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The HR – Firm Performance Relationship: Can it be in the Mind of the Beholder?

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Working Paper 00 – 02



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Can it be in the Mind of the Beholder?**

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This paper has not undergone formal review or approval of the faculty of the ILR School. It is intended to make results of Center research available to others interested in preliminary form to encourage discussion and suggestions.

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Abstract

This study examined whether respondents' implicit theories of performance could impact their responses to surveys regarding HR practices and effectiveness. Senior Human Resource and Line Executives and MBA, graduate Engineering, and graduate HR students read scenarios of high and low performing firms and were asked to report on the prevalence of various HR practices and effectiveness of the HR function in each firm. Results indicated that all four groups of respondents held implicit theories that high performing firms were characterized by extensive HR practices and had highly effective HR functions relative to low performing firms. Subjects with substantial work experience reported greater differences between high and low performing firms than did subjects with relatively little work experience. The implications of these results for research on the HR Practices – Firm Performance relationship are discussed.

The HR – Firm Performance Relationship: Can it be in the Mind of the Beholder?

Recent research in the field of Strategic Human Resource Management (SHRM) has explored both the substance of organizational human resource strategies and the impact of the various strategies on important firm outcomes (Dyer, 1985). This research has examined both the impact of individual HR practices on firm outcomes, such as compensation (Gerhart & Milkovich, 1990) and employee selection (Terpstra & Rozell, 1993), and the effect of sets of human resource practices on firm performance (Arthur, 1994; Delaney & Huselid, 1996; Delery & Doty, 1996; Huselid, 1995; Huselid & Becker, 1996; Huselid, Jackson & Schuler, 1997; Ichniowski, Shaw & Prenzushi, 1997; Koch & McGrath, 1996; MacDuffie, 1995; Welbourne & Andrews, 1996; Youndt, Snell & Lepak, 1996). This stream of research has documented statistically and practically significant relationships between various measures of “planned human resource deployments” (Wright & McMahan, 1992, p. 298) and business unit and/or firm outcomes. Effect sizes in these studies typically indicate that a one standard deviation increase in the use/quality of a set HRM practices is associated with approximately a 20% increase in profits (return on assets) (Becker & Huselid, 1998; Gerhart, 1998; Gerhart, Wright, McMahan & Snell, 1999).

While extremely promising, this research, with few exceptions, has relied on the survey responses from one knowledgeable informant per company to measure the content and quality of firms’ human resource management systems. Reliance on just one informant makes the measurement of the human resource management construct susceptible to excessive random (i.e., unreliability) and systematic (i.e., bias) measurement error thus threatening construct validity and the validity of an entire subset of SHRM empirical research (Schwab, 1980). Thus, in order to push the SHRM field forward, serious attention must be focused now on ensuring adequate construct validity of measures used through demonstrating that they are free from both random and systematic error.

Recent research by Gerhart and his colleagues (1999) points to the potentially problematic nature of construct validity of measures of HR practices, particularly with regard to random measurement error. Lacking direct estimates of the interrater reliability of the SHRM construct, Gerhart (1998) compiled estimates of interrater reliability of a variety of organizational constructs measured with one informant and reported the median to be 0.39. Gerhart et al (1999) replicated a typical SHRM study and estimated the G-coefficient, a measure of multiple sources of measurement error, to be .077, significantly less than Nunnally and Bernstein’s

(1994) recommended minimum of .70. As random measurement error leads to a downward bias in observed relationships, the “true” impact of HR practices on firm financial outcomes may be significantly greater than current empirical research suggests.

The measurement of Human Resource constructs is also susceptible to systematic measurement error. This type of error will occur if respondents report HR practices based not on accurate valid estimates, but rather based on an implicit theory that high performing firms must be engaged in progressive HR practices while low performing firms must not be engaged in such practices. However, to date, no empirical data exists that respondents might hold such a implicit theory, nor that this implicit theory might impact their responses.

Thus, this study explores the possibility that systematic error can exist in measures of HR practices, potentially artificially inflating estimates of the relationship between HR practices and firm performance. In doing so we sought to answer two questions: (1) Do potential respondents hold implicit theories that high performing firms have more progressive HR practices than low performing firms, and (2) Do these implicit theories differ based on either functional orientation (HR versus non HR) or experience (students versus practicing managers)?

Review of the Literature

Implicit Theories and Their Impact on Empirical Results

The most commonly considered forms of systematic bias in organizational research are percept-percept inflation and halo bias. Percept-percept inflation results when each subject provides information for the independent and dependent variable at the same point in time (Gerhart, 1998). Halo error exists when respondents use a common schematic framework to rate items or scales for distinct constructs (Avolio, Yammarino & Bass, 1991). However, neither of these are relevant to the research on HR practices and firm performance because, with one exception (Delaney & Huselid, 1996), all of the studies cited above collected information regarding firm performance from a source different than the respondent providing information regarding HR practices.

However, a third, and less frequently considered possible source of systematic bias is the implicit theories of the informants. Informants, like researchers, have implicit theories regarding the causes of firm performance. As organizational research is rarely, fully counterintuitive, informant theories of performance are likely quite similar to researchers’ theories of performance (Staw, 1975). When retrieving information regarding the characteristics of the organization (i.e., the extent/quality of HR practices) from memory, implicit theories may bias the recall in a way consistent with the theory the researcher is trying to test. In other

words, subjects in high performing companies may exaggerate the use/quality of HR practices while subjects in low performing companies may understate practices resulting in a spurious relationship between HR practices and firm performance. Below we examine the theory underlying implicit theories (attribution theory) as well as the prevalence of implicit theories in organizational research.

Attribution Theory and Implicit Theories

Attribution theory (Kelly, 1973) attempts to explain how people make causal explanations of the world around them and the consequences of these beliefs on behavior. The theory was originally developed to explain how and why individuals assigned traits and dispositions to themselves and others. However, Kelly (1973) broadened the scope of the theory to include all causal attributions of the type “Property X causes Effect Y” (Kelly, 1973; Staw, 1975).

The theory assumes that all individuals behave as naïve scientists seeking to understand the causes of salient outcomes. Possible causes that appear to precede and covary with the effect of interest over time are attributed as likely causes of the effect. The final choice of a cause or causes is based on the subject’s experience in observing cause and effect relationships, quasi-experiments in which subjects manipulate possible causal factors, and from implicit and explicit teachings of the causal nature of the world (Kelly, 1973, p. 115). Related pairs of causes and effects are grouped into implicit theories which explain larger portions of the world with fewer variables.

