rewards strengthens cooperative goals and reduces competitive and independent ones. Reward distribution seems to be a concrete way to convince departments that their goals are positively related so that as one department moves toward accomplishing its goals, other departments also succeed.

Chinese people have long argued that relationships are key to teamwork and indeed to organizational work and business. Personal relationships, *guanxi*, promotes mutual exchange and is needed to supplement rules and roles that are often limited and ineffective (Hui & Graen, 1997). Western theorists have recently agreed that the nature of relationships critically affects work, especially in the today's open, networked organizations and economies (Gersick et al., 2000; Kostova & Roth, 2003; Lewicki & Wiethoff, 2000; Perez-Nordtvedt et al., 2008; Rousseau et al., 1998). This study provides an empirical documentation of the contribution of relationships for psychological safety.

The theory of cooperation and competition, despite its origins in the West, proved useful for understanding teamwork in China (Deutsch, 1973). The research approach of identifying conditions that impact organizational dynamics and outcomes in China with a theory with universalistic aspirations may be a viable addition to the traditional alternatives of comparing samples from different cultures and exploring a cultural variable with an indigenous theory (Leung, 1997). The research approach used here can both probe general theories and improve understanding of organizational dynamics in non-western cultures.

Results suggest that the ideas of shared rewards, cooperation and competition, and psychological safety, although developed in the West, are useful to understand dynamics within Chinese organizations. There may be though indigenous ideas that are more useful. Testing ideas developed in the West and in China in both Western and Chinese settings may suggest how these ideas can be usefully integrated and refined.

Limitations

The sample and operations limit the results of this study. The data are correlational and do not warrant causal inferences. Therefore, they provide only indirect evidence of the hypothesized causal links between shared rewards, goal interdependence, and psychological safety. However, the model was tested in two ways, both using independent sources of the data. Developing different sources for the independent and dependent measures should reduce the possibilities of same source method as an alternative explanation of the results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The very poor fit of the one factor analysis also suggests that common method is not a likely explanation of the results (Podsakoff et al., 2003). The data are also self-reported and subject to biases and may not accurately describe the relationships, although recent research suggests that self-reported data are not as limited as commonly expected (Spector, 1992).

Spector and Brannick (1995) have argued that the most effective way to overcome causal inference, recall, and other methodological weaknesses is to test ideas with different methods. It would be desirable to provide direct experimental verification of the role of shared rewards and goal interdependence on psychological safety in East Asian organizational settings.

Practical implications

Learning from experience has considerable potential to help organizations adapt to the changing marketplace but developing the psychological safety found to be useful for such learning is difficult (Barney, 1991, 1992, 2001). In addition to developing theoretical understanding, support for this study's hypotheses may have important practical implications for structuring the relationships among departments, especially in China and other collectivist cultures.

Sharing tangible and intangible rewards, results suggest, can help departments develop cooperative goals and thereby feel psychologically safe. Previous research identifies a number of ways that shared rewards can be implemented. Companies have used profit sharing and gain-sharing plans and these plans, when effectively administered, can improve coordination and productivity (Hanlon et al., 1994; Klein, 1987; Rosen et al., 1986). Previous research also suggests that a common direction, tasks, and values can reinforce shared reward distributions for cooperative goal interdependence (Hambrick, 1994; Hanlon et al., 1994; Li, Xin, Tsui, & Hambrick, 1999; Pearce, 1997; Tjosvold & Tjosvold, 1995).

Results support the theorizing that shared rewards and cooperative relationships can help departments develop psychological safety. With cooperative goals, departments develop confidence that they can rely upon each other to respond positively to their reflections and support their efforts to consider their experiences open-mindedly. They expect that they will combine their ideas to find solutions to problems identified. Competitive and independent goals, on the other hand, do not appear to be a realistic basis for departments to feel psychologically safe. Results were interpreted as suggesting that shared rewards and cooperative goals are important foundations for psychological safety in Chinese organizations and perhaps organizations in other countries too.

Appendix

Measures

Cooperative goals

Departments 'swim or sink' together.
Departments want each other to succeed.
Departments seek compatible goals.
The goals of departments go together.
When departments work together, they usually have common goals.

Competitive goals

Departments structure things in ways that favor their own goals rather than the goals of other team members.
Departments have a 'win-lose' relationship.
Departments like to show that they are superior to each other.
Departments' goals are incompatible with each other.
Departments give high priority to the things they want to accomplish and low priority to the things other departments want to accomplish.

Independent goals

Each department "does his own thing."
Departments like to be successful through their own individual work.
Departments work for our own independent goals.
The success of one department is unrelated to others success.
Departments are most concerned about what they accomplish when working by themselves.

Profit Sharing within organization

In our company, each department will share material (such as money) reward for its contribution if the whole company achieves good performance and profit.
In our company, each department will share spiritual reward for its contribution if the whole company achieves good performance and profit.
In our company, other departments will share material (such as money) reward for their contributions if one department achieves good performance and profit.
In our company, other departments will share spiritual material reward for its contribution if one department achieves good performance and profit.
Generally speaking, departments share common goal and mutually support each other in our company.

Inter-departmental psychological safety

Departments are able to bring up and discuss problems and tough issues during cooperation with other departments.

Departments seldom reject other departments for being different.
It is safe to for department to take a risk during cooperation with other departments.
It is easy to for department to ask other departments for help.
No department would deliberately act in a way that undermines other departments' efforts.
Working with other departments, my department's unique skills and talents are valued and utilized.
If one department makes a mistake during cooperation with other departments, other departments are often held against it.

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