

TASK CHARACTERISTICS AND TEAM PERFORMANCE: THE MEDIATING EFFECT OF TEAM MEMBER SATISFACTION

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Team design characteristics are important antecedents in Input-Process-Outcome models. The aim of this study was to explore the relationships among traditional task characteristics (task meaningfulness, autonomy, and feedback), team performance, and team member satisfaction within the same framework. We collected data from 382 members and 100 managers of 100 teams. The results of structural equation analysis partly supported our theoretical framework. Team member satisfaction mediated the effects of task autonomy and feedback on the team performance. Task meaningfulness had a directly positive effect on team performance. These results draw attention to the different effects of the aspects of traditional task characteristics and the satisfaction-performance relationship in a team context.

Keywords: team task characteristics, team performance, team member satisfaction.

Work teams have become a popular work design in organizations today and a great deal of research has been conducted to understand factors that explain how and why teams achieve desired outcomes. As an important factor in the Input-Process-Outcome model, task characteristics have been shown to be positively related to team performance and team member satisfaction (Campion,

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Medsker, & Higgs, 1993; Cohen, Ledford, & Spreitzer, 1996; Spreitzer, Cohen, & Ledford, 1999). However, some traditional task characteristics, such as feedback and meaningfulness, has received little or no attention in these studies (Parker, Wall, & Cordery, 2001; Stewart, 2006), nor has the satisfaction-performance relationship received much attention at a team level. In the present study we examined the relationships among traditional task characteristics, team performance and member satisfaction, and especially the possible mediating role of member satisfaction.

TASK CHARACTERISTICS THEORY

As a widely used measure of perceived task characteristics at the individual level, the *Job Characteristics Model* (JCM; Hackman & Oldham, 1975) is an important foundation of studies on team design and effectiveness (Campion et al., 1993; Cohen et al., 1996; Spreitzer et al., 1999). The JCM identified five core dimensions, which are *skill variety*, *task identity*, *task significance*, *autonomy*, and *feedback* (Hackman & Oldham). Fried and Ferris (1987) concluded that the JCM received modest support and that task characteristics were related to psychological and behavioral outcomes at the individual level. Strubler and York (2007) extended the JCM to the *Team Characteristics Model* (TCM) by defining the five core characteristics at team level. According to the JCM and TCM, skill variety, task identity, and task significance established the experienced meaningfulness of the work; and teams might perform better through these three characteristics (Stewart, 2006). In the current study, we have combined the five core dimensions with three *task characteristics* which are *task meaningfulness*, *task autonomy*, and *feedback*.

THE EFFECTS OF TASK CHARACTERISTICS ON TEAM PERFORMANCE AND TEAM MEMBER SATISFACTION

Team task meaningfulness is enhanced when teams perceive their work to be worthwhile, valuable, and important (Stewart, 2006; Strubler & York, 2007). Teams engaged in meaningful tasks should perform better as team members will experience higher levels of intrinsic motivation (Batt & Appelbaum, 1995). Stewart quantitatively reviewed research concerning collective task meaningfulness and concluded that task meaningfulness had a modest relationship with team performance. Additionally, the meta-analytic results at the individual level have demonstrated that task identity and significance are related to job satisfaction (Humphrey, Nahrgang, & Morgeson, 2007). The extrapolation of this finding to the team level of analysis might be possible.

Team task autonomy is the degree to which the team is allowed or expected to do its own work and to manage the work of the team (Strubler & York, 2007). Task autonomy motivates effective team performance by increasing a sense of

responsibility (Hackman & Oldham, 1975; Spreitzer et al., 1999). The results of meta-analysis indicate that the relationship between team autonomy and performance is positive (Stewart, 2006). Autonomy has also been associated with increased work motivation, and increased job satisfaction (van Mierlo, Rutte, Kompier, & Doorewaard, 2005).

Team task feedback is the extent to which a team is given information on the quality of its work (Strubler & York, 2007). Task feedback could build internal work motivation by providing the results of work activities (Cohen et al., 1996; Hackman & Oldham, 1975). Through task feedback, team members could monitor their own activities and make improvements by responding to performance situations (Cohen et al., 1996; Spreitzer et al., 1999). The meta-analytic results at the individual level indicate a strong positive correlation between task feedback and job satisfaction (Humphrey et al., 2007). Furthermore, there is evidence indicating that task-related feedback is positively correlated with motivation, satisfaction, and performance in virtual teams (Geister, Konradt, & Hertel, 2006).

Thus, we posited that:

Hypothesis 1: Task characteristics (task meaningfulness, autonomy, and feedback) will be positively related to team performance.