There is a strong conceptual basis for believing that implicit theories of performance affect the responses subjects provide in management research. Completing a survey for management research involves a complex sequence of information processing events. Whether providing objective information or subjective evaluations, subjects must be exposed to the stimulus of interest, attend to the stimulus, encode, and store the information. There is usually a gap in time between the time the information is stored and retrieved for the purpose of completing a survey. Once retrieved from memory, the information is recorded on the questionnaire. It is unlikely informants encode, store, and retrieve the desired information with perfect accuracy. Even in the absence of memory decay, the entire process poses substantial information processing demands. To reduce these demands, subjects rely on implicit theories to cue the salient information, structure it into coherence, and fill in gaps of missing information (Rush, Thomas & Lord, 1977). Thus when informants retrieve subjective or objective information about their organization that corresponds to an implicit theory of firm performance, the information is likely to be biased consistent with this theory in the direction of the (perceived)

performance of the firm (Downey, Chacko & McElroy, 1979; Eden & Leviatan, 1975; Gerhart, 1998; Martell & Guzzo, 1991; Martell, Guzzo & Willis, 1995).

This is particularly true with measures for which it is extremely difficult to gather and/or report information such as HR practices. In small organizations (100-200 employees), asking the senior HR person about the percentage of employees who are covered by a set of HR practices might be information that is readily accessible and/or easy to gather and report. However, as organizations grow larger (in terms of number of employees) and more complex (in terms of more job categories, more sites, and more business units/divisions), this information is less readily accessible. For a company with 40,000 employees spread across the globe in diversified industries, one would not expect that senior HR respondents could, or even should know, with any accuracy, the percentage of employees who are covered by particular practices. In such cases, it would be easy for the respondent to simply rely on an implicit theory to deduce the answer to the questions. The following discussion examines how similar effects have been observed in other areas of macro and micro organizational research.

Impact of Implicit Theories in Macro Organizational Research

There is extensive theoretical and empirical support for the proposition that implicit theories systematically bias results in macro organizational research. In their 1967 book Organization and Environment, Lawrence and Lorsch concluded that firms have higher performance when managers align the properties of the organization with the properties of the environment (Lawrence & Lorsch, 1967; Starbuck & Mezias, 1996). Suspecting bias, several researchers attempted to replicate the methodology used in their study and came to the conclusion that there is a lack of convergent validity among managers' perceptions, archival measures, and outsiders' perceptions of firm-specific environmental uncertainty (Boyd, Dess & Rasheed, 1993; Downey, Hellriegel & Slocum, 1975; Tosi, Aldag & Storey, 1973). Numerous studies have suggested that managers' communications to outside stakeholders about the external environment are a function of the performance of the firm (Bettman & Weitz, 1983; Salancik & Meindl, 1984). However, these attributions are the end product of communications attempting to influence the beliefs of stakeholders (McCabe & Dutton, 1993). McCabe and Dutton (1993), using methodology to tap into the internalized mental models of managers, documented the impact of the perceived performance of the firm on the perceptions of the external environment. Consistent with our proposition, these results support the notion that the (perceived) performance of the firm may influence subjects' responses in macro organizational research.

Theories and empirical studies in the field of strategic management attempt to explain firm performance as a function of the purposeful actions of the top management team. Strategy researchers frequently rely on managers as informants regarding these practices. It is therefore surprising that so little work has been done to explore the effect of firm performance on managers' descriptions and evaluations of firm policies and their enactment (Martell & Guzzo, 1991; Starbuck & Mezias, 1996). As mentioned above, researchers have been and continue to be interested in managers' perceptions of the external environment; there appears to be little interest in their perceptions of the internal environment of the firm. To our knowledge, only the accuracy of managers' retrospective accounts of past organizational and managerial actions has received empirical attention (Golden, 1992).

Golden (1992) surveyed a group of hospital CEOs at two points in time two years apart regarding their hospitals' placement on Miles and Snow's typology of strategic types. The inter-temporal reliability of these responses were quite low. Although Golden's methods have been criticized by Miller and his colleagues (Miller, Cardinal & Glick, 1997), there is general consensus that executives' descriptions of past events suffer from low reliability. Although not directly tested, several scholars reviewing these results hypothesize the lack of reliability may be partially the result of respondents' implicit theories of performance (Golden, 1992; Miller, et al., 1997; Starbuck & Mezias, 1996).

One stream of strategy research attempts to document the correlates of corporate reputation and its economic value to the firm. There is strong evidence that outsiders' perceptions of reputation is function of financial performance. Every year since 1983, Fortune magazine has published a list of the most admired corporations based on ratings of such attributes as quality of management, quality of products/services, innovativeness, and ability to attract, develop, and keep talented people. These ratings are provided by 8000 outside executives, directors, and market analysts. In addition to a high degree of intercorrelation among the performance measures, firm financial performance explains 39% to 59% of the variance of these measures (Brown & Perry, 1994). It is not such a great leap to believe that if external experts' evaluations of company policies and practices are strongly biased by firm performance, internal informants responses are also likely to be biased (Gerhart, 1998).

Impact of Implicit Theories in Micro Organizational Research

Numerous lab and field experiments have documented how implicit theories impact results in micro organizational research. Psychologists first suspected that implicit theories biased subjects' responses during early testing of the factor structure of personality tests. Researchers (Norman & Goldberg, 1966) noted that similar personality factor structures

emerged whether raters had known ratees for a long time or only a few days. Eden and Leviatan (Eden & Leviatan, 1975) suspected that implicit theories may also affect organizational research subjects. To verify their hypotheses, the authors instructed a large group of undergraduates to complete the leadership scales of the 1969 version of the Survey of Organizations. They were told to describe “a plant you do not know. It is Plant X, and is located in the central region of the country” (Eden & Leviatan, 1975, p. 737). Factor analysis resulted in the same four factor solution found in studies using the scale with subjects of actual organizations. The authors concluded the four factor solution for leadership in the Survey of Organizations reflected a homogeneous implicit theory of leadership.

