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ACADEMIC PAPER

Human resource management practices and organizational effectiveness: internal fit matters

John Delery and Nina Gupta
*Department of Management, Sam M. Walton College of Business,
University of Arkansas, Fayetteville, Arkansas, USA*

Abstract

Purpose – The purpose of this paper is to test alternative conceptualizations of the relationship between systems of human resource management (HRM) practices and organizational effectiveness. The authors describe a framework suggesting a complex relationship between HRM practices and organizational effectiveness, test this approach empirically in a large sample of US motor carriers, and compare the results to those derived using other approaches prevalent in the strategic HRM literature.
Design/methodology/approach – The study used a large scale cross-sectional survey design. In a sample of US motor carriers, questionnaires completed by senior HRM department staff were used as the primary data. The data were supplemented by organizational effectiveness data reported by motor carriers to the US Government.
Findings – The results support the general hypothesis that HRM practices enhance organizational effectiveness, provide some evidence that HRM practices can enhance each other's effectiveness, and underscore the value of theory driven methodological approaches. Specifically, the authors found that HRM system comprising practices that ensure selectivity in staffing, performance-based pay, and enhanced employee opportunity through participation in decision-making result in higher levels of organizational effectiveness. Additionally, the effects of other combinations of these practices varied.
Practical implications – This study highlights the need for HRM departments and organizations to approach the strategic management of employees with a systems perspective. The optimal design of an HRM strategy must take into account the various components.
Originality/value – This study is one of the first to test the main assumptions of the systems perspective in strategic HRM using multiple measures and empirical approaches for combining HRM practices into systems. Comparison of these different approaches in a single study offers insight into how researchers can test the relationship between HRM practices and organizational effectiveness and provide practitioners more useful approaches for designing HRM systems.
Keywords Selection, HR strategy, Organization effectiveness, Performance related pay,
Job design, Work systems
Paper type Research paper

The strategic human resource management (SHRM) field has witnessed significant growth in the last 25 years. It is reasonably well-established, for example, that the right combinations of human resource management (HRM) practices can have a substantial effect on firm performance. Unfortunately, empirical evidence of this argument has failed to keep pace with theoretical developments. Almost from the very beginning, scholars have embraced the idea that synergies among HRM practices are critical.

Whether referred to as bundles, synergies, or configurations, the idea is that combinations of HRM practices, rather than individual practices by themselves, yield major benefits. This idea is almost universally accepted (for an exception, see Pfeffer's, 1994 best practices approach). But as Chadwick (2010) and Gerhart (2012), among others, point out, there is virtually no empirical work that spells out and tests these configurations, bundles, or synergies, in all their complexity. It is still unclear which HRM practices constitute an effective HRM system; it is also unclear precisely which and how HRM practices combine in achieving organizational effectiveness (Delaney and Huselid, 1996; Guest, 2011; Paauwe *et al.*, 2012). From both a scientific and an academic perspective, it is vital that theoretical propositions be validated empirically. This paper is designed to move us forward toward this end.

Specifically, this paper uses generally prevailing theoretical approaches to: first, derive a testable proposition that captures the complexity of HRM configurations or bundles; second, specify alternative empirical approaches based on extant research to testing this prediction; and third, offer empirical evidence of the relative efficacy of the alternative approaches. Thus, the paper has both substantive and methodological goals, but its primary objective is to move beyond theorizing to empirical assessment.

Theoretical framework

Although there is some support for the notion that individual HRM practices are effective across a wide range of contexts (Delery and Doty, 1996; Jiang *et al.*, 2012; Pfeffer, 1994, 1998; Subramony, 2009), the configurational or systems perspective, highlighting issues of fit and complementarity among HRM practices, is arguably the most popular approach in the strategic HRM literature (Arthur, 1994; Delery and Doty, 1996; Huselid, 1995; Ichniowski *et al.*, 1997; Wright, 2008; Youndt *et al.*, 1996). According to this perspective, HRM practices must fit with one another, and desired workforce characteristics and consequent workforce performance are achieved through the entire system of practices and the goodness of their internal fit. For instance, in one of the earliest descriptions, MacDuffie (1995) argued that maximum gain is achieved through "bundles" of HRM practices that reinforce and enhance one another.

That HRM practices function as a system is intuitively appealing, as is the idea that their internal fit is crucial to success. For a systems perspective to be theoretically enlightening, however, it should specify: first, the particular HRM practices that must fit together; second, the way in which they must fit together; and third, the appropriate measurement and analytic tools for "fit" dynamics. Without clear specification of these, it is difficult to develop testable hypotheses. Strategic HRM scholars tend to have different views on these issues. Thus, "although most studies assert that there are positive interactions between practices, few present arguments as to how particular practices should interact with each other, instead simply assuming that more practices are better" (Cappelli and Neumark, 2001, p. 744). Similar arguments have also been put forward by Chadwick (2010) and Gerhart (2012). A cursory review of the literature shows that the HRM practices included in HRM systems differ greatly across studies, without a strong justification for these differences (Boselie *et al.*, 2005; Combs *et al.*, 2006). To address Cappelli and Neumark's criticism and with the strategic HRM literature as the context, we outline below a framework for resolving these issues.

The strategic HRM literature generally explains the relationship of HRM practices and firm performance through the resource-based view (Barney, 1991; Barney and Wright, 1998; Cappelli and Singh, 1992; Chadwick and Dabu, 2009; Delery and Shaw, 2001; Lado and Wilson, 1994; Lepak, and Snell, 1999; Wright *et al.*, 1994). This view

argues that competitive advantage is obtained when resources are valuable, rare, and inimitable. One such resource is human capital or human capital resources (Pfeffer, 1998; Nyberg *et al.*, 2014; Ployhart and Moliterno, 2011; Ployhart *et al.*, 2014; Wright *et al.*, 1994). Both the micro and macro literatures agree that the critical workforce characteristics in this context are skill/ability, motivation, and resources/ opportunity (Heneman *et al.*, 2000; Mitchell, 1973; Porter and Lawler, 1968 in the micro literature; Arthur, 1992; Delaney and Huselid, 1996; MacDuffie, 1995; in the SHRM literature). This background led Delery and Shaw (2001) and Lepak *et al.* (2006), among others, to develop variations of the ability, motivation, and opportunity (AMO) framework commonly accepted in the SHRM literature today.

Thus, literature at the individual, group, and organizational levels indicates that the critical human attributes for high performance are skill/AMO. HRM practices can promote or impede the prevalence of these characteristics in the workforce. When HRM practices promote these characteristics, the organization should manifest superior performance. The literature suggests furthermore that each of these characteristics – skill/AMO – is a necessary condition for performance, but by itself is not a sufficient condition. A skilled workforce that is not motivated or is not allowed to use its skills effectively cannot perform well, for example. To gain competitive advantage through HRM systems, it is essential for the organization to develop systems of practices that foster all three characteristics. Only in combination do these characteristics realize their full potential. Indeed, a system of practices that increases only one of these characteristics may be dysfunctional (Becker *et al.*, 1997).

