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THE IMPACT OF HUMAN RESOURCE MANAGEMENT PRACTICES ON PERCEPTIONS OF ORGANIZATIONAL PERFORMANCE

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In 590 for-profit and nonprofit firms from the National Organizations Survey, we found positive associations between human resource management (HRM) practices, such as training and staffing selectivity, and perceptual firm performance measures. Results also suggest methodological issues for consideration in examinations of the relationship between HRM systems and firm performance.

In recent years, U.S. companies have been urged to adopt a variety of performance-enhancing or *progressive* human resource management (HRM) practices to improve their competitiveness in the global marketplace (U.S. Department of Labor, 1993). Such recommendations are unsurprising given that professionals and academics have long asserted that the way in which an organization manages people can influence its performance. Spurred by Peters and Waterman's (1982) description and assessment of "excellent" organizations, the past decade has produced many testimonials to the value of progressive HRM practices and systems of such practices. In particular, employee participation and empowerment and job redesign, including team-based production systems, extensive employee training, and performance-contingent incentive compensation, are widely believed to improve the performance of organizations (Pfeffer, 1994). Moreover, a developing body of research has reported positive associations between firm-level measures of HRM systems and organizational performance (Arthur, 1994; Cutcher-Gershenfeld, 1991; Delaney, forthcoming; Huselid, 1995; Huselid & Becker, 1994; Ichniowski, Shaw, & Prennushi, 1994; MacDuffie, 1995). Substantial uncertainty remains, however, as to how HRM practices affect organizational

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outcomes, whether some practices have stronger effects than others, and whether Complementarities or synergies among such practices can further enhance organizational performance (Baird & Meshoulam, 1988; Jackson & Schuler, 1995; Lado & Wilson, 1994; Milgrom & Roberts, 1995; Wright & McMahan, 1992).

This study extends empirical research on the firm-level impact of progressive HRM practices in three ways. First, we draw on a unique national probability sample of for-profit and nonprofit organizations to evaluate the association between a variety of progressive HRM practices and perceptual measures of organizational performance. Second, we conduct some rudimentary empirical tests of the effect of Complementarities *among* HRM practices on firm-level outcomes. Finally, we identify some important methodological issues that merit consideration as scholars and practitioners seek to better understand the relationship between HRM practices and firm performance.

BACKGROUND AND HYPOTHESES

Research focusing on the firm-level impact of HRM practices has become popular in recent years (for reviews, see Appelbaum and Batt [1994]; Berg, Appelbaum, Bailey, and Kalleberg [1994]; Huselid [1995]; Ichniowski et al. [1994]; and Wagner [1994]). The literature includes studies that focus on the performance effects of specific HRM practices, such as training (Bartel, 1994; Knoke & Kalleberg, 1994) and information sharing (Kleiner & Bouillon, 1988; Morishima, 1991), and research that examines the influence of systems of such practices on organizational outcomes (Huselid, 1995; Huselid & Becker, 1994; Ichniowski et al., 1994; MacDuffie, 1995). Although many studies have reported a positive association between various HRM practices and objective and perceptual measures of firm performance, some authors (Levine & Tyson, 1990; Wagner, 1994) have expressed concern that results may be biased because of methodological problems. In addition, the absence of a widely accepted measure of the "progressive" or "high performance" HRM practices construct makes it difficult to compare findings across studies (for examples of different approaches, see Appelbaum and Batt [1994]; Cutcher-Gershenfeld [1991]; Huselid [1995]; Ichniowski et al. [1994]; and MacDuffie [1995]). Nonetheless, the literature can be generally categorized as optimistic concerning the potential for progressive HRM practices to enhance the performance of employees and organizations. The optimism has stimulated additional theoretical and empirical research.

Scholars from different disciplines have suggested various conceptual frameworks as explanations for the links between progressive HRM practices and firm-level outcomes. Jackson and Schuler (1995) reviewed this literature and reported that approaches as divergent as general systems theory (von Bertalanffy, 1950), role behavior theory (Katz & Kahn, 1978), institutional theory (Meyer & Rowan, 1977), resource dependence theory (Pfeffer & Cohen, 1984), human capital theory (Becker, 1964), transaction cost economics (Williamson, 1979), agency theory (Jensen & Meckling, 1976), and the resource-based theory of the firm (Barney, 1991) have been used to study the potential

role of human resources (and thus HRM practices) in the determination of firm performance. Although a review of each of these frameworks is beyond the scope of this study, the prior conceptual work generally converges on the importance of HRM practices in the determination of both employee and firm-level outcomes. Conceptually, such practices can be classified in terms of their impact on employees' skills and ability, motivation, and the way that work is structured (Arthur, 1994; Bailey, 1993; Cutcher-Gershenfeld, 1991; Huselid, 1995; Ichniowski et al., 1994; Kochan & Osterman, 1994).

Organizations can adopt various HRM practices to enhance employee skills. First, efforts can focus on improving the quality of the individuals hired, or on raising the skills and abilities of current employees, or on both. Employees can be hired via sophisticated selection procedures designed to screen out all but the very best potential employees. Indeed, research indicates that selectivity in staffing is positively related to firm performance (Becker & Huselid, 1992; Schmidt, Hunter, McKenzie, & Muldrow, 1979). Second, organizations can improve the quality of current employees by providing comprehensive training and development activities *after* selection. Considerable evidence suggests that investments in training produce beneficial organizational outcomes (Bartel, 1994; Knoke & Kalleberg, 1994; Russell, Terborg, & Powers, 1985).