A stream of lab research followed Eden and Leviatan’s (1975) study that attempted to document the effect of implicit theories on subjects’ pattern of responses to surveys in leadership and group process research. Specifically, scholars hypothesized that subjects with information about the performance of a group or leader would provide biased descriptive and evaluative information consistent with a common, implicit theory of performance. Typically, leadership researchers would first present subjects with either a written description of a leader (Rush, et al., 1977), an audio or videotape of a person leading a small group (Mitchell, Larson & Green, 1977), or allow the subjects to participate in a small group with a leader (Mitchell, et al., 1977). They would then provide subjects with (bogus) information about the performance of the leader, and have the subjects complete standard leader behavioral questionnaires. Group process researchers typically presented subjects with a video of a group engaged in a problem solving activity (Lord, et al. 1978; Martell & Guzzo 1991; Martell, et al. 1995; Mitchell, et al. 1977; Rush & Beauvais 1981) or allowed subjects to participate in a group activity (Staw, 1975). They provided (bogus) performance information, then had the subjects complete questionnaires asking them about group behaviors (objective questions) and processes (evaluative questions). Across all studies, subjects given positive performance information provided more positive evaluations of leaders and group processes and “recalled” the leader or group engaging in more positive behaviors than subjects provided negative performance information.

The variations in methodology used by the researchers demonstrate the robustness of this effect. Lord et al (1978) manipulated the performance information provided to the subjects as well as the behaviors of the groups in the video stimulus. There were main effects for the behavioral and performance cue information with no interaction effects. And although the effect of the behavioral manipulation was larger, the performance cue consistently caused subjects to bias their descriptions and evaluations of group processes.

Rush and Beauvais (1981) suspected that the performance cue effect might be the result of subjects providing biased responses to questions they did not have sufficient information to answer. They allowed half of their subjects to skip questions they did not have sufficient information to answer and encouraged the other half to answer the entire survey. There was no evidence that the performance cue effect was smaller for subjects with the option of answering only questions of which they were sure.

Martell et al (1995) noted that all performance cue experiments had manipulated performance information in exactly the same way. Subjects were always told the group they had observed (or participated in) was judged to have performed very effectively or ineffectively. Instead of a performance cue effect, the consistent findings could be the result of experimenter demand characteristics. Martell et al (1995) analyzed the responses of subjects (from Martell & Guzzo's (1991) study) who had not received performance information to see if their internally generated performance cues led to biased descriptions and evaluations. Those that had formed more positive perceptions of the group's performance identified more positive group behaviors and gave more positive evaluations of group processes than subjects who had perceived more negative perceptions of group performance. These findings allow us to conclude the performance cue effect is not merely the result of experimenter demand characteristics.

Hypotheses

The previous discussion has suggested that implicit theories have been shown to influence the estimates of relationships between independent and dependent variables across a wide variety of fields at all levels of analysis. It has also suggested the existence implicit theories that might bias the estimates of the relationship between HR practices and firm performance. Our study uses a simulation methodology to examine if implicit theories can impact estimates of the relationship between HR and firm performance. In this study, participants were asked to read scenarios describing both a high performing (in terms of financial and operating performance) and low performing firms. They were then asked to report the percentage of managerial and professional employees who were covered by a variety of HR practices, as well as the effectiveness of the HR function. Given the fact that absolutely no information regarding HR practices existed in the scenarios, participants' responses (in terms of the differences between high and low performing firms) were solely due to their implicit theories regarding the impact of HR on firm performance.

Drawing upon the above literature review we propose four primary hypotheses. The first two suggest that the impact of implicit theories that has been documented in leadership, small group and organizational environment research will also impact measures of the internal

environment, specifically HR policies and practices. Given that a plethora of research has shown that information about performance (whether individual or organizational) influences subjects' reports of processes, we propose:

Hypothesis 1: The estimated extent of the usage of human resource practices for high-performing firms will be greater than low performing firms.

Hypothesis 2: The evaluation of the effectiveness of the HR function for high performing firms will be higher than for low performing firms.

As mentioned above, implicit theories are developed and reinforced through the observation of cause and effect relationships, quasi-experiments in which people are able to manipulate possible causal factors and from explicit and implicit teachings of the causal nature of the world (Kelly, 1973). Such experience in observing cause and effect could moderate the impact of implicit theories regarding the relationship between HR and firm performance in two ways. First, naïve subjects (i.e., those who have little or no experience in working for real organizations in higher level decision making positions) might have very different implicit theories than those who hold such positions. This would lead to the expectation that students would differ from experienced managers in their implicit theories regarding the impact of HR on firm performance. One might expect that students, based on their limited experience with all of the variables (e.g., prices, competitors, customer preferences, etc.) that influence firm performance, might overestimate the impact of HR. This leads to Hypothesis 3:

Hypothesis 3: Students will report greater differences between high performing and low performing firms on both the estimated extent of usage of human resource practices and evaluation of the human resource function relative to experienced executives.

Second, the functional background of the respondents might also moderate the impact of implicit theories on the relationship between HR and firm performance. Subjects coming from an HR background have a self-serving bias to believe that HR practices and the HR function are integrally related to firm performance. However, respondents who are not from an HR background may believe that HR has less, or even no impact on firm performance. Thus we expect that persons with training and/or experience in the field of human resource management will have stronger implicit theories regarding the covariation of HR practices and firm performance.

Hypothesis 4: Subjects from an HR background will report greater differences between high performing and low performing firms on both the estimated extent of usage of human resource practices and evaluation of the human resource function relative to non-HR subjects.

Methods

Subjects

Data were gathered from four subsamples of individuals. First, 55 senior HR executives were contacted by fax through the Center for Advanced Human Resources Studies (CAHRS) at Cornell University to explain the purpose and procedure for the study, and asking them to volunteer to participate. CAHRS sponsors are virtually all large Fortune 500 firms such as Shell, BAT, IBM, PepsiCo, Monsanto, Allied Signal, Xerox, GTE, General Mills, Continental Airlines, Starbucks, Citigroup, Bristol-Myers Squibb, Eastman Kodak, and Toshiba . Executives representing these companies typically hold the title of Senior Vice President or Vice President of their respective corporations, and in most cases are the person that would receive a survey regarding corporate HR practices. Executives from twenty-six (47%) firms agreed to participate in the study themselves along with one or more of their direct reports and one or more of their (peer) top line executives. Each HR executive was mailed an appropriate number of survey packets for themselves and participating colleagues. The executive served as the contact point, and was asked to distribute the surveys to the appropriate people within the organization. Of the 26 firms whose HR executives agreed to participate, surveys were received from that HR executive, a direct report and/or a line executive from 19 (73.1%) of them. In total, we received 32 surveys from HR executives and 16 surveys from Line executives.

