Research Note

Productive organizational collaboration: The role of values and cooperation

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Introduction

Many managers are working to develop teamwork within their departments and synergy across business units. Researchers have argued that collaboration is a key to organizational success (Kanter, 1983; Porter, 1985). This study uses interdependence dynamics to specify productive collaboration in organizations and suggest its antecedents.

Based on Deutsch’s (1973) theory of cooperation and competition, Tjosvold (1986a, c) proposed a model of interdependence that stipulates how values, tasks, and rewards affect interaction in organizations. Specifically, shared vision, supportive culture, group tasks, and common rewards are hypothesized to induce cooperative interdependence and interaction. In cooperation, people believe their goals are positively linked; one’s goal attainment helps others reach their goals.

Alternatively, mistrust, individual tasks, and win/lose rewards induce competition. Competitors believe their goals are negatively correlated so that one’s goal attainment makes it more difficult for others to attain their goals.

Considerable research, including field experiments, indicate that people in cooperation compared to those in competition exchange resources, assist each other, and manage conflicts constructively so that they are all successful (Johnson, Johnson and Maruyama, 1983; Johnson, Maruyama, Johnson, Nelson and Skon, 1981; Tjosvold, 1986b).

Studies suggest that cooperative interaction strengthens morale, commitment to the organization, and productivity. The positive experiences of working together leads employees to believe they have gained a great deal from the organization; teamwork binds them to each other and to the organization (O’Reilly, 1983; Tjosvold, Andrews and Jones, 1983). As they work cooperatively, employees explore issues and make successful decisions, and are more productive especially on complex tasks that benefit from sharing information (Johnson et al., 1981).

However, more research needs to be carried out directly in organizations, particularly on the impact of cooperation on productivity. Developing a useful measure of productivity has proved difficult, but economists have recently proposed total factor productivity (TFP) (Caves, Christensen and Diewet, 1982; Pang, 1977; Tsao, 1982). Organizations differ in their outputs because of capital
outlays and other inputs. However, collaboration should affect efficiency by which firms transform their inputs into outputs (Nelson, 1981). The TFP measures the firm's productivity by dividing its output by its capital, labor, energy, and material inputs.

Research is also needed to identify conditions that promote cooperative interaction in organizations. 'Strong culture' companies communicate that they value collaborative effort, care about employees as people, and seek to be highly productive and, therefore, develop a cohesive, productive workforce.

Espousing values alone is insufficient to develop a strong corporate culture or a productive organization (Tjosvold, 1986a). Tasks and rewards of the organization’s structure must support these values. Forming groups to solve problems and using other channels to communicate are apt to help employees work together productively (Van De Ven, Delbecq and Koenig, 1976). Employees need appropriate procedures and settings to coordinate.

The empirical support for the dynamics of cooperation and competition is based largely on Western sources. The data for this study were collected from Singaporean workers with Malay, Chinese, and Indian ethnic backgrounds. This study tests the generalizability of previous findings to an Asian culture.

The hypotheses of this study are: (1) An orientation to people, shared vision, an emphasis on productivity, procedures to exchange, and cooperative interaction reinforce each other and contribute to effective collaboration and organizational commitment.

(2) An orientation to people, shared vision, an emphasis on productivity, procedures to exchange, and cooperative interaction characterize productive companies.

Method

Companies and participants

The household appliances section of the electronics industry was selected because of the number of companies in Singapore and because they use relatively similar technology. It could then be assumed that measures of TFP would not be distored by the employment of much different technologies. Because size is also probably related to technology employed and returns to scale, the population was restricted to medium and large companies. Twenty companies were randomly selected and were sent letters. Five companies agreed to discuss the project and participate, but one turned out to be much smaller than the others and was dropped from the study. All four were part of large, multi-national companies. The sample was large enough for a full-scale test except for the measure of productivity. The sample was sufficient for an exploratory study with this variable.

After obtaining management’s approval, the questionnaires were distributed to a cross-section of the employees. Workers had their choice to complete English, Malay, and Chinese translations of the questionnaire. Indian workers in Singapore read English.

The companies argued that the random selection of the participants would be too disruptive, but they did follow guidelines to give a representative sample. Care was taken so that employees would not be pressured to complete the questionnaire and their responses would be confidential. They returned completed questionnaires in sealed envelopes. Company 1 returned 99 questionnaires, company 2, 46; company 3, 130 (company 3 had two factory settings which were both surveyed), and company 4, 76. The response rate of employees was above 75 per cent.
Values, procedures, effectiveness, and commitment measures

A questionnaire was developed to measure the company's values, its coordination channels and procedures, the interaction that occurs on the job, and employee conclusions about effective collaboration and their commitment to the company. In the first section, respondents indicated on five-point scales the extent their company emphasized various values. A subsequent factor analysis yielded three reliable factors. To develop the independent scales, the square of the item's loading on the factor had to be twice the square of its loading on either of the other two factors. The factors were labelled people orientation (the company cares for its employees) with five items and a Cronbach alpha of 0.82, shared vision which has seven items and an alpha reliability of 0.78, and productivity emphasis (uses knowledge to be productive) with five items an alpha of 0.77.

