Empowering Individuals for Team Innovation in China: Conflict Management and Problem Solving

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Abstract

Although emphases on teams and on individuals are often considered mutually exclusive, teams both rely upon individuals to perform their tasks skillfully and can support and encourage individuals to perform effectively. This study proposes that team capability to help individual team members overcome obstacles to performance facilitates the integration of individual's ideas and efforts that results in team innovation. It further suggests that managing conflict cooperatively helps teams provide effective support so that individuals solve problems and contribute. Two hundred employees in 100 work teams in China completed measures of their team's cooperative, competitive, and avoiding approaches to managing conflict and team support for problem solving by individuals, and 100 managers indicated the team's innovation. Structural equation analysis suggests that a cooperative conflict management approach promotes group support for problem solving by individuals that in turn results in team innovation. These findings, coupled with previous research, suggest that cooperative conflict management and team assistance to help individuals solve problems provide a strong foundation for innovative teams.

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Although managers are increasingly advised to structure their organizations around groups rather than individuals, teamwork depends upon individual contributions (Barrick, Stewart, Neubert, & Mount, 1998; Stewart & Barrick, 2000; West, 2002). Teams are more effective when each individual team member coordinates his or her efforts. But teams can help individuals recover from mistakes and learn from errors. This study argues that groups that are able to assist individuals to identify and solve problems that block their individual performance are more innovative. It also proposes that teams that are able to manage their conflicts productively support individual problem solving (De Dreu, Weingart, & Kwon, 2000; Rubin, Pruitt, & Kim, 1994). Specifically, it investigates the hypotheses that a cooperative compared with a competitive approach to managing conflict develops a group's ability to assist individuals to solve problems and that this group support for individual problem solving results in innovation by the team.

This study uses the conflict management theory of Deutsch to develop a model of the relationships between group support of individual problem solving and this support to innovation by the team (Figure 1). Specifically, it proposes that a cooperative approach in contrast to a competitive or an avoiding approach, to conflict helps teams have the confidence and ability to help individuals identify and solve problems. As group innovation depends upon the effective performance of individuals, group support for individual problem solving in turn facilitates team innovation. This study and framework empirically link group, conflict management, and innovation literatures. They also test the extent that the theory of cooperation and competition developed in the West is useful to analyze conflict among group members in China.

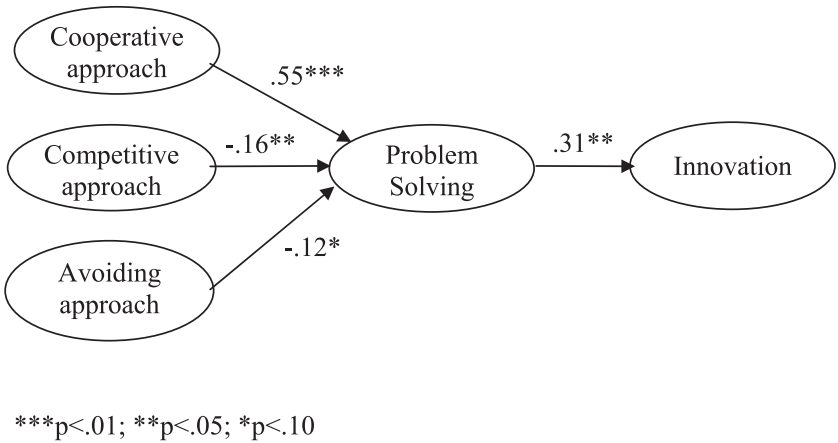

Figure 1. Hypothesized models.

Groups for Innovation

Innovation, the planned and effective introduction of change, is increasingly considered not only a significant strategic advantage but required for organizations to survive and

flourish in rapidly changing marketplaces (Burpitt & Bigoness, 1997; West, 2002). The pressures to innovate appear to be especially intense for the Chinese enterprises that participated in this study. They must learn to compete in a dynamic market system with many new domestic and foreign competitors after decades in a heavily subsidized, closed system where the State ordered and purchased production.

Traditionally, organizational researchers have been skeptical of the value of groups, especially for the demands of innovation (Ilgen, 1999; Steiner, 1972). They doubted that groups have the cognitive abilities and discipline to analyze complex issues and create new, quality solutions (Arkes & Ayton, 1999; van Knippenberg, van Knippenberg, & van Dijk, 2000; Simon, 1976; Tversky & Kahneman, 1974). Studies have emphasized process losses where the result is below the optimal that should occur if group members combine their information and ideas (Sheppard, 1993; Steiner, 1972).