The effectiveness of skilled employees will be limited, however, if they are not motivated to perform their jobs. The form and structure of an organization's HRM system can affect employee motivation levels in several ways. First, organizations can implement merit pay or incentive compensation systems that provide rewards to employees for meeting specific goals. A substantial body of evidence has focused on the impact of incentive compensation and performance management systems on firm performance (Gerhart & Milkovich, 1992). In addition, protecting employees from arbitrary treatment, perhaps via a formal grievance procedure, may also motivate them to work harder because they can expect their efforts to be fairly rewarded (Ichniowski, 1986; Ichniowski et al., 1994).

Finally, the way in which a workplace is structured should affect organizational performance to the degree that skilled and motivated employees are directly involved in determining *what* work is performed and *how* this work gets accomplished. Employee participation systems (Wagner, 1994), internal labor markets that provide an opportunity for employees to advance within a firm (Osterman, 1987), and team-based production systems (Levine, 1995) are all forms of work organization that have been argued to positively affect firm performance. In addition, it has been argued that the provision of job security encourages employees to work harder. As Ichniowski and his associates noted, "Workers will only expend extra effort. . . if they expect. . . a lower probability of future layoffs" (1994: 10). Because it is also unlikely that rational employees will identify efficiency-enhancing changes in work structures if such changes would eliminate their jobs, the provision of job security should encourage information sharing (Levine, 1995: 55-58). Taking these arguments as a whole, then, we expect

Hypothesis 1: Progressive HRM practices (those affecting employee skills, employee motivation, and the structure of work) will be positively related to organizational performance.

The first hypothesis proposes that individual HRM practices have a positive “main effect” on firm-level outcomes. As we note in our later discussion of the different HRM practice measures, however, the exact mechanisms creating that positive association may vary somewhat across practices. Recent conceptual work has also argued that Complementarities, or synergies, both *among* a firm’s HRM practices and *between* a firm’s HRM practices and its competitive strategy, can have an additional and positive effect on firm performance (Baird & Meshoulam, 1988; Milgrom & Roberts, 1995). An example of the former would be an increase in the returns from the adoption of an employee training program when it was matched with a rigorous selection system that identified the employees most likely to benefit from training. An illustration of the latter would be the occurrence of additional firm-level returns when an organization’s HRM system was aligned with and supportive of its operational goals and competitive strategy. The notion of Complementarities is intuitively appealing, but it is not easily measured. Consequently, recent work evaluating this concept (Huselid, 1995; Ichniowski et al., 1994; MacDuffie, 1995) has employed divergent measures of HRM Complementarity, and the empirical results have been mixed. Although data limitations prevented us from constructing measures of complementarity between organizational strategy and HRM practices, the paucity of empirical evidence on this subject led us to develop several crude measures of complementarity among HRM practices for the firms in our sample. Accordingly,

Hypothesis 2: Complementarities or synergies among progressive HRM practices will be positively related to organizational performance.

METHODS

Data

Our data were obtained from the National Organizations Survey (NOS), a special module of the General Social Survey (GSS), which was conducted in 1991 with support from the National Science Foundation. The NOS “surveyed a representative sample of U. S. work establishments about their structure, context, and personnel practices” (Kalleberg, Knoke, Marsden, & Spaeth, 1994: 860). By design, the NOS is based on a national probability sample of establishments and organizations in the United States. The sample frame was identified from information provided by respondents to the 1991 GSS on the organizations for which they worked. As the GSS is a national equiprobability sample, this method produces a sampling frame in which the probability that an organization is included in the sample is proportionate to the number of people it employs (Spaeth & O’Rourke, 1994).

This procedure yielded a sampling frame of 1,427 organizations. Of these organizations, it was possible for the research team to contact 1,127 (79 percent of the sample frame). These organizations were asked by telephone to participate in a survey addressing organizational characteristics, policies, and practices relevant to HRM. Representatives of 727 organizations (64.5 percent of the organizations that could be contacted; 50.9 percent of the total sample frame) completed either a telephone interview or a questionnaire survey. The median NOS telephone interview lasted 42 minutes. Analyses indicated that, with respect to industry, occupation, and establishment size, the 727 organizations were "reasonably representative" of the population of organizations the NOS was intended to sample (Spaeth & O'Rourke, 1994: 882).

The NOS gathered objective and perceptual data on HRM practices and perceptual indicators of organizational performance. Information on the financial performance of organizations was not collected, and NOS researchers' assurances to respondents of confidentiality precluded the ex post collection of such data. For some measures, such as the effectiveness of organizational training, informants were asked to provide their perceptions on Likert-type scales. For other measures, such as organization size, respondents provided extensive factual data. Multiple respondents were contacted (in 17 percent of the cases) and respondents were interviewed more than once (in 26 percent of the cases) if it was necessary for them to review organizational records to obtain the factual information requested. As a result, the NOS provides a broad array of information on a representative sample of U.S. organizations.

