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Leadership Values for Learning in China:

The Mediating Role of Psychological Safety

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Abstract

Organizations are relying increasingly on teams to promote critical objectives, including learning and development. The values of leaders have traditionally been thought to have powerful effects on individual performance but few studies have examined their impact on teamwork among employees. This study proposes that leader values of participation, people, and productivity can promote team learning and that psychological safety within teams is an important mediator between leader values and team learning. Leaders and members of 101 groups in Shanghai, China, participated in the study. Structural equation analysis suggested that psychological safety mediated the relationships between leader values and learning. These results were interpreted as suggesting that leader values can help members develop psychological safety that in turn induces learning.

Keywords: leader values; psychological safety; learning

LEADERSHIP VALUES FOR LEARNING IN CHINA:

THE MEDIATING ROLE OF PSYCHOLOGICAL SAFETY

Leaders are increasingly expected to help individuals and teams learn so that their organizations adapt and compete successfully in the rapidly changing marketplace (Levitt and March 1988; Luo and Peng 1999). Research has confirmed that learning can contribute substantially to organizational performance (Luo and Peng 1999; VandeWalle, Brown, Cron and Slocum 1999). Argyris and Schon (1978, 1996) have proposed that leader values can profoundly promote learning by inducing open interaction among leaders and employees. Considerable empirical research has investigated the leader values of productivity, people, and participation on individuals, but not on their effects on teams and learning (Bass, 1990; Judge, Piccolo and Ilies 2004; Kerr and Schrieshiem 1974; Matsui, Ohtsuka and Kikuchi, 1978; Misumi and Peterson 1985; Stogdill and Coons 1957). This study argues that these leader values develop the interpersonal climate where individuals and teams learn. Specifically, this study tests the hypotheses that the leader values of productivity, people, and participation together develop the psychological safety (Edmondson 1996, 1999) that in turn induces learning.

This study makes several contributions to the literature. Research on leader values has a long history but few studies have examined their effects on teams and on learning. This study empirically links the research on leader values to the important outcome of team learning and the learning of individuals in teams. In addition, research is needed on the mediators between leader values and outcomes (Jung and Avolio 2000; Kirkpatrick and Locke 1996; Wang, Law, Hackett, Wang and Chen 2005). It suggests that these values are useful because they develop a psychologically safe environment that encourages open sharing of knowledge and reflection on

experiences. Western-developed ideas cannot be assumed to apply in China (Hofstede 1993). This study also tests the utility of Western developed ideas of leader values and psychological safety for understanding learning in Chinese organizations.

The paper first discusses the need for the appropriate climate to help team members discuss and learn and specifically argues for the value of psychological safety as an important foundation for teams to learn. Then it shows how leader values of participation, people, and productivity can be the basis for psychological safety in teams. The paper also discusses about how Chinese values may affect the relationship between leader values, psychological safety, and learning. Finally, it uses data from leaders and members of 101 groups in Shanghai, China to support its argument that leader values of participation, people, and productivity can promote team learning and that psychological safety within teams is an important mediator between leader values and team learning.

Psychological Safety for Organizational Learning (Heading 2)

Learning from experience, though challenging, is thought to have powerful effects on organizational performance (Barkema and Schijven 2008; Carter and West 1998; Pak and Snell 2003; West 1996). Teams oriented to learning reflect on their practice, develop their competence, and adapt their behaviors so that their groups and organizations perform effectively (Bunderson and Sutcliffe 2003). Learning from experience is recognized as vital in order for organizations to respond to rapid changes in technology and market forces (Levitt and March 1988; Luo and Peng 1999).

But learning, especially the more important innovation skills, is complex and difficult to accomplish (Lu, Leung and Koch 2006; Pak and Snell 2003). Experiences, including mistakes and

errors, can be valuable stimulates for learning (Starkey 1998; Nonaka and Takeuchi 1995). 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 and Sonnentag 2005; West 1996). However, considerable research suggests that individuals and teams 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, team 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 (Fisher and White 2000; Lane and Lubatkin 1998; Nonaka and Takeuchi 1995; Senge 1990). Interaction among organizational members appears to be critical for their ability to reflect on their experiences and learn from mistakes (Kale, Singh and Perlmutter 2000). However, interaction itself is unlikely to facilitate learning uniformly. Interaction can reinforce biases and defensiveness rather than openness and learning (Houghton, Simon and Goldberg 2000; Schwenk 1984; Van Knippenberg, Van Knippenberg and Van Dijk 2000). Organizational members may join together to make excuses for their behavior and reinforce their closed-mindedness. They can blame shortcomings on other members and believe that they have little to learn, convinced that others should change their ways.