The student samples were gathered as follows. Fifty-six predominately first-year MBA and graduate Engineering students were asked to complete surveys in class during the first week of a manufacturing management class. 100% returned completed surveys. Finally, 38 first year graduate students in HR management were asked to complete surveys in-class during the first week of a training and development class. The same researcher provided an identical explanation and collected the completed surveys. 100% returned surveys.

Fully completed surveys usable for analysis were collected from 25 HR executives, 11 line executives, 44 MBA/graduate Engineering students, and 28 HR students. The difference between the number of surveys completed and the number available for analysis was due to missing data. Because there were multiple dependent variables (see below), MANOVA was used for data analysis resulting in the exclusion of cases with incomplete responses for any of the independent and six dependent variables.

Procedure

Subjects were contacted as noted above. HR and Line executives received packets with a cover letter explaining the general purpose of the study as well as all of the experimental materials. (The field survey included items regarding their own firm's HR practices as well, but these results are reported in another paper). The survey itself asked subjects to read a scenario of a high (low) performing company, respond to a survey regarding the HR practices of this hypothetical company, turn the page, read a similarly worded scenario describing a low (high) performing company and complete an identical survey regarding HR practices. The first 15 questions consisted of commonly used items regarding HR practices (Arthur, 1994; Huselid, 1995; Becker & Huselid, 1998). Questions 16 through 20 assessed participants' perceptions of the HR functions' contributions to firm performance. These questions were drawn from a (unpublished) study of the perceptions of line and HR managers' perceptions of the effectiveness of the HR function (Wright, McMahan, Snell & Gerhart, 1999). Previously reported reliability estimates were within acceptable guidelines. The Order of the presentation of the high and low performing company scenario was counterbalanced across subjects. The entire survey can be found in the Appendix. Executive respondents returned the surveys in self-addressed, postage paid envelopes, while student respondents handed their surveys in directly to the second author.

Dependent Variables

SHRM researchers typically standardize each item in an organizational HR survey and factor analyze the set of items to uncover common factors usable as composite variables (Huselid, 1995; Huselid & Becker, 1996; Huselid, et al., 1997). Standardizing items converts them to a common scale of measurement so items can be aggregated with equal weights. Such procedures were not possible with this data as standardization of the items would have reduced all means to zero preventing the analysis of differences between estimated human resource practices in the high performing and low performing firms. Thus six dependent variables (2 multi-item scales and 4 single items) were constructed from the twenty-item HR survey.

The first 11 questions asked the respondents to estimate the proportion of managerial/technical employees covered by various HR practices. Because all of these items were on the same scale of measurement, we aggregated them into a scale called HR Practice Usage by calculating the mean of the 11 items for each company for each respondent. The Cronbach's alpha for this scale was 0.82 for the high performing company and 0.85 for the low performing company.

Question 12 asked subjects to estimate the market percentile of the total compensation package. This single item was used as an indicator of Value of Total Compensation. Question 13 asked subjects to estimate the change in total compensation for low performers. This single item was used as an indicator of Rewards for Poor Performance. Question 14 asked subjects to estimate the change in total compensation for high performers. This single item was used as an indicator of Rewards for High Performance. Question 15 asked subjects to estimate the number of qualified applicants for each open position. This item was used as an indicator of Selectivity/Recruiting Activity. Although there is always great concern when using one item to represent a construct (Nunnally & Bernstein, 1994), we were unable to include these items in an aggregate scale and were forced to choose between deleting them or including them in the analysis as single items. We conducted the analyses with and without these items (not shown). As their inclusion did not change the results discussed below, we left them in the analysis as they add depth to the conclusions we draw regarding the impact of performance information on the response to SHRM surveys.

Finally, items 16 through 20 asked the subjects to estimate the contribution of the HR function to strategic and financial outcomes. We aggregated these items into a scale called HR Effectiveness by calculating the mean of the five items. The Cronbach's alpha for this scale was 0.89 for the high performing company and 0.91 for the low performing company.

Independent Variables

As mentioned above, subjects came from pools of graduate HR students, MBA students, graduate Engineering students, HR executives, and Line executives. **Experience** was operationalized by whether the respondent was from the student or the executive sample. **Functional Background** was operationalized by whether the respondent was in HR (either within the organization or as a major) or some other functional area of business. **Performance** served as the within-subjects factor and was operationalized as to whether the responses were to the high or low performing firms. However, subjects varied in the order in which they evaluated the high and low performing companies. Thus, **Order** was operationalized as to whether the subject was presented with the high or low performing firm scenario first. This was only coded to ensure that Order did not confound the results, and was meant to be left out of the tests of hypotheses. Thus each subject was coded for Experience, Functional Background, Performance, and Order of scenario presentation allowing a 2 x 2 x 2 x 2 design. Constructing these blocking factors allowed a more fine-grained analysis of the influences on the responses to the surveys and a greater reduction in within group variability.

Analyses

Analysis of the data involved the use of MANOVA with repeated measures. MANOVA was necessary due to the use of multiple dependent variables. As ANOVA reduces the inflation of Type I error due to making multiple comparisons of treatment groups, MANOVA reduces the error associated with testing the significance of a series of dependent variables (Hair, Anderson, Tatham & Black, 1998). Secondly, repeated measures analysis was necessary as the same subjects provided information for the same measures under two different experimental conditions. Without this type of analysis, the assumption of the independence of the error terms is violated potentially biasing the effect size and direction estimates (Hair, et al., 1998).