In a general descriptive analysis of the measures collected in the NOS, Kalleberg and Moody (1994) noted that the survey focused on a narrow range of HRM practices and, as a result, is not appropriate for a comprehensive analysis of the association between progressive HRM practices and organizational performance. Nonetheless, the means and zero-order correlations presented by Kalleberg and Moody (1994) suggested some promising associations between a variety of HRM practices and single-item perceptual measures of firm performance. Given the problems associated with single-item measures of performance and evidence of collinearity across HRM practices in the NOS data (Kalleberg & Moody, 1994), a multivariate analysis of the association between HRM practices and perceptions of performance is needed. After describing the measures and estimation model, we report the results of such an analysis.

Measures

Dependent variables. Because financial measures of firm performance were not collected by the NOS research team, we created two perceptual measures of organizational performance from the items contained in the NOS. The measures we employ are relative, or benchmarked, in the sense that they are derived from questions asking informants to assess organizational performance relative to the performance of industry competitors. Although perceptual data introduce limitations through increased measure-

ment error and the potential for monomethod bias, it is not unprecedented to use such measures. Research has found measures of perceived organizational performance to correlate positively (with moderate to strong associations) with objective measures of firm performance (Dollinger & Golden, 1992; Powell, 1992). In addition, the use of perceptual measures permits an analysis of profit-making and nonprofit organizations (objective firm performance data are generally unavailable for the latter). Table 1 presents the 11 NOS questions that we used to construct the dependent variables. The first variable was constructed from seven items assessing respondents' perceptions of their firm's performance over the past three years relative to that of similar organizations (perceived *organizational performance*, $\alpha = .85$). The second dependent variable is available only for profit-making organizations and was constructed from four questions concerning respondents' perceptions of their firm's performance over the past three years relative to product market competitors (perceived *market performance*, $\alpha = .86$). Each of the dependent variables is based on questionnaire items answered on Likert scales ranging from 1, "worse" to 4, "much better."

Together these variables provide a broad assessment of perceptions of organizational performance. The perceived organizational performance measure gets at important issues such as product quality, customer satisfaction, and new product development. The perceived market performance variable focuses more narrowly on economic outcomes such as profitability and market share. Given the nascent stage of the literature, examination of alternative dependent variables and samples should provide important confirmatory information on the association between HRM practices and firm performance.

Independent variables. Table 1 also includes information on the HRM practice measures included in our empirical models. Although we were constrained in the development of these items by the questions contained in the NOS, we sought to develop as wide a variety of progressive HRM practices as was possible.

Organizations can influence the skills of employees through selectivity in hiring and employee training. We measured selectivity in staffing using a variable that captures the number of applicants considered for each position filled by an organization for three different types of employees—those in the occupation most directly involved with the organization's primary product (core employees); those in the occupation of the respondent to the GSS; and managers. We averaged the standard scores for the logged value of these responses to form the *staffing selectivity* index ($\alpha = .66$). We measured the extensiveness of employee training using a 3-item index that included a variable indicating whether the organization had provided any formal job training in the past two years, the number of employees that had received formal training in that time period, and respondents' views on the overall effectiveness of their training programs, using a scale that ranged from 1, "not at all effective," to 3, "highly effective." These measures were standardized and averaged to create our *training* index ($\alpha = .88$).

One of the primary means organizations use to enhance employee motivation is providing performance-contingent incentive compensation

(Gerhart & Milkovich, 1992; Kandel & Lazear, 1992) to align employee and shareholder interests. In our analyses we used a three-item index of *incentive compensation* ($\alpha = .83$) that reports respondents' perceptions of how important job performance is in determining the earnings of the three primary occupational groups identified above. In addition, employees may be less inclined to shirk when organizational HR management practices promote equitable treatment (Levine, 1995: 58–59). To represent this concept, we used a dummy variable indicating the existence of a formal procedure for resolving disputes between employees and supervisors or co-workers (*grievance procedure*, 0 = no, 1 = yes).

Job or work structures have also been argued to enhance firm performance by allowing skilled and motivated employees to become more involved in determining what work is to be done and how it is to be performed. Although employee involvement programs are regularly advocated as a means to increased firm performance (Levine, 1995), the NOS contained little information on employee participation. As a result, we represent employee involvement in decisions with an 8-item scale ($\alpha = .91$) that indicates the level at which important organizational decisions rest (such as hiring or performance evaluation). This variable is scaled so that the lowest value occurs if the CEO makes these decisions and higher values occur if the decisions are made by "someone lower in the organization"; the variable is called *decentralized decision making*.

Internal labor markets for employee promotions and the provision of employment security are also forms of work structure that have been held to positively affect firm performance (Ichniowski et al., 1994; Osterman, 1987; Pfeffer, 1994). Although we could not measure these constructs directly, we used NOS data to create two alternative indicators of organizational advancement opportunities. First, we developed a 5-item *internal labor market* index ($\alpha = .82$) that captures the existence of opportunities for promotion from within; for each item, response options were "yes" and "no" (coded 2 and 1, respectively). Although this measure only partially reflects the concept of employment security, it offers an indication of organizations' willingness to extend organizational security through internal promotions. Second, we included in the model the number of occupation levels in the organization between the highest and lowest jobs (*vertical hierarchy*). Because many organizations have made efforts to flatten their positional hierarchies, this variable captures the extent to which organizations are able to provide promotion opportunities. Although potential promotion ladders do not guarantee promotions, because they indicate to employees the value of retaining organization-specific skills that transfer between positions they should be positively related to performance measures.