In section 2, respondents indicated on five-point scales the frequency their company used various communication channels (groups to discuss productivity and quality of worklife) which yielded one four-item scale with an alpha reliability of 0.64. The respondents also indicated on scales previously shown to be reliable and to have construct validity the extent they cooperated with co-workers and supervisors (Tjosvold et al., 1983; Tjosvold, 1986b). The reliability for cooperation with supervisor and for cooperation with co-worker were both 0.91. Previous studies have indicated strong negative correlations between cooperation and competition, and thus competitive scales were excluded to shorten the questionnaire.

In the last section, respondents indicated on seven-point scales the extent they thought their co-workers and supervisors were effective and helped them be productive, and their commitment to the organization. These scales have previously been shown to have reliability and construct validity (Tjosvold et al., 1983; Tjosvold, 1986b). The four-item co-worker effectiveness scale had a Cronbach alpha reliability of 0.77, the four-item supervisor effectiveness had an alpha of 0.80, and three-item commitment scale had an alpha of 0.83. All scales demonstrated reliability sufficient for research purposes.

Productivity measure

Total factor productivity (TFP) is a measure of the relative efficiency of the use of inputs that can be used to compare firms. (Caves et al. (1982) provide detailed descriptions of the measure). TFP assumes that the firms are in a competitive profit-maximizing equilibrium and returns to scale are constant. TFP is derived as the logarithmic difference in output less a weighted sum of the logarithmic difference in inputs, where these weights are the cost shares of the inputs. First the difference in TFP levels for each company vis-à-vis a hypothetical representative company is computed. The company selected to be representative has output and inputs equal to the average of the logarithms of the outputs and inputs of the four companies. Denoting output as $Y$ and each of the inputs as $X_n$, the difference in TFP between company $K$ and the representative company $r$, is

$$TFP_{kr} = \ln Y^k - \ln \bar{Y} - \frac{1}{2} \sum_{n=1}^{N} (v_n^k + \bar{v}_n) (\ln X_n^k - \ln \bar{X}_n),$$

where $v_n^k$ is the value share of the $n$th input in the firm $k$, and a bar denotes the average value; For example, for four firms,
The difference between the TFP levels of any two companies, for example between company 1 and 2, is derived as,

$$\text{TFP}_{12} = \text{TFP}_{1R} - \text{TFP}_{2R}$$

In order to make these computations, the firms supplied the following data on a confidential basis: Value of gross output produced and energy and non-energy intermediate inputs used; average number of workers employed (labor input) and gross fixed assets at the beginning of the year (capital input). The firms supplied this information for 1983; employees completed the questionnaires in November and December of 1983. The differences in TFP levels were then computed according to the above equations.

**Results**

**Effective collaboration and organizational commitment**

Consistent with the first hypothesis, shared vision, values of people and productivity, coordination procedures, and cooperation were related to each other and to perceived effectiveness of co-workers and supervisors and to worker commitment (Table 1). Regression analyses were completed to indicate the relative strength of these predictors. Cooperation with co-worker entered first in the regression analysis, followed by people orientation, and productivity emphasis and together they accounted for 29 per cent of the variance of effective co-workers. Cooperation with supervisor, people orientation, and productivity emphasis were retained and accounted for 35 per cent of the variance in effective supervising.