Individuals may not be properly motivated. Believing that they can prosper from group success without effort, team members have been found to engage in social loafing and letting others do the work (George, 1992; Karau & Williams, 1993; Williams & Karau, 1991). Individuals may attempt to promote their own interests and bargain for methods and decisions that promote their own agendas, not those of the group as a whole (Pfeffer, 1981).

Team members may lack needed capabilities and be unable to apply them sensitively and effectively to the team task (Campion, Medsker, & Higgs, 1993; Edmondson, 1999; Hare & O'Neill, 2000; Salas, Rozell, Driskell, & Mullen, 1999). They may feel that their groups suppress their individuality and creativity despite the costs of compromised, mediocre solutions (Aldag & Fuller, 1993). Through such dynamics as "groupthink," decision-makers are expected to reinforce simplifications and biases (Valacich & Schwenk, 1995).

Despite the difficulties of obtaining competent, coordinated effort by team members, researchers have recently emphasized the potential value of groups for innovation. Groups are thought to be highly useful to stimulate creative solutions and implementation (Laughlin, VanderStoep, & Hollingshead, 1991; Banker, Field, Schroeder, & Sinhan, 1997; Laughlin, Magley, & Shupe, 1997; West, 2002). Although individuals can complete some tasks effectively, groups have been found to accomplish tasks, especially complex ones, more effectively than individuals working alone under a wide range of conditions (Hill, 1982; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Kelley & Thibaut, 1968). Overall, studies suggest that groups can be productive when the task and situation are appropriate for collaborative work. Indeed, organizations are turning to groups to enhance quality, develop new products, and in other ways promote organizational innovation (Barrick et al., 1998; Stewart & Barrick, 2000; West, 2002).

Researchers are concluding that innovation in organizations is a collaborative process of ongoing effort to understand customer needs and develop effective ways to meet them (Burpitt & Bigoness, 1997). In contrast to the popular image of innovation driven by a creative individual with a new insight, researchers have found that innovation typically requires persistent teamwork focused on gradual improvement in delivering value to present and future customers (West, 2002).

Overall, research suggests that groups both have considerable potential for innovation and confront many obstacles that can potentially very much frustrate success. Theorists have argued that, because developing the proper conditions for members to work together productively and innovate is very challenging, competitors find it difficult to imitate teamwork capability (Barney, 1991, 1992, 2001; Katzenbach & Smith, 1993).

Team Support for Individual Problem Solving

Individuals may not be properly motivated or trained to contribute to their groups, especially for the challenging task of innovating. Researchers have argued that groups can compound these difficulties through undercutting motivation and suppressing individuality. However, groups can potentially be very useful for individual performance and in particular help individuals recognize errors and deficiencies and develop and implement viable solutions that allow individual team members to contribute more effectively to their teams.

The problem solving capabilities of groups may be focused on the obstacles and frustrations of individual team members (Banker et al., 1997; Laughlin & Shupe, 1996; Laughlin et al., 1997; West, 2002). Teams monitor and become aware of how individuals are contributing to the group, develop plans that realistically overcome obstacles, and help implement these plans. With such attention and assistance, individual team members are able to contribute to the team so that the team can combine their efforts and integrate their ideas to innovate.

Some previous research supports the value of problem solving for aiding individual contributions to teams. West (1996, 2000, 2002) has argued that teams need considerable management in order to identify barriers and develop and implement solutions. This group management has been labeled team reflexivity and defined as the extent to which team members collectively reflect upon and adapt their team's objectives, strategies, and processes. Teams monitor and become aware of how they work together, develop plans to strengthen themselves, and then implement these plans. Reflexivity is expected to help teams know their actual workings and develop new understandings and methods that respond to emerging conditions and challenges (Bouwen & Fry, 1996; Carter & West, 1998). Reflexivity is especially useful in complex environments and challenging tasks. The major implication is that, to the extent that teams engage in this management of their processes, they are able to perform effectively over time (Frese & Zapf, 1994; Gollwitzer, 1996). Team reflecting can keep groups focused and efficient.

This study proposes that teams may be able to assist their team members to identify and solve problems that are frustrating their individual performance. Group reflecting on feedback has been found to promote the learning of individuals (Johnson, Johnson, Stanne, & Garibaldi, 1990; Yager, Johnson, Johnson, & Snider, 1986). However, developing the capabilities to solve problems for individuals effectively can itself be quite challenging. The next section argues that productive conflict management is an important foundation for team support for individual problem solving (Peterson & Behfar, 2003).

