What Works at Work? Evidence from the Minnesota Human Resources Management Practices Study

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Recent debates about the future of Minnesota's economy have focused on a number of key factors thought to underlie competitive success, such as the amount of venture capital received by Minnesota start-up businesses, the efficiency with which the University of Minnesota converts its discoveries into marketable goods and services, and the number of Fortune 500 companies headquartered here.

Often overlooked as a source of competitive advantage, however, is the technology of managing workers—that is, the day-to-day practices of human resources management. Basic decisions such as how compensation structures are set, how decision-making rights are allocated, and how much training employees receive have major effects on organizational performance and, by extension, the health of the regional economy. In fact, with unemployment rates at historic lows, finding, retaining, and deploying workers in the most effective manner has emerged as the leading economic issue in Minnesota.

At the same time, human resources technologies have evolved dramatically during the past 20 years—401(k) plans, stock options, cross-functional work teams, employee stock-ownership plans, and joint labor-management committees are just a few innovations that have revolutionized the workplace in the United States.

Given the importance of human resources to Minnesota's continued economic health, during the past five years researchers from the Industrial Relations Center (IRC) at the University of Minnesota's Carlson School of Management have been documenting the spread of innovative human resources management practices within the state, and delineating their impacts on employers and employees alike. This article presents results from the 1994–1996 Minnesota Human Resources Management Practices Study (MHRMPS), which was supported by grants from CURA, the Sloan Foundation, and the University of Minnesota's Retail Food Industry Center.

The MHRMPS had three main goals: to gain a detailed picture of which human resources practices have been adopted over time; to determine how the mix of practices differs across industries and ownership structures; and to evaluate the relationships between human resources practices and employee productivity, firm profitability, and workplace safety. This article describes the methodology of the MHRMPS; summarizes findings related to the adoption of human resources practices and their distribution across industries and ownership structures; discusses factors that influence the adoption of particular practices; considers the impact of particular human resources practices on workplace safety, employee productivity, and firm profitability; and offers concluding remarks regarding the adoption of human resources practices by Minnesota businesses.

The Minnesota Human Resources Management Practices Study

The study focused on 2,021 private, for-profit, Minnesota-based firms with at least 20 employees representing a broad spectrum of industries, ownership types, and sizes. The dataset used for the study included information supplied directly by firms through a survey instrument, data made available by Minnesota state agencies, and other publicly available information. In addition, we also assembled some information about the industries in which sample firms operate, and about the Minnesota counties in which they are located. Below we describe how the MHRMPS dataset for sample firms was constructed, emphasizing our collection of original survey data.

The Minnesota Human Resources Practices Survey. The survey sought to obtain information about human resources management and the organization of work in Minnesota companies. The questionnaire asked respondents about plans and programs that involve employees in decision making (for example, through self-managed work teams) or in the financial returns of the company for which they work (for example, through individual or group incentives such as profit sharing); supporting human resources practices (such as training, employment security, and job design); the degree of employee participation in decision making; the degree of information sharing with employees; the nature of the tasks carried out by different groups of employees; the company's reliance on computerized technology; and various aspects of firm organization. The survey also asked when various programs and practices were introduced or discontinued. The survey questionnaire was pilot tested on 11 firms in October and November 1993, and was subsequently circulated for comments among colleagues at various universities.

The sample of firms we surveyed was intended to include a diverse group of Minnesota-based firms that represent both the variety of workplace programs and practices found in U.S. corporations, and the wide range of technologies and other factors that are likely to influence the organization of work within a particular firm. The sample was constructed from among four primary groups of firms:

1. All 291 Minnesota firms that appeared on the Security and Exchange Commission's (SEC) 1993 Compact Disclosure database of publicly traded companies;
2. A total of 296 private Minnesota companies identified by various sources as having an employee stock ownership plan in 1993;
3. All 476 retail and wholesale food industry firms in Minnesota with 20 or more employees that were listed in a 1995 dataset compiled by Dun and Bradstreet;

4. A randomly selected group of 958 Minnesota firms with 20 or more employees that were listed in the 1995 Dun and Bradstreet dataset.

The survey was conducted in two waves: firms in the first two groups were mailed the survey in mid-1994, while firms in the last two groups received the survey in early 1996. We received responses from 874 firms, yielding a response rate of roughly 43% (see Table 1). Of the 874 surveys returned, 806 were used in our analyses; the remaining 68 were excluded either because they were duplicates (7), because the firm did not operate principally in Minnesota (11), or because there were fewer than 20 employees at the firm at the time of the survey (50).

Basic characteristics of responding firms are listed in Table 2. The average firm is fairly large, with a mean of 760 employees. This is a result of having a few large retail firms among the respondents. The average age of all firms at the time of the survey was approximately 36 years; by industry, average ages ranged from almost 50 years (service firms) to around 30 years (commerce firms). Almost one-fourth (23%) of the survey respondents were publicly traded, with the highest proportion in manufacturing and the lowest in commerce.