The general arguments that HRM practices lead to workforce characteristics, which in turn lead to firm performance, necessitates the specification of: first, how HRM practices determine workforce characteristics, particularly AMO; and second, how workforce characteristics, i.e., AMO, determine workforce performance. This exposition also requires an explicit specification of the appropriate measurement, operationalization, and analysis of the inherent synergies. Is to these issues that we turn next.
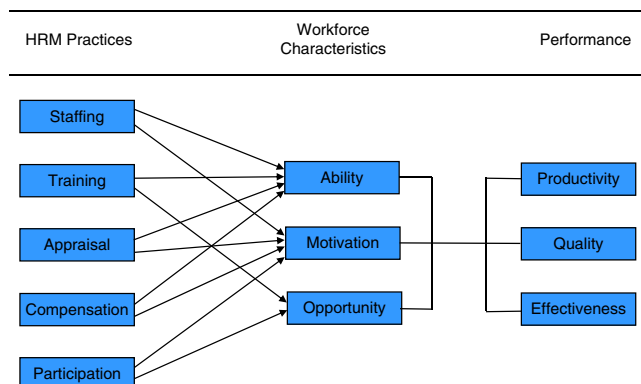
HRM practices and workforce characteristics
Implicit in the strategic HRM literature, and explicit in our framework, is the idea that HRM practices influence firm performance, in part, through their direct effect on workforce characteristics, namely, AMO (Lepak *et al.*, 2006; Liao *et al.*, 2009). This issue, while often discussed in the literature, is seldom addressed specifically, probably due to at least two factors. One, a specific HRM practice can influence multiple workforce characteristics simultaneously. The compensation system can be used to illustrate this point. One element of the compensation system (pay level) affects attraction and retention of workers, thereby determining workforce ability. Another element (performance-based pay) is more likely to affect workforce motivation. When the HRM system is measured broadly (i.e. the overall compensation system is measured), these complexities are elided. Two, several HRM practices can influence the same workforce characteristic. For example, the workforce characteristic of ability can be enhanced through selective staffing and/or through training, to name just two HRM practices (e.g. Subramony, 2009). Furthermore, to enumerate the infinite variations and peculiarities of each broad HRM practice (e.g. compensation, selection) is a daunting task. Indeed, this is a reason that firms can sustain competitive advantage through the inimitability of HRM systems.

Despite these difficulties, if sustained competitive advantage is to be fostered through HRM systems, it is critical that the relationship between HRM practices and

workforce attributes be detailed. Figure 1 is a preliminary attempt to do so using a sampling of broad HRM practices commonly discussed in the strategic HRM literature. We see this as a more complete depiction of the basic theoretical framework proposed by Huselid (1995), MacDuffie (1995), Delery and Shaw (2001), and a variation of that proposed by Jiang *et al.* (2012). The left half of the figure demonstrates the two issues discussed above, that multiple HRM practices affect each workforce characteristic, and that a broad HRM practice affects multiple workforce characteristics. One could argue, for instance, that workforce ability is likely to be enhanced by staffing (e.g. valid selection devices, a favorable selection ratio, internal selection), training (pre- or post-employment), performance appraisal (e.g. developmental feedback), and compensation practices (e.g. base pay). Likewise, one could argue that motivation is likely to be enhanced by staffing, compensation, and participation practices such as profit sharing plans, ESOPs, merit pay, individual incentives, and through the use of objective and fair performance appraisals; opportunity is likely to be enhanced by training and participation practices such as the use of quality circles, information-sharing processes, survey feedback, and formal grievance procedures. Each arrow in Figure 1 may be open to debate, but not the general idea that different HRM practices can have differential effects on specific workforce characteristics.

The right half of the figure shows that workforce characteristics, taken in combination, affect organizational outcomes. We emphasize that in our model it is the synthesis of workforce characteristics, not any workforce characteristic in isolation, that is related to organizational effectiveness. Although this point is emphasized in much of the strategic HRM and high involvement work systems literature (Huselid, 1995; Ichniowski *et al.*, 1997; Lawler, 1992; MacDuffie, 1995), it has not been given the attention it deserves, both theoretically and empirically. This synergy was also not specifically addressed in the AMO meta-analysis performed by Jiang *et al.* (2012). While that meta-analysis supports the basic premise that skill-enhancing, motivation-enhancing, and opportunity-enhancing practices are directly and indirectly related to organizational effectiveness, it was not possible to test the more fundamental assumption in the literature that the different types of practices interact to create synergistic results (Delery, 1998). This issue is addressed further in the next section.

In to, Figure 1 underscores the following points: first, HRM practices can affect workforce characteristics differentially; second, each element of an HRM practice can affect one workforce characteristic more than it does others; third, each broad HRM

Figure 1.
Framework for the relationship between HRM practices, workforce characteristics, and performance

practice can affect multiple workforce characteristics simultaneously; fourth, multiple HRM practices can affect each workforce characteristic; and fifth, the workforce characteristics of AMO affect organizational outcomes conjointly.

This approach provides the context for a systematic examination of the relationship between HRM practices and organizational performance. It suggests that HRM practices influence organizational performance both through a complex interaction that creates a valuable workforce and through the inimitability that results from such a complex relationship. These linkages imply that HRM systems themselves would be a source of competitive advantage in addition to the human capital resources they may create. In other words, an HRM system consisting of practices that enhance AMO could lead to high organizational performance. Such a system is valuable in that it leads to a more valuable and productive workforce; it is rare, since few organizations actually use such a system (Pfeffer, 1998); it is also likely to be inimitable given the complex interactions among the HRM practices within the system that create "positive combinations" (Becker *et al.*, 1997). These characteristics, according to the resource-based view, are what promote sustained competitive advantage. Organizations could, of course, imitate a particular HRM practice that another firm uses successfully. But it is quite unlikely that an entire HRM system can be imitated. A competing organization would have to identify each critical component of the system and implement it effectively. Not only that, the competing organization would have to take care to preserve the complex interplays among the different components. Given the number of HRM practices used by organizations, and the potential interactions among them, imitating an entire HRM system would be an extremely daunting task.

This framework enables a global prediction about the effects of HRM systems on firm performance. It suggests that all three types of HRM practices – ability-enhancing, motivation-enhancing, and opportunity-enhancing – must be present for organizational performance to improve. HRM systems with practices that promote only one or two of these characteristics are less likely to be successful than those with practices that promote all three characteristics. For instance, focussing on HRM practices that promote motivation, without also ensuring the presence of HRM practices that promote skill and opportunity, is unlikely to improve firm performance; instead, such an approach may actually erode performance. These arguments lead to the following hypothesis:

H1. HRM practices interact in predicting firm performance, such that HRM systems consisting of practices that enhance workforce ability, motivation, and opportunity lead to higher organizational performance than HRM systems consisting of practices that enhance only one or two of these workforce characteristics.