Conflict Management for Effective Problem Solving

Recent studies have emphasized that conflict can very much impact the dynamics and outcomes of groups (Amason, 1996; Bettenhausen, 1991; Bettenhausen & Murnighan, 1991; Jehn, 1995, 1997; Nemeth & Owens, 1996). Conflict would seem to stimulate problem solving for individuals, as group members contend over such issues as the effective and fair distribution of work and rewards, social loafing, and the best ways to coordinate to accomplish their goals (Wageman, 1995). These conflicts may provide the incentives and medium within which groups identify obstacles, errors, and shortcomings of individuals and engage in problem solving to improve their contributions to the team.

Although conflict has traditionally been considered disruptive, researchers have found that conflict has considerable potential to contribute to team and organizational effectiveness (De Dreu & Van de Vliert, 1997; De Dreu, van Dierendonck, & Dijkstra, 2005). Group researchers have found that giving voice to minority views and heterogeneity of perspectives can improve group functioning (De Dreu & Van de Vliert, 1997; Gruenfeld, 1995; Maier, 1970; Peterson & Nemeth, 1996; Tetlock, Armor, & Peterson, 1994). Discussing conflict without rejecting those with opposing views and imposing "groupthink" can be useful for solving problems and task accomplishment (Aldag & Fuller, 1993; Amason, 1996; Jehn, 1995; Kruglanski & Webster, 1991; Leonard & Sensiper, 1998). However, it is how conflicts are managed, not conflict itself, that can contribute to group performance (De Dreu & Weingart, 2003; Edmondson, Roberto, & Watkins, 2001; Pelled, Eisenhardt, & Xin, 1999).

This study uses the theory of cooperation and competition to identify major approaches to managing conflict. Deutsch (1973, 1980) defined conflict as incompatible activities, where one person's actions are interfering, obstructing, or in other ways making the behavior of another less effective. He argued that whether conflict is handled cooperatively or competitively affects the dynamics and outcomes of conflict. Protagonists can emphasize their cooperative goals; as one moves toward goal attainment the other also moves toward goal achievement. Recognizing that the success of one promotes the success of the other, they tend to view a conflict as a mutual problem that needs common consideration and solution. The emphasis on cooperative goals leads to mutual exchange and an open-minded discussion that in turn help develop useful, mutually beneficial resolutions that reaffirm the relationship. With this mutual affirmation and success, team members are confident that they can handle their conflicts and continue to deal with conflicts successfully. Repeated effective conflict resolution leads to high quality, implemented solutions that result in team effectiveness.

Protagonists can also emphasize their competitive interests; as one succeeds, the other moves away from goal attainment. They tend to view the conflict as a win–lose struggle; if the other wins, they lose. The emphasis on competitive interests heightens the tendency to avoid a direct discussion or, alternatively, leads to a tough, closed-minded discussion and attempts to coerce the other to do one's bidding, dynamics that undermine decision-making and relationships. Competitive conflict frustrates communication

and results in a deadlock or imposed solution. Consequently, team members have little confidence that they can handle their conflicts. With low levels of confidence, they fail to make use of their conflicts to solve problems and work productively.

Social psychological research has documented that whether protagonists emphasize cooperative or competitive goals very much alters the dynamics and outcomes of conflict (Deutsch, 1980, 1990). A great deal of research has developed our understanding of the impact of cooperative and competitive goal interdependence on relationships more generally (Johnson et al., 1981; Stanne, Johnson, & Johnson, 1999). Studies have extended the cooperative–competitive conflict approach to organizational settings (Alper, Tjosvold, & Law, 2000; Barker, Tjosvold, & Andrews, 1988; Tjosvold, Dann, & Wong, 1992).

Studies have also shown that avoiding impacts the dynamics and outcomes of conflict. Avoiding is the attempt to smooth over conflicts and minimize discussion of them whereas openness encourages direct discussion. Avoiding communicates the intention that issues should not be openly discussed and dealt with. Studies overall indicate that avoiding conflict reinforces competitive conflict whereas a more open way complements cooperative conflict (Barker et al., 1988; Tjosvold, 1982). For example, competitive conflict project managers were found to avoid conflict; these competitive and avoiding managers decreased employee commitment (Barker et al., 1988). Cooperative conflict project managers were more open in their conflict management and more successful leaders.