Wage and Employment Data. Data on wages/salaries and employment for most of the 2,021 firms in the sample were acquired from the Minnesota Department of Economic Security. The data are available only at the level of individual establishments, so we combined them to yield a total for the firm as a whole. No individual employee data were made available to us.

Occupational Safety Data. Data for all workplace injury claims filed against the 2,021 sample firms during the period 1983–1995 were obtained from the Minnesota Department of Labor and Industry. The department's database contains "first reports" of injuries filed in 1993 and 1994. First report forms classify injury claims by type of injury (such as strain or laceration) and body part (such as back or neck), and include information about employee age, gender, and occupation.

Pension Benefits and Deferred Compensation. Detailed information about employee stock-ownership plans, deferred profit sharing, and various pension plans was extracted from U.S. Internal Revenue Service Form 5500 Series data files. Companies are required to report on such plans under the Employee Retirement Income Security Act of 1974, and these data files are publicly available. The data files include, for each individual plan, the number of active participants, total asset value, and other financial information.

Table 1. Response Rates for Minnesota Human Resources Practices Survey by Type of Firm

	Publicly Traded Companies	Private Companies	Retail and Wholesale Food Firms	Randomly Selected Firms	Total
Surveyed	291	296	476	958	2,021
Nonrespondent	114	133	303	597	1,147
Respondent	177	163	173	361	874
Response rate	61%	55%	36%	38%	43%

Other Datasets. Financial and ownership data for public firms are available from a number of public sources. Publicly traded firms are required by law to report data for the benefit of their shareholders. Nevertheless, complete financial data were available for only about one-third of public firms in Minnesota.

Prevalence of Human Resources Practices

This section summarizes information derived from the survey questionnaire, with a particular focus on the prevalence of human resources practices, and the nature of core employees' tasks and skills at the companies surveyed.

In general, human resources practices can be grouped according to two sets of criteria: (1) the level at which they operate (individual employees, groups of employees, or the whole firm); and (2) the nature of the practice (participation in decision making, participation in financial performance, or supporting practices).

Programs fostering employee *participation in decision making* include, at the individual level, latitude for employees to make discretionary decisions; at the group level, various plans that involve employees in making decisions (such as quality circles, self-managed work teams, and joint labor-management committees); and, at the firm level, employee representation on the board of directors.

Plans that provide for employee *participation in the financial performance* of the firm tie the employees' compensation to some measure of performance. Individual financial performance plans include commissions and performance-based pay. Group bonuses and gain-sharing programs are examples of group-level financial performance plans, while stock purchases, cash profit sharing, deferred profit sharing, and employee stock ownership plans are firm-level financial performance plans.

Finally, *supporting practices* are those that complement the first two categories. For example, self-managing work teams may not live up to their promise if workers do not receive training in team-building skills. Individual-oriented supporting practices include skill-based pay, employment security, and training

Table 2. Characteristics of Survey Respondents by Sector

	Sector			
Characteristics	**Manufacturing**	**Service**	**Commerce**	**All Firms**
Number of firms	310	154	342	806
Average number of employees	648	567	949	760
Average birth year of firm	1959	1947	1965	1960
Percentage publicly owned	34%	28%	11%	23%
Percentage unionized	25%	9%	18%	19%

in statistical analysis; group-based practices include job rotation, job redesign, and training in team-building skills.

Figure 1 shows the proportion of firms with at least one program in each category (excluding suggestion and employee-discretion programs), with human resources practices classified into five categories based on the nature of the practice and the level at which the practice operates. The figure illustrates the growth in usage of these human resources practices during the study period (1980 to 1996). Clearly, programs to promote employee participation in decision making and the financial performance of the firm have increased dramatically since the early 1980s, with particularly strong growth in the second half of the 1980s. The most prevalent type of plan throughout the period was group-based participation in financial performance, with nearly two-thirds of respondents using this approach by 1996. The proportion of firms providing group-based participation in decision making increased more than fourfold, from 11% to 48%. Although the trends cut across all industries, they were most pronounced in the manufacturing sector and were least significant among firms engaged in commerce.

Table 3 shows the incidence of human resources practices among respondents at the time of the survey. Employee participation in decision making was most common at the level of the individual employee; suggestion systems were used by more than half of the firms surveyed, and individual discretion in decision making was relied upon by 42%. Manufacturing firms tended to use self-managing work teams, joint labor-management committees, and quality circles at higher than average levels. In general, group-based systems were used by one-sixth to one-fifth of all firms. Only a few firms had employee representatives on the board of directors.