Simply stated, this hypothesis implies the highest level of performance among organizations with HRM practices focussing on all three workforce characteristics. It is likely that some suboptimal combinations are better than others. It may be better, for instance, to have HRM systems with practices that promote skill and opportunity (but not motivation) than to have HRM systems that promote motivation and opportunity (but not skill). Such complex interaction effects undoubtedly exist, but our knowledge of these issues is still too nebulous for definitive predictions. Thus, we predict an overall three-way interaction. We are, of course, interested in exploring the effectiveness of other theoretically less powerful, interactions as well.

Measurement of the HRM system

Most theoretical frameworks (including ours) predict that organizational performance results from combinations of HRM practices. In other words, bundles or systems of skill-enhancing, motivation-enhancing, and opportunity-enhancing HRM practices are more likely to be sources of competitive advantage. While much prior research has implicitly acknowledged this, there has been little agreement on the precise method to test this idea. Specifically, while researchers argue that systems of practices are important, they have developed their measures of these systems in different ways. For example, Arthur (1992) and Ichniowski *et al.* (1997) both used cluster analysis procedures to discover the common groupings of HRM practices in their samples. Huselid (1995) used principal components analysis to determine combinations. Becker and Huselid (1998) presented analyses from several studies in which they used an additive index created by summing the standardized scores across a large number of HRM practices. Arguably, the vast majority of studies purporting to measure a system of HRM practices have since used the additive index approach.

Empirically derived combinations, however, do not necessarily coincide with the underlying theoretical dictates (Delery, 1998). Strategic HRM frameworks imply interactions among particular HRM practices. That is, HRM practices promoting skill interact with those promoting motivation and opportunity. The frameworks also imply some interchangeability or substitutability among HRM practices promoting the same workforce characteristic. For example, skill could be fostered through a variety of different staffing practices. These complexities are not directly addressed in common empirical approaches. An additive approach (Becker and Huselid, 1998) implies an additive rather than an interactive framework. A factor analysis approach likewise ignores potential interactions; it also ignores whether the HRM practices within a factor promote the same or different workforce attributes. The cluster analysis approach may obviate some of these problems by detecting the different HRM systems in use across organizations but, because it is data driven, may not result in clusters that capture the underlying theoretical framework. For instance, two or more clusters may use HRM systems that contain all three types of practices, or there could be no clusters using such systems.

Thus, Chadwick (2010), Delery (1998), and Gerhart (2012), among others, pleaded with strategic HRM scholars to study the synergies and interaction among HRM practices. In response to these calls, we propose an alternative approach, one that is derived from theoretical roots, and one that offers a clear empirical test. This alternative approach, more consistent with the basic theoretical underpinnings, is to select HRM practices that *a priori* are likely to promote the workforce attributes of AMO, and to examine the main and interactive effects of these practices. This approach, while not eliminating all empirical problems, is likely to come closer to the theoretical premise of strategic HRM research. As a point of comparison, we also analyze the data using the three traditional approaches of factor analysis, cluster analysis, and additive index.

In sum, this paper develops and tests a theoretically grounded framework of the relationship of HRM practices and firm performance. The framework is tested using a variety of analytic approaches, allowing a comparison of results obtained through each.

Method
Sample
The sample was drawn from a population of 3,104 motor carrier organizations included in the 1993-1994 version of the *TTS Blue Book of Trucking Companies* (*Blue Book*). In all, 1,072 companies met the sampling criteria. As part of a larger research effort, a

lengthy questionnaire concerning HRM practices, organizational effectiveness, and other issues was mailed to the highest ranking HRM or personnel manager in each company. Completed questionnaires were returned by 379, yielding a 36 percent response rate. Details on the sample and data collection procedures are contained elsewhere (Delery *et al.*, 2000; Shaw *et al.*, 1998, 2000, 2002). Questionnaire information was supplemented with additional information from the 1994-1995 *Blue Book*. Since only 268 respondents were common to both the questionnaire and *Blue Book* data, the maximum analysis sample is constrained to these respondents. Sample sizes vary by analysis and are reported in the tables.

Development of HRM systems

As noted, to test the hypothesis we used an interaction approach based on our conceptual framework. In addition, solely for the sake of comparison, we used three other approaches common in the literature – factor analysis, cluster analysis, and additive index. These approaches are detailed below.

Interaction approach. We posited that HRM practices that enhance AMO interact in predicting firm performance. While most strategic HRM research measures a large number of practices and reduces the data empirically using techniques such as cluster or factor analysis, we opted for a rational rather than empirical approach to accomplish this. To test *H1*, we isolated a single broadly measured HRM practice that is uniquely adept at fostering each of the three workforce characteristics. In our dataset, selective staffing is such an HRM practice with respect to ability, performance-based pay with respect to motivation, and participation in decision making with respect to opportunity. Several factors guided the choice of these HRM practices. One, these practices are not controversial since both macro and micro literatures offer convincing evidence that selective staffing fosters ability, performance-based pay fosters motivation, and participation in decision making fosters opportunity (Jenkins, 1986, 1998; Lawler and Jenkins, 1992; Levine and Tyson, 1990; Locke and Schweiger, 1979; Snell and Dean, 1992). Two, the use of broad measures, arguably higher in the HR architecture (Becker and Gerhart, 1996), circumvents issues of combinations of practices fostering the same workforce attribute, issues such as whether valid selection devices and selection ratio are additive, multiplicative, or substitutes in determining employee ability. Prior research typically measured HRM practices lower in the HR architecture (Huselid, 1995). But given the nebulous state of current knowledge, the use of a broad selective staffing measure obviates these operational enigmas – the mathematical complexities should already be incorporated into the broader measure. That is, broad measures allow for substitutions and synergies, and avoid the additive assumption. For instance, two firms may be equally selective in staffing, but use very different selection devices. Three, these broad HRM practices collectively capture the essence of the proposed theoretical AMO framework and enable detection of mathematical functions across practices fostering different workforce attributes.

It can be argued that the three broadly measured practices are inadequate because there are clearly other practices that also enhance each workforce characteristic. For instance, training can influence the ability level of the workforce, and performance appraisals may influence motivation. This is true. Our approach does not address all potential problems. While our approach is clearly limited, it also has strengths. It allows for a more direct test of the interaction of the practices. Also, as stated above, there is a clear rationale for the choice of the three practices, since each broad practice we picked

is likely to be the practice most directly linked with the relevant underlying workforce characteristic (i.e. ability, motivation, or opportunity). Furthermore, the goal here was to identify a manageable collection of HRM practices. Identifying many characteristics that foster each workforce characteristic and testing potential interactions both within and across the practices was not possible. As noted, Figure 1 cannot be tested in its entirety, and certainly not within the limitations of our dataset.

For the comparison approaches, we opted to use measures of HR practices more similar to those used in previous research. Thus, instead of the three broadly measured practices we used in the interaction approach, we identified 18 HRM practices in our dataset similar to those in Huselid (1995) and Huselid and Becker (1997). They are defined later in this section. These practices, being lower in the HRM architecture, are more obvious measures of specific HRM practices rather than global HRM policies.