Although avoiding conflict is often used in many cultures (Von Glinow, Shapiro, & Brett, 2004), conflict avoiding may be quite familiar to the Chinese sample of this study. Studies have documented that Asians tend to use avoiding and other accommodative approaches to deal with conflicts where Westerners tend to confront conflict directly (Graham, Kim, Lin, & Robinson, 1988; Kirkbride, Tang, & Westwood, 1991; Leung & Tjosvold, 1998; Triandis, 1990; Triandis, McCusker, & Hui, 1990; Tse, Francis, & Walls, 1994; Weldon, Jehn, Doucet, Chen, & Wang, 1998). Researchers have drawn upon considerable research in cross-cultural management and psychology to conclude that a sense of interdependence explains these differences (Bond, Wan, Leung, & Giacalone, 1985; Ho, 1998; Hofstede, 1980). Asians are collectivists whose identity is embedded in their relationships and who have a strong sense of their connections with others. Consequently, they are highly sensitive to the possibility of losing social face in public; they avoid conflict so that they and their conflict partners need not fear disrespect and alienation (Bond & Lee, 1981; Cocroft & Ting-Toomey, 1994; Gudykunst, Ting-Toomey, & Chua, 1988; Ting-Toomey, 1988). However, little research has documented the effects of avoiding conflict in China (Leung, 1997; Leung, Koch, & Lu, 2002).

Overall, this study tests a model linking conflict management in teams with problem solving by individuals and team innovation (Figure 1). Specifically, cooperative conflict among team members is expected to promote effective team support for individual problem solving; competitive conflict management and conflict avoidance undermine support for individual problem solving. Teams able to manage their conflicts cooperatively effectively assist individuals to perform. Problem solving for individuals in turn helps teams innovate for the organization. These proposed relations are summarized in the following four hypotheses:

H_1: Teams that rely on a cooperative approach to conflict support individual problem solving.

H_2: Teams that rely on a competitive approach to conflict have low levels of support for individual problem solving.

H_3: Teams that rely on an avoiding approach to conflict have low levels of support for individual problem solving.

H_4: Teams that support individual problem solving innovate.

The study makes methodological contributions to previous research in that it allowed independent measures of conflict approaches and innovation. Managers rated the innovativeness of the team and employees rated their conflict management approaches and team support for individual problem solving. This study used questionnaires with a sample of teams in Shanghai, China. Although questionnaires are popular means to study organizational conflict, much of the previous research on cooperative and competitive conflict has been experimental. This study directly tests the assumption that teams that rely on cooperative conflict are able to aid problem solving for individuals that in turn facilitates team innovation.

Method

Participants

Work teams of 150 organizations in Shanghai were recruited to participate in the study. Graduate student research assistants contacted former colleagues, students, and friends to solicit the participation of their team and their organization. Typically, these teams were either functional departments or project teams, and varied in size from 4 to 13 employees. In addition to company support for the study, confidentiality of responses was provided.

To be included in the final sample, at least two employees in the work team had to complete a survey and their manager had to complete another survey. Of the 150 sets of questionnaires distributed, 32 sets were not completed because of lack of time or interest in the study; 118 sets were collected. However, 18 sets were not complete because they lacked either the manager or two employees' replies. Thus, 100 sets of questionnaires were included in the data analysis. There were 100 managers and 200 employees involved in 100 teams and each team included one manager and two employees.

Average age of the participants was 33 and 60% of the participants were males. Nearly, all respondents had been in their work teams for over 1 year. For the participants, 17% teams were State-Owned Enterprises, 14% were joint ventures, 15% were private enterprises, 25% were limited liability corporations, 22% were stock-owned corporations, and 7% were other kinds. As for the industry of the sample team, 24% were in industry, 7% in wholesale and retail, 29% in banking and insurance, 8% in social services, 3% in real estate, 11% in transportation, 5% in research, 1% in architecture, and 12% in other

fields. This pattern is similar to the industry structure in Shanghai. The teams had various tasks: 14 sample teams operated within the financial department, 11 investment, 5 production, 11 sales, 13 research and development, 6 personal management, 21 business management, 4 logistics management, 15 are from other departments.

Team Support for Individual Problem Solving

The measure of team support for individual problem solving was adapted from previous scales (Rybowiak, Garst, Frese, & Batinic, 1999; Van Dyck, Frese, & Sonnentag, 1998). Six items were included in this scale. Sample items for problem solving for individuals are as follows: ''After an individual has made a mistake, we help him or her analyze it thoroughly.'' ''Because mistakes provide important information for how individuals can complete their work, we discuss them,'' and ''After a team member has made an error, people help him think through how he or she can correct it.'' Employees of the team were asked to rate on a 5-point scale (1 = strongly agree, 5 = strongly disagree) their degree of agreement to the six statements. The coefficient alpha for problem solving for individuals was .77. The scale demonstrated acceptable reliability.