When conducting MANOVA with repeated measures, two important assumptions in addition to the assumption of independence of the error terms, must be tested and corrected if necessary. These include the assumption that the variables are multivariate normal and the assumption the variance-covariance matrices are equal for within and between group factors. As there were only two measurement episodes, equality of variance for the within subject factors was not a consideration in this study (Bergh, 1995). There is no direct test of multivariate normality and univariate normality is usually used as a proxy (Hair, et al., 1998). Analysis of the normal probability plots and skewness and kurtosis statistics indicated three variables (Rewards for Low Performance, Rewards for High Performance, and Selectivity/Recruiting Activity) were not normally distributed. Tests for equivalence of between subject covariance matrices indicated the matrices were not equal across factors due to these variables. The Reward for Low Performance variable was transformed by taking the square root of the variable plus a constant (to ensure it exceeded zero); the Reward for High Performance and Selectivity/Recruiting Activity variables were transformed by adding a constant and taking the natural log of the resulting number. Reanalysis indicated normality and covariance equality were within acceptable limits (Hair, et al., 1998).

Results

The means, standard deviations and intercorrelations of all of the study variables are presented in Table 1.

TABLE 1: Correlations and Descriptive Statistics

Variables ^a	Mean ^b	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Order of Scenario Presentation ^c	.50	.50														
2. HR or Non-HR Background ^d	.49	.50	-.02													
3. Experience ^d	.70	.46	-.06	-.25**												
4. HR Practice Usage (H)	73.22	15.36	-.20*	.15	-.31**											
5. HR Practice Usage (L)	27.70	15.99	.11	-.14	.14	.07										
6. Value of Total Compensation (H)	70.18	16.71	-.13	.12	-.09	.35**	.06									
7. Value of Total Compensation (L)	40.31	15.30	.00	.29**	.04	-.04	.32**	.12								
8. Rewards for Low Performance (H)	9.13	16.93	.00	.10	.09	-.01	.13	-.10	.10							
9. Rewards for Low Performance (L)	8.21	16.21	.02	.12	.11	-.02	.19*	-.10	.10	.51**						
10. Rewards for High Performance (H)	22.06	20.83	.12	.03	.00	.07	.03	.03	.02	.57**	.53**					
11. Rewards for High Performance (L)	12.31	18.77	.05	-.01	.17	.02	.22*	-.10	.04	.47**	.69**	.57**				
12. Selectivity/Recruiting Activity (H)	31.82	51.30	-.18*	-.06	.17*	.08	-.08	.09	-.05	.11	.05	-.06	.03			
13. Selectivity/Recruiting Activity (L)	10.67	16.17	-.16	-.14	.26**	-.08	.10	.07	.17	.17	.08	-.04	.08	.76**		
14. HR Effectiveness (H)	4.20	.63	.11	.21*	.15	.53**	-.23*	.23*	-.01	-.10	-.20*	.01	-.13	.11	-.10	
15. HR Effectiveness (L)	1.86	.65	.03	-.14	.18*	-.23**	.50**	-.11	.23*	.22*	.07	.02	.12	.02	.16	-.36**

^aVariables followed by 'H' are for the high performing scenario; 'L' for the low performing scenario.

^bMeans and standard deviations calculated with untransformed values. Correlations calculated with transformed values.

^cCoded as 1 or 0; low performing company first – 0, high performing company first – 1.

^dCoded as 1 or 0; Non HR or non-student – 0; HR or student – 1.

* $p < .05$. ** $p < .01$. *** $p < .001$.

TABLE 2: Summary of Multivariate Tests of Order as a Between and Within Subjects Main and Interaction Effect

	Model 1 Performance & Order			Model 2 Performance, Order, & HR Status			Model 3 Performance, Order, & Experience		
	Exact F	Hypo. df	Error df ^a	Exact F	Hypo. df	Error df ^a	Exact F	Hypo. df	Error df ^a
Between Subjects									
Order	1.22	6	102	1.21	6	99	1.10	6	100
Order x HR Status	--	--	--	.77	6	99	--	--	--
Order x Experience	--	--	--	--	--	--	1.36	6	100
Within Subjects									
Performance x Order	.93	6	102	.81	6	99	.57	6	100
Performance x Order x HR Status	--	--	--	.47	6	99	--	--	--
Performance x Order x Experience	--	--	--	--	--	--	1.29	6	100

^aThe degrees of freedom differ in these columns as the number of subjects providing information for all variables differs by group.

* $p < .05$. ** $p < .01$. *** $p < .001$.

As Order of Presentation might confound the results, we investigated the effects of Order on the dependent variables. As there was insufficient power to include Order in the full model, we tested the impact on the set of dependent variables using several partial models. Table 2 presents the results of three models of main and interaction effects of Order as a between and within subjects variable. Model 1 tested the effects of Order without inclusion of the categorical variables Experience and HR Status. Model 2 included Order of scenario presentation and HR Status. Finally model 3 included Order and Experience. As can be clearly seen in Table 2, the MANOVA results indicate that Order did not have a main or interaction effect as a between subject or within subject variable in any of the three models. Thus we can conclude that Order of presentation did not significantly affect the subjects' responses and that it can be dropped from the remainder of the analyses.

Hypothesis 1 predicted that subjects would rate the objective descriptions of HR practices of the company with high performance higher than the company with low performance. Specifically the high performing company would be expected to have higher HR Practice Usage, Value of Total Compensation, Rewards for High Performance, and Selectivity/Recruiting Activity. In addition, high performing companies were expected to have lower Rewards for Low Performance than low performing companies. Hypothesis 2 predicted that the HR Effectiveness of the high performing company would be rated higher than the low performing company. Hypotheses 3 and 4 proposed that Experience (students vs. executives) and functional orientation (HR vs. non-HR) would moderate these relationships. To test these hypotheses we performed MANOVA with repeated measures. When testing between subjects effects, the null hypothesis tested is the equality of the means of a linear combination of the dependent variables across groups. Support for Hypotheses 1 and 2 would be demonstrated by a significant within subjects performance scenario effect in the MANOVA results. Support for hypotheses 3 and 4 would be demonstrated by significant Experience x Performance and Function x Performance interactions, respectively.

The multivariate results can be seen in Table 3. As can be seen from the top half of Table 3, no between subjects effects were significant. This indicates that any differences across groups were likely due to the experimental manipulation of the performance scenarios and not an overall difference in responses across the groups.