<table>
<thead>
<tr>
<th></th>
<th>People</th>
<th>Shared</th>
<th>Productivity</th>
<th>Channels</th>
<th>Coop co</th>
<th>Coop sup</th>
<th>Eff co</th>
<th>Eff sup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared vision</td>
<td>0.69*</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Productivity</td>
<td>0.66*</td>
<td>0.61*</td>
<td></td>
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<tr>
<td>Channels</td>
<td>0.58*</td>
<td>0.57*</td>
<td>0.54*</td>
<td></td>
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<tr>
<td>Cooperation co-worker</td>
<td>0.28*</td>
<td>0.32*</td>
<td>0.25*</td>
<td>0.31*</td>
<td></td>
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<tr>
<td>Cooperation supervisor</td>
<td>0.47*</td>
<td>0.48*</td>
<td>0.48*</td>
<td>0.49*</td>
<td>0.49*</td>
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</tr>
<tr>
<td>Effective co-worker</td>
<td>0.32*</td>
<td>0.26*</td>
<td>0.30*</td>
<td>0.30*</td>
<td>0.51*</td>
<td>0.34*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective supervisor</td>
<td>0.49*</td>
<td>0.42*</td>
<td>0.45*</td>
<td>0.40*</td>
<td>0.30*</td>
<td>0.54*</td>
<td>0.52*</td>
<td></td>
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<tr>
<td>Organization commitment</td>
<td>0.48*</td>
<td>0.34*</td>
<td>0.41*</td>
<td>0.30*</td>
<td>0.22*</td>
<td>0.31*</td>
<td>0.45*</td>
<td>0.57*</td>
</tr>
</tbody>
</table>

*p<0.01
People orientation, productivity emphasis, and cooperation with co-workers were retained in the regression analysis and accounted for 24 per cent of the variance on organizational commitment. In an analysis that allowed the effective collaboration measures to enter the regression, results were effective supervision, people orientation, effective co-workers, cooperative supervisor, and productivity emphasis with an $R^2$ of 0.40. These results support the hypothesis that effective collaboration coupled with appropriate values build employee loyalty and commitment.

**Productivity, values, and cooperation**

The TFP results are presented in Table 2. Company 1 had the highest productivity in the group and company 4 the lowest.

In addition, $t$ tests were computed to compare the companies. Overall, results indicate that companies 1, 2, and 3 had more progressive human resource management environments than company 4. The specific significant comparisons ($p<0.05$) are as follows. Company 1 had less cooperative interaction among co-workers than company 2. Company 1 had a greater people orientation, productivity emphasis, communication channels, and cooperation with supervisor than did company 4. Company 2 had a stronger productivity emphasis, more communication channels, and stronger cooperation with co-workers and supervisors than company 4. Company 3 had more people orientation and communication channels than company 4.

The small sample of four firms makes the use of statistical procedures questionable. A comparison of the results, however, suggests a trend for positive relationship between productivity and human resource management. Firm 4 had the lowest values and cooperation profile and was also the least productive.

**Discussion**

Results support the model of cooperative dynamics in organizations (Tjosvold, 1986a, c). A shared vision and mission, values on people and productivity, group procedures to coordinate, and cooperative interaction among employees were strongly related, and together contributed to effective collaboration and commitment to organizations.

Findings on the link between cooperation and productivity are more tentative. The company that had the lowest values and cooperation profile also had the lowest total productivity factor score. Although more data are needed to link cooperation with productivity, this and other
studies are beginning to suggest that cooperative interaction improves productivity and profitability (Janz and Tjosvold, 1985; Katz, Kochan and Weber, 1985; Tjosvold, 1986b).

Managers have been advised to espouse values and use symbolic actions to develop teamwork on the job. Providing procedures and designs has also been advocated (Porter, 1985). This study suggests an integrated approach. Managers can work for values of shared vision and concern for people and productivity, structure group procedures, and promote skills and incentives to foster cooperative interaction (Tjosvold, 1986c).

Researchers have argued that organizations can value productivity and people (Blake and Mouton, 1983). This study suggests that promoting a shared vision and cooperative interaction can develop a company oriented both to productivity and people. Employees feel they benefit from the camaraderie and support as they work cooperatively to complete organizational tasks. Cooperative work appears to provide an important way to integrate the needs of individuals with the organization’s requirement of productivity.

Findings indicate that the model of interdependence is valid for companies operating in Singapore, even though nearly all previous research has been in North America and Western Europe. The relationships between the variables of cooperative interaction, corporate values, and commitment appear to hold across these societies. It should be noted, however, that there may be important cultural differences in the extent that employees believe their companies have a shared vision, interact cooperatively, and so on.

Results of this study are of course limited by its sample and operations. The findings are correlational, and causal links must be drawn cautiously. Results on productivity especially need to be better documented. TFP scores are affected by differences in technology that were not directly controlled in this study; technology differences may obscure productivity differences due to collaboration. Future research should develop a larger sample with considerable variance. An effective test of the link between cooperation and productivity requires sensitive, valid organizational behavior and economic research measures and the assistance of many firms within the same industry and country.

Shared vision and mission, valuing people and productivity coupled with coordination procedures and actual cooperative interaction appear to reinforce each other and are important antecedents for successful collaboration and organizational commitment. Although results are consistent with the idea that cooperative interaction is productive, studies are needed to document the contribution of corporate values and cooperation to company productivity.

Acknowledgement

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References