Conflict Approaches

Scales for cooperative and competitive approaches to conflict were developed from a series of experimental studies (Tjosvold, 1985) and from a questionnaire study on project managers (Alper et al., 2000; Barker et al., 1988). Respondents were asked to indicate how their teams negotiated differences among group members. The five cooperative approach items measured the emphasis on mutual goals, understanding everyone's views, orientation toward joint benefit, and incorporating several positions to find a solution good for all. Sample items for the cooperative approach scale are ''Team members seek a resolution that will be good for all of us,'' ''Team members treat conflict as a mutual problem to solve,'' and ''We work so that to the extent possible we all get what we really want.'' Respondents were asked to rate on a 5-point scale (1 = strongly agree, 5 = strongly disagree) their degree of agreement to the five statements.

The competitive approach scale had four items with similar anchors to measure the assumption that the conflict was a win–lose situation and the use of pressure and intimidation to get others to conform to one's view. Sample items are ''Team members treat conflict as a win–lose contest,'' ''Team members demand that others agree to their position,'' and ''Team members overstate their position to get their way.''

The four items for the avoiding approach were developed from a questionnaire study (Barker et al., 1988). Its items are ''We try to avoid discussing divisive issues,'' ''Our team tries to keep differences of opinion quiet,'' ''Our group smoothes over differences by trying to avoid them,'' and ''My teammates seek harmony even at the expense of open discussion.'' Employees of the team were asked to rate on a 5-point scale (1 = strongly agree, 5 = strongly disagree) their degree of agreement to the four statements.

The scales demonstrated acceptable reliability. The coefficient alphas for the cooperative, competitive, and avoiding approach scales were .70, .89, and .79 respectively.

Innovation

As with other self-managing work team research (Cohen & Ledford, 1994; Goodman, Devadas, & Griffith-Hughson, 1988), obtaining objective work outcome measures proved impossible despite the willingness of the organizations to provide them. Therefore, we used managerial ratings of team effectiveness and innovation as the criterion measures. Proposing that there is no strictly objective measure of performance in organizations, Pritchard (1992) argued that ratings can measure the extent users of the team outputs find them effective. In addition, these managers should be informed about the group's performance (Hackman, 1987).

Managers were asked to rate the innovativeness of the team using an 8-item scale taken from Burpitt and Bigoness (1997). Sample items are "Using skills they already possess, this team learns new ways to apply those skills to develop new products that can help attract and serve new markets," "This team identifies and develops skills that can improve their ability to serve existing business needs," and "This team seeks out and acquires information that may be useful in developing multiple solutions to problems." The scale had a Cronbach alpha of .88.

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.

Analysis

Data Aggregation

We aggregated group members' ratings of cooperative, competitive, and avoiding approach and problem solving to the group level in the analyses. The fundamental reason was that the hypotheses identified the unit of analysis as the group. The operations were carefully constructed so that individual team members reported on the team's cooperative, competitive, and avoiding approach and problem solving.

However, the aggregation required that the perceptions of team members within a team were reasonably homogeneous. We used James, Demaree, and Wolf's (1984) procedure to estimate the inter-rater reliability of members within each team for each of the four individual-level variables (cooperation, competition, avoiding approach, and problem solving). James et al.'s $r_{WG(J)}$ index was used as an estimate of inter-rater reliability because each of the four variables was 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 four variables across the 100 teams were .95, .85, .80, and .94, respectively. Second,

George and Bettenhausen (1990) argued that $r_{WG(J)}$ which were greater than or equal to .70 could be considered as indicators of good agreement within group. Out of the 100 teams, the percentages of teams with $r_{WG(J)}$ greater than or equal to .70 across the four variables were .89, .80, .80, and .85, 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 manager ratings of the organization's effectiveness and innovation. The final sample size of the merged data file was 100 teams. Correlations among the three exogenous variables, the two mediating variables, and the one outcome variable at the team level are shown in Table 1.

Scale Validation

We conducted a series of confirmatory factor analyses to test whether the team members' rating would load on five distinct factors, namely, cooperative, competitive, and avoiding approaches, problem solving, and manager's ratings of team innovation, so as to ensure that the items were measuring distinct constructs.

The confirmatory factor analyses were conducted using LISREL 8.30 (Jöreskog & Sörbom, 1993). Because of computational limitations for LISREL models involving a number of indicators (Bentler & Chou, 1987), we simplified the structural model in the present study by reducing the number of indicators for the constructs. Specifically, we combined the items with the highest and the lowest loading by averaging until we yielded three indicators for each construct. That is, the items with highest and the lowest loadings were averaged to form a first new indicator, and the items with the next highest and the next lowest loadings were averaged to form the second new indicator, etc. This is a common approach in the literature of structural equation analysis and was used in Mathieu and Farr (1991) and Mathieu, Hofmann, and Farr (1993).