Researchers have begun to develop frameworks for identifying the climate and interaction that supports learning. Argyris and Schon (1978, 1996) distinguished between the interaction that

promotes and frustrates 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 recently identified psychological safety as a vital condition that fosters learning. Psychological safety provides team members with the supportive, accepting climate so that they can engage in reflection and innovate. They feel their individual 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 and 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).

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

1. The psychological safety of teams develops team learning and the learning of individuals from their teams.

Leader Values (Heading 2)

How can leaders foster psychological safety among their employees? Researchers have long distinguished leaders in terms of their values, such as the extent to which they value people and productivity (Bass 1990; Kerr and Schrieshiem 1974; Matsui, Ohtsuka and Kikuchi 1978; Misumi and Peterson 1985; Stogdill and Coons 1957). However, Argyris and Schon (1978, 1996) have vigorously argued that leader's espoused values may confuse and obstruct especially when they are inconsistent with the leader's actions. This study proposes that leader's values regarding participation, productivity, and people result in learning to the extent that they promote psychological safety.

Researchers have argued that participative leadership where employees are invited to discuss issues in an attempt to reach a broad consensus can strengthen an organization (Likert 1961). Employee involvement has been thought to help reduce costs and improve quality (Allen and Allen 1992; Cusumano 1988; Roth 1994). Studies indicate that participation promotes employee involvement in decision-making and taking ownership in the decisions (Heller and Wilpert 1981; Miller and Monge 1986). Participative leaders are expected to help employees feel they are able to identify and solve problems together and thereby that they feel psychologically safe and learn.

Leaders who value productivity want employees to follow procedures and instructions so that they work effectively. People values, also labeled a maintenance orientation, reveal that the leader is supportive and concerned about employees as individuals. These dimensions can be independent so that leaders can be high or low on both productivity and people orientations. Overall, research indicates that people values may be particularly useful for such outcomes as

satisfaction and productivity for the outcome of task accomplishment (Bass 1990; Kerr and Schrieshiem 1974; Matsui, Ohtsuka and Kikuchi 1978; Misumi and Peterson 1985; Stogdill and Coons 1957).

However, it is often suggested, and meta-analyses confirm, that leaders should strive to be high on both people and production values to maximize constructive outcomes (Judge, Piccolo and Ilies 2004). It seems that participation, people, and productivity values together should promote psychological safety as they help employees become involved in confronting issues and try to resolve them in a supportive manner and thereby learn.

Recent research has emphasized that transformational and other leaders can be effective to the extent that they develop constructive relationships (Bono and Anderson 2005; Wang, Law, Hackett, Wang and Chen 2005). This study proposes that leaders can help their teams develop relationships where they support and accept each other so that they improve. To do this, leaders model for their team members valuing and supporting people, getting everyone involved and participating, and striving to get things done and improve performance. With these kinds of values and relationships, team members are able to reflect openly on their experiences and learn.

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

2. Leader values of participation, people, and productivity develop the psychologically safe climate of their teams.

3. The psychologically safe climate of teams mediates the relationship between participation, people, and productivity leader values and team learning and individual learning in their teams.

Yet doubts have been raised that leader values really have much constructive impact. An important limitation of the research support is that these values have been measured through questionnaires administered to employees. Employees though are not simply objective observers but use their own implicit theories to interpret and report on their leaders (Engle and Lord 1996; Lord 1985; Lord and Emrich 2000). Employee responses reflect their experience and framework as well as their leader's values and behavior. Employees may not accurately perceive leader values or find them credible (Argyris and Schon 1978, 1996). Indeed, recent research has largely ignored leader values despite their long history (Hunt and Dodge 2000; Judge, et al. 2004).

However, research on the effects of leader values on team and individual learning in teams may help to make participative, maintenance, and production leadership research more current and useful (Brower, Schoorman and Tan 2000). This study argues that production, people, and participative values can promote psychological safety among followers that in turn facilitates learning. This study then can contribute to the research on mediators between the values of leaders and their effects on employees (Congor, Kanungo and Menon 2000; Dormann and Zapf 1999; Foels, Driskell, Mullen and Salas 2000; Jung and Avolio 2000; Kirkpatrick and Locke 1996; Pillai, Schriesheim and Williams 1999).

Applying structural equation analysis to these hypotheses allows the testing of the combined effects of leader participation, people, and productivity values on psychological safety. It also allows exploring the relationship between the learning outcomes measured in the study, specifically team learning and the learning by individuals in teams. Groups have been found to promote individual learning but these groups must be well structured to do so (Johnson and

Johnson 1989; Johnson, Maruyama, Johnson, Nelson and Skon 1981). It seems likely that teams which are effective at learning help individuals learn from their teammates.