Taken as a whole, these seven items provide a reasonably broad reflection of the progressive HRM practices that have been identified in the literature. As noted above, however, HRM systems, rather than individual practices, are the appropriate level of analysis when an estimate of the firm-level effect of HRM practices is desired. Essentially, collinearity among HRM practices

TABLE 1*
Questionnaire Items for the Independent and Dependent Variables

Variable and Items	Mean	Range	α
Perceived organizational performance			
How would you compare the organization's performance over the past 3 years to that of other organizations that do the same kind of work? What about...		1-4	.85
Quality of products, services, or programs?	3.26		
Development of new products, services, or programs?	3.02		
Ability to attract essential employees?	2.88		
Ability to retain essential employees?	3.01		
Satisfaction of customers or clients?	3.17		
Relations between management and other employees?	3.00		
Relations among employees in general?	2.96		
Perceived market performance ^a			
Compared to other organizations that do the same kind of work, how would you compare the organization's performance over the last 3 years in terms of...		1 - 4	.86
Marketing?	2.88		
Growth in sales?	2.92		
Profitability?	2.90		
Market share?	2.82		
Employee skills			
Staffing selectivity ^b			
In the past 2 years, about how many applications have you considered for each CORE opening?	0.10		.66
In the past 2 years, about how many applications have you considered for each GSS opening?	0.08		
In the past 2 years, about how many applications have you considered for each MANAGERIAL opening?	0.09		
Training effectiveness ^b			
Apart from on-the-job training, in the past 2 years did the organization provide any employees with formal job training, either on or off the premises?	0.05		.88
Within the last 2 years, how many employees participated in formal job training?	0.08		
Overall, how effective would you say your employee training is?	0.04		



TABLE 1 (continued)

Variable and Items	Mean	Range	α
Employee motivation			
Incentive compensation	2.73	1-3	.83
How important is job performance in determining the earnings of managers and administrators?	2.56		
How important is job performance in determining the earnings of CORES?	2.55		
How important is job performance in determining the earnings of most GSSs?			
Grievance procedure			
Are there formal procedures for resolving disputes between employees and their supervisors or coworkers?	0.70	0-1	
Structure of jobs and work			
Decentralized decision making			
Who actually makes the final decision about the number of people employed here?	2.78	1-5	.91
Who actually makes the final decision about which new employees to hire?	3.77		
Who actually makes the final decision about using subcontractors or temporary employees?	3.50		
Who actually makes the final decision about evaluating worker performance?	4.11		
Who actually makes the final decision about worker promotions?	3.63		
Who actually makes the final decision about wage rates or salary levels?	2.75		
Who actually makes the final decision about discharging or laying off workers?	3.34		
Who actually makes the final decision about work scheduling and overtime?	4.10		
Internal labor market			
Do you sometimes fill CORE vacancies with people already employed at the organization?	1.59	1-2	.82
Is it possible for a CORE to be promoted to a level above CORE?	1.74		
Do you sometimes fill GSS vacancies with people already employed at the organization?	1.56		
Is it possible for a GSS to be promoted to a level above GSS?	1.69		
Do you sometimes fill managerial or administrative vacancies with people already employed at the organization?	1.75		
Vertical hierarchy ^a			
About how many levels are there between the lowest and highest positions at the organization, including both the lowest and highest levels?	1.85		

^aN = 590, except for perceived market performance, where N = 373. Latter was available only for publicly held firms.

^bStandard score of logged value for all.

^cValue is a logarithm.

may cause studies focusing on one practice at a time to overestimate its contribution to firm performance. At the same time, studies including multiple HRM practice measures may understate the effects of those practices in two ways. First, collinearity among the HRM variables inflates their estimated standard errors and reduces the likelihood that individual HRM coefficients will achieve statistical significance. Second, such studies may understate the combined firm-level effect of the multiple measures to the extent that complementarities exist among the HRM practices (Huselid, 1995; MacDuffie, 1995). These possibilities have led researchers to employ various data reduction procedures, such as cluster analysis (Ichniowski et al., 1994) and factor analysis (Huselid, 1995) to create HRM practice bundles or clusters. Unfortunately, the mixture of dichotomous and ordinal measures contained in the NOS precluded those approaches because of the extreme degree of nonnormality exhibited in the data (Nunnally & Bernstein, 1994). Thus, we used multiple regression analysis to examine the individual and joint effects of progressive HRM practices.

Measures of Complementarity. We explored two broad categories of empirical specifications to evaluate the potential for complementarity among HRM practices. First, assuming that returns from investments in progressive HRM practices are enhanced to the degree a firm invests in such practices at a uniform (and high) level throughout, we created a variable that indicates the number of practices for which each firm was above the sample median (range: 0 to 7). A significant positive coefficient on this variable, with all other HRM practices under consideration controlled, should reflect the magnitude of any synergistic effect of investing widely in such practices. Second, following Venkatraman (1989), we conceptualized the potential for complementarity in terms of a moderated or interactive relationship. As noted above, moderation could be said to exist if the returns for training, for example, varied across the level of staffing selectivity. As noted below, based on conceptual groupings, we examined various interactions among the HRM practices. We stress that these analyses are highly exploratory, however, and the results should be interpreted cautiously.