Factor analysis. For the factor analysis approach, we used the 18 HRM practices that were consistent with Huselid (1995), and analyzed these practices using a principal components approach with Varimax rotation, as Huselid (1995) did. Both an analysis of the scree plot, and the eigenvalue greater than one rule, indicated a two-factor solution to be appropriate. The results of the factor analysis are contained in Table I. The two factors correspond roughly to those of Huselid (1995), and they are accordingly named the employee motivation and employee skills and organizational structures factors. The resulting scales representing latent variables were constructed by summing the standardized scores of variables loading on the factor (with a weight of 0.40 or more). The Cronbach's α reliabilities for these scales were 0.63 and 0.58, respectively. While low, these reliabilities are in the range of those reported by Huselid (1995).

Cluster analysis. We replicated Arthur's (1992) cluster analysis approach. Specifically, we ran a cluster analysis routine using Ward's method. To decide on

HRM practice	1	2	α
Employee motivation			0.63
Merit pay	*0.62*	0.00	
Individual incentives	*0.58*	−0.12	
Company-wide bonuses	*0.54*	0.09	
Profit sharing	*0.52*	0.04	
Objective performance measures	*0.43*	0.19	
Team/group bonuses	*0.43*	0.29	
Performance appraisal	*0.42*	0.33	
Pre-employment training	0.37	0.36	
Internal hiring	−0.36	0.35	
ESOP	0.25	0.03	
Employee skills and organizational structures			0.58
Information sharing	0.23	*0.56*	
Quality circles	0.23	*0.54*	
Formal grievance procedures	−0.29	*0.53*	
Training	0.16	*0.53*	
Base pay	−0.02	*0.51*	
Valid selection devices	0.19	*0.49*	
Survey feedback	0.32	*0.42*	
Selection ratio	−0.04	0.17	
Eigenvalue	3.21	1.69	
Proportion of variance accounted for	17.80	9.40	

Table I.
Factor structure of human resource management practices

the number of clusters, we investigated 2-6 cluster solutions to see which solution was the most interpretable. A three-cluster solution was most interpretable for the 18 HRM practices identified above. The means of the standardized variables across the three clusters are shown in Table II. Cluster 3 closely resembles the elements of a high performance work system, Cluster 1 resembles the opposite, and Cluster 2 falls somewhere in between. More descriptively, Cluster 1 is weak on HRM practices, Cluster 2 consists of organizations that measure and reward individual performance, and Cluster 3 includes organizations with HRM practices that foster AMO.

Additive index. Each of the 18 HRM practices identified above was standardized and an average across HRM practices was computed for each firm (Becker and Huselid, 1998). Standardization of the variables was necessary because different items were measured on different scales. Firms were included in the index if they had valid observations for at least 17 practices.

In short, HRM systems were developed using one theoretically grounded interaction and three commonly used empirically based approaches. The theoretically grounded approach led to the identification of three broadly measured HRM practices-selective staffing, performance-based pay, and participation in decision making. The factor analysis yielded two factors – employee motivation and employee skills and organization structures. The cluster analysis yielded three clusters-weak on HRM practices, use of individual measurement and rewards, and high performance system. The additive index yielded one simple additive index.

HRM practice	1 Weak HRM	2 Individual incentives	3 High involvement
Ability enhancing			
Valid selection devices	−0.35	0.03	0.41
Selection ratio[a]	0.14	−0.12	0.03
Internal selection	0.26	−0.17	−0.03
Pre-employment training	−0.52	0.12	0.46
Training	−0.39	0.10	0.27
Base pay	0.01	−0.15	0.36
Motivation-enhancing			
Profit sharing	−0.38	0.13	0.49
ESOP	−0.21	−0.19	1.05
Merit pay	−0.55	0.12	0.77
Individual incentives	−0.70	0.29	0.36
Company-wide bonuses	−0.43	−0.06	1.06
Team/group incentives	−0.36	−0.30	1.44
Performance appraisal	−0.63	0.30	0.41
Objective performance measures	−0.56	0.23	0.21
Opportunity-enhancing			
Quality circles	−0.36	0.05	0.69
Information sharing	−0.48	0.13	0.51
Survey feedback	−0.43	0.08	0.63
Formal grievance procedures	0.18	−0.20	0.17
Number of firms	107	155	52

Note: [a]There are significant differences ($p < 0.01$) across clusters on all variables except selection ratio

Table II.
Standardized HRM
practice means
by cluster

Measures – HRM practices

Information on HRM practices was obtained through the survey. The relevant focus for these practices was the job of the truck driver. Concentrating on a single job ensured consistency of focus across companies and reduced contamination from the use of different frames of reference by respondents. Although organizational performance is likely to be a function of the performance of employees across many different jobs, in the trucking industry, the drivers' job is critical. Not only does this job have the greatest number of employees, it is also the job that influences the delivery of service most directly. Thus, although performance of employees in other jobs is important to organizational performance, drivers possibly have the strongest influence on many organizational performance indicators.

Information on all HRM practices was obtained from the respondent. Psychometric properties of the measures are reported later. For descriptive purposes, we report the practices within the three major categories of ability-enhancing, motivation-enhancing, and opportunity-enhancing practices. Recall, however, that individual practices could foster multiple workforce characteristics. Recall also that three broadly measured practices are used for the theoretically grounded empirical approach, and the 18 specific practices are used for the three traditional approaches.

Ability-enhancing HRM practices. One broad and six specific skill-enhancing HRM practices were identified. The broadly measured practice, selective staffing was measured as the mean of seven items with seven-point Likert-type agree/disagree response options ($\alpha = 0.68$). A sample item is "We are very choosy about who we hire." It is broadly measured in the sense that different organizations could be very selective, but use one of many different combinations of the specific practices described below. The specific HRM practices used for the traditional analyses are as follows. For valid selection devices, respondents reported whether they used each of eight selection devices shown in meta-analytic studies to be generally valid: structured interviews, mental ability tests, physical ability tests, technical knowledge tests, performance or job sample tests, personality tests, honesty or integrity tests, and biographical information questionnaires. The measure is the number of valid devices used. Selection ratio was calculated by dividing the number of new hires by the total number of applicants during the previous year. Internal selection was measured as the percentage of current permanent drivers who were initially hired as temporary, part-time, or casual drivers. Pre-employment training was the number of hours of formal training (beyond licensing requirements) that a new driver received before going on the road. Training was measured as the hours of formal training that a typical driver received in a year. Base pay was measured as the average annual pay for a typical driver in the organization.

