Cooperating Teams and Competing Reward Strategies: Incentives for Team Performance and Firm Productivity

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ABSTRACT

Managers and executives from 257 organizations completed mailed surveys investigating relationships among reward strategies, task interdependence, team performance, and firm productivity. All measures attained at the firm level. As expected, firms that based employee rewards on either personal or collective output tended to demonstrate higher levels of productivity. Output-based reward strategies had no direct relationships, however, with team performance. Also as expected, task interdependence moderated the relationship between rewards based on human capital and team performance. Team performance was highest when firms with complex task interdependence used human capital strategies to reward employees.

One of the more perplexing challenges facing human resource professionals today involves finding ways to compensate teams and team members fairly and efficiently, while providing incentives to enhance productivity and performance. Teams have become popular foci for redesigning organizational structures (Barker & Tompkins, 1994), as a means of increasing productivity (Womack, Jones, & Roos, 1990), improving flexibility (Reed, 1992), spanning organizational boundaries (Ancona, 1990) and raising employee involvement and commitment (Wood & Albanese, 1995). As many as 80% or more of companies in the U.S. use teams in some of their critical transformation processes (Gross & Safier, 1995). Some people even claim that teams have become the "cornerstone of American modern industry" (Klimoski & Mohammed, 1994: 406). Team-based settings, however, present special problems for reward systems (Mohrman, Cohen, & Mohrman, 1995). Merit pay for individual accomplishment, for instance, could conflict with pay for team accomplishment (Weinberger, 1998). Long-term collective incentives like gain-sharing and profit-sharing sometimes suffer from line-of-sight problems (Lawler, 1990). Differentiating pay among team members who are highly marketable versus those who are less marketable can introduce another source of conflict (Taylor, 1997). Compensation strategists need to understand better how to motivate higher productivity and performance among workers in team settings, while maintaining fairness and efficiency.

First, we identify alternative reward strategies that characterize an organization's strategic compensation system. Then we identify the structural impact of designing work for teams rather than individuals. Next we propose relationships among alternative reward strategies and performance outcomes. Finally, we present the results of a nationwide survey of human resource managers in the U.S., asking them about some of these relationships. We analyze our data at the

organization level. This is the only study of reward strategies, teams, and performance measured at the level of the firm that we are aware of. We begin by identifying alternative reward strategies compensation managers might use.

Reward Strategies

One objective of pay systems is to motivate productivity and performance. Strategic compensation seeks to take advantage of the symbolic and reinforcing value inherent in compensation by emphasizing the instrumentality of meeting well-defined criteria for learning rewards (Lawler, 1990). A particular reward strategy, therefore, specifies a criterion for determining entitlement to a reward. The objective to motivate often seems to exist in conflict with the fairness objective, since while pay equity refers to degrees of parity, the typical approach to motivating workers is differentiating pay among them. Given such multiple and sometimes competing objectives, selecting appropriate reward strategies is complicated, and usually results in some kind of compromise or mix (Kabanoff, 1991).

There are at least five alternative reward strategies that have strategic intent (Howard & Dougherty, 2000): personal output, collective output, human capital, market-based, and position-based. Each reward strategy implies particular reward criteria and is associated with an alternative strategic target and form of equity, as illustrated in Table 1. For example, reward strategies emphasizing personal output make variable compensation contingent upon achieving specific measures of individual productivity. Personal output reward strategies are designed to reinforce effort directed toward maximizing quantity of output while also attaining individual equity. Collective output reward strategies make employee rewards contingent upon the performance of a larger entity, such as the work unit, department, or the organization. Collective output reward strategies are intended to encourage cooperation on collaborative tasks and to maintain a sense of internal equity. Human capital reward strategies tie compensation to the acquisition or use of specified educational, training, or experience attributes. Human capital strategies are used primarily to develop a more flexible and capable workforce while contributing to perceptions of personal equity. Market-based reward strategies emphasize pay rates across job classes within a firm to pay rates in the marketplace for similar job families, while considering additional environmental factors that might influence pay rates, such as changes in the costs of living. Market-leading strategies pay higher rates than competitors, to attract candidates and retain incumbents. Market-based strategies also affect a sense of external equity. Finally, position-based reward strategies tie rewards to factors within jobs or roles in organizations, regardless of incumbents. The most common criteria for position-based rewards are job evaluation points. Position-based reward strategies are intended to encourage predictability and group harmony with a sense of internal equity regarding the firm's pay structure. Most organizations are likely to employ each of these reward strategies to some extent, some more than others, depending upon their particular industries, values, and competitive strategies.