Control variables. To capture other organizational and environmental forces that are related to both the adoption of HRM practices and organizational performance, our regressions include several control variables. Because of differences in priorities, culture, and environment related to organizational mission and goals, we included a dummy variable that indicates whether an organization is nonprofit or for-profit (*nonprofit organization*). To capture size and scale effects, we included a dummy variable to indicate whether an organization is a subsidiary of another organization (*subsidiary*) and the natural logarithm of the number of employees in the organization (*log of total employment*). We also included the age of the firm in years (*firm age*, calculated as 1991 minus the founding year) to capture any founding values (Stinchcombe, 1965) and maturation effects.

The degree of product or service market competition faced by an organization likely influences both its performance and its HRM practices. We

therefore controlled for competition with a variable called *market competition*; respondents were asked the amount of competition faced by the organization in its primary product or service market (1 = none, 4 = a great deal). We also included two dummy variables to indicate whether the firm produced a product (*product*) or delivered a service (*service*). The omitted category for these comparisons was composed of firms that offered both products and services.

There is much evidence that unions affect firm performance (Freeman & Medoff, 1984). Thus, we included an index called *union pressure* ($\alpha = .81$) measuring respondents' perception of the influence of unions on their organization. Higher values of this index reflect a greater amount of union influence on management. Although this measure is less desirable than conventional measures of union density or coverage, it was the only measure of union influence available in the NOS. We also included a variable indicating the percentage of employees in managerial occupations (*percent managers*) to capture omitted organizational factors. For example, progressive HRM practices have been viewed as a substitute for monitoring (Kandel & Lazear, 1992) and, with size held constant, a firm's ability to monitor depends somewhat on the number of managers it employs. Relative managerial employment could also capture the extent of organization fat or bureaucracy, which may constrain the effects of progressive HRM practices. Finally, we include 33 dummy variables representing two-digit Standard Industrial Classification (SIC) industries to capture any other industry characteristics associated with performance perceptions.

RESULTS

Table 2 provides descriptive statistics and correlations for all variables. The correlation between the two dependent variables is .51. Consistent with prior work, the relationship between the HRM practices and perceptual performance measures is generally positive (11 of 14 correlations). The magnitude of the correlations is generally small to moderate, however, potentially raising questions about the substantive importance of HRM practices. Associations among HRM practices also tend to be positive (19 of 21 correlations).

We focus on the coefficients on the HRM practice variables in our discussion of the results. Inspection of Tables 3 and 4 shows, however, that many of the control variables are significantly associated with the perceptual performance variables. Table 3 (models 1–5) reports results of the regression equations for perceived organizational performance and Table 4 (models 6–10) presents the results for perceived market performance. Each of the HRM practice coefficients reported in the first column of Table 3 is from a separate regression that contained the control variables and that one HRM practice. The model 1 results indicate that five of the seven HRM practice coefficients are positive and significant. Only the internal labor market and staffing selectivity coefficients are insignificant at conventional levels. Models 2 and 3 report results obtained when the HRM practices are included simultaneously in the same equation. Two equations are reported because the internal labor

TABLE 2
Means, Standard Deviations, and Correlations for All Variables^a

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Perceived organizational performance	3.05	0.65																		
2. Perceived market performance	2.85	0.76	.51																	
3. Staffing selectivity	0.09	0.79	.01	.19																
4. Training	0.05	0.88	.06	.19	.38															
5. Incentive compensation	2.62	0.59	.17	.13	.05	.01														
6. Grievance procedure	0.70	0.46	-.06	.12	.30	.47	-.06													
7. Decentralized decision making	3.49	0.97	.07	-.01	.24	.26	.16	.08												
8. Internal labor market	1.67	0.35	-.06	.20	.38	.56	.02	.52	.22											
9. Vertical hierarchy	1.85	0.66	.02	.17	.27	.46	-.01	.41	.32	.52										
10. Nonprofit organization	1.35	0.46	-.21	.21	.26	-.23	.40	-.08	.20	.17										
11. Subsidiary	1.44	0.50	.11	-.12	-.12	.30	.07	-.43	.26	-.42	-.25	-.17								
12. Log of total employment	4.15	2.36	-.06	.11	.42	.64	-.04	.56	.49	.67	.62	.29	-.29							
13. Log of firm age	3.16	1.18	-.17	-.10	.21	.26	-.01	.31	.20	.34	.28	.36	-.10	.43						
14. Percent managers	0.24	0.26	.00	-.22	-.35	-.50	.05	-.49	-.20	-.55	-.46	-.27	.25	-.67	-.30					
15. Union pressure	1.40	0.59	-.12	-.02	.15	.26	-.33	.35	.00	.28	.25	.21	-.28	.36	.17	-.29				
16. Product	0.15	0.36	.04	.00	-.03	.11	-.01	.06	.19	.11	.12	-.30	-.07	.24	.04	-.11	.11			
17. Service	0.74	0.44	-.05	.05	-.01	-.06	-.03	-.07	-.20	-.16	-.10	.37	.09	-.19	-.01	.06	-.11	-.72		
18. Both product and service	0.10	0.30	.02	-.06	.05	.04	.06	.03	.07	.10	.00	-.17	-.05	.00	-.03	.02	-.14	-.58		
19. Market competition	0.44	0.50	.12	-.03	-.01	.08	.18	-.08	.17	.06	.04	-.38	-.02	.07	-.05	-.04	-.07	.20	-.21	.06

^aN = 590, except for perceived market performance, where N = 373. All correlations (except those involving perceived market performance) greater than .05 are significant at the .05 level; those greater than .07 are significant at the .01 level; and those greater than .10 are significant at the .001 level (one-tailed tests). For the correlations involving perceived market performance, all correlations greater than .09 are significant at the .05 level; those greater than .12 are significant at the .01 level; and those greater than .16 are significant at the .001 level (one-tailed tests).