Chinese Context (Heading 2)

Theories developed in the West cannot be assumed to apply in China (Hofstede 1993). China is a collectivist culture whereas the West tends to be be individualistic. Collectivist compared to individualistic values emphasize a collective rather than personal self, that in-group goals are important rather than personal goals, and that social norms rather than individual attitudes should determine behavior (Kashima, Siegel, Tanaka and Kashima 1992; Kim, Triandis, Kagitcibasi, Choi and Yoon 1994; Triandis 1995).

However, Chinese and other collectivist people do not necessarily have or even value close relationships. Many observers of Chinese social relations (e.g., Butterfield 1983) have noted that in comparison with Westerners, Chinese have a much stronger tendency to divide people into categories and treat them accordingly. It cannot be assumed that Chinese team members have the relationships that will help them discuss issues and mistakes openly so that they learn.

Indeed, this study may be a particularly strong test of the hypotheses because the data were collected in China. Given China's collectivist culture, it may be difficult for team members to develop a psychological safe climate that they can reflect openly and skillfully so that they learn. Indeed, Chinese people have been thought to avoid conflict in order to protect each other's face and maintain their relationship (Chan 1963; Triandis, McCusker and Hui 1990; Tse, Francis and Walls 1994).

In addition, as China is a high power distance society, its leaders and employees may not have much experience and success in participative management. Chinese employees may expect their leaders to make decisions and promote employee welfare without much direct consultation (Lau, Liu and Fu 2007). This study explores the usefulness of the ideas of leader values, including participation, and psychological safety for understanding learning in Chinese organizations.

Method (Heading 1)

Participants (Heading 2)

A sample of firms was recruited in Shanghai, China, through contacts of professors and graduate students of a university in Shanghai. We contacted 300 companies and identified 150 organizations with cross-functional project teams. Eighty-five of the 150 organizations agreed to participate in the study and they returned 101 sets of questionnaires on 101 teams. Of the 85 firms, 18 firms are in manufacturing, 15 in telecommunication, nine in consultancy, five in construction, four in wholesale and retailing, three in trading, two in information technology and the rest in various other industries. This pattern is similar to that of the industry structure in Shanghai (Shanghai Statistical Bureau 2007). The 101 teams are part of companies with different ownership structures: specifically, 24 teams are from state-owned enterprises, 25 from sole proprietor companies, 6 from joint-stock companies, 18 from Chinese foreign joint ventures, and 28 from private enterprises. The 101 cross-functional teams were mainly involved in projects related to product development, business development, and technology and process improvements.

Both top and middle management of the 85 firms indicated their strong support for the study. Team members were assured that their individual responses would remain confidential. To be included in the final sample, project team members had to complete a survey and project

leaders had to complete a second survey. The contact person in each firm distributed the questionnaires to the project team manager and the team members and collected the completed questionnaires for us. A hundred and one sets of questionnaires from 101 project leaders and 292 team members were included in the data analysis. The team size ranged from 3 to 20 and the average size was 5. Apart from the team leader, at least one third of the members in each project team were recruited to answer the questionnaire. The number of members in each team responding to the questionnaire ranged from one to eight and the average number of team members answering the questionnaire was 2.89. Most of the team members were in the age group of 25 to 34 and had bachelor degrees. The average period of time for members and leaders working in the teams was 1.5 years. Most of the team leaders were also in the age group of 25 to 34 and were middle level managers. 42% of them had bachelor degrees while 41% had master's degrees.

A coding system was devised to allow us to match each team member's survey with a survey administered to her or his project team leader. Employees were assured that the numbers on the survey were for matching purposes only.

Measures (Heading 2)

Leader participation, people, and production values Team leaders were asked to rate the three leader value scales. The leader participation, with its emphasis on leader's concern for involvement of team members in decision-making, had four items (Tjosvold 1998). Team leaders were asked to rate on a five-point scale (1 = strongly agree, 5 = strongly disagree) their degree of agreement to the four statements. A sample item is "I want my team members as well as me to decide how to solve difficult problems".

Scales for leader production and people values were taken from Misumi and Peterson (1985) and modified so that they reflected the values of the leader rather than the perceptions of employees. The five items about leadership style of a productivity orientation measured the emphasis on whether the employees followed procedures and instructions to work productively. A sample item for the leader production scale is "It is important that my team members know the deadlines I have set for their work." The scale was also 5-points with similar anchors to the participation items. (Appendix A has all the items for this scale and other scales used in this study.) The leader maintenance, with its emphasis on the leader's support and concern for employees, had six items with similar anchors. A sample item is "I want my team members to talk freely with me".

The three scales demonstrated acceptable reliability. The coefficient alphas for leader participation, people, and production values were 0.83, 0.89, and 0.81 respectively. The three scales were combined to form an integrated construct of Leader Values with an alpha of 0.87. Table 1 shows the means, standard deviations, and coefficient alphas of these and other scales used in this study.