Team Workers

When a worker becomes a member of a team, at least two things change that can also influence the reward system: their goal and their role (Gross, 1997). The goal of an independent

worker is to achieve some individual output. A goal is more motivating when the worker commits to it (Locke & Latham, 1984). Promising a reward for goal attainment can increase commitment to a goal by increasing the instrumentality of task performance in advancing personal objectives (Wood, Atkins, & Bright, 1999). A reward for goal attainment also reinforces the behaviors that led to goal attainment (Skinner, 1998). Rewards for outcomes also communicate some of the terminal values held in the organization (Lawler, 1990). Such values clarification may lead to internalization of and further commitment to goals (Knoop, 1994). For all of these reasons, rewarding individual output in an independent task can increase employee motivation and productivity.

The goal of a team worker, however, is to achieve some collective output (Avolio, Jung, Murry, & Sivasubramaniiam, 1996). Several factors might influence the extent to which team members accept and commit to a shared goal, including reward systems. For instance, rewarding output measured at some level higher than the individual helps to unify the direction of multiple goals among group members, increasing their commitment to the superordinate goal and encouraging mutual aid (Kerr, 1999). Tying rewards to group- or organization-level output also puts social pressure on members to conform and perform (Heneman & von Hippel, 1995).

Table 1
Alternative Reward Strategies, Criteria, and Targets

Reward Strategy	**Reward Criteria**	**Strategic Target** (Theoretical Basis)	**Equity Target** (Theoretical/Empirical Basis)
Personal Output	Individual work output	**Higher Productivity** (Locke et al, 1981; Locke & Latham, 1984; Skinner, 1998; Vroom, 1964)	Personal Equity (Adams, 1965)
Collective Output	Group, unit, or firm output	Higher Productivity (Locke et al, 1981; Skinner, 1998; Vroom, 1964) Collaboration (Deutsch, 1975)	Internal Equity (Deutsch, 1985; Milkovich & Newman, 2002)
Human Capital	Personal level of education, training, experience	Human Resource Development (Vroom, 1964) Firm Flexibility (Lawler, 1990)	Personal Equity (Adams, 1965)
Market Based	Salary surveys of comparable jobs across competitors	Candidate Attraction Employee Retention (Lawler, 1990)	External Equity (Lawler, 1990; Milkovich & Newman, 2002)
Position Based	Job evaluation points, job title, responsibilities	Predictability Consistency (Gomez-Mejia & Balkin,	Internal Equity (Lawler, 1986; Milkovich & Newman, 2002)

		1992) Group Harmony (Deutsch, 1985)	

When a worker becomes a member of a team his or her role also changes. According to role theory (Katz & Kahn, 1978), roles are behaviors expected of persons filling certain positions, as communicated by members of the focal person's role set. Role sets are those individuals defined by workflows, technology, and authority structures who have a stake in the focal person's performance. Role definitions evolve over time, through a series of cyclical episodes, each of which includes role-sending communications by the members of the role set, and receiving, perceiving, and providing feedback by the focal person.