Motivation-enhancing HRM practices. The broad HRM practice concerned the use of performance-based pay, measured as the mean of four items with five-point "To what extent [...]" response options ($\alpha = 0.83$). The items concerned the extent to which pay differences across drivers were based on driver performance, driver accident rates, traffic violations, and driver fuel mileage. Eight specific motivation-enhancing practices were also identified. Profit sharing, ESOPs, merit pay, individual incentives, company-wide bonuses, and team/group incentives were operationalized as the extent (on a five-point scale) to which the company used each plan for drivers. Performance appraisal was measured as whether (coded 1) or not (coded 0) the company conducted formal performance appraisals for drivers. Objective performance measures was measured as the mean of six items with five-point "To what extent [...]" response

options. The items concerned the extent to which the following factors were considered in judging driver performance: the number of miles driven, percentage of on-time deliveries, accident-free miles driven, citations for moving violations, average gas mileage, or other objective measures of driver behaviors.

Opportunity-enhancing HRM practices. The broad opportunity-enhancing practice was participation in decision making, measured as the mean of five items that used seven-point Likert-type agree/disagree response ($\alpha = 0.60$). A sample item is "Our drivers can make important work-related decisions." Four specific opportunity-enhancing practices were identified. Information sharing was the mean of four items adapted from Lawler *et al.* (1992) ($\alpha = 0.80$). The items asked for the percent of drivers routinely provided with information about the company's overall operating results, about new technologies that might affect them, about competitors' relative performance, and about new technologies in general. Responses were recorded on seven-point scales ranging from 0 (None) to 7 (100 percent). Quality circles, survey feedback, and formal grievance procedures were measured as the percent of drivers involved in each activity. Response options ranged from 0 (none) to 7 (100 percent).

Measures – criteria and controls

Criterion variables. Three criterion variables from the *Blue Book* containing 1994 data were used to operationalize firm performance. Operating ratio, the standard measure of operating performance in the trucking industry (Transportation Technical Services, 1993-1994), was defined as total operating expenses divided by total gross revenue times 100. Lower values reflect better organizational performance. Net profit margin was measured as net income divided by total operating revenue times 100. Return on equity (ROE) is often used as a measure of organizational performance in strategic HRM research (e.g. Delery and Doty, 1996), and is defined as net income divided by total equity. Higher values of net profit margin and ROE reflect better organizational performance.

Control variables. Consistent with the strategic HRM literature and to enable generalizations beyond the trucking industry, several control variables were included. Three general organizational factors that could influence the independent and dependent variables are size, age, and unionization. Size was operationalized as the log of the total number of employees in the company, as reported by the respondent. We chose to log the number of employees, given the relatively skewed distribution. Unionization was also reported by respondents as the percent of drivers covered by collective bargaining agreements. Age was operationalized as the log of 1994 minus the founding year of the company. Again, we used the log because the distribution for age was highly skewed. Information on founding year was obtained from the *Blue Book*. Three controls specific to the trucking industry and available in the survey were also used. Carrier type was operationalized as carriers in the less-than-truckload segment vs others since the former show remarkably different dynamics than other segments. Percent owner operators was measured as the percent of work done by owner operators. Percent-owned tractors was the percent of tractors actually owned (as opposed to leased or rented) by the company. The latter two variables enabled control over different cost structures across firms.

Analysis approach

The hypothesis was tested using four sets of hierarchical regression analyses. The interaction approach entailed entering the controls first, the three HRM practices in

Model 1, the two-way interactions in Model 2, and the three-way interaction in Model 3. To reduce collinearity between the component variables and the interaction terms, the variables were mean-centered prior to creating the interaction terms (Cohen *et al.*, 2003). The factor analysis approach entailed entering the controls first, the two factors in Model 1, and their interaction in Model 2. The cluster analysis approach entailed the creation of dummy variables representing two of the three clusters, entering the controls first, and the two dummy variables in Model 1. The additive index approach entailed entering the controls first and the additive index in Model 1.

Results
Descriptive statistics on all variables, as well as the intercorrelations among them, are shown in Table III. The table also contains internal consistency reliability estimates where appropriate. The small to moderate correlations among HRM practices reinforce the independence of HRM practices and the absence of underlying latent HRM factors.

Although we did not hypothesize that individual HRM practices would be related to firm performance, given that some researchers posit these individual relationships, we decided to test them. We did this by examining the correlations between each HRM practice and the outcomes with the controls partialled out. Only six of the possible 63 partial correlations reached significance, and even these were of small magnitude. Thus, they are not reported here, but are available from the authors. Overall, the partial correlations do not provide support for a relationship between individual practices and firm performance.

H1 predicted interactive effects between HRM practices and performance, and four operational approaches were used to test the hypothesis – an interaction, a factor analysis, a cluster analysis, and an additive index approach. The results of these approaches are reported separately below.

Results of the analyses using the interaction approach are shown in Table IV. With respect to operating ratio, Model 2 including the two-way interactions explained an additional 5 percent of variance ($p < 0.01$) and contained a significant interaction between selective staffing and participation in decision making ($\beta = -0.24$, $p < 0.01$). Model 3 including the three-way interaction added 2 percent more variance ($p < 0.10$). The results were substantively identical for net profit margin, but the three-way interaction term reached statistical significance for this variable ($\beta = -0.16$, $p < 0.05$). With respect to ROE, Model 2 containing the two-way interactions explained an additional 4 percent of variance ($p < 0.05$). Participation in decision making interacted significantly with both other HRM practices (with selective staffing, $\beta = 0.13$, $p < 0.10$; with performance-based pay, $\beta = -0.16$, $p < 0.05$). Model 3 incorporating the three-way interaction did not explain significant additional variance. Taken together, these results show some but not complete support for *H1*. They are particularly consistent in supporting the interaction of selective staffing and participation in decision making (i.e. the workforce attributes of skill and opportunity) in predicting firm performance.

To clarify the interaction effects, we plotted the significant three-way interaction using values one standard deviation above and below the mean on each of the independent variables. The significant two-way interactions in Model 2 show the same form of relationship as the three-way. We chose to split the two plots for the three-way interaction using performance-based pay, since the strongest interaction was found between selective staffing and participation in decision making. The three-way interaction is illustrated for net profit margin in Figures 2(a) and (b). Figure 2(a) shows the interaction of selective staffing and participation in decision making under conditions of high performance-based pay; Figure 2(b) shows the same effects under conditions of low performance-based pay.