Psychological safety The project team members indicated the extent the team had a shared belief that the team is safe for interpersonal risk-taking on a 5-point scale ranging from 1 (strongly agree) to 5 (strongly disagree). The six psychological safety items measured the extent that project team members felt safe to make mistakes, to get help and support from other members, and valued others' unique skills and talents and were taken from Edmondson (1999). A sample item is "As a member in our team one is able to bring up problems and tough issues". The scale had a coefficient alpha of .73.

Team learning The project team members indicated the extent that the team could learn through reflection and knowledge and information sharing among members on a 5-point scale ranging from 1 (strongly agree) to 5 (strongly disagree) on a 4-item scale taken from Druskat and Kayes (2000). A sample item was "This team regularly seeks information that will help it evaluate the way it is operating" and the scale's coefficient alpha was .78.

Individual learning The project team members indicated the extent that they themselves learn from other members in the team on similar anchors as the other scales on a 2-item scale also taken from Druskat and Kayes (2000). A sample item was "I've developed many new skills from working with members from other functions" and the scale's coefficient alpha was .71. As this scale measures the learning individuals do in their team as they interacted with their team members, it is considered a team-level variable. Members provided a measure of the extent that individuals learn by indicating their own learning in the team.

Two members of the research team who are native Chinese translated the questionnaires originally written in English into Chinese. To ensure conceptual consistency, the questionnaires were back translated 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.

Analyses (Heading 1)

Scale Validation (Heading 2)

We conducted a series of confirmatory factor analyses to test whether the respondents' rating would load on four distinct factors, namely leader values, psychological safety, team learning, and

individual learning, so as to ensure that the items were measuring distinct constructs. Leader values are viewed as an integrated construct (technically, a second-order factor or construct) that comprises three dimensions: participative value, people value, and productivity value.

We assessed discriminant validity by analyzing possible pairs of constructs in a series of 3-factor models (Anderson 1987). These five alternative 3-factor models were selected based on the inter-correlations among the four variables. Table 1 shows that team learning has high correlation with individual learning (r=.57) and psychological safety (r=.28). Moreover, psychological safety has high correlation with individual learning (r=.43) and leader values (r=.40) while leader values has high correlation with individual learning (r=.28). These five pairs of variables were therefore combined to form one aggregate factor in turn. The aggregate factor together with the remaining two factors formed a 3-factor model. The CFA results of the five different 3-factor models (M_1, M_2, M_3, M_4 and M_5) were compared to that of the 4-factor model (M_0).

A series of confirmatory factor analyses were conducted using the LISREL 8 program (Joöreskog and Soörbom 1996) and are reported in Table 2. Model M_0 in Table 2 shows that our proposed 4-factor model fits the data quite well ($\chi^2 = 119.31$, df = 80, CFI = .92, INFI = .92, RMSEA = .07). Steiger (1990) suggested that RMSEA values below .10 indicate a good fit to the data, and values below .05 a very good fit to the data. Bentler and Bonett (1980) suggested that a level of .90 indicates a good fit to the data.

Results in Table 2 show that model chi-square increases significantly when we move from the 4-factor model (M_0) to any of the five 3-factor models (M_1, M_2, M_3, M_4 and M_5). Given the strong support from the nested series of confirmatory factor analysis, we concluded that the four factors are distinct measures of four different constructs in our study.

We also tested convergent validity to determine whether the items in a scale converge or load together on their single constructs (Steenkamp and Trijp 1991). Dunn, Seaker and Waller (1994) suggested that convergent validity exists if the factor loadings are statistically significant. CFA results show that all the factor loadings of the indicators for each of the four factors in this study are statistically significant. Moreover, the measurement model has a good overall fit. These results support convergent validity of the scales. Because the items for each factor were developed from previous studies to tap information on different constructs, they appear to have face validity.

To test for common method variance (CMV), we used the Harmon one-factor test (Podsakoff and Organ 1986) where all the four variables were submitted to an exploratory factor analysis (EFA). The basic assumption of this approach is that CMV exists when there is only one factor or the first factor explains a majority of the variance. The EFA results indicated that there were four factors and the first factor only explained 31.3 %. Therefore, CMV does not pose a potential threat to this study. More recently, some researchers using this technique (Iverson and Maguire 2000; Korsgaard and Roberson 1995) have used CFA as a more sophisticated test of the hypothesis that a single factor can account for all of the variance in their data. The 4-factor model (M_0) had a better fit of the data than the one factor model (M_6) and the difference in the chi-square statistics was significant (the change in $\chi^2 = 250.24$, the change in df=6, $p<.01$). Thus, it provides evidence that inter-item correlations are not driven purely by method bias.

Data Aggregation (Heading 2)

We aggregated team members' ratings of psychological safety, team and individual learning to the team level in the analyses. The fundamental reasons were that the variables are team-level and the hypotheses identified the unit of analysis as the group.