The role of an independent worker is fundamentally that of a technician. The technician's role set is primarily constituted of his or her immediate supervisor. When a part of a team, in order to conduct role episodes with all other team members, now part of his or her role set, the first requirement for the focal person becomes a need for communication skills. Over time, the development of the new role will also require skills in negotiating, decision making, and managing conflict, as role expectations become clarified and mutually accepted (Stevens & Campion, 1994). Consequently, regardless of the content of one's role, team membership demands conceptual and interpersonal skills that independent work does not demand, and requires that the team member engage not only in production activities but also in team maintenance activities (Stevens & Campion, 1999). Unlike the job analyses available for independent jobs, no reliable systems currently exist for standardizing team member role content (Baker, Salas, & Cannon-Bowers, 1998). Therefore, it becomes more important to develop a broad range of skills among team workers.

One of the defining characteristics of teams is that team members' tasks are interdependent (Guzzo & Shea, 1993). The simplest level of interdependence exists when workers add their outputs to a common pool (Thompson, 1967). Sequential interdependence is more complex, and exists when one person's output becomes the input for another (Thompson, 1967). When tasks are mutually compensating (Steiner, 1972), such as those involving set-up personnel, operators, and machine maintenance personnel, they comprise reciprocal interdependence (Thompson, 1967), a more complex level. When each member's tasks are somehow mutually compensating with all other members' tasks, the relationship among them is called team interdependence (Van de Ven, Delbecq, & Koenig, 1976). At this, the most complex level of interdependence, individual output may be virtually indistinguishable from group output.

Hypotheses

According to reinforcement theory, people tend to do whatever gets them rewarded (Skinner, 1998). Specific behaviors can be shaped, therefore, by making rewards contingent upon the demonstration of those behaviors. When the behaviors leading to desirable outcomes are uncertain, rewards attached to the outcomes will reinforce whatever behaviors lead to those outcomes. According to expectancy theory, tying meaningful rewards to task performance also increases motivation by making task performance instrumental in attaining personal outcomes (Vroom, 1964). In addition, identifying an output criterion is tantamount to setting a goal

(Hollensbe & Guthrie, 2000). Goals affect performance by focusing attention, mobilizing effort, and motivating people to develop goal-attainment strategies (Locke, Shaw, Saari, & Latham, 1981). Therefore, we would expect reward strategies that target output to encourage higher productivity.

Hypothesis 1: Firm productivity will be positively related to the extent the organization uses (a) personal output or (b) collective output reward strategies.

Task interdependence has long been recognized as a central feature of organization (Barnard, 1938), and may represent the most critical managerial constraint (Weick, 1979). The degree of task interdependence may also be a critical factor in determining the appropriateness of individual versus collective rewards. One research finding indicates, for instance, that team members' commitment to a shared goal is significantly related to the degree of task interdependence among members (Wageman, 1995; see also Hollensbe & Guthrie, 2000). When rewards among workers are based on total output, it also encourages cooperation in pursuing collective goals (Deutsch, 1985). Other scholars suggest that aspects of task complexity, including interdependence, might moderate relationships between contingent incentives and performance, although very little research has examined this notion directly (Stajkovic & Luthans, 2001). The general conclusion in this area is that in order to motivate productivity individuals should be rewarded for their personal output when working on independent tasks and rewarded on the basis of collective outputs when working as a team member on interdependent tasks (Wageman & Baker, 1997).

Hypothesis 2: The relationship between personal output reward strategies and firm productivity will be greater when interdependence is low than when interdependence is high.

Hypothesis 3: The relationship between collective output reward strategies and firm productivity will be greater when interdependence is high than when interdependence is low.

All workers need the knowledge, skills, abilities, and confidence necessary in order to succeed (Locke & Latham, 1984). Providing rewards based on human capital both encourages people to develop their human capital, and entices them to use it (McKenzie & Lee, 1998). As workers develop their human capital, they are likely to raise their expectancies for success, motivating them to higher performance (Vroom, 1964). Furthermore, the more highly interdependent the tasks of a team are, the more important it becomes that each team member possess the requisite skills for teamwork, because the success of the team will be contingent upon the least capable worker (Steiner, 1972). A chain can be only as strong as its weakest link.