TABLE 3
Results of Regression Analyses for Perceived
Organizational Performance ^a

Variable	Model 1 ^b	Model 2	Model 3	Model 4	Model 5
Constant	Yes	3.517** (0.330)	3.167** (0.288)	3.344** (0.732)	3.134** (0.472)
Staffing selectivity	0.044 (0.038)	0.015 (0.038)	0.011 (0.038)	-0.001 (0.041)	-0.008 (0.040)
Training	0.130** (0.040)	0.125** [0.041]	0.111** (0.040)	0.123** (0.041)	0.111** (0.040)
Incentive compensation	0.137** (0.048)	0.120** (0.048)	0.117** (0.048)	0.110† (0.086)	0.098 (0.085)
Grievance procedure	0.112† (0.081)	0.078 (0.082)	-0.059 (0.081)	-0.048 (0.296)	-0.012 (0.295)
Decentralized decision making	0.049† (0.038)	0.032 (0.039)	0.030 (0.039)	-0.087 (0.192)	0.057 (0.099)
Internal labor market	-0.058 (0.111)	-0.156 (0.112)	No	-0.037 (0.369)	No
Vertical hierarchy	0.117* (0.051)	No	0.103* (0.051)	No	0.164 (0.188)
Training X staffing	No	No	No	0.053 (0.046)	0.072† (0.045)
Grievance x incentive compensation	No	No	No	0.013 (0.104)	0.029 (0.103)
Internal labor market x decentralized decision making	No	No	No	-0.031 (0.108)	No
Vertical hierarchy X decentralized decision making	No	No	No	No	-0.014 (0.051)
Nonprofit organization	Yes	-0.209** (0.092)	-0.203* (0.092)	-0.205* (0.092)	-0.201* (0.092)
Subsidiary	Yes	0.100† (0.068)	0.128* (0.067)	0.089† (0.069)	-0.107† (0.068)
Log of total employment	Yes	-0.022 (0.024)	-0.044* (0.024)	-0.028 (0.025)	-0.047* (0.024)
Log of firm age	Yes	-0.073** (0.026)	-0.076** (0.026)	-0.076** (0.026)	-0.078** (0.026)
Percent managers	Yes	-0.203† (0.130)	-0.159 (0.128)	-0.244† (0.137)	-0.207† (0.135)
Union pressure	Yes	-0.051 (0.054)	-0.055 (0.053)	-0.046 (0.055)	-0.051 (0.055)
Product	Yes	0.038 (0.118)	0.062 (0.116)	0.052 (0.118)	0.060 (0.117)
Service	Yes	-0.065 (0.098)	-0.074 (0.098)	-0.065 (0.098)	-0.079 (0.098)
Competitive pressure	Yes	-0.004 (0.059)	-0.001 (0.059)	-0.004 (0.059)	0.001 (0.059)

TABLE 3 (continued)

Variable	Model 1 ^b	Model 2	Model 3	Model 4	Model 5
SIC industry dummies	Yes	Yes	Yes	Yes	Yes
R^2		0.182	0.186	0.185	0.190
F		2.515**	2.570**	2.387**	2.468**
ΔR^2		0.032	0.036	0.002	0.003
F for ΔR^2		3.582 ** ^c	3.953* ^c	0.445 ^d	0.868 ^d
N	590	590	590	590	590

^a Unstandardized regression coefficients are reported, with standard errors in parentheses.

^b Model 1 reports coefficients estimated from seven separate regressions, each of which contained the control variables and one HRM practice variable. "Yes" means that the indicated variable was included in each model 1 regression equation. "No" means that the variable was not included in the referenced equation.

^c These statistics (joint F-tests) reflect the incremental variance accounted for when the staffing selectivity through vertical hierarchy variables are added to the complete specification for each model.

^d These statistics (joint F-tests) reflect the incremental variance accounted for when the interaction terms are added to the complete specification for each model.

† $p < .10$, one-tailed test

* $p < .05$, one-tailed test

** $p < .01$, one-tailed test

market and vertical hierarchy variables are used as alternate measures of the same construct. The overall model is always statistically significant, and joint-F tests indicate that the HRM practices jointly explain a significant amount of the variance in perceived organizational performance. These results show that five of the six HRM practice coefficients in each equation are positive and three (those on training, incentive compensation, and vertical hierarchy) are statistically significant. The HRM practice coefficients are smaller in models 2 and 3 than in model 1, suggesting that the results obtained in analyses focusing on individual HRM practices overstate the effects. Indeed, the decentralized decision making and grievance procedure coefficients become insignificant when entered with the other HRM practice variables.

Table 4 presents results for the perceived market performance dependent variable in a format identical to that used in Table 3. The Table 4 findings are similar to those described above. For example, the coefficients on five of the seven HRM practices are positive and significant when the variables are entered individually into the regression (model 6). At least two of the HRM practice coefficients retain their statistical significance in models 7 and 8. In addition, the coefficients on the HRM practice variables are smaller when the variables are entered together than when they are entered individually. In general, the results in Tables 3 and 4 generally suggest that HRM practices are positively associated with perceptions of performance, consistent with Hypothesis 1.