However, the aggregation required that the perceptions of team members within a team were reasonably homogeneous. We used James, Demaree and Wolf (1984) procedure to estimate the inter-rater reliability of members within each team for the individual-rated variable. James et al.'s $r_{WG(J)}$ index was used as an estimate of inter-rater reliability because the variable was measured by multiple items. Two indicators showed that the ratings among members in each group were quite homogeneous:

1. The median $r_{WG(J)}$ for the three variables, psychological safety, team learning, and individual learning across the 101 teams was 0.94, .91 and .92 respectively.

2. George and Bettenhausen (1990) argued that $r_{WG(J)}$ which was greater than or equal to 0.70 could be considered as indicators of good agreement within group. Out of the 101 teams, the percentage of teams with $r_{WG(J)}$ greater than or equal to 0.70 for psychological safety, individual learning and team learning was 0.97, .88, and .92 respectively.

We also calculated intraclass correlation coefficients (ICC1 and ICC2) for the team scales of psychological safety, team learning, and individual learning by using the one-way random effects ANOVA (Bliese 2000). James (1982) interprets the ICC (1) as an index of interrater reliability (the extent to which individual raters are substitutable) and recommends using it as a criterion for aggregating. On the other hand, the ICC (2) is interpreted as an estimate of the reliability of the group means. ICC (1) values were .20, .07, .08 for psychological safety, team learning and individual learning respectively. Kenny and LaVoie (1985) suggest that an ICC (1) value greater than zero with a corresponding significant ANOVA test statistic (F) is an indication of convergence within units. The ICC (1) values of the three scales in this study were all greater than zero and the corresponding F values were significant at .001, .01, and .10 levels. The results

of the ICC (2) for the three scales were .42, .18, and .20 respectively. We therefore concluded that the within-team ratings were homogeneous enough to be aggregated to the team level. Individual team members' ratings were aggregated to the team level and the data merged with team leaders' ratings of leader values. The final sample size of the merged data file was 101 teams.

Hypotheses Testing (Heading 2)

Correlational analyses were used as an initial test of the hypotheses. To more vigorously test the hypotheses, structural equation analysis with the LISREL 8 program (Joöreskog and Soörbom 1996) was used to examine the underlying causal structure between leader values, psychological safety, team learning, and individual learning. These analyses involved only the structural model, not the measurement model. The research reviewed suggests that psychological safety mediates the relationship between leader values and outcome of learning. A nested model test commonly adopted in causal model analysis was used where the theorized model was compared to the saturated model and other alternative models.

Results (Heading 1)

Zero-order correlations provide an initial examination of the hypotheses linking leader values of participation, productivity and people, psychological safety, team learning, and individual learning (Table 1). Consistent with Hypothesis 1, psychological safety correlated positively with team learning ($r=0.28$, $p<0.01$) and individual learning ($r=0.43$, $p<0.01$). Consistent with Hypothesis 2, leader values related positively to psychological safety ($r=0.40$, $p<0.01$).

To test the mediating effects of psychological safety (Hypothesis 3) and Hypotheses 1 and 2 more thoroughly, we used structural equation analyses. Although psychological safety was assumed to promote both team learning and individual learning, it was also thought that effective learning teams promote the learning of individuals in teams. Indeed, team learning and individual

learning were highly correlated ($r=0.57$, $p<0.01$). Therefore, we modified the model so that team learning predicted individual learning. In addition to a significant effect of team learning on individual learning, the fit statistics indicate that the Modified Hypothesized Model (with team learning affecting individual learning) fits the data well and better than the original Hypothesized Model (Table 3). In addition, there is no significant difference between the Modified Hypothesized Model (A3 Model) and the Saturated Model.

In regards to model fit, the Modified Hypothesized Model (A3) had a chi-square of 1.82 with 1 degree of freedom. The Incremental Fit Index (IFI) and Comparative Fit Index (CFI) for the model were 1.0 and 1.0 respectively. Both fit indices were considered as indicating very good model fit, given the usually accepted critical value of .90 (Bentler and Bonnett 1980). The RMSEA value of .00 of the model also indicated a very good fit to the data. Results of the causal model comparison suggest accepting the Modified Hypothesized Model. The Modified Hypothesized Model was also compared to three alternative models (Hypothesized, A1 and A2 models). These models did not improve model fit and did not fit the data very well compared to the Modified Hypothesized Model.