Hypothesis 2: Task characteristics (task meaningfulness, autonomy, and feedback) will be positively related to member satisfaction.

THE MEDIATING ROLE OF TEAM MEMBER SATISFACTION

The job satisfaction-job performance relationship has been examined in many studies including three prominent meta-analyses which provided strong support for the positive relationship between job satisfaction and performance. For instance, in a recent meta-analysis, Judge, Thoresen, Bono, and Patton (2001) found that the mean corrected true correlation between satisfaction and performance was .30 ($k = 312$, $N = 54,471$). Mason and Griffin (2003) found a positive correlation between team member job satisfaction and team performance in student teams. For these correlations, a causal model might be one possible explanation (Judge et al., 2001). On this point, Politis (2006) found that job satisfaction had a direct, positive effect on team performance and mediated the relationship between self-leadership behavioral-focused strategies and team performance. This mediation relationship was explained by the connection between self-efficacy and satisfaction and the mediator role of self-efficacy between self-leadership and performance.

Moreover, according to social exchange theory, employees will reciprocate with positive behaviors such as organizational citizenship behaviors (OCBs) to benefit the unit or organization when they feel satisfied with their job (Chiu & Chen, 2005). At the team level, OCBs such as helping behavior and

sportsmanship were found to have significant effects on performance quantity or quality (Podsakoff, Blume, Whiting, & Podsakoff, 2009). We can assume, therefore, that job satisfaction might have positive effect on team performance through OCBs.

In sum, researchers have found that team member satisfaction has a positive effect on team performance. As argued in the previous section, task characteristics have a positive relationship with team member satisfaction and team performance. In addition, Chiu and Chen (2005) found that job characteristics had a significant positive effect on OCB and that job satisfaction mediated this relationship. Thus, we contended that task characteristics would have a positive effect on team member satisfaction, which, in turn, would lead to the improvement of team performance. Therefore, the following hypothesis was proposed:

Hypothesis 3: Member satisfaction will mediate the relationship between task characteristics (task meaningfulness, task autonomy, and task feedback) and team performance.

METHOD

SAMPLE

With the assistance of 45 graduate students, 176 teams were invited to participate in this study and 106 teams from 39 companies responded. After excluding 6 teams which had fewer than 2 members or no response from the team manager, we attained a sample of 100 teams composed of 382 individuals from 39 companies. Team size ranged from 2 to 9 members, with an average of 3.82 members ($SD = 1.79$). Among the 382 individual respondents, 55.7% were male. Respondents were highly educated: 70.6% held at least a 4-year college degree qualification. In addition to team members, 100 team managers were included in our sample. These managers were officially appointed by top management with assigned administrative duties and also worked with team members on the team tasks. The managers were invited to rate their own team's performance. All the participants were informed that individual responses would remain confidential.

MEASURES

Team task characteristics The individual team members were asked to assess the characteristics of their team task. Then these assessments were averaged to compose a team level construct. We adapted the items from the study by Cohen et al. (1996) and their reference was changed to "our team job". Response choices range from 1 = *strongly disagree* to 5 = *strongly agree*.

Team performance The overall team performance was measured by five items (e.g., meet performance goals in a timely manner; member rating scale, $\alpha = .88$; manager rating scale, $\alpha = .89$) drawn from Rosenstein's (1994) team performance

questionnaire, which has been used in China (Liu, 2006). This was rated on a 5-point scale ranging from 1 = *almost never* to 5 = *almost always*.

Team member satisfaction Team member overall satisfaction was measured by team satisfaction (2 items, $\alpha = .75$) and job satisfaction (2 items, $\alpha = .72$). All items were drawn from the study by Cohen et al. (1996). Response choices range from 1 = *strongly disagree* to 5 = *strongly agree*.

All measures were translated into Chinese and backtranslated to guarantee the equivalence of the constructs.

ANALYSIS

Data aggregation Prior to aggregating team members' assessments, we assessed the $r_{wg(j)}$ index of within-group agreement (James, Demaree, & Wolf, 1984) and the intraclass correlation coefficients ICC(1) and ICC(2) (Bliese, 2000) for each core dimension. Based on the results of the $r_{wg(j)}$ agreement index, 8 teams were dropped from subsequent analysis. Also, for all variables, the mean of the values of $r_{wg(j)}$ was above .80. The ICC (1) values of all variables ranged from .28 to .63, and all were significant $p < .001$ level. Four ICC(2) values exceeded or were near .70.