Table 2 shows the results of these series of confirmatory factor analyses. Model M_0 in Table 2 shows that our proposed 5-factor model fits the data extremely well. The CFI and the NNFI are .96 and .94. This 5-factor model was then tested against five different 4-factor models. Each of these 4-factor models was formed by merging two of the four factors into one aggregate factor. These five alternative 4-factor models were selected based on the inter-correlations among the five variables. Table 1 shows that problem solving has high correlation with cooperative approach (r = .45), competitive approach

Table 1
Correlations Among Variables at the Team Level (N = 100)

	Mean	*SD*	(1)	(2)	(3)	(4)	(5)
(1) Cooperative approach	2.24	.37	(.70)				
(2) Competitive approach	2.97	.64	−.02	(.89)			
(3) Avoiding approach	3.15	.63	−.13	.35**	(.79)		
(4) Problem solving	2.52	.47	.45**	−.28**	−.29**	(.77)	
(5) Innovation	2.58	.59	.07	−.02	−.08	.25*	(.88)

Note: Values in parentheses are reliability (coefficient alpha) estimates.
**p < .01; *p < .05.

Table 2
Results of the Confirmatory Factor Analysis of the Indirect Model

	df	Model χ^2	χ^2 change	CFI	NNFI
Baseline 5-factor model (M_0)	44	66.21**		.96	.94
Combined cooperative approach and problem solving (M_1)	48	104.38**	74.17	.89	.85
Combined competitive approach and avoiding approach (M_2)	48	116.36**	50.15	.87	.82
Combined avoiding approach and problem solving (M_3)	48	121.83**	55.62	.86	.80
Combined competitive approach and problem solving (M_4)	48	172.48**	106.27	.76	.67
Combined problem solving and innovation (M_5)	48	206.42**	140.21	.69	.58

Note: χ^2 is the model Chi-square; χ^2 is the change in model Chi-square; *df* = 4 for all alternative models.
**$p < .01$.

($r = .-28$), avoiding approach ($r = -.29$), and innovation ($r = .25$). The competitive approach also has high correlation with the avoiding approach ($r = .35$). These five pairs of variables were therefore combined to form single factors, which were tested against the proposed 5-factor model.

Results in Table 2 show that the model Chi-square increase significantly when moving from the 5-factor model to any of the five 4-factor models. Five 4-factor models had marginal (<.90) fit indices measures. Given the strong support from the nested series of confirmatory factor analyses, we concluded that the five factors are distinct measures of the constructs in our study.

Hypotheses Testing

Correlational analyses were used as an initial test of the hypotheses. Structural equation analyses tested the model connecting cooperative, competitive, and avoiding approach and problem solving, and manager ratings of team innovation. The covariance structure analysis of the inter-relationship among these constructs was analyzed using EQS for Windows (Bentler & Wu, 1995).

A nested model test commonly adopted in causal model analysis was used where the Indirect Model was compared with the Direct Effects Models. The Direct Effects Models posited that cooperative, competitive, and avoiding approach impact outcomes directly whereas the Indirect Model proposes that conflict approaches impact team support for individual problem solving that in turn affects innovation.

Results

Zero-order correlations provide an initial examination of the hypotheses (Table 1). Results provide strong support for the first three hypotheses that cooperative and competitive approaches and avoiding approach affect problem solving. Cooperative approach positively and significantly correlated with problem solving (.45, $p < .01$). But competitive (−.28, $p < .01$) and avoiding (−.29, $p < .01$) approaches had negative and significant relationships with team support for individual problem solving. Results also provide support for the fourth hypothesis that team support for individual problem

Table 3
Parameter Estimates in the Structural Modeling

Indirect effects model			Direct effects model 2		
Path from	Path to	Path coefficient	Path from	Path to	Path coefficient
Cooperative approach	Problem solving	.55***	Cooperative approach	Innovation	.10*
Competitive approach	Problem solving	−.16**	Competitive approach	Innovation	.01*
Avoiding approach	Problem solving	−.12*	Avoiding approach	Innovation	−.07***
Problem solving	Innovation	.31**			
Model χ^2	0.64		Model χ^2	14.05	
df	3		*df*	3	
NFI	0.99		NFI	0.07	
CFI	1.00		CFI	0	

***$p < .01$; **$p < .05$; *$p < .1$.

solving affects team innovation in that they were significantly and positively correlated (.25, $p < .05$).