In order to test the mediating effect of psychological safety, the Mediated Model (the original Hypothesized Model) and the Non-mediated Model (A1) were compared. The χ^2 of the Mediated Model was 28.76 (d.f.=3) and the χ^2 of the Non-mediated Model was 49.47 (d.f.=3). The results indicated that the Mediated Model was much better than the Non-mediated Model (A1). The χ^2 of the Partially Mediated Model (A2) was 26.35 (d.f.=1). It was not significantly better than the Mediated Model, which was more parsimonious. The better fit of the Mediated Model provides support to the Modified Hypothesized Model that includes indirect effects of

leader values on team learning and individual learning through psychological safety and effects of team learning on individual learning. The χ^2 differences between the Modified Hypothesized Model and the Saturated Model were not significant (χ^2 difference=1.82, d.f. difference=2, p =n.s), while the differences between the Saturated Model and the Non-mediated Models (A1) and the Partially Mediated Model (A2) were both significant. Thus, results indicate that the Modified Hypothesized Model (A3) is superior to the Non-mediated Model (A1) and the Partially Mediated Model (A2).

The path coefficients of the Modified Hypothesized Model help to explore the findings more specifically (Table 3). Psychological safety had a significant impact on team learning (ß=.28, p<.01) and individual learning (ß=.30, p<.01). These results provide good support for H1. Team learning had a significant impact on individual learning (ß=.48, p<.01). Leader values had a significant impact on psychological safety (ß=.40, p<.01), providing good support for Hypothesis 2. Results overall support the framework developed in this study.

Discussion (Heading 1)

Results support the theorizing that leader values can result in team learning through their effects on team psychological safety and that team learning can promote individual learning. Leaders' own descriptions of their commitment to participation, people, and productivity were correlated with employee reports of the psychological safety within their team that in turn predicted learning. The structural equation analysis further indicates that psychological safety fully mediated the relationship between leader participation, people, and productivity values on team and individual learning.

Findings support previous research that psychological safety is a useful way to characterize the climate and interaction that helps teams and individuals learn (Edmondson 1996, 1999). Learning is not a simple process but requires considerable openness to feedback and flexibility in thinking. Believing they are valued with few fears of being blamed and exploited, team members who feel psychologically safe ask for assistance, accept feedback, recognize mistakes and errors, combine ideas, and implement new approaches (Cannon and Edmondson 2001; West 1996). In this way, they help each other develop their individual and joint competencies so that they can be more successful in the future (Edmondson 1996, 1999; West 1996).

Importantly, results suggest that leader values of participation, people, and productivity together can develop psychological safety. Psychological safety is a complex condition in which team members must participate in that they voice their ideas, identify and dig into problems, and develop viable solutions that in turn are a foundation for psychological safety (Heller and Wilpert 1981; Miller and Monge 1986). Productivity values can reinforce this participation by communicating to team members that they should work together to improve their performance and encourage them to engage in the give-and-take interaction of psychological safety. People values appear to contribute to psychological safety by fostering personal support.

Results have implications for research on leader values more generally. Consistent with Argyris and Schon, values that are lived and implemented were found to promote learning but results only partially support Argyris and Schon's idea that leader's espoused positive values are often counter-productive and undermine open interaction. Findings support the theorizing that leader values themselves can be constructive (Judge, et al. 2004). Productivity, people, and

participation values were found to induce psychological safety. These values seem to encourage leaders to act in ways that develop constructive relationships that provide psychological support. Research is needed to identify how leaders model and express these values so that team members feel psychologically safe with each other and use their experiences to learn.

In addition to psychological safety's effects on team learning, results indicate that teams that were effective at learning also helped individuals learn from their teammates. Consistent with previous research (Johnson and Johnson 1989; Johnson, et al. 1981), findings suggest that well-structured teams are important vehicles for helping individuals learn. Team learning appears to promote and complement the learning of individuals; future research can explore the dynamics by which team learning results in individual learning.

Chinese Context (Heading 2)

The collectivist culture of China with its emphasis on protecting relationships and social face may make it difficult for Chinese team members to discuss issues and mistakes openly and directly (Chan 1963; Triandis, McCusker and Hui 1990; Tse, Francis and Walls 1994). Results from this study suggest that Chinese team members can reflect usefully on their experiences to learn and that leader values and psychological safety are important contributors to this openness. Perhaps then this study is a strong test of the hypotheses. However, results do not provide direct evidence about the frequency of these open discussions nor the ease of establishing conditions that facilitative them.

Yet it could be argued that high-power distance Chinese employees (Hofstede 1993) are particularly oriented toward their leaders and therefore highly responsive to their leader values. It

would be useful to test the hypotheses with samples drawn from other cultures to explore the impact of leader values on team psychological safety and learning.

The ideas of leader values and psychological safety, although developed in the West, proved useful for understanding learning in China. The research approach of identifying conditions that impact organizational dynamics and outcomes in China with concepts that have universal 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 (Bass 1997; Leung 1997). The research approach used in this study can both probe ideas and improve understanding of organizational dynamics in non-Western cultures.