HRM practices	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Firm performance												
1. Operating ratio	95.46	5.04	1.00									
2. Net profit margin	2.94	4.12	−0.78***	1.00								
3. Return on equity	18.66	38.37	−0.39***	0.51***	1.00							
Ability enhancing												
4. Selective staffing	5.37	0.77	−0.14**	0.05	−0.02	(0.68)						
5. Valid selection devices	3.46	2.38	0.07	−0.09	−0.13**	0.18***	1.00					
6. Selection ratio	0.31	0.20	0.08	−0.11	−0.12*	−0.17***	−0.02	1.00				
7. Internal selection	7.47	20.91	0.09	−0.10	−0.06	0.02	0.00	−0.07	1.00			
8. Pre-employment training	2.97	1.35	−0.14**	0.09	0.05	0.13**	0.15***	−0.05	−0.13**	1.00		
9. Training	2.39	1.13	−0.05	−0.02	−0.05	0.20***	0.24***	−0.03	0.02	0.41***	1.00	
10. Base pay	10.45	0.18	−0.08	0.04	−0.05	0.30***	0.07	−0.06	0.18***	0.08	0.10*	1.00
Motivation-enhancing												
11. Performance-based pay	2.03	1.08	−0.16**	0.18***	0.15**	0.08	0.11**	0.02	−0.18***	0.08	0.10*	−0.09
12. Profit sharing	2.22	1.52	−0.23***	0.22***	0.15**	0.08	−0.01	−0.06	−0.14**	−0.15***	0.04	0.05
13. ESOP	1.12	0.62	−0.04	−0.03	−0.03	−0.02	0.03	0.04	−0.03	0.12**	−0.01	0.06
14. Merit pay	1.82	1.20	−0.09	0.13**	0.09	0.10*	0.02	0.00	−0.04	0.10*	0.06	−0.01

Table III.
Means, standard
deviations, and
correlations of all
HRM practices and
firm performance
measures

Table III.

15. Individual incentives	2.91	1.54	−0.04	0.07	0.03	0.09*	0.02	0.01	−0.15***	0.20***	0.10	0.03
16. Company-wide bonuses	1.93	1.35	−0.04	0.03	0.05	0.11**	0.12**	0.03	−0.12**	0.05	0.08	0.09
17. Team/group bonuses	1.46	0.98	−0.09	0.07	−0.04	0.12**	0.17***	−0.01	−0.01	0.21***	0.17***	0.09
18. Performance appraisals	1.36	0.48	−0.11*	0.08	0.05	0.08	0.22***	0.08	−0.14**	0.20***	0.14***	0.04
19. Objective performance measures	3.40	0.69	−0.03	0.02	0.03	0.23***	0.30***	−0.01	−0.17***	0.12**	0.17***	0.22***
Opportunity-enhancing												
20. Participation in decisions	4.83	0.88	0.02	−0.04	0.02	0.14***	−0.06	−0.15***	0.03	0.02	0.11**	0.06
21. Quality circles	1.54	1.13	−0.14**	0.09	0.01	0.14***	0.13**	−0.10*	0.02	0.12***	0.15***	0.14***
22. Information sharing	3.89	1.62	−0.08	−0.01	0.01	0.30***	0.19***	−0.10*	0.06	0.23***	0.22***	0.22***
23. Survey feedback	2.12	1.73	−0.08	0.10	0.11	0.10*	0.19***	−0.03	0.00	0.20***	0.11**	0.14***
24. Formal grievance Procedures	2.59	2.22	0.15**	−0.07	−0.07	0.07	0.10*	−0.08	0.14**	0.00	0.09	0.14***

HRM practices	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.
Motivation-enhancing														
11. Performance-based pay	(0.83)													
12. Profit sharing	0.24***	1.00												
13. ESOP	0.03	0.14**	1.00											
14. Merit pay	0.45***	0.20***	0.11**	1.00										
15. Individual incentives	0.29***	0.08	0.01	0.30***	1.00									
16. Company-wide bonuses	0.31***	0.35***	0.12*	0.32***	0.10	1.00								
17. Team/group bonuses	0.23***	0.18***	0.03	0.22***	0.20***	0.31***	1.00							
18. Performance appraisals	0.26***	0.18***	0.11*	0.16***	0.17***	0.14***	0.12**	1.00						
19. Objective performance measures	0.35***	0.10*	0.01	0.19***	0.19***	0.20***	0.16***	0.23***	1.00					
Opportunity-enhancing														
20. Participation in decisions	0.01	0.04	0.02	0.11**	−0.01	0.06	0.03	0.05	0.05	(0.60)				
21. Quality circles	0.13**	0.08	0.04	0.15***	0.07	0.06	0.26***	0.18***	0.09*	0.03	1.00			
22. Information sharing	0.12**	0.15***	0.05	0.07	0.04	0.22***	0.10*	0.20***	0.21***	0.24***	0.20***	(0.80)		
23. Survey feedback	0.16***	0.18***	0.06	0.16***	0.20***	0.08	0.18***	0.21***	0.13	0.00	0.16***	0.39***	1.00	
24. Formal grievance procedures	−0.05	0.01	0.05	−0.05	−0.10*	−0.01	0.03	0.09	0.02	0.05	0.09	0.15***	0.13**	1.00

Notes: $n = 228$-357. $*p < 0.10$; $**p < 0.05$; $***p < 0.01$

Table III.

| Variables	Operating ratio			Net profit margin			Return on equity		
	Model 1[a]	Model 2	Model 3	Model 1[a]	Model 2	Model 3	Model 1[a]	Model 2	Model 3
Controls[b]	–	–	–	–	–	–	–	–	–
HRM practices									
Selective staffing (SS)	-0.12[c]	-0.18***	-0.18***	0.03	0.11	0.11	-0.02	0.02	0.02
Performance-based pay (PBP)	-0.10	-0.10	-0.12*	0.12	0.13*	0.15**	0.23***	0.24***	0.24***
Participation in decision making (PDM)	-0.04	-0.07	-0.09	0.03	0.05	0.09	0.07	0.09	0.10
Two-way interactions									
SS×PBP		-0.02	0.01		-0.02	-0.05		-0.07	-0.07
SS×PDM		-0.24***	-0.23***		0.25***	0.24***		0.13*	0.13*
PBP×PDM		0.06	0.04		-0.06	-0.03		-0.16**	-0.15**
Three-way interactions									
SS×PBP×PDM			0.13*			-0.16**			-0.03
ΔR²	0.03*	0.05***	0.02*	0.02	0.05***	0.02**	0.05**	0.04**	0.00
R²(adj)	0.21 (0.17)***	0.26 (0.20)***	0.27 (0.22)***	0.12 (0.06)***	0.17 (0.10)***	0.19 (0.12)***	0.18 (0.12)***	0.21 (0.15)***	0.21 (0.14)***
n		203			202			189	

Notes: $n = 203$. [a]The ΔR^2 statistic for Model 1 is the increase from adding the HRM practices to the controls. [b]Control variables included total number of employees (log), age (log), average length of haul (log), computer technology, percent unionized, percentage of runs by owner operators, and percentage of tractors owned. The regression coefficients for the controls are omitted since they are not the focus of the study, and to conserve space. [c]Standardized regression coefficients (β) are presented in the table. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Table IV.
Results of the hierarchical regression analyses using the interaction approach

(a) High Performance-Based Pay

Net Profit Margin

3.25 → 4.19
3.27 → 3.33

High PDM
Low PDM

Low   High
Selective Staffing

(b) Low Performance-Based Pay

Net Profit Margin

High PDM
Low PDM

2.59 → 1.33
0.77 → 4.95

Low   High
Selective Staffing

Figure 2.
Interaction of
performance-based
pay, selective
staffing, and
participation in
decision making in
predicting net
profit margin

The combination of selective staffing, participation in decision making, and performance-based pay is as effective as the use of selective staffing and participation in decision making without performance-based pay. More noteworthy is the fact that the lowest performance levels are evident when participation in decision making is used without selective staffing or performance-based pay. Likewise, selective staffing in the absence of performance-based pay or participation in decision making was not effective.