TABLE 3: Summary of Multivariate Between and Within Subjects Effects

Variable	Exact F ^a	η^2
Between Subjects		
HR Status	1.54	.09
Experience	1.47	.08
HR Status x Experience	.21	.01
Within Subjects		
Performance	143.36***	.90
Performance x HR Status	.86	.05
Performance x Experience	2.75*	.14
Performance x HR Status x Experience	.41	.02

^aDegrees of freedom for all tests were 6 for hypothesis and 99 for error.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The bottom half of Table 3 shows the results of the multivariate test of within subject effects. The results give preliminary confirmation of hypotheses one and two as the results indicated a significant performance effect ($F=143.36$; $p < .001$; $\eta^2 = .90$). One or more of the mean differences in HR values between the high and low performing company identified in Table 2 is significant.

To determine which of the six dependent variables were responsible for the significant main effect of Performance identified in the multivariate test, we conducted multiple univariate tests of the effect of the Performance scenarios on the six variables. Table 4 shows the results of that analysis. To reduce the inflation of Type I error associated with multiple univariate tests, we adjusted our alpha by dividing it by the number of univariate tests for a new alpha of .008 (.05/6). As can be seen in the right hand column of the Table 4, five of the six dependent variables were significantly different in the low performance condition than the high performance condition. Referring to the means of these variables in Table 2, one can see the values are consistently higher for the high performing company than the low performing company as predicted by hypothesis one and two. Specifically, objective descriptions of HR practices are higher (HR Practice Usage, Rewards for High Performance, and Selectivity/Recruiting Activity). Additionally, the evaluation of HR Effectiveness was also higher for the high performing company than the low performing company. Counter to the prediction of hypothesis 1, Rewards for Low Performance were not significantly lower for the high performing company than the low performing company. Either subjects do not believe that low performing companies reward low performers differently than high performing companies or the one item measure is unreliable.

Table 4: Univariate Tests of Within Group Differences in HR Measures Due to Performance Scenarios

Variable	F Statistic ^a
HR Practice Usage	603.71***
Value of Total Compensation	172.92***
Rewards for Low Performance	.02
Rewards for High Performance	14.59***
Selectivity/Recruiting Activity	136.92***
HR Effectiveness	712.09***

^aDegrees of freedom are (1, 107) for all tests.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The results provide some support for hypothesis 3 as a significant Experience x Performance interaction was observed ($F = 2.75$, $p < .05$; $\eta^2 = .14$) however, the nature of the interaction was opposite what we predicted. To determine which of the variables were causing the interaction effect identified in the multivariate test, we ran multiple univariate ANOVAs with repeated measures of the interaction effect of Performance Scenario and Experience for each of the variables (not shown). As before, to prevent the inflation of Type 1 error associated with multiple univariate tests, we adjusted our alpha by dividing it by the number of univariate tests for a new alpha of .008. It appears HR Practice Usage ($p < .001$) and HR Effectiveness ($p < .004$), the two multi-item variables, were the two variables contributing to the interaction identified in the multivariate results. The four single item variables did not contribute to the multivariate effect. Figures 1 and 2 graph the interaction effect of these two variables. The interaction appears to be ordinal indicating that although the effect of Performance on these variables is dependent on Experience, the main effect of the Performance Scenario is consistent for both groups (Hair, et al., 1998). In other words, experienced and non-experienced subjects rate both variables higher in the high performance company than the low performance company, but experienced subjects rated the high performance company higher, and low performance company lower, relative to the non experienced subjects.

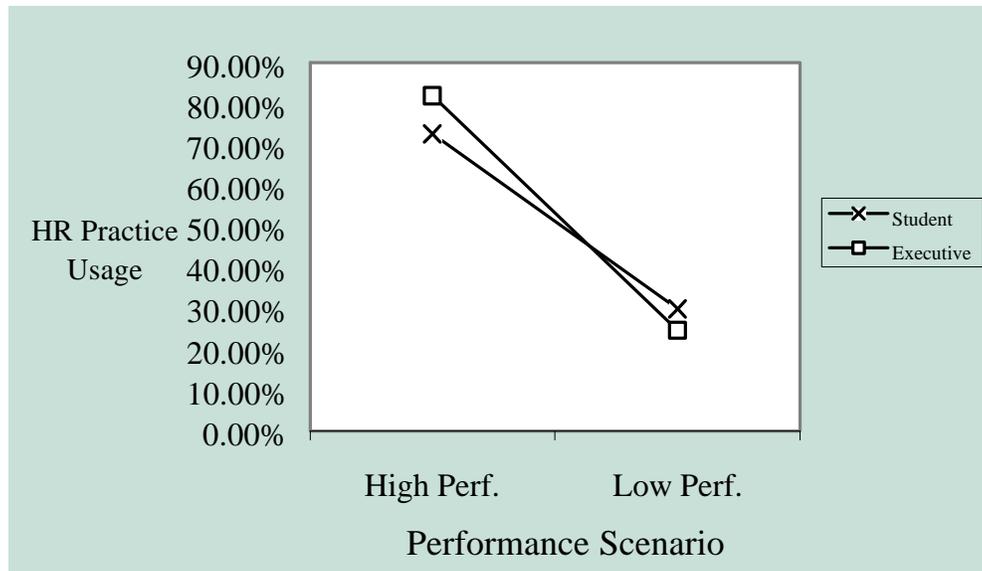


FIGURE 2. Mean estimate of student and executive subjects of the proportion of managerial, professional, and technical employees covered by a standard set of human resource practices in hypothetical high-performing and low-performing companies. Both subject groups estimated greater use of HR practices in the high-performing company relative to the low performing company. Executives relative to students estimated significantly greater usage of practices in the high performing company and significantly less usage in the low performing company.