Among plans that provided for employee participation in the financial performance of the firm, individual-oriented plans were used by approximately one-third of survey respondents, with rather consistent levels reported across all industries. Group-based bonuses, cash profit sharing, employee stock ownership plans, and deferred profit sharing were used by one-fifth to one-fourth of firms overall. Interestingly, firms in the manufacturing sector used these plans at a higher rate than firms in services or commerce. A smaller percentage sponsored stock purchases by employees, and only a tiny fraction of firms used gain sharing (although the proportion of gain-sharing options in manufacturing is almost double the average for all industries). As noted above, almost two-thirds of all firms had some kind of group-based financial performance plan in place; the smaller proportion of individual-oriented plans indicates that, to some extent, these plans are substitutes for each other.

With respect to supporting practices, promotion from within, training in team-building skills, and skill-based pay were used in a consistent manner across industries. Firms in the service sector were markedly less likely to use job rotation, and service and commerce firms lagged behind in the adoption of employment security and training in statistical analysis. Manufacturing firms were less likely to have adopted job redesign as a supporting practice.

The tasks of core employees (those who carry out the main activity of a firm) can be characterized in various ways. In this article, however, we consider only the complexity of tasks, and the extent to which the tasks of different workers are interdependent. On a scale of 1 to 5, we found that the average task complexity for workers is roughly 3. The interdependence of tasks is significant on average, and similar across all industries. However, manufacturing and service firms report that their employees execute more complex tasks than firms engaged in commerce. The skills required of workers in manufacturing and service firms are greater on average than those in commerce, and the skills seem to be slightly more firm-specific in the manufacturing and service sectors than in commerce.

Some of the relationships between task complexity and human resources practices can be seen by examining the data in Table 4. Greater complexity is associated with substantially greater reliance on employee involvement in team work. Of the firms that report that their core employees' tasks are not at all complex, only 11% have self-managed teams and 2% have quality circles. In contrast, among firms that report that

Figure 1. Rate of Participatory Human Resources Practices, 1980–1996

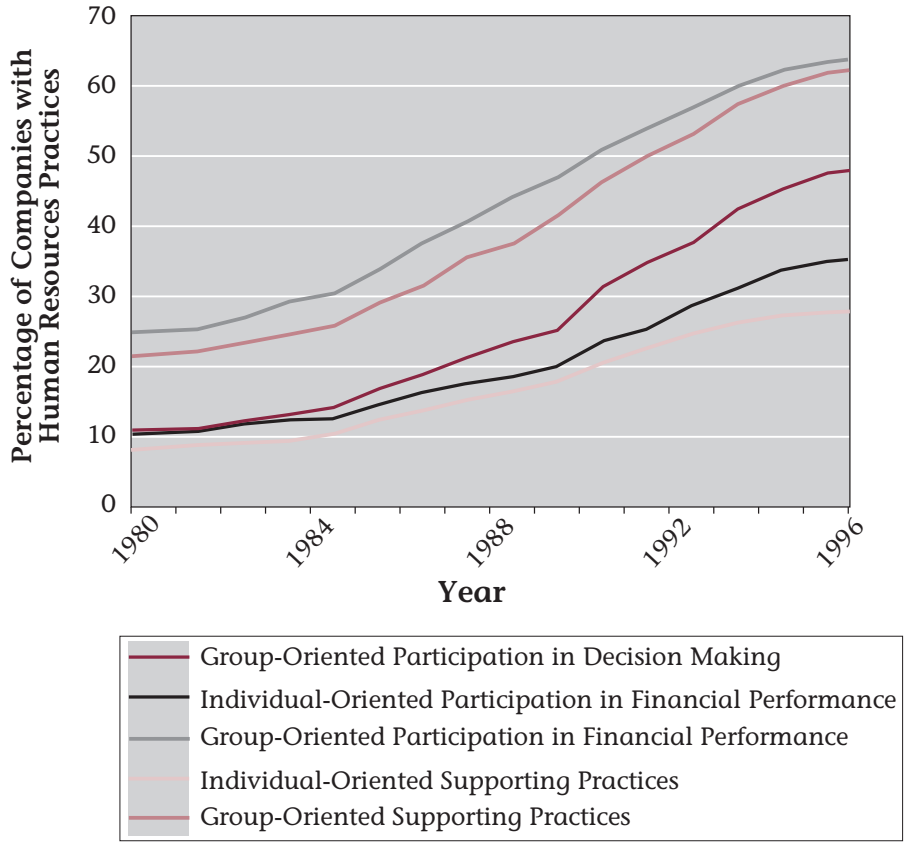


Table 3. Incidence of Human Resources Practices among Survey Respondents by Sector (%), and Attributes of Core Employees' Tasks and Skills (5-point scale)