Limitations (Heading 2)

The sample and operations, of course, limit the results of this study. The data are 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). These data are also correlational and do not provide direct evidence of causal links between values, psychological safety, and learning. However, leaders completed measures of values and team members completed measures of psychological safety and learning. Developing different sources for the independent and dependent measures should reduce the possibilities of same source method as an alternative explanation of the results.

Spector and Brannick (1995) have argued that the most effective way to overcome 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 leader values on learning in East Asian organizational settings.

Practical Implications (Heading 2)

In addition to developing theoretical understanding, the hypotheses, if they can continue to be supported, have important practical implications for promoting learning, especially in China. Results further document that leader values on participation, people, and productivity can be useful and, specifically, can promote psychological safety and learning. Leader values should be supplemented with psychological safety to result in learning.

Although leader values are thought to be relatively enduring, they are also subject to learning and modification through reflection and experience (Argyris and Schon 1978, 1996). Training sessions could orient leaders to understand the value of participation, people, and productivity values and develop psychological safety where team members feel accepted and valued and together dig into issues and take risks (Edmondson 1999). Team members could be trained in the skills of asking for assistance, showing acceptance, recognizing each other's abilities, and expressing their doubts to identify tough issues. They also emphasize team goals and using each other's abilities to help each other be effective. These ways of working can strengthen learning for individuals and teams.

This study shows one way to reinvigorate research on leader values (Judge, et al. 2004). It contributes to the growing recognition of the importance of examining mediators between the values and styles of leaders and their effects on employees (Congor, et al. 2000; Dormann and Zapf 1999; Foels, et al. 2000; Jung and Avolio 2000; Kirkpatrick and Locke 1996; Pillai, et al. 1999). Specifically, it provides an empirical examination of the dynamics by which leader values affect learning. Leader commitment to participation, people, and productivity were found to predict to psychological safety among team members that in turn predicted to learning. Leader

values can be a basis for promoting learning by developing a climate of psychological safety in China and perhaps in other countries as well.

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TABLE 1

Correlations

	Mean	SD	Alpha	1	2	3	4	5	6
1. Participative value	1.65	.63	.83						
2. Productivity value	1.70	.57	.81	.68**					
3. People Maintenance value	1.63	.58	.89	.63**	.76**				
4. Psychological Safety	2.24	.44	.73	.38**	.38**	.30**			
5. Individual Leaning	2.03	.46	.71	.23*	.35**	.18	.43**		
6. Team Learning	2.37	.45	.78	.16	.19	.09	.28**	.57**	
7. Leader Values	1.66	.53	.87				.40**	.43**	.16

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

TABLE 2

Results of the Confirmatory Factor Analysis of the Measurement Models

Model	d.f.	Model χ^2	$\Delta\chi^2$	χ^2/d.f.	IFI	CFI	RMSEA
Baseline 4-Factor* Model (M0)	80	119.31	-	1.49	.92	.92	.07
3-Factor Model: combined Team Learning & Individual Learning (M1)	83	150.61	31.3**	1.81	.87	.86	.09
3-Factor Model: combined Psychological Safety & Individual Learning (M2)	83	156.09	36.78**	1.88	..88	.87	.09
3-Factor Model: combined Psychological Safety & Leader Values (M3)	83	171.97	52.66**	2.07	.86	.85	.10
3-Factor Model: combined Psychological Safety & Team Learning (M4)	83	184.14	64.83**	2.22	.86	.85	.11
3-Factor Model: combined Individual Learning & Leader Values (M5)	83	195.21	75.90**	2.35	.80	.79	.12
1-Factor Model: combined Leader Values, Psychological Safety, Team Learning and Individual Learning (M6)	86	369.55	250.24	2.91	.59	.57	.18

(1) 4-Factor Model (M_0) includes Leader Values, Psychological Safety, Team Learning and Individual Learning.

(2) ** $p < .01$

(3) χ^2 is the model chi-square; $\Delta\chi^2$ is the change in model chi-square; Δd.f.=3 for alternative models M_1, M_2, M_3, M_4 and M_5 and Δd.f.=6 for M_6.