Hypothesis 4: The relationship between human capital reward strategies and team performance will be greater when task interdependence is high than when task interdependence is low.

Pay strategies reflecting concerns for external labor market forces are implemented to attract and retain workers and promote external equity. These strategies have become so universal, however (in the U.S. at least), that they have become institutionalized and taken for granted (Howard, 1993). Consequently, neglecting market strategies might negatively affect fairness judgments, but they should otherwise be unrelated to either firm productivity or team performance.

To summarize, we expect that both personal and collective output reward strategies will be related to firm productivity, and that the strength of the relationships will be moderated by the interdependence among teams in the organizations. Task interdependence will also moderate the relationship between human capital reward strategies and team performance. We also expect to find no systematic relationships between market-based reward strategies and either firm productivity or team performance. Next, we describe a study designed to test the hypotheses.

Methods

Sample and Subjects

We drew the sample from the membership of the world's largest association of human resource management professionals, with over 130,000 members. We selected members from the United States with job titles placing them at the level of manager or higher. These persons were expected to have knowledge of both the team-based programs and reward systems in their organizations, and at least elementary familiarity with their respective organization's overall performance. We selected a random sample of 5,000, stratified by job title, and mailed them our survey. In order to inspire responses, we included one-dollar tokens of appreciation, offered an alternative survey located at our website, and after three weeks sent reminder cards to non-respondents. Three hundred and eighty-four surveys were returned and 116 were undeliverable, for an overall response rate of 7.9%. Of those returned, 257 (5.3%) were useful for most analyses. Only 131 respondents reported information for calculating their organization's productivity.

In spite of the low rate of response, the responses we received appear to be reasonably representative of the universe we sampled. Of the 247 firms identifying their primary industry, 27.1% were in health care, 36.0% were in manufacturing, 23.1% were in services, and 13.8% were in retail or wholesale sales. Proportions of association members from the industries of health care, durable manufacturing, for-profit services, and retail/wholesale are about 21%, 32%, 35%, and 12%, respectively. These proportions compare well with our proportions of respondents' industries, although service firms may be slightly under-represented. Nineteen percent of our respondent firms employed fewer than 100 workers, compared to 16% of the membership; 40% of our firms employed between 100 and 500 workers, compared to the membership's 29%; 13% of our respondents employed between 500 and 1000 workers, compared to the membership's 12%; another 13% of our respondents employed between 1000 and 2500, compared to the membership's 13%; more than 6% of our respondents employed between 2500 and 5000 workers, compared to about 7% of the member firms; and about 8% of our respondent firms employed more than 5000 workers, compared to about 22% of the membership's firms. These proportions are also reasonably comparable, although very large companies might be somewhat under-represented in our data.

Measures

We asked respondents to estimate their firm's annual revenue, number of full time employees, payroll expense, rate of employee turnover, and union representation (as a control). We also solicited ratings on measures of reward strategies, team performance, and team task interdependence. These latter scales are described briefly next.

Reward Strategies.

For this study, we added to and slightly modified items from Howard and Dougherty's (2000) measures of reward strategies. Respondents were instructed to indicate on a scale of 1 to 7 ("highly unlikely" to "highly likely") the probability that rewards in their organization would be given for each of the listed events, achievements, or attributes. Rewards were defined as any of a variety of financial incentives, including pay raises, bonuses, and commissions. The five reward strategies, or alternative bases for rewards, include personal output, collective output, human capital, market-based, and position-based.

We submitted all reward strategy items to exploratory factor analyses. Since we expected intercorrelations among reward strategies, we rotated the initial solution to an equimax solution. Five factors explained about 65.9% of the variance in the items. The resulting factor pattern is presented in the Appendix. In constructing scales we selected only those items that loaded above .40 on their intended factor, not that highly on any other factor, and higher than the item's second-highest loading by at least .20.