Hypothesis 2 concerns the potential for Complementarities among HRM practices. The first variable we constructed to evaluate this hypothesis indicated the number of HRM practices for which a firm was above the sample

TABLE 4
Results of Regression Analyses for Perceived Market Performance ^a

Variable	Model 6 ^b	Model 7	Model 8	Model 9	Model 10
Constant	Yes	3.429** (0.512)	3.517** (0.440)	2.628** (1.098)	3.960** (0.723)
Staffing selectivity	0.169** (0.055)	0.145** (0.057)	0.147** (0.057)	0.131* (0.059)	0.139* (0.058)
Training	0.114* (0.057)	0.073 (0.060)	0.076* (0.058)	0.071 (0.060)	0.082† (0.059)
Incentive compensation	0.149* (0.081)	0.125† (0.061)	0.134* (0.081)	0.123 (0.108)	0.146† (0.107)
Grievance procedure	0.083 (0.104)	0.034 (0.105)	-0.034 (0.104)	0.043 (0.459)	-0.111 (0.458)
Decentralized decision making	-0.047 (0.061)	-0.071 (0.061)	-0.071 (0.061)	0.162 (0.294)	-0.192 (0.167)
Internal labor market	0.292* (0.161)	0.134 (0.167)	No	0.588† (0.566)	No
Vertical hierarchy	0.126† (0.082)	No	0.099 (0.082)	No	-0.134 (0.320)
Training × staffing	No	No	No	0.080 (0.066)	0.069 (0.066)
Grievance × incentive compensation	No	No	No	0.001 (0.162)	-0.029 (0.161)
Internal labor market × decentralized decision making	No	No	No	-0.132 (0.164)	No
Vertical hierarchy × decentralized decision making	No	No	No	No	0.066 (0.083)
Subsidiary	Yes	-0.047 (0.106)	-0.063 (0.101)	-0.066 (0.108)	-0.087 (0.104)
Log of total employment	Yes	0.004 (0.038)	-0.004 (0.039)	0.008 (0.039)	-0.007 (0.040)
Log of firm age	Yes	-0.132** (0.037)	-0.129** (0.037)	-0.136** (0.037)	-0.130** (0.037)
Percent managers	Yes	-0.522** (0.179)	-0.529** (0.177)	-0.528** (0.190)	-0.604** (0.186)
Union pressure	Yes	-0.050 (0.094)	-0.049 (0.094)	-0.047 (0.100)	-0.051 (0.099)
Product	Yes	0.209† (0.147)	0.193† (0.145)	0.191† (0.148)	0.191† (0.146)
Service	Yes	0.132 (0.125)	0.111 (0.125)	0.121 (0.125)	0.091 (0.126)
Competitive pressure	Yes	-0.214** (0.082)	-0.217** (0.082)	-0.209** (0.082)	-0.217** (0.082)
SIC industry dummies	Yes	Yes	Yes	Yes	Yes
R ²		0.263	0.265	0.267	0.269
F		2.466**	2.489**	2.349**	2.373**
ΔR ²		0.037	0.039	0.004	0.005

TABLE 4 (continued)

Variable	Model 6 ^b	Model 7	Model 8	Model 9	Model 10
F for ΔR^2		2.703* ^c	2.489* ^c	0.640 ^d	0.665 ^d
N	373	373	373	373	373

^aUnstandardized regression coefficients are reported, with standard errors in parentheses.

^bModel 6 reports results estimated from seven separate regressions, each of which contained the control variables and one HRM practice variable. "Yes" means that the indicated variable was included in each model 1 regression equation. "No" means that the variable was not included in the referenced equation.

^cThese statistics (joint F-tests) reflect the incremental variance accounted for when the staffing selectivity through vertical hierarchy variables are added to the complete specification for each model.

^dThese statistics (joint F-tests) reflect the incremental variance accounted for when the interaction terms are added to the complete specification for each model.

† $p < .10$, one-tailed test

* $p < .05$, one-tailed test

** $p < .01$, one-tailed test

median. In an analysis (results not shown) that controlled for all of the other HRM practices, we found this variable to be consistently positive but insignificant for each dependent variable. In addition, various transformations of this scale (including individual dummy variables indicating whether each practice was above the sample median, and a spline function to capture any nonlinearities in the relationship) did not improve the explanatory power of this model for either dependent variable.

The second complementarity test we conducted focused on interactions among the HRM practice variables. The extreme degree of multicollinearity among the interactions precluded our simultaneously evaluating them all. Moreover, given the exploratory nature of this research, we experimented extensively with subsets of interactions, both within each HRM practice category (employee skills, motivation, and the structure of jobs and work) and between the categories. Coefficients on interactions were insignificant in nearly all of the models we evaluated. For example, models 4 and 5 in Table 3 and 9 and 10 in Table 4 report two-way interactions within conceptual groupings of variables. The interaction between training and selective staffing has a positive and marginally significant coefficient in model 5, but all other interactions are insignificant. Joint-F tests indicate that addition of the group of interactions did not significantly raise the amount of variance explained in the overall model in any case. We found little evidence of complementarity among HRM practices in the NOS data.