Structural equation analyses through EQS were used to explore the underlying relationships among the variables. Table 3 shows the path estimates for the model tested in the study's hypotheses. The Indirect Model was compared to the Direct Effect Model. The χ^2 of the Indirect Model was .64 ($df = 3$, $p < .01$) and the χ^2 of Direct Effects Models were 14.05 ($df = 3$, $p < .01$). The χ^2 differences between the Indirect Model and the Direct Effects Model were significant (χ^2 difference = 13.41), indicating that omission of team support for individual problem solving significantly deteriorated the Indirect Model. Results of the causal model comparison suggest that the Indirect Model be accepted.

The path coefficients of the accepted model help to explore the findings more specifically. Results indicate that cooperative approach had significant positive effects on problem solving ($\beta = .55$, $p < .01$), and competitive approach had significant negative effects on problem solving ($\beta = -.16$, $p < .05$). However, the effect of avoiding approach on problem solving was not significant ($\beta = -.12$, $p =$ ns). Team support for individual problem solving had a significant positive effect on manager rating of team innovation ($\beta = .31$, $p < .05$).

In regards to model fit, the Indirect Model had a Chi-square of .64 with 3 degrees of freedom. The CFI and NFI for the model were 1.00 and .99, respectively. Both fit indices are considered as indicating good model fit, given the usually accepted critical value of .90 (Bentler & Bonnett, 1980).

Discussion

Results support the theorizing of the value of conflict management for group support for individual problem solving and team innovation. Teams that relied upon cooperative but not competitive or avoiding approaches to managing their conflicts were able

to assist individuals to identify obstacles and overcome them. Teams that were able to assist individuals in this manner were found to be highly innovative as rated by their manager.

Debate has centered on whether organizations should rely on individuals or teams as their basic building block and whether organizations should value individual or team contributions (Barrick et al., 1998; Stewart & Barrick, 2000; West, 2002). However, this study underscores the limitations to the notion of a choice between individuals and groups. An emphasis on teams and an emphasis on individuals are not mutually exclusive. Teams can be valuable resources for individual team members. They can provide the support and perspectives that help individuals identify obstacles that are frustrating their performance and interfering with their contributions to the team. Individuals receiving this problem solving assistance were in turn found to be part of successful, innovative teams. Results of this study underline that teams can very much contribute to individual performance and thereby to team innovation.

Findings extend previous research indicating that teams able to reflect upon and strengthen the way group members relate and work together contribute to the organization (Borrill et al., 2000; Carter & West, 1998; West, Patterson, & Dawson, 1999). The study shows that groups can be more effective to the extent that they assist individuals to overcome obstacles that are interfering with their individual work and contributions to the team. Group support for individual problem solving appears to be an important component of effective teamwork in organizations.

This study supports the findings of previous research, much of it experimental, documenting the value of a cooperative approach to conflict (Deutsch, 1973; Tjosvold, 1998). It contributes to this literature by offering team support of individuals and their problem solving as a mediating mechanism. Indeed, cooperative conflict may be quite useful because team members are able to identify that individuals have barriers and frustrations. Then an open, cooperative discussion can help them integrate their ideas into suggesting effective ways that individuals can overcome these barriers.

Helping individuals deal with problems is not always successful and often requires considerable sensitivity as well as direct discussion of difficulties. Group members must be aware and monitor individual performance, confront them without alienating individuals, and work with them to develop and implement viable solutions. Group members must be both skilled and motivated to engage in such activities. Results of this study indicate that the procedures and abilities of managing conflict cooperatively very much contribute to team support for individual problem solving. Managing conflict cooperatively appears to be a concrete way that group members have the confidence, procedures, and abilities to monitor and improve individual performance. Discussing divisive issues competitively and avoiding discussions, results suggest, are generally counter productive.

Findings may seem contrary to the general conclusion that harmony in the form of avoiding conflict is prevalent and culturally appropriate for China as a collectivist culture (Graham et al., 1988; Kirkbride et al., 1991; Leung & Tjosvold, 1998; Triandis, 1990; Triandis et al., 1990; Tse et al., 1994; Weldon et al., 1998). However, Leung (1997) and Leung et al. (2002) have argued that in addition to avoiding conflict to

defuse potential interpersonal problems (Hwang, 1996), harmony motives in China can also refer to the desire to strengthen relationships and solve interpersonal problems out of a genuine concern for harmony as a value in and of itself. Consistent with this reasoning, this study suggests that conflict, when managed cooperatively as well as openly, can be quite useful for individual problem solving and team performance even in collectivist China. Direct evidence is needed to test the role of conflict and feelings of harmony. For example, teams could be directly surveyed about their feelings of genuine harmony and this related to a cooperative approach. Experiments can also investigate the link between harmony and cooperative conflict.