The four personal output items include meeting productivity and quality objectives and demonstrating initiative and effort. The coefficient alpha for the personal output scale was α = .93. Eight items measured aspects of collective output (α = .94), including work groups improving productivity, and receiving high ratings for quality and efficiency, and the organization improving productivity, revenues, and customer satisfaction. Four items measured human capital (α = .89), including receiving training certifications, professional credentials, or higher education degrees. Five items reflected market considerations (α = .79), including salary surveys and competitor pay rates, minimum wage rates, and salary compression and equity adjustments. The four items intended to reflect a position-based reward strategy did not comprise a reliable scale (i.e., α = .53). In addition, while a limited information factor analysis including only the four position-based items resulted in one principal component, that component explained only about 42% of the variance in the four items. Since a position-based reward strategy is not central to our hypotheses, we dropped these items from substantive results and tables.

We recognize that organizations frequently use multiple reward strategies and that different reward strategies might be applied to different sub-populations of employees. We deliberately chose to generalize at the organization level to ease the cognitive load for respondents and to consistently reference the firm level of analysis, while allowing respondents to put as much emphasis on any reward strategy items as was characteristic of their respective firms. Therefore, responses indicate what is generally done in each firm, although there may be differences within firms in terms of reward strategies.

Team Performance.

Four items asked respondents to rate the performance of teams in their organizations, compared to the performance of work units where employees were not organized into teams. On a scale of 1 to 7, they rated team performance as very inferior to very superior along four dimensions: quantity of output, quality of output, resource efficiency, and administrative efficiency. The coefficient alpha was α = .87. We did not ask respondents to try to distinguish among different

types of teams within their respective organizations, so that our measure of team performance would be consistent with our measures of reward strategies, which are operationalized at the firm level.

Interdependence.

Respondents indicated the complexity of task interdependence by indicating the proportions of team work flows that most resembled illustrations of four alternative levels of interdependence: pooled, sequential, reciprocal, and team. They did so by allocating 100 points among the four levels. To calculate a score, we weighted the complexity of each level 1-4, respectively, based on the geometric progression of relationships implied by advancing levels. That is, with pooled interdependence, each party interacts with only one other group component, the input pool; with sequential interdependence, each party interacts with two group components, the input source and the output target; with reciprocal interdependence, each party interacts with four group components, including the input source, the output target, and the reciprocal of each. The number of interacting relationships doubles at each higher level of complexity, consistent with the 1-4 scaling. We multiplied the proportion of workers at each level of interdependence by the complexity of interdependence at that level, summed the products, and divided by 100 to represent the firm's overall level of task interdependence.

Analyses

We examined the data using correlation analyses and moderated hierarchical regression analyses. Since we are proposing significant interactions, and the power to detect interactions using moderated regression is constrained, we report results using a level of significance at $p < .10$ (Aiken & West, 1991).

Results

Descriptive statistics and bivariate correlations are presented in Table 1. The average number of employees per firm was 3,005 (s.d. = 14,551; median = 300). Of the 175 firms responding to this item, the average annual revenue was $731 million (s.d. = $2,045 million; median = $75 million). While 14 respondents failed to indicate whether or not any employees were represented by labor unions, 168 (65.4%) reported no employee unions, and 75 firms (29.2%) had some unionized employees. Among the firms with unions, only 10% of employees were members, on average. Next, we turn to tests of the hypotheses.

Table 2

Descriptive Statistics and Intercorrelations

Variable	Mean	S.D.	N	1	2	3	4	5	6	7	8	9
1.Number of Employees	3006	14551	239									
2.Proportion of Workers in Teams	35.97	32.33	253	15**								
3.Total Firm Productivity	0.71	0.19	131	-03	-06							
4.Annual Employee Turnover %	25.58	45.13	230	01	07	-24***						
5.Team Performance	4.74	0.93	216	-05	13*	11	00					

6.Team Task Interdependence	2.54	0.96	209	01	-03	06	-06	13*				
7.Human Capital Reward Strategy	3.80	1.30	256	-04	-04	04	-07	03	-02			
8.Market-Based Reward Strategy	4.11	1.26	256	-04	-04	-00	07	12*	-03	30***		
9.Personal Output Reward Strategy	4.21	1.47	256	-03	02	16*	05	-03	-05	42***	23***	
10.Collective Output Reward Strategy	3.84	1.45	256	-03	19***	16*	05	07	04	43***	20***	61***

Decimals omitted.