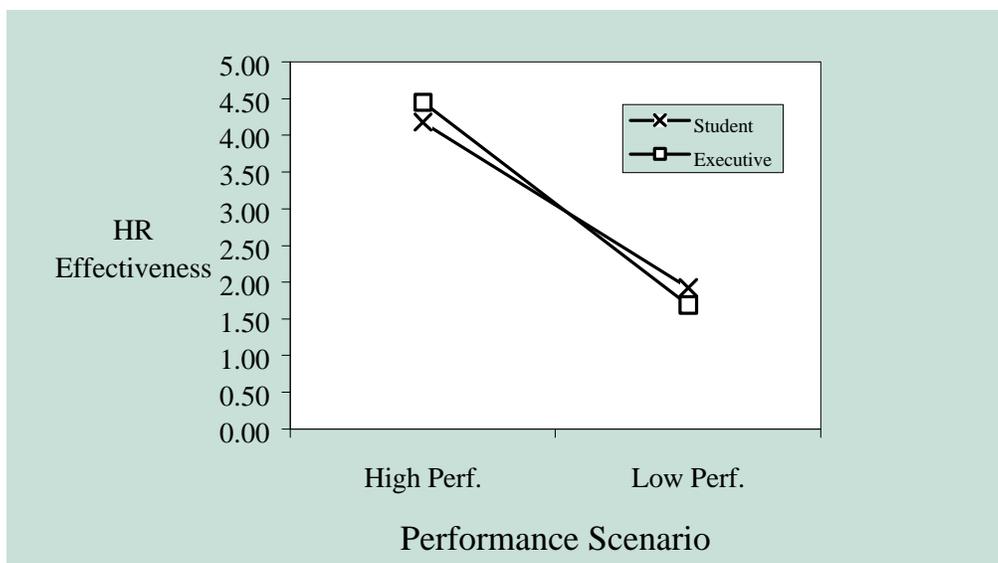


FIGURE 2: Mean rating by student and executive subjects of the effectiveness of the human resource function in hypothetical high-performing and low-performing companies. Both subject groups rated the function more effective in the high performing company relative to the low performing company. Executives, relative to students rated the HR function significantly more effective in the high-performing company and significantly less effective in the low performing company.

Finally, as can be seen in Table 3, no support was shown for hypothesis 4, as the Function x Performance interaction failed to reach significance ($F=.86$; $p < .53$; $\eta^2 = .05$). These results indicate no differences in implicit theories between those with an HR and those without an HR functional background.

Discussion

Over the last 40 years, researchers from various disciplines have attempted to build justification for bringing mental models into their field of study by first establishing the existence and content of these models. After reviewing this vast literature, Walsh (1995) concluded that we know individuals have mental models and that they affect their decision making processes. Therefore, he calls for a moratorium on research seeking only to establish the existence and content of mental models and exhorts potential researchers to examine the impact of mental models on outcomes of interest (Walsh, 1995). In this study we heeded Walsh's call by assuming the existence of individuals' mental models of HR practices and firm performance and examined the impact of these models on HR survey responses.

The results of this study suggest that respondents to surveys of HR practices in organizations may hold implicit theories that their firm's HR practices are associated with their firms' performance. Participants in our study had no information regarding the prevalence of HR practices in the two scenarios they were presented. Thus, their responses fully represented their implicit theories regarding the covariation between HR practices and firm performance. In essence, given their belief that HR matters, when presented with a high (low) performing firm, these respondents inferred a high (low) level of HR practices must exist.

These results imply that in the absence of complete and accurate information regarding HR practices, respondents to HR surveys **may** respond in a way consistent with their firms' performance, such that those working for high (low) performing firms will exhibit a bias for over-(under-) reporting the prevalence of these practices. This could cause an overestimate of the impact of HR practices on firm performance.

Note that these results do not necessarily suggest that past research is flawed. All research requires tradeoffs in order to be conducted, and at this point in time, surveys of key informants seem to be the most plausible methodology for examining the impact of HR practices on firm performance. While problems with this methodology, such as low interrater reliability have been noted, there is still reason to believe that future research will and should continue using it, although we believe that multiple key respondents are preferable and may, in fact, be a necessity (Gerhart, et al., 1999). In addition, in this study, respondents had no accurate information or experience from which to respond, so only implicit theories guided their

responses (i.e., all of the variance was error variance, and none was true variance). In past field research, respondents had significant experience with the firm and knowledge of the HR practices (i.e., there is a significant amount of true variance in the total variance). Thus, while implicit theories may influence the responses, it is unlikely to fully determine them to the extent observed here.

Note also that these results do not necessarily suggest that HR practices are not related to firm performance. Attribution theory argues that the implicit theories stem from experience in quasi-experiments that help individuals to form cause-effect theories. Thus, the implicit theories themselves must have some basis in reality through individuals' experience that suggests that HR practices are associated with firm performance. Thus, our results do not imply that HR is unrelated to firm performance, only that past effect sizes may be overestimates of the true effect.

The results also suggest the moderating effect of experience in the implicit theory. Students tended to report smaller differences between high and low performing firms relative to executives. This ran counter to our hypothesis. We expected that the naivete of students would cause them to overestimate the impact of HR on firm performance. On the contrary and surprisingly, executives indicated a significantly greater impact of HR on firm performance relative to the students. Rather than a naivete in overestimating the importance of people issues in organizations, it appears that students underestimated their importance.

Anecdotal support for this interpretation came from an HR professor who taught (as part of a team) in a field-based manufacturing management course. The MBA and Engineering students completed the survey during the first week of the class. They expressed at the end of the semester that there was "too much HR." This perception could not have come from the "in-class" time because the formal structure of the class was such that the amount of class time devoted to HR was equal to the other functional areas. However, on the numerous site visits during the semester, the issues that the company (mostly line) executives discussed inevitably involved people and HR issues, thus, possibly accounting for their perception that HR was overly emphasized. This may simply indicate that most real organizational issues are people issues with HR implications, and that students simply cannot comprehend that until they spend a significant amount of time in an organization.

Somewhat surprising was the failure to find any differences between those from an HR background/orientation relative to those who are not from HR. Given the frequent anecdotal data from HR executives complaining that their line executive counterparts do not seem to "get" the importance of HR, we fully expected to see less of an effect among the non-HR sample.

However, this effect simply was not observed, and this may be explained by 3 reasons. First, given the human capital shortage firms face and the increasing importance that people play in firm success, it may be that line executives are increasingly recognizing the importance of HR practices and activities. Wright and colleagues (Wright, et al., 1999) found that when asked to rate how critical a variety of HR practices/services were to their firms' competitive advantage, line and HR executives gave equal importance ratings.

Second, while the covariation perceptions may be shared by those both inside and outside of HR, it may be that the causal direction differs. In essence, it may be that HR people believe that it is the HR practices that are driving the firm to perform, while the line people believe that high performing firms have resources to invest in developing state-of-the-art HR practices.

Third, the failure to find a difference may be an artifact of the study methodology. By using a senior-level HR executive as the contact within the organization, it opens the possibility that the line executives asked to participate were those who already held a positive view of HR.