TABLE 3

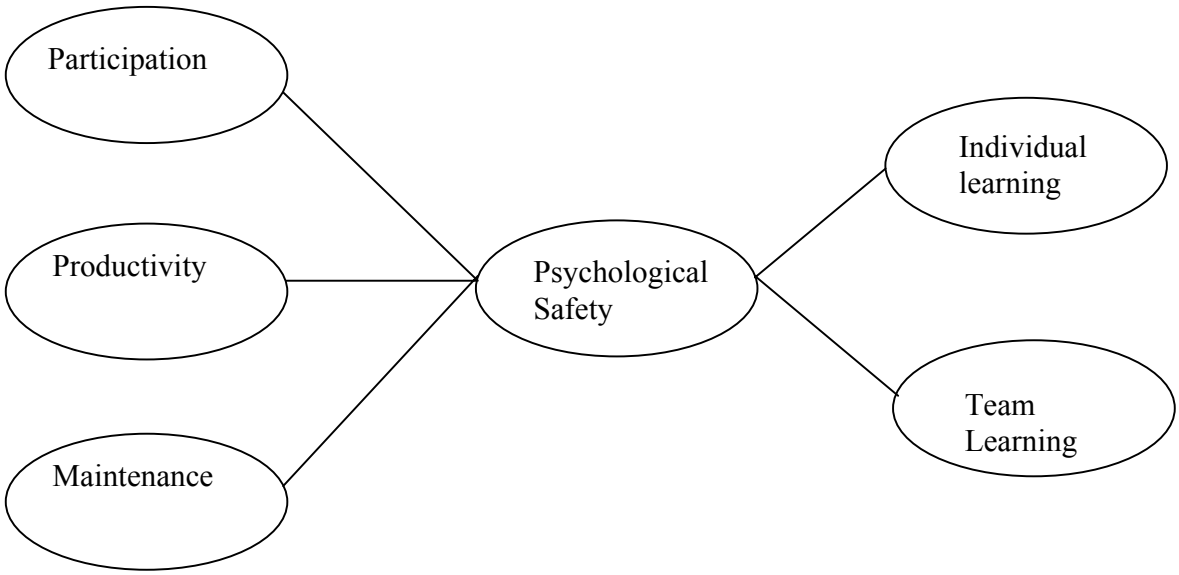
Saturated, Hypothesized and Alternative Models

	χ^2	*df*	$\triangle\chi^2$	CFI	IFI	RMSEA
Models						
Saturated: Leader Values has direct links to Psychological Safety, Individual Learn and Team Learn; Psychological Safety has direct links to Individual Learn and Team Learn; Team Learn has direct links to Individual Learn	-	0	-	-	-	-
Hypothesized: Leader Values has direct links to Psychological Safety; Psychological Safety has direct links to Individual Learn and Team Learn (deleting links from Leader Values to Individual Learn and Team Learn and from Team Learn to Individual Learn)	28.76	3	28.76**	.59	.61	.29
Alternative models:						
A1: Leader Values has direct links to Psychological Safety, Individual Learn and Team Learn (deleting links from Psychological Safety to Individual Learn and Team Learn and from Team Learn to Individual Learn)	49.47	3	49.47**	.34	.37	.40
A2: Leader Values has direct links to Psychological Safety, Individual Learn and Team Learn; Psychological Safety has direct links to Individual Learn and Team Learn (deleting links from Team Learn to Individual Learn)	26.35	1	26.35**	.59	.62	.51
A3: Modified Hypothesized Model Leader Values has direct links to Psychological Safety; Psychological Safety has direct links to Individual Learn and Team Learn; Team Learn has direct links to Individual Learn (deleting links from Leader Values to Individual Learn and Team Learn)	1.82	2	1.82	1	1	.00

1. Dashes indicate statistic cannot be computed for the saturated model.
2. IFI=incremental -fit index; CFI=comparative fit index,
3. ** $p < .01$

FIGURE 1

Hypothesized Model



APPENDIX A

Scales rated by team leaders:

Participative value

1. I want my team members to discuss with me how to improve productivity and work-life.
2. I want my team members as well as me to decide how to solve difficult problems.
3. I try to take time to visit and listen to my team members and use their ideas to improve the company.
4. I seek to have the full input of all my team members before we make an important decision.

Productivity value

1. It's important that my team members follow regulations
2. It's important that my team members know the deadlines I have set for their work.
3. I want my team members to work at their maximum capacity.
4. My team members are to give me reports on the progress of their work.
5. I want to give my team members specific instructions for how to achieve their goals.

People maintenance value

1. I want my team members to talk freely with me.
2. I believe it is important for me to communicate support to my team members.
3. It's important that my team members trust me.
4. I want to recognize publicly the accomplishments of my team members.
5. I want my team members to know that I am concerned about their future promotions, pay raises, and other benefits.
6. My treating my team members fairly is very important to me.

Scales rated by team members:

Psychological safety

1. In our team, some members are rejected for being different.
2. When someone in our team makes a mistake, it is often held against him.
3. No one in our team would deliberately act in a way that undermines others' efforts.
4. It is difficult to ask other team members for help in our team.
5. The people in our team value others' unique skills and talents
6. As a member in our team one is able to bring up problems and tough issues.

Team learning

1. This team regularly seeks information that will help it evaluate the way it is operating.
2. Experienced members of this team are constantly sharing their knowledge with less-experienced members.
3. Members on this team share their knowledge and tell each other what they know.
4. This team can always be seen sharing knowledge and information.

Individual Learning

1. I've developed many new skills from working with members from other functions.
2. I've learned things working in this group that I will use in other groups.