	Sector			
	All Firms	**Manufacturing**	**Service**	**Commerce**
Participation in Decision Making				
Employee discretion	42	47	46	34
Suggestion systems	53	52	49	56
Self-managing work teams	22	27	19	19
Joint labor-management committees	17	21	10	15
Quality circles	14	16	13	12
Employee representation on board of directors	7	5	10	8
Participation in Financial Performance				
Individual incentives	34	32	36	35
Group bonus	23	23	21	23
Gain sharing	4	7	2	3
Cash profit sharing	22	28	17	19
Employee stock ownership plan	22	28	24	15
Deferred profit sharing	21	23	21	18
Stock purchase	12	18	13	6
Supporting Practices				
Promotion from within	80	78	75	85
Employment security	22	27	19	19
Skill-based pay	16	15	13	18
Training in statistical analysis	15	26	7	10
Training in team-building skills	42	44	36	42
Job rotation	30	34	14	33
Job redesign	12	9	13	13
Attributes of Core Employees' Tasks and Skills (1 = not at all and 5 = extreme)				
Complex	2.95	3.11	3.19	2.69
Interdependent	3.62	3.68	3.66	3.55
High skill required	2.90	3.06	3.17	2.63
Transferability of skills to other firms	3.63	3.48	3.87	3.64

tasks are extremely complex, 44% have self-managed teams and 24% have quality circles. In other categories the association is much less apparent, or even lacking altogether. This suggests a possible link between complexity and decision-making plans.

A link between complexity and skill is also evident in Table 4. Extremely complex tasks are associated with much greater skill requirement (4.41 on a scale from 1 to 5) than tasks that are not at all complex (1.57). The skills associated with more complex tasks are somewhat easier to transfer from one firm to another than are the skills that serve simpler tasks. In addition, the greater the complexity of tasks, the greater the likelihood that they will be involved in interdependent relationships with other tasks.

Influences on the Adoption of Human Resources Management Practices

As Figure 2 illustrates, a firm's choice of human resources management practices can be viewed as an intervening force between a set of given factors and a series of outcomes. A firm chooses particular human resources practices to optimize a set of desired outcomes—such as profitability, productivity, workplace safety, or wages—for the firm and its employees. The choices will vary among different firms because they generally face different contingencies. These might include such things as a firm's business strategy; the technology of production; market forces; and the firm's size, age, and ownership structure.

Human resources practices influence desired outcomes in two ways. The first is the impact of individual practices in and of themselves. For example, providing bonuses for the attainment of specific safety outcomes should, by itself, result in fewer injuries. The second type of influence is through the interaction of human resources practices with each other. To continue with the previous example, financial rewards alone may do little to improve safety if employees have no ability to choose or implement safer courses of action. Moreover, financial incentives and decision-making rights cannot be fully effective, even if well aligned with each other, if they are not complemented by appropriate training and other supporting practices.

The relationship among different practices can be complex, and the choice of a package or system of human resources practices may be quite complicated as a result. Suppose, for example, that a company seeks to induce its employees to invest in nontransferable skills—that is, skills that are useful mostly to the company, and that have relatively little value elsewhere. In addition to offering appropriate training programs, the firm may have to engage in further restructuring of its human resources practices. Employees will invest willingly in firm-specific skills if they believe that they are likely to stay with the company for a long time. Hence, the company would be wise to offer some assurance of continued employment (perhaps through a pledge of employment security), and to tie the future material well-being of employees to productivity by issuing stock to them (perhaps through an employee stock ownership plan). Furthermore, if employee skills are best deployed by granting individual or team decision-making autonomy, then appropriate plans for employee input also have to

Table 4. Incidence of Human Resources Practices in Relation to Complexity of Tasks of Core Employees (%) and Task and Skill Attributes (5-point scale)

	Complexity of Tasks				
	Not at All	**Small**	**Moderate**	**Large**	**Extreme**
Participation in Decision Making					
Employee discretion	13	25	35	59	76
Suggestion systems	36	55	54	55	56
Self-managing work teams	11	13	22	31	44
Joint labor-management committees	17	18	15	18	18
Quality circles	2	8	13	22	24
Employee representation on board of directors	2	7	7	10	12
Participation in Financial Performance					
Individual incentives	26	35	29	43	46
Group bonus	19	21	23	25	32
Gain sharing	6	2	5	6	2
Cash profit sharing	15	20	24	21	30
Employee stock ownership plan	19	14	22	31	34
Deferred profit sharing	19	18	21	20	28
Stock purchase	13	10	9	19	18
Supporting Practices					
Promotion from within	79	81	82	82	72
Employment security	23	23	22	22	26
Skill-based pay	4	12	17	3	20
Training in statistical analysis	8	12	18	15	24
Training in team-building skills	23	36	43	49	58
Job rotation	26	33	31	28	26
Job redesign	11	10	11	14	14
Attributes of Core Employees' Tasks and Skills (1 = not at all and 5 = extreme)					
Interdependent	3.32	3.49	3.59	3.84	3.94
High skill required	1.57	2.24	2.82	3.79	4.41
Transferability of skills to other firms	3.42	3.47	3.59	3.79	4.08

be devised. Such plans may, in turn, necessitate financial incentives, perhaps through programs that grant employees participation in firm performance.