* = p<.10

** = p<.05

*** = p<.01

Hypothesis 1

The first hypothesis proposed that firm productivity would be positively related to both (a) personal output reward strategies and (b) collective output reward strategies. Both of the bivariate correlations were of similar magnitude, $r = .16$, and statistical significance, $p = .07$. Because we had measures of productivity from only 131 firms, our power to detect significant relationships of this magnitude was only about $\beta = .50$. Therefore, these marginally significant results were consistent with the relationships we proposed.

Hypotheses 2 and 3

The second and third hypotheses proposed that interdependence would moderate the relationships between personal output and collective output reward strategies, respectively, and firm productivity. Since there were several differences among firms in terms of industry and unionization, we controlled for these differences by entering them into the first step of the regression analyses. Next, we entered interdependence along with each reward strategy in respective analyses. Finally, for each model we entered the interaction term between interdependence and the respective output-based reward strategy. In both tests, the only variable that significantly predicted variance in productivity was the industry code. Therefore, neither Hypothesis 2 nor Hypothesis 3 was supported. While all four reward strategies were intercorrelated, as expected, the relationship between the personal output and the collective output reward strategies was significantly stronger than any of the other bivariate reward strategy correlations (e.g., $r = .61 > r = .43$, $t_{(253)} = 3.04$, $p < .01$). Apparently organizations that emphasize maximizing productivity tend to reinforce output at multiple levels.

Hypothesis 4

The fourth hypothesis predicts that task interdependence will moderate the relationship between human capital reward strategies and team performance. The first step of the regression analysis controlled for industry and unionization. The second step included the level of interdependence and the extent of basing rewards on human capital as predictors of team performance. The third step added the product term of human capital and interdependence. The results of this analysis are presented in Table 2. Adding the interaction term in the final step increased the variance explained (R^2) by a significant amount (at $p = .07$). The interaction term

was also significant in the equation, producing a standardized beta weight of .45 (p = .07). Consequently, Hypothesis 4 was supported.

Table 3

Hierarchical Regression Analyses for Team Performance

	Factor	Standardized Beta	R-squared
Step 1			.00
	Proportion Unionized	-.05	
	Number of Employees	-.04	
	Industry	-.03	
Step 2			.02
	Interdependence	-.20	
	Human Capital R.S.	-.27	
Step 3			.02*
	Interaction Term, Interdependence * Human Capital	.45*	

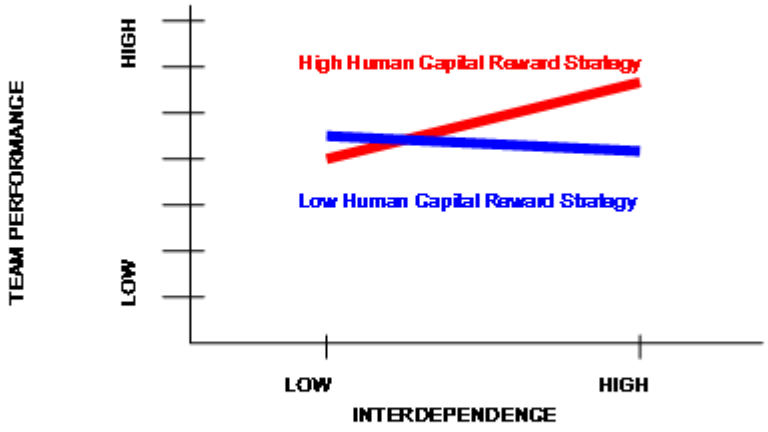
Final model F (6,189) =1.32, p>.10, and total R-squared=.04.