To illustrate the significant two-way interaction between performance-base pay and participation in decision making we plotted it in the same manner and present the plot in Figure 3. The plot shows that ROE was highest under high performance-based pay,

Return on Equity

18.75 → 21.31
8.23 → 23.91

High PDM
Low PDM

Low   High
Performance-Based Pay
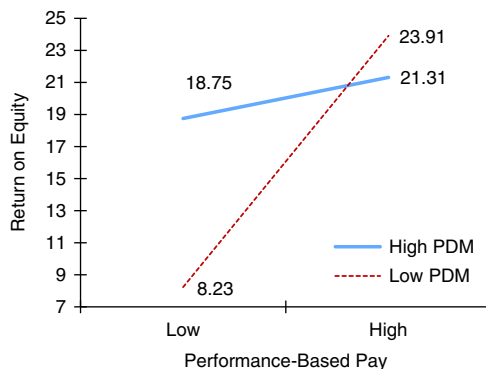
Figure 3.
Interaction of
performance-based
pay and
participation in
decision making
in predicting
return on equity

regardless of the level of participation in decision making. Under conditions of low performance-based pay, however, the greater use of participation in decision making was associated with higher returns. The other significant interaction predicting ROE was between selective staffing and participation in decision making. This relationship was very similar to the relationship plotted in Figure 2(b). Highest returns were achieved when selective staffing was combined with participation or neither was used.

The results for the factor analysis approach are contained in Table V. Neither the addition of the main effects of the two factors, nor the addition of their interaction resulted in significant increases in explained variance for any dependent variable. The employee motivation factor showed significant effects in Model 1 predicting ROE and net profit margin, but in both cases the step itself was only marginally significant. That is, the factor analysis approach offers little support for *H1*.

The cluster analysis approach necessitated the creation of two dummy variables, the first being coded one for the high involvement cluster and zero for the others, and the second being coded one for the individual incentives cluster and zero for the others. The results of this analysis approach are shown in Table VI. Model 1 did not show a significant increase in explanatory power over the model including the controls alone. Thus, the cluster analysis approach also showed no support for *H1*.

The additive index was unable to explain additional variance beyond the control variables in ROE ($\Delta R^2 = 0.00$, $p = $ ns), operating ratio ($\Delta R^2 = 0.00$, $p = $ ns) or net profit margin ($\Delta R^2 = 0.00$, $p = $ ns). Thus, this approach for developing HRM systems also received no support.

In all, the interaction approach offers some support for *H1*. This is in stark contrast to the lack of support using the factor analysis, cluster analysis, and additive index approaches. These differences offer both substantive and methodological insights about the systems perspective of HRM practices.

Variables	Operating ratio		Net profit margin		Return on equity	
	Model 1[a]	Model 2	Model 1	Model 2	Model 1	Model 2
Controls[b]	–	–	–	–	–	–
HRM practice scales						
Employee skills and organizational structures (ESOS)	−0.03[c]	−0.03	−0.13	−0.13	−0.10	−0.10
Employee motivation (EM)	−0.09	−0.09	0.19**	0.19**	0.20**	0.20**
Two-way interactions						
ESOS × EM		0.02		0.01		0.04
ΔR^2	0.01	0.00	0.03*	0.00	0.03*	0.00
R^2 (adj.)	0.18 (0.14)***	0.18 (0.13)***	0.14 (0.09)***	0.14 (0.09)**	0.15 (0.10)***	0.15 (0.10)***
n	207		202		192	

Table V.
Results of the hierarchical regression analyses using the factor analysis approach

Notes: [a]The ΔR^2 statistic for Model 1 is the increase from adding the HRM practices to the controls. [b]Control variables included total number of employees (log), age (log), average length of haul (log), computer technology, percent unionized, percentage of runs by owner operators, and percentage of tractors owned. The regression coefficients for the controls are omitted since they are not the focus of the study, and to conserve space.[c]Standardized regression coefficients (β) are presented in the table. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Variables	Operating ratio Model 1[a]	Net profit margin Model 1	Return on equity Model 1
Controls[b]	–	–	–
HRM practice scales			
High involvement (dummy)	−0.06[c]	−0.01	0.09
Individual incentives (dummy)	0.04	−0.03	0.00
ΔR^2	0.01	0.00	0.01
R^2 (adj.)	0.20 (0.16)***	0.13 (0.08)***	0.13 (0.08)**
n	195	196	183

Notes: [a]The ΔR^2 statistic for Model 1 is the increase from adding the HRM practices to the controls. [b]Control variables included total number of employees (log), age (log), average length of haul (log), computer technology, percent unionized, percentage of runs by owner operators, and percentage of tractors owned. The regression coefficients for the controls are omitted since they are not the focus of the study, and to conserve space. [c]Standardized regression coefficients (β) are presented in the table. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Table VI.
Results of the
hierarchical
regression analyses
using the cluster
analysis approach

Discussion
This study offers both substantive and methodological insights. Substantively, it underscores the value of using configurations of HRM practices to promote organizational effectiveness (Delery, 1998; Kepes and Delery, 2007). Methodologically, it provides as assessment of the relative value of alternative analytic approaches to examining HRM configurations. These issues are addressed below.

Efficacy of a systems perspective
The study supported the idea, popular in the strategic HRM literature (Delery, 1998; Kepes and Delery, 2007; MacDuffie, 1995), that better predictive power is obtained when HRM practices are used as a bundle. Specifically, stronger prediction occurred when selective staffing and participation were used in conjunction. Performance-based pay did not show strong effects, but it was not irrelevant. Figures 2(a) and (b) show that, under high levels of performance-based pay, the primary difference in financial performance occurred between employers who were selective and participative, and employers who used other combinations. But when the use of performance-based pay was low, financial performance suffered substantively among employers who were either selective or participative, but not both. In other words, performance-based pay mitigated the dysfunctional effects of the disjointed use of staffing and participation.

That performance-based pay was not a strong predictor is likely attributable to at least two reasons. One, other means of enhancing motivation beyond performance-based pay are possible. As Hackman and Oldham (1976) suggested and the Jiang *et al.* (2012) meta-analysis confirmed, participation can also enhance motivation. Two, organizations could well use other HRM practices such as job design to enhance motivation. Indeed, a general concern about our approach is that workforce characteristics were not measured directly, and the HRM practices we used (although broad) still do not capture the relevant workforce characteristics. Employees could have been motivated, just not through performance-based pay.