The foregoing discussion can be summarized by putting forward two principles that underlie the rational combination of individual human resources practices into work/human resources systems. The first is the principle of *horizontal consistency*, which refers to a complementary relationship among the different categories of human resources practices. This principle implies that decision-making rights, for example, should be supported by appropriate incentives such as financial returns participation, and that both decision making and financial returns participation have to be backed by appropriate supporting practices such as training, sharing of relevant information, investment by employees in their skills, assurances by employers that employment is secure and that acquisition of firm-specific skills will not disadvantage employees, and so on.

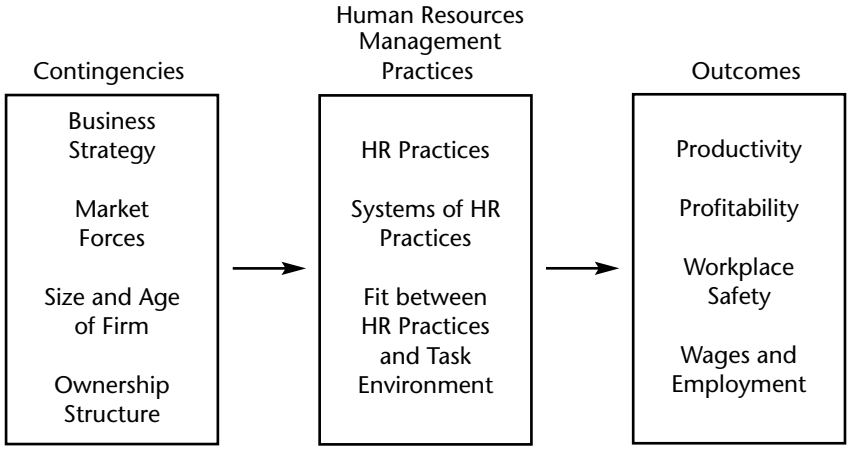
The second principle concerns *vertical consistency*, which refers to the relationship between practices at different levels of the organization. This principle implies that practices at different levels should not contravene each other. If, for example, group decision making and group participation in financial returns are considered desirable, then there should be little reliance in the organization on individual-oriented practices.

Because the influences in the left-hand box in Figure 2 are, for the most part, either things a firm can change only with difficulty or things over which it has little control, we now turn to a consideration of the fit between human resources practices and the task environment (found in the middle box). Two major dimensions of task environment form the basis of our analysis: the *uncertainty of outcome* of the employees' efforts, and the *interdependence* among employees' work.

Uncertainty of outcome stems primarily from the complexity of an employee's tasks. Complexity prevents both the employee and his or her supervisor from being able to predict the exact outcome of a given task. To illustrate, let us compare a situation in which the outcome is quite easy to predict—such as collecting tolls at a toll booth—with one where it is not—say, developing a new Internet software application. The toll collector's tasks are fairly simple, and the work can be governed by simple rules and monitoring. In contrast, the software developer's tasks are significantly more complex and less predictable. Almost by definition, this situation demands that the employee exercise judgment and individual discretion rather than follow a simple set of rules or procedures handed down by a supervisor. Furthermore, such complex tasks will likely require consultation and cooperation with other software developers, as well as joint decision making with coworkers in the context of a work team. Generally speaking, the greater the complexity of tasks and the higher the uncertainty of the outcome, the more useful it becomes to involve employees in decision making.

If uncertainty influences the *amount* of employee involvement, the level of interdependence between employees helps determine the *scope*—that is, whether these programs should operate at the individual or group level. In general, the more employees rely on each other to complete tasks, the more useful group-based programs are.

Figure 2. Relationship between Contingencies, Human Resources Management Practices, and Outcomes



As noted, to generate the right fit between human resources practices and the overall task environment, these practices must be designed with a view to the contingencies an organization faces. The most important contingencies are those imposed on the task environment by the firm's business strategy and the nature of market forces. Business strategy refers to how a firm creates its competitive advantage: Does it focus on being a low-cost producer? on quality? on product innovation? Market forces include conditions such as whether demand is growing or declining, steady or fluctuating, and the nature of competition in the industry. The firm's size, age, and ownership structure serve as important factors as well. Based on combinations of these factors, human resources practices can vary within an industry and size class. Similar-sized restaurants, for example, will have different practices depending on whether they serve the high or low ends of the market. Many of these contingencies manifest themselves at the level of the individual worker by influencing the tasks workers have to execute and the skills they need for effective execution of these tasks. The task environment may call for human resources practices that rely to different degrees on employee involvement in decision making and in financial returns, and that are oriented to the individual employee, groups of employees, the entire firm, or a combination thereof.