DISCUSSION AND CONCLUSIONS

It has been long and widely asserted that people are the preeminent organizational resource and the key to achieving outstanding performance (Peters & Waterman, 1982; Pfeffer, 1994). Until recently, this assertion was largely a statement of faith. Our results add to the growing empirical evidence

suggesting that such assertions are credible (cf. Arthur, 1994; Huselid, 1995; Huselid & Becker, 1994; Ichniowski et al., 1994; MacDuffie, 1995). Overall, and in support of Hypothesis 1, our results suggest that progressive HRM practices, including selectivity in staffing, training, and incentive compensation, are positively related to perceptual measures of organizational performance. Our confidence in the results is bolstered by the nature of the NOS, which is a national equiprobability sample of a wide variety of organizations. Further, our results were robust to a variety of model specifications. For example, subgroup analyses (available upon request) indicated that the effect of progressive HRM practices is similar in for-profit and nonprofit organizations. We take this as evidence of the generality of the progressive HRM practice-firm performance linkage.

Our results do not support the assertion that complementarities among HRM practices enhance firm performance, contrary to Hypothesis 2. Given that we could not measure complementarity between firms' strategies and HRM practices and that our measures of complementarity among HRM practices were crude, however, we cannot say whether our results were a product of poor measures of this construct or the absence of its impact in the sample. In either case, the development of reliable and valid measures of progressive HRM practices and complementarities among these practices remains a critical issue for researchers to address.

Several limitations suggest that our assessments be viewed cautiously. First, the NOS data required us to rely on perceptual measures of organizational performance. Although financial measures of firm performance are more desirable, perceptual measures are regularly used in research, and our results are generally consistent with the findings of studies that used objective performance measures (cf. Huselid, 1995). More important, the use of perceptual measures of firm performance allowed us to assess the firm-level impact of progressive HRM practices in firms for which financial measures of performance are generally unavailable (e.g., nonprofit firms).

Second, the measures of progressive HRM practices that can be constructed from the NOS are incomplete. For example, the degree of employee participation, the form and structure of a firm's incentive compensation system (e.g., the proportion of pay at risk), and more detailed information concerning each firm's performance management system would have allowed the construction of a more complete set of HRM practice measures. Because it was not possible to gauge the potential impact of these omitted variables on the results, we relied on the use of control variables to capture any relevant unmeasured organizational characteristics. Given the consistency of our results with those reported in studies specifically designed to test HRM practice-performance links (Huselid, 1995; Huselid & Becker, 1994; Ichniowski et al., 1994), we do not believe this problem to be serious.

Third, the NOS data limitations that constrain our attempts to measure HRM practices precisely hamper substantially our efforts to construct complementarity measures. Indeed, the disappointing results for our tests of complementarity may be due to the limits of the data and measures rather

than to the absence of a complementarity effect. We are unable to distinguish between these possibilities. To avoid this problem in future research, we suggest the collection of information on HRM practices at a level of detail that permits the determination of whether specific practices are consistent or inconsistent with each other. This may mean that researchers should initially conduct industry-level (see Ichniowski et al., 1994) or case studies to identify consistent and inconsistent HRM patterns.

Fourth, common method variance is a potential problem whenever data are collected from a single source. The issue is magnified by the perceptual nature of our dependent variables because managers who report the use of progressive HRM practices (which are said to improve performance by the business press) may also report good organizational performance. We believe that the extent of this problem was reduced by the careful way that the NOS data were collected. For example, most of the HRM practice measures we employed were based on informants' responses to factual questions, and the dependent variables were highly reliable indexes of their perceptions of organizational performance on several different dimensions. In addition, inclusion of wide-ranging control variables—both perceptual and factual—produced little variation in the patterns of results.

Fifth, there is the potential for simultaneity between HRM practices and perceptions of organizational performance in our results. If more profitable firms systematically adopt progressive HRM practices, then our cross-sectional estimates would be overstated. As it was not possible to correct for such endogeneity (appropriate instrumental variables were unavailable), our analyses do not support direct causal attributions. At the same time, the consistency of our results with recent related work providing explicit corrections for simultaneity bias (Huselid, 1995; Huselid & Becker, 1994) raises our confidence in the results of this study.

Data limitations aside, our analyses suggest three main observations. First, consistent with earlier research (Ichniowski et al., 1994), our results indicate that an evaluation of individual HRM practices in isolation is likely to lead to biased estimates of their effects. When HRM practice measures were entered individually in our analyses, their estimated coefficients were always larger (often substantially larger) than their coefficients in models containing other HRM practice measures. Future studies that fail to address this issue should be interpreted cautiously.

Second, increasing interest in the firm-level effects of HRM practices is a very positive development for the human resources field. The complexity of the subject requires the integration of micro-level and macro-level conceptual and empirical frameworks from diverse disciplines, as well as the strategy, leadership, and management literatures more generally. Multidisciplinary discussion and exchange among scholars can only serve to produce research that is better and more relevant to practitioners.

Third, as scholars place more emphasis on the links between HRM practices and firm performance and study them from different perspectives, there is a critical need for consensus concerning the measurement of HRM

practices and systems. To date, the relevant literature is distinguished by the fact that virtually no two studies measure HRM practices in the same way. In addition, few studies have considered important related issues, such as whether firms implement HRM practices effectively (Huselid, Jackson, & Schuler, in press). As a result, we see the development of reliable and valid measures of HRM systems to be one of the primary challenges (and opportunities) for scholars interested in advancing this line of research.

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