Still, the general AMO approach, with its emphasis on synergies, was supported. Contrary to the idea that individual HRM practices can be universally effective (Pfeffer, 1994), the disjointed use of HRM practices can be financially problematic. For example, the results suggest that participation within a low-ability workforce, or

non-participation within a high-ability workforce, is not advisable. Using both or neither is better than using one or the other in isolation.

The resource-based view suggests that human resources can be a source of competitive advantage (Barney and Wright, 1998; Wright *et al.*, 1994). Our results indicate that competitive advantage through HRM can be obtained in at least two ways. Within the Lepak and Snell (1999) framework, firms can adopt either a "market-based" approach and emphasize the effective selection and participation of the workforce, or they can take a "compliance" approach, where employee selection and participation are de-emphasized. Either of these approaches is more instrumental for financial performance than one that bundles inconsistent HRM practices together. The latter clearly results in "deadly combinations" (Becker *et al.*, 1997). In other words, competitive advantage stems from systems of HRM practices.

This is also consistent with the larger perspective introduced by Lepak and Snell (1999) that some positions in the firm are more valuable to the execution of business strategy than others. Becker *et al.* (2009) expanded on this by focussing on the differentiation of positions within the firm based on their contribution to strategy. It is possible that in our sample, drivers were more valuable for the execution of business strategy in some firms than in others. Firms that were selective and allowed participation were likely trying to gain a competitive advantage through their driver workforce, whereas firms that were not selective and did not allow participation either emphasized a different part of their workforce, or possibly used technology or other means to substitute for a high-quality drive human capital resource. This would also be consistent with Campbell *et al.*'s (2012) framework that described when human capital might serve as a competitive advantage.

Methodological advancements
This study provides insights on two broad methodological issues: first, using methodological approaches that are derived directly from theoretical dictates; and second, assessing the relative efficacy of alternative approaches prevalent in strategic HRM research.

A critical contribution of this study is the use of a methodology derived from the theoretical framework. Most strategic HRM frameworks implicitly or explicitly posit interactive relationships among HRM practices, but empirical tests often use factor analyses or additive indexes, approaches not necessarily consistent with theory (Cappelli and Neumark, 2001; Chadwick, 2010; Delery, 1998; Gerhart, 2012). This inconsistency implies that results are as easily attributable to faulty analysis approaches as they are to lack of theoretical soundness or validity.

Following the strategic HRM literature, we derived a theoretical definition of the system of HRM practices likely to stimulate financial performance, identified HRM practices likely to foster a highly performing workforce, used broad measures of these HRM practices to capture their intricate dynamics, and examined unique and interactive effects of the HRM practices. This approach allowed us to begin addressing the theoretical and pragmatic complexities inherent in HRM research. It is consistent with theory, and it offers the potential for a much more precise specification of strategic HRM dynamics. In that, it promises theoretical clarity and practical utility.

The second methodological contribution is the comparison of the different methodological approaches within the same dataset. This precludes concerns about attribution of variations in results to differences across samples. We used three traditional approaches and our interaction approach. Generally speaking, the strongest

results were obtained using the interaction approach. The results using traditional approaches resemble those obtained in parallel studies in the literature. For example, our factors explained 1 percent variance in operating ratio and 3 percent variance in net profit margin and ROE. These estimates are similar to those reported by Huselid (1995). The factors and clusters are also similar to those reported in strategic HRM research (e.g. Arthur, 1992, 1994; Huselid, 1995). Thus, the stronger results obtained using the interactive approach cannot be attributed to peculiarities of the data. It is reasonable to conclude that the interaction approach offers a promising path for disentangling strategic HRM dynamics.

In some ways, the different empirical approaches actually test different theoretical propositions (Delery and Shaw, 2001). The additive index approach, for instance, arguably tests the proposition that the more "high performance" work practices a firm uses, the better the firm performance. This is not completely consistent with the systems approach generally prevalent in the strategic HRM literature, but it is still widely used (Chadwick, 2010; Gerhart, 2012; Guthrie, 2001). Likewise, the factor analysis approach is based on the assumption that some underlying factors are driving firms' choices of HRM practices. By creating scale scores based on the factors, researchers are really testing whether a firm's level on the underlying factor influences performance. Cluster analysis identifies groups of firms with similar HRM practices. If a large enough group of firms follows a similar HRM strategy, they will be grouped into a cluster. While analysis of the resulting clusters may reveal interesting groupings that could help to test the AMO framework, a great deal of variation among firms within a cluster is discarded in this approach. This reduces power.

Limitations
The present study, like most studies, must be viewed in light of its practical constraints and limitations. Perhaps the most significant limitation is that we did not measure workforce characteristics. This was a practical constraint of the dataset. The AMO framework nonetheless guided the specification of the HRM practices that make an HRM system a source of competitive advantage. Direct estimates of workforce characteristics, while extremely helpful, can also pose other problems such as reduction in statistical power (Vandenberg *et al.*, 1999). Since the choice of HRM practices was based on a vast body of past research, the interpretability of the results is not eroded. Rather, these issues define the boundaries within which the results must be viewed.

An obvious constraint of the study is its focus on a single industry and a single job. This deliberate choice allowing better control over extraneous factors is also consistent with strategic HRM research. Nonetheless, it imposes constraints on generalizability. Moreover, we tested a causal framework with an essentially cross-sectional design. The dependent measures were obtained for a period subsequent to that for the independent variables, attenuating the problem. Still, the non-experimental design does not represent a true causal test.

Except for dependent variables, we obtained information from a single key informant in each organization. Gerhart *et al.* (2000), and Wright *et al.* (2001) point to the possible unreliability of such data. It is for these reasons that we focussed on a single job, picked key informants who were knowledgeable about the job, and studied much smaller (and likely more homogeneous) organizations (the average firm had 401 employees, compared to an average of 46,000 employees in the Gerhart *et al.*, 2000 sample). The issue is also mitigated since Shaw *et al.* (1998) reported reasonable consistency between these key informant data and archival measures. Using other

informants in this sample could have actually led to lower reliability since we would have to seek information from less knowledgeable informants. In short, many factors indicate that the key informant reports are reliable and construct valid. The possibility of common method variance is eliminated through the use of different data sources for independent and dependent variables.

These constraints of our dataset and approach define the boundaries for interpreting the results. They also represent issues that future research should address.

Conclusions and implications

All in all, the present study shows substantively that the components of an HRM system (the individual practices) interact in a complex manner to predict financial performance. The study also shows that, in general, the configurational perspective holds much more promise than does the individual "best practices" perspective, and that it is unlikely that there is a universally effective HRM configuration. In partial support for the resource-based view of the firm, our results suggest that competitive advantage can be obtained through investments in human capital or through other strategies. They also point to the complexity inherent in achieving an HRM system and human capital resources that are valuable, rare, and inimitable. In a practical vein, the study suggests that organizations must use internally consistent HRM practices. Using practices that enhance AMO characteristics of the workforce is financially advantageous. But using inconsistent practices together can indeed be "deadly."

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Corresponding author

John Delery can be contacted at: jdelery@walton.uark.edu

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