The principles we have just considered suggest a number of hypotheses that we sought to test using regression analysis and data from the MHRMPS. Regression analysis is a standard statistical technique used to quantify the relationship between a dependent variable and an independent variable (or variables). Some of the key findings of our analysis are presented in Table 5. The dependent variables we sought to analyze are listed across the table, and include the broad categories of practices presented in Figure 1—namely individual and group participation in decision making, individual and group

Table 5. Determinants of Human Resources Practices Logistic Model*

	Individual-Oriented Participation in Decision Making	Group-Oriented Participation in Decision Making	Individual-Oriented Participation in Financial Returns	Group-Oriented Participation in Financial Returns	Individual-Oriented Supporting Practices	Group-Oriented Supporting Practices
Task Environment						
Complexity	+	+	+	+	+	+
Interdependence	+	+	+	+	-	+
Transferability	+	+	+	-	-	+
High skill	+	+	+	+	+	+
Control Variables						
Number of employees	-	+	+	+	+	+
Firm age	+	+	-	+	-	-
Unionization	+	+	+	-	-	-

* Multiple regression analysis was used to examine the multivariate relationship between the independent variables (listed in the far left column) and the six dependent variables. The results are listed in simplified form as follows, with bold characters indicating a statistically significant relationship at a probability level of .01 or better ($p < .01$):

- A "+" indicates a positive relationship between the two variables, holding all other variables constant. This means that higher levels of a particular independent variable (greater task complexity, interdependence, skills transferability, skill level, more employees, greater age of firm, or unionization) were found to be associated with a greater likelihood of a certain dependent variable (individual or group-oriented participation in decision making, participation in financial returns, or provision of supporting practices).
- A "-" indicates a negative relationship between the two variables, holding all other variables constant. This means that higher levels of a particular independent variable were found to be associated with a lesser likelihood of a certain dependent variable.

participation in financial returns, and individual- and group-oriented supporting practices. The independent variables are listed in the left-hand column, and include descriptors of a firm's task environment (complexity, interdependence, and the level and transferability of the skills required to execute them), as well as several control variables (number of employees, age of firm, and unionization status).

We have indicated statistical relationships among the variables by using a "+" (positive relationship) or "–" (negative relationship), with statistically significant results indicated by bold characters. The results of our analysis highlight the importance of task uncertainty in shaping human resources practices, as indicated by the results for the task complexity variable. The data are consistent with the hypothesis that firms respond to the complexity of tasks by involving employees in decision making at both the individual and group level, and by offering them individual and group financial incentives. As we predicted, task interdependence is also directly associated with a greater reliance on employee involvement in decision making. However, we did not find a significantly increased reliance on collective incentives due to interdependence of tasks, contrary to our expectations.

Table 6. Associations between Human Resources Practices and Profitability, Occupational Safety, and Wages

	Profitability, Occupational Safety, and Wages	
	All measures above average	All measures below average
Firm and Employee Characteristics		
Average number of employees	2,000	300
Average age of company	40	20
Union status	may be union	non-union
Average age of employees	40	30
Average tenure of employees	8	2
Task Environment and Skills		
Task complexity	very high	very low
Task variability	high	low
Employee skills	very high	very low
Human Resources Practices		
Team work	prevalent	not used
Employee ownership	widely offered	not offered
Profit sharing	widely offered	not offered
Employment security	may be offered	not offered
Training	may be offered	not offered
Pay for skill	may be offered	not offered
Job rotation	may be offered	not offered

Outcomes for Firms and Workers

How do human resources practices contribute to the well-being of workers and shareholders? This important question is the focus of our present efforts under a grant from the Centers for Disease Control and Prevention and the National Institute for Occupational Safety and Health. This three-year project uses data that were generated by the MHRMPS, as well as information collected from human resources managers, supervisors, and line employees. The project is in its final year, and the investigators are currently completing data collection and beginning data analysis.

To reach an initial understanding of how different dimensions of firm performance are affected by various human resources practices, we used regression analysis and other statistical analyses to examine the factors that contribute to above- or below-average outcomes for profitability, occupational safety, and wages. These analyses generated several preliminary findings, which are summarized in Table 6. The table focuses on two broadly defined types of firms: healthy and unhealthy. Unhealthy firms produce below-average outcomes for employees and shareholders, while healthy firms produce above-average outcomes for both groups. The table omits firms that generate above-average outcomes for one group and below-average outcomes for the other group. Shareholder outcomes (profitability) refer to returns on stock. Employee outcomes include the average wage in the firm in which they work, and occupational safety as measured by the incidence of injuries. A firm's average for each of these three variables was considered relative to the industry in which the firm operates, so that a high-technology firm was compared with other high-technology firms, a fast-food restaurant with other fast-food restaurants, and so on.