Structural equation modeling Maximum likelihood structural equation modeling (SEM) was used to test our hypothesis. A two-stage strategy was adopted. In the first stage confirmatory factor analysis (CFA) was used to test the fit of the measurement model to the observed data. In the second stage the fit of the hypothesized structural model was evaluated.

RESULTS

SCALE VALIDATION

Firstly, CFA was performed with individual team members' data to validate the structure of the JCM. The one-factor and five-factor models were tested. The results indicated that the latter model fit the data better than the former ($\Delta\chi^2 = 163.12$, $df = 10$, $p < .00$). Then the five-factor model was examined at the team level, and this provided an adequate fit to the team level data ($N = 92$), $\chi^2/df = 1.32$ ($p < .05$); comparative fit index (CFI) = .97; Tucker-Lewis index (TLI) = .96; incremental fit index (IFI) = .97; root mean square error of approximation (RMSEA) = .05, with each indicator found to load significantly on the appropriate factor with loading above .50. These results verified that the JCM could be used at the team level. Table 1 displays descriptive statistics and correlations among all research variables at the team level, providing preliminary evidence for the discriminant validity of the research constructs.

TABLE 1
MEANS, STANDARD DEVIATIONS, AND CORRELATION COEFFICIENTS OF ALL VARIABLES

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Meaningfulness	3.86	.42						
2. Autonomy	3.74	.56	.65**					
3. Feedback	3.92	.45	.65**	.53**				
4. Performance Member	3.93	.50	.51**	.35**	.37**			
5. Performance Manager	3.87	.64	.30**	.31**	.31**	.40**		
6. Job Satisfaction	3.92	.48	.51**	.46**	.55**	.63**	.38**	
7. Team Satisfaction	3.97	.50	.44**	.51**	.49**	.52**	.32**	.79**

Notes: *N* = 92. Meaningfulness is the average of variety, identity, and significance. ** $p < .01$

HYPOTHESIS TESTING

According to Table 1, task meaningfulness, autonomy, and feedback are all significantly related to team performance, member job satisfaction, and team satisfaction. Therefore, H1 and H2 were supported. Then we explored the mediating role of member satisfaction by SEM. Prior to this analysis, the overall factor structure of all research variables was examined at the individual level, which provided an adequate fit to the data ($N = 382$), $\chi^2/df = 1.61$ ($p < .05$); CFI = .99; TLI = .98; IFI = .99; RMSEA = .038. These results verified the posited relationships among indicators and constructs, confirming the convergent validity and discriminant validity of the constructs.

According to H3, member satisfaction will mediate the effects of the three task characteristics on team performance. So we tested the fit of this supposed full mediation model to the team level data. The fit indices indicated a strong fit of the model to the data, $\chi^2/df = 1.67$ ($p = .08$); CFI = .98; TLI = .95; IFI = .98; RMSEA = .086. But the standardized structural coefficient between task meaningfulness and member satisfaction was not significant ($t = 1.47$, $p > .10$). Then, we adjusted the model by changing this pathway to team performance and achieved the final model shown in Figure 1 where all four standardized structural coefficients were significant and the new model fits the data adequately, $\chi^2/df = 1.31$ ($p = .22$); CFI = .96; TLI = .97; IFI = .99; RMSEA = .059. Figure 1 shows that member satisfaction is positively correlated with team performance ($\gamma = .66$, $p < .01$), task autonomy ($\gamma = .27$, $p < .01$) and feedback ($\gamma = .43$, $p < .01$). Furthermore, the paths from autonomy and feedback to performance were examined and were proved to be insignificant. These results indicate that member satisfaction mediates the effects of task autonomy and feedback on team performance. Therefore, H3 was partly supported. In addition, task meaningfulness was found to have a direct positive effect on team performance ($\gamma = .29$, $p < .01$).