* = p=.07

To examine this interaction in more detail, simple regression slopes representing the relationship between interdependence and team performance were plotted separately at low and high levels of human capital reward strategies (i.e., 1 standard deviation below and 1 s.d. above the mean, respectively; see Figure 1). There was no significant relationship between human capital reward strategies and team performance in organizations reporting low levels of task interdependence ($F_{(1, 28)} = .21$, n.s.). In contrast, there was a significant positive relationship between human capital reward strategies and team performance in those organizations reporting relatively high levels of task interdependence ($F_{(1,26)} = 5.84$, $p < .05$). As Figure 1 indicates, team performance was highest under conditions of both complex interdependence and high use of human capital reward strategies.

Figure 1

Team Performance at High and Low Levels of Interdependence and High and Low Levels of Human Capital Reward Strategies



Discussion

We collected data from human resource managers and executives in 257 firms and examined relationships among reward strategies, firm productivity, and team performance, all measured at the organization level. We found that tying rewards to human capital made a significant contribution to team performance under conditions of high task interdependence. Team performance is increasingly sensitive to each team member's abilities as the members become increasingly dependent on each other. Under conditions of high task interdependence, team performance is constrained by the least capable team members in ways that the other members cannot compensate for. Therefore, it becomes more important as the work of the team becomes more complex that each member be multi-skilled. Basing rewards on human capital may help to encourage skill development and use. Although this line of reasoning is not new, this is the first study we know of to integrate reward strategies as a firm-level intervention. The role of human capital reward strategies in teams and team-based structures deserves further examination.

We expected and observed moderate correlations among reward strategies, since most firms strive to meet multiple objectives and use multiple compensation schemes. The average correlation between reward strategies was r = .37. Nonetheless, as we predicted, market-based reward strategies did not correlate with either firm productivity or team performance. These

reward strategies are engaged in pursuit of pay fairness and employee attraction and retention rather than as productivity or performance incentives. On the other hand, the relationship between market-based reward strategies and team performance was marginally significant ($r = .12$, $p < .10$), suggesting the possibility of selecting people for their team skills rather than developing them internally via human capital investment, an example of the fundamental "make or buy" decision in human resource management. This result highlights the complexity of compensation systems and the application of alternative strategies to achieve multiple objectives. The most appropriate mix of reward strategies deserves further research.

Although interpretation of marginally significant relationships (i.e., $.05 > p < .10$) must be guarded, we find it interesting that both personal and collective output reward strategies were marginally significantly related to firm productivity, as strategic compensation theorists would predict. However, neither relationship was moderated by the degree of team member interdependence. The significant correlation between the proportion of employees organized into teams and the use of collective output reward strategies also suggests that compensation managers might anticipate such productivity effects, but the heuristic that rewarding personal output when task interdependence is low and collective output when task interdependence is high was neither supported nor refuted. Additional research at the firm level regarding this issue would seem justified.

This project faced some noteworthy limitations, including untested measurement instruments. The four scales measuring reward strategies nonetheless demonstrated acceptable reliabilities. This study extends previous work in developing measures of reward strategies. The scale constructed to measure task interdependence is also novel, and should be validated in subsequent research. We are aware of no alternative measure that would have been useful in this research. Although there was no evidence to indicate that common method variance was a problem, respondents provided scores for both independent and dependent variables, at least raising the possibility of such a problem.

The most severe limitations to this study are its response rates and sample size. We had anticipated some reluctance to participate, and tried using monetary tokens, reminder cards, a promise of a research summary, and an alternative format available at a website in order to counter such reluctance. Subsequent to our data collection, we learned that this particular population is approached several times every year for survey participation, and that response rates had declined steadily through the years. Our response rate actually exceeded some precedents in this population. In spite of the rate of response, our data represent a sizable sample of organization-level measures, and we determined that respondents' firms are largely representative of the universe we sampled, in terms of industry and size, although service firms and very large firms might be somewhat under-represented. We have no compelling reason to believe that the responses we received are not generalizable to the universe from which we sampled. The sample size also becomes an issue with respect to some of our statistical analyses, and the power to detect significant effects. In particular, several respondents were either unwilling or unable to provide information about their respective firm's overall payroll productivity. By the same token, we discovered several statistically significant effects, and in light of the relatively small sample, these findings are perhaps even more noteworthy.