Table 6 lists firm and employee characteristics, task environment and skills, and human resources practices that may be associated with shareholder and employee outcomes. Based on our initial analysis, it appears that healthy firms are more likely to have employee involvement in decision making and financial returns, particularly at the group and firm levels, compared to unhealthy firms. In other words, more participatory firms generate better returns to shareholders, provide safer workplaces, and offer higher wages to their employees. Healthier organizations are also characterized by more complex task environments compared to other firms in their own industries, and employ older workers with more skills and longer tenure than unhealthy firms (again, relative to other firms in their own industries). Healthy firms are typically more established and larger than unhealthy firms as well.

Finally, with respect to the fit between a firm's task environment and its human resources practices, it appears that greater task complexity is associated with firms that allow employees to participate in both decision making and firm financial returns. This appears to support the idea that a better fit between the contingencies listed in Figure 2 and the human resources practices of a firm tends to generate better outcomes for both shareholders and employees.

We should note that the number of observations underlying our results for productivity and economic performance

is somewhat small, due to the availability of information only for publicly traded companies. Recent additions to our data collection, which incorporate results from our newly completed survey, will enable us to update our analyses in the near future and achieve more reliable results.

Conclusion

The organization of work and the human resources practices that accompany it have been thoroughly transformed since the early 1980s. By and large, the "new" workplace relies more heavily on employee involvement in both decision making and in firm performance, requires greater worker skills, and entails more complex tasks than the "old" workplace. The proportion of firms without plans that provide for employee participation in decision making or financial returns has declined from more than 60% in the early 1980s to less than 30% by the mid-1990s. The proportion of firms that have both decision-making and financial returns plans has increased from about 5% to almost 30%.
A number of changes in the economy are responsible for these transformations, but the single most important factor has been the increased reliance on computer-based technologies.

Although the changeover to computer technology has been sweeping, it has not swept all firms equally, nor has the change been equally successful. Many occupations that required fewer skills and less complexity in the past—such as those of line workers in manufacturing, services, and commerce—have become more complex and interdependent. In addition, the task of organizing workers has become much more complex than in the times of relative stability in the economic and technological environments. Thus, the knowledge held and practices exercised by executives and managers in earlier decades are no longer as useful for structuring human resources practices as they once were. The flexibility that is being demanded of most employees is also required of those in positions of responsibility. Those managers who succeed in figuring out their firms' contingencies and who choose the appropriate human resources practices that foster employee productivity, firm profitability, and workplace safety benefit both employees and shareholders. Others are leading less successful companies or outright unhealthy firms, firms whose future is in doubt particularly in periods of shake-up and shake-out in the economy.

Determining the optimal combination of human resources practices is not an easy matter. The decision must be made in the context of preexisting conditions, such as the nature of competition in the firm's industry or the nature of the tasks the firm's employees perform. Consideration must be given not only to the potential effects of individual practices on desired outcomes, but also to possible interactions and conflicts between them. Finally, it may not be possible to obtain optimal results on all measures simultaneously; for example, improved profitability may be achieved through practices that increase the number and duration of workers' compensation claims.

The MHRMPS data represent a snapshot of human resources practices and their outcomes at a particular point in time. As we continue to add to our data collection, we hope to investigate the impact of particular human resources practices over the longer term.

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Yong-Seung Park is assistant professor of human resources management and industrial relations in the Department of Business Administration at Kyung Hee University, South Korea, with teaching

Other Projects Related to the Minnesota Human Resources Management Practices Study

For more information about the Minnesota Human Resources Management Practices Study (MHRMPS), or current work on this project that is being continued under the sponsorship of the Centers for Disease Control and Prevention and the National Institute for Occupational Safety and Health, contact Dr. Avner Ben-Ner, Industrial Relations Center, 3-300 Carlson School of Management, University of Minnesota, Minneapolis, MN 55455.

MHRMPS was the foundation for a number of doctoral thesis projects by graduate students at the University of Minnesota's Industrial Relations Center, including those listed below.

- Tzu-Shian Han, "Employee Participation in Decision Making and Financial Returns: Effects on Firm Performance" (1995).
- Yong-Seung Park, "Occupational Safety: Effects of Employee Participation Plans in Decision Making and Financial Returns" (1997).
- Nien-Chi Liu, "Determinants of Innovative Human Resources Practices and Systems" (1998).
- Fanmin Kong, "The Effects of Profit Sharing Plans and ESOPs on Firm Employment Fluctuations" (in progress).

and research interests in human resources management practices, workers' compensation, and occupational safety.