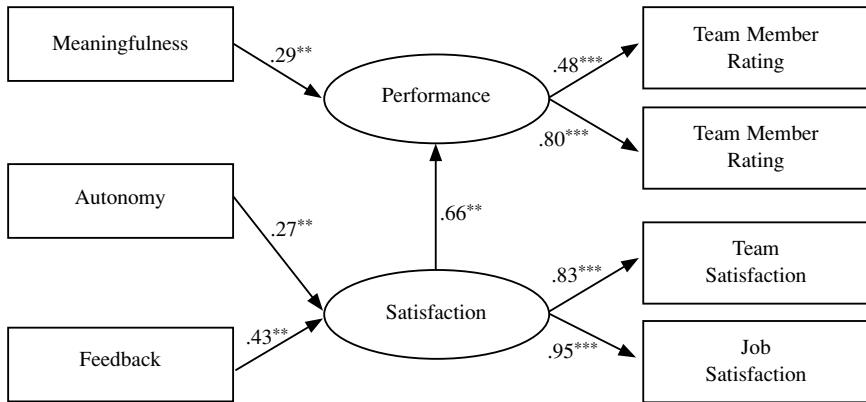


Figure 1. Estimated coefficients for the relationships among task characteristics, team performance, and team member satisfaction. Standardized structural coefficients are reported. Model fit indices: $\chi^2 = 1.31$ ($p = .22$); CFI = .99; TLI = .96; IFI = .99; RMSEA = .059.

** $p < .01$, *** $p < .001$

DISCUSSION

The goal of this study was to examine the positive correlation among the three traditional task characteristics, team performance, and member satisfaction, and especially the mediating role of member satisfaction. The correlation results supported the correlated relationship. The structural equation modeling results based on team level data indicated that (1) team member satisfaction mediated the effects of task autonomy and feedback on the team performance, and (2) task meaningfulness had a directly positive effect on team performance. Based on these findings, in this study the literature on the effects of task characteristics on team effectiveness has been extended in three ways.

First, the relationship between task characteristics, team performance, and member satisfaction has been investigated in just a few studies (Campion et al., 1993; Cohen et al., 1996; Spreitzer et al., 1999). The mediating role of member satisfaction has not been explored in any of those studies, although the job satisfaction-job performance relationship at the individual level has received much attention. In our study, for the first time, this relationship was explored and proven as was the mediating role of satisfaction at the team level.

Furthermore, previous researchers either combined the task characteristics into one variable such as group task design (Cohen et al., 1996) or team design (Spreitzer et al., 1999) or were concerned with only one characteristic, such as autonomy. In our study different aspects of traditional task characteristics were

found to have different effects on team performance or member satisfaction, which helps to build an integrated picture of these relationships. The research currently being carried out, especially the work on team task meaningfulness and feedback is making up for the neglect in related studies (e.g., Parker et al., 2001; Stewart, 2006).

Moreover, researchers in this field have always claimed that the theoretical level for their study was the team level; and yet none of them provided a strong rationale for this claim. The most extensive rationale offered by Campion et al. (1993, p. 826) that "all the job characteristics of Hackman and colleagues can be applied to groups, even though there have been few tests at the group level", still does not clarify why the team level is judged appropriate (van Mierlo, Rutte, Vermunt, Kompier, & Doorewaard, 2007). The confirmation of the structure of the JCM at the team level in the current study might bridge the gap between this rationale and "level issue".

PRACTICAL IMPLICATIONS

The findings of our study have some important implications for management practices by illustrating the potential importance of proper design of productivity and satisfaction differences associated with teams that are high or low in terms of the characteristics (Campion et al., 1993). As noted earlier, task meaningfulness has a direct effect on team performance; task autonomy and feedback have a direct effect on member satisfaction. If only to improve team performance by task design or redesign, managers can increase task variety, significance, and identity, for example by implementing task enrichment and task enlargement, by increasing skill variety and challenges, or enabling members to understand their team's importance to company operations (Chiu & Chen, 2005). Furthermore, if managers pay equal attention to member satisfaction and team performance, they should also pay more attention to proper autonomy and timely feedback.

FUTURE RESEARCH

In this study some questions have been left unanswered and deserve further investigation. Firstly, task characteristics, team performance, and member satisfaction are, respectively, input and output variables of the Input-Process-Output model. No process variables were included in this study. This means it is still unclear how task characteristics affect team performance and member satisfaction. Rousseau, Aube, and Savoie (2006) posited that the relevance of teamwork behaviors to improve team performance might vary as a function of different components of task design characteristics; more teamwork behaviors variables should, therefore, be considered in a future study.

Secondly, in the current study we were concerned only with the effects of task characteristics on the team level. However, multilevel theory has attained

much attention in organizational research. van Mierlo et al. (2007) found that the individual job characteristics mediated the relationship between team autonomy and team learning behaviors reported by members. Thus, a multilevel theory should be applied to explore further the effects of team task characteristics on team effectiveness.

Lastly, although we collected performance data from the team managers, and the task characteristics, performance, and satisfaction were printed on different pages, most data collected were from the members' self-reporting. This procedure might limit the validity of the results because of common method bias. Accordingly, in further research a longitudinal design could be employed. In this way, common method bias could be reduced to the fullest extent, and conclusions on causal order could be drawn.

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