Although open, cooperative conflict was found productive in collectivist China, the evidence does not describe or provide examples of how Chinese discussed issues directly. Cooperative conflict is a social psychological approach rather than a specific kind of strategy; indeed, various actions can communicate that people want to resolve the conflict cooperatively (Deutsch, 1973). Chinese people may tend to have different, less confrontational ways of communicating a cooperative, open approach than Westerners. Although cooperative, open conflict can have similar theoretical dynamics as in the West, the operations may be quite different in China than in the West.

Results suggest boundary conditions and pose additional issues that could be explored. Several characteristics of teams may well affect their ability to identify the problems of individuals. For example, it seems more likely that teams that are located together and interact face-to-face regularly are in a good position to recognize when individuals face a problem. Traditionally, managers are expected to provide support for individuals to solve problems. Studies could compare the roles of manager and team support for individual problem solving. Indeed, team members may be in a better position to provide support than managers in that they are more informed about individual problems and do not need to overcome the complexities of communicating across status differences. Managers of course can be quite useful for informing and linking teams to the larger organization.

The theory of cooperation and competition, although developed in the West, proved useful for understanding team dynamics in East Asia (Deutsch, 1973). As in the West, teams that rely on resolving issues for mutual benefit can work productively whereas teams that emphasize competitive, win–lose ways were unable to solve individual problems effectively. Theories developed in one culture cannot be assumed to apply to another (Hofstede, 1993). The research approach of identifying conditions that impact organizational dynamics and outcomes in China with a theory with 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 (Leung, 1997). The research approach used in this study can both probe general theories and improve understanding of organizational dynamics in non-Western cultures.

Limitations

The sample and operations, of course, limit the results of this study. The data are self-reported and subject to biases, and may not be accurate, although recent research sug-

gests 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 conflict management, problem solving, and team performance. However, employees completed measures of conflict management and problem solving for individuals, and their managers completed the measures of team innovation. 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 cooperative conflict management and problem solving for individuals on team innovation in East Asian organizational settings.

Practical Implications

In addition to developing theoretical understanding, continued support for the hypotheses can have important practical implications for structuring teams and stimulating their performance. In diagnosis, cooperative, competitive, and avoiding conflict and problem solving for individuals measures can be given to teams to identify barriers to their effectiveness.

Training, especially for teams rated low on cooperative conflict, can be provided to develop key conflict skills and to socialize members to adopt a cooperative approach. Previous research provides guidance for developing cooperative conflict skills (Tjosvold, 1993). Team members are trained to express their ideas, positions, and feelings directly without accusations. They use personal statements that describe their ideas and feelings as they avoid blaming the conflict on others. They emphasize their respect for each other even as they disagree with each other's position. They stop defending their own views long enough to ask each other for more information and arguments; they put themselves in each other's shoes and see the problem from the other perspectives. They combine the best ideas to create new solutions; they avoiding thinking that the only possibilities are the ones first proposed by the conflicting members. They work to resolve the conflict so that everyone benefits, not just themselves, and agree and implement the one that is most effective for all.

Reward and task systems are potentially very critical for inducing cooperative conflict. Group bonuses, group responsibility for completing challenging tasks, and team recognition help members become committed to cooperative goals so that they believe their conflicts are common problems that they want to resolve for mutual benefit (Tjosvold & Tjosvold, 1994, 1995). They realize that their goal is to help each other get what each other really needs and values, and not to try to win or outdo each other. Employee compensation could be based in part on team outcomes (Hanlon, Meyer, & Taylor, 1994). The managers and employees together develop shared goals, integrated roles, common tasks, team identity, personal relationships, and shared reward distributions that reinforce cooperative goals (Hambrick, 1994; Hanlon et al., 1994; Li, Xin, Tsui, & Hambrick, 1999; Pearce, 1997; Tjosvold, 1989).

Teams were found to innovate when they were able to help individuals solve problems that frustrated their performance and contribution to the team. Then they were able to apply their abilities and coordinate their efforts so that they continued to perform effectively. Consistent with considerable recent research, how productively team members were able to manage their conflict was found to be an important antecedent of effective teamwork. In particular, the cooperative management of conflict was found to predict effective team support for individual problem solving. Teams that manage their conflicts cooperatively would appear to be in a good position to help individuals overcome obstacles and contribute in China and perhaps in other cultures as well. Results suggest that the choice between the team and the individual is a misleading one for innovative teams were found to focus their attention and skill at helping individuals work more effectively for the team.

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