Stephen J. Smela earned a Ph.D. in geography from the University of Minnesota in 1998 for his work on the geographical diffusion of employee stock ownership plans. He now works at the Human Resources Research Institute in the Industrial Relations Center at the University of Minnesota's Carlson School of Management.

CURA provided seed money for this research project, and leveraged additional support from the Sloan Foundation and the University of Minnesota's Retail Food Industry Center. The initial success of the research has led to a series of related projects and doctoral dissertations, as well as financial support from other organizations.

Stephen J. Smela received the John R. Borchert Fellowship, an award created by CURA to honor our first director. The fellowship is awarded annually to an advanced graduate student in geography for work on an issue of importance to the citizens of Minnesota. Selection for the award is made jointly by CURA and the Department of Geography.

Funding Available from CURA

■ The **Communiversity Program** funds quarter-time graduate student assistantships for one semester to help community-based nonprofit organizations or government agencies with a specific project. The application deadline for fall semester 2001 assistantships is June 28, 2001. For more information, contact Communiversity program manager Ed Drury by phone at (612) 625-6045, or by e-mail at drury001@umn.edu.

■ The **Graduate Interns for State Agencies Program** fosters opportunities for graduate students to work outside the University of Minnesota on research, program development, program evaluation, or other short-term projects for a state agency in Minnesota. The agency supervises the graduate assistant, and shares costs equally with CURA. Grants for 2001–2002 are for up to one academic year, and the application deadline is May 3l, 2001. Interested state agencies can contact program manager Ed Drury by phone at (612) 625-6045, or by e-mail at drury001@umn.edu.

■ The **Community Assistantship Program (CAP)** matches community-based nonprofit organizations, citizen groups, and government agencies in Greater Minnesota with students who can provide research assistance. Eligible organizations define a research project, submit an application, and if accepted, are matched with a qualified student to carry out the research. The deadline for applications for fall 2001 (September through December) is July 1, 2001. For more information, to discuss potential projects, or for assistance with applications, contact CAP coordinator Jan Joannides by phone at (612) 251-7304, or by e-mail at joann001@umn.edu.

■ **Neighborhood Planning for Community Revitalization (NPCR)** provides student research assistance to Minneapolis and St. Paul community organizations involved in neighborhood-based revitalization. Projects may include any issue relevant to a neighborhood's needs and interests, including planning, program development, or program evaluation. Priority is given to projects that support and involve residents of color. Applications from organizations collaborating on a project are encouraged. Applications are due July 10, 2001, for fall 2001 assistance. For more information, visit NPCR's website at http://www.npcr.org, or contact NPCR project director Kris Nelson by phone at (612) 625-1020, or by e-mail at nelso193@umn.edu.

■ The **University Neighborhood Network (UNN)** links community organizations to course-based neighborhood projects that students carry out as part of course requirements. For more information about support for course-based projects, visit UNN's website at http://www.unn.umn.edu, or contact UNN coordinator Karin Bolwahn by phone at (612) 625-0744, or by e-mail at unn@umn.edu.

2000 Population Distribution Maps

The state of Minnesota and Twin Cities area population distribution maps on pages 18 and 19 are based on 2000 U.S. Census data. Dots were plotted within each city or township across the state. Within the Twin Cities metropolitan area and for many cities in greater Minnesota, block data were used to allow more accurate placement of dots. Some manual adjustments were made to remove dots from lakes and parks, or to add dots where rounding errors would have eliminated them. In more remote areas of the state, dots may summarize a population scattered across a wide geographic area.

We are pleased to announce that four-color poster-sized versions (17 by 22 inches) of these maps have been created through a joint effort of CURA, Minnesota Planning (State Demographic Center and Land Management Information Service), and the Metropolitan Council. The wall map versions are printed back-to-back, and include county and city names, major water features, and selected major roads and highways.

CURA will ship up to two folded copies of the wall map free of charge, and will ship flat (unfolded) copies of the map for the cost of shipping and handling. To order, call (612) 625-1551 or send e-mail to cura@umn.edu. Please specify flat or folded copies and the quantity you would like to order, and include your complete mailing address and phone number. Allow 3–6 weeks for delivery. To obtain a free flat (unfolded) copy of the map, or for multiple folded copies, visit CURA during regular business hours at the University of Minnesota (West Bank), 330 HHH Center, 301—19th Avenue South, Minneapolis, MN 55455.

Wall maps can also be ordered from Minnesota Planning's Demographer's Helpline at (651) 296-2557 or helpline@mnplan.state.mn.us, the Land Management Information Center at (651) 296-1211, or the Metropolitan Council at (651) 602-1140 or by e-mail at data.center@metc.state.mn.us.