The results of this study are constrained, as well, by what we did not try to do. For example, we did not try to distinguish among types of teams, such as cross-functional teams, project teams, or self-managing teams. Likewise, we did not try to account for multiple compensation and reward systems possibly operating in the same organization. By virtue of the survey design and instructions, however, we directed respondents to consider all types of teams and reward criteria across the entire organization. We also did not try to account for non-financial incentives in this study. We focused on financial incentives to avoid potential confounds. In addition, we were not able to assess the levels or frequencies of payouts under any of the incentive strategies. We also may not have captured all conceivable reward strategies. For example, the items we had selected to capture a position-based strategy failed to achieve an adequate level of reliability in this sample. It seems likely that such a strategy would also be widely used, since it is grounded on job evaluation data and job evaluations are ubiquitous. By the same token, such a strategy would also likely be taken for granted. Therefore, a position-based reward strategy might help explain additional variance in rewards actually paid out, but not offer much additional prediction in terms of performance effects. Future research could nonetheless examine this presumption. In addition, a "social capital" reward strategy has become evident recently also, at least in terms of controversy over executive compensation (E.g., Boxman, de Graaf, & Flap, 1991; Reingold, 1999). The concept of social capital has been construed to mean somewhat different things at various levels of analysis, but in terms of a reward strategy, the social capital criterion for earning compensation would include indices of possessing legitimate, expert, and referent power (French & Raven, 1959). There has been no research examining the role of social capital reward strategies in compensation programs, but this remains an option for subsequent research. In general, the scope of this study does not constitute a limitation of its findings.

In conclusion, our results confirm the popular consensus that the best reward strategy for teams depends on the level of task interdependence they experience. However, contrary to popular opinion, while reward strategies based on either personal output or collective output may be associated with overall firm productivity, neither was associated with team performance. To improve the performance of teams with increasingly complex interdependence, an organization's compensation managers should consider including rewards for human capital attributes in its compensation mix.

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Appendix

Factor Pattern from Analyses of Reward Strategies*

Indicate the likelihood that each of these achievements or events would lead to a raise or a bonus for one of your firm's employees (1=highly unlikely; 7=highly likely):	Factor 1 Collective Output	2 Personal Output	3 Human Capital	4 Market Rates	5 Position Based
Organization increases productivity	**83**				
Organization increases revenues	**80**				
Customer retention/satisfaction improves	**79**				
Work group increases productivity	**78**	31			
Work group receives high efficiency rating	**76**	36			
Work group receives high rating for quality	**76**	38			
Organization receives quality award	**72**				
Organization achieves profit target	**72**				
Meets individual work quality objectives		**86**			
Supervisor rates personal initiative high		**85**			
Supervisor rates individual effort high		**85**			
Meets individual productivity objectives		**85**			
Receives an advanced college degree			**88**		
Receives a college degree			**87**		
Receives technical training certificate			**84**		
Receives a professional license/credential			**79**		
Gains experience on related job	38	35	49		
Learns a new technical skill			46		40
Salary compression adjustment				**82**	
New salary survey of labor competitors				**80**	
Equity salary adjustment				**75**	
Competitor raises salaries				**63**	31
Legal minimum wage is raised				**56**	
Moves to a job with a higher point value					72
Receives promotion in job title					59
Accepts additional responsibility for planning/monitoring own work					57
Has tasks added to the job					52
Moves to an undesirable or dangerous job					46

% Variance Explained by Factor	19.2	14.4	14.2	10.1	8.0

* **Bold** items retained; decimals omitted; factor loadings <30 are suppressed.

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