Overall, while certainly not calling for a moratorium on the use of key informant methodologies, these results imply that great caution should be taken in the design of SHRM research which uses such methodology. First, researchers should ensure that key informants are in a position to accurately report the practices that exist. This, at a minimum, requires that they hold a position in an organization whose size is not so large as to preclude good accessible information on the practices. Second, the practices need to be as specific as possible in order to minimize ambiguity. Thus, items such as "performance based pay" might not capture differences between firms that use only merit increases and those that use multiple incentives such as merit, stock options, profit sharing and gainsharing. Third, whenever possible, researchers should seek to gather information from multiple respondents from the firm (Gerhart, et al., 1999). In order to assess reliability, one would hope to get multiple respondents to assess all items. However, Huselid (personal communication, April 1999) notes that some firms in his study actually passed the survey to appropriate parties within the HR function so that, for example, the compensation expert completed the compensation items, etc. While such procedures can not guarantee the elimination of the response bias, they can minimize its effect.

Limitations

Finally, some limitations must be noted. First, the methodology of using paper organizations (written descriptions of an organization) certainly calls into question the generalizability of the results to actual studies in field settings. Second, because the subjects were not randomly selected, generalizability to the larger population cannot be guaranteed.

However, Mook (1983) questioned the assumption that generalizability is the goal of all research. He noted that some research is designed to test a theory rather than to generalize to some population. The purpose of our study was not to demonstrate that implicit theories **do** affect responses in SHRM research, only to demonstrate that they **can** affect these responses.

In addition, while the failure to randomly select our subjects limits our ability to generalize to the larger population, one must note that the respondents in the HR executive sample are certainly the kind of people who usually receive surveys of this type in field settings. 76.2% of our HR executives held the titles of Senior VP, VP, or Director for a corporation or a business unit.

An additional limitation is the potential for alternative explanations for the findings. For example hypothesis guessing or acquiescence (Cook & Campbell, 1979) might also account for results. Given that subjects were informed that the study was on “HR practices and firm performance” and was being conducted by HR researchers, they could have guessed that the researchers were hoping to find a positive relationship and attempted to answer the questions accordingly. In order to examine if this was the case, we performed two analyses. First since the Order of presentation was counterbalanced, we had a group of participants who saw the scenario of the high performing group first and another group who saw the low performing group first. Given that at the point they saw these scenarios they had no idea there was a second similar scenario, we compared the two groups’ responses in a between subjects design. The results were almost exactly the same. The performance scenario had a significant main effect ($F = 65.67$; $p < .001$; $\eta^2 = .79$). There was a significant interaction effect for Experience (student/executive) and performance scenario ($F = 2.15$; $p < .05$; $\eta^2 = .11$). Performance scenario and HR status did not interact ($F = 1.12$; $p < .36$).

Second, as respondents were aware to some extent of the study’s purpose (it was stated as examining the relationship between HR practices and firm performance), this might have influenced their responses. Thus, we took another group of 29 graduate HR students and presented half with the high and half with the low performance scenario absent any description of the study’s purpose. They were simply asked to complete the questionnaire. These results were consistent with the above. The multivariate results indicated the effect of the performance scenario was significant ($F = 15.28$; $p < .001$; $\eta^2 = .84$). Multiple univariate tests indicate three of the six dependent variables (HR Practice Usage, Market Value of Total Compensation, HR Effectiveness) were responsible for the multivariate results. Responses for the high performing scenario were higher than responses for low performing scenario. These univariate results differ only slightly from the results above. The two variables without significant differences were

single items and possibly unreliable. In addition, although the differences for these two variables were not significant, they were in the expected direction.

Clearly, these results do not eliminate hypothesis guessing or demand characteristics as possible influences; but they seem to indicate that these explanations are less likely to be responsible for the results we observed.

Conclusion

This study suggested that in the absence of valid accurate information regarding HR practices, knowledge of the firm's performance **can** influence respondents' reports of the prevalence of HR practices and the effectiveness of the HR function. This response bias may inflate the estimates of the relationship between HR practices and firm performance, but by how much is not known. Future research should attempt to ascertain the extent to which this bias exists in traditional field surveys in order to more accurately estimate the dollar value that firms can gain by investing in sophisticated HR practices.

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Appendix

You work for a relatively large (25,000 employees, \$4 billion in sales) organization as the Vice President of Human Resources. Your firm is thought of as highly successful within the industry. It has established a reputation for being among the **BEST in both quality and service**, and it has developed and taken to market a consistent stream of **innovative products**. The result has been that over the past 5 years it has been among the **TOP firms in the industry in market share, revenue growth, profitability, earnings growth and total return to shareholders**.

You work for a relatively large (25,000 employees, \$4 billion in sales) organization as the Vice President of Human Resources. Your firm is thought of as not very successful within the industry. It has established a reputation for being among the **WORST in both quality and service**, and it has developed and taken to market very few **innovative products**. The result has been that over the past 5 years it has been among the **BOTTOM firms in the industry in market share, revenue growth, profitability, earnings growth and total return to shareholders**.

Assume you just joined the organization and received the following survey. Answer the questions based on the limited information you have.

What proportion of the **managerial/professional/technical** workforce:

1. ...has their merit increase or other incentive pay determined by a performance appraisal?
2. ...receives formal performance appraisals?
3. ...is promoted based primarily on merit (as opposed to seniority)?
4. ...has any part of their compensation determined by a skill-based compensation plan?
5. ...is eligible for bonuses based on individual performance or productivity/profitability?
6. ...is regularly administered attitude/satisfaction surveys?
7. ...is administered an aptitude, skill, or work sample test prior to employment?
8. ...has access to a formal grievance procedure/complaint resolution system?
9. ...receives more than 40 hours of formal training per year on a regular basis?
10. ...receives sensitive information on the company's operating performance (costs, quality, etc.)?
11. What proportion of non-entry level jobs have been filled from within in recent (i.e., past 5) years?
12. If the market rate for **total** compensation (Base+Bonus+Benefits) is considered to be the 50th %ile, what is your firm's target percentile for **total** compensation?
13. What proportional change in total compensation could a **low performer** normally expect as result of a performance review?
14. What proportional change in total compensation could a **high performer** normally expect as result of a performance review?
15. For the five positions that your firm hires most frequently, how many qualified applicants do you have per position (on average)?

How **effective** do you think the HR function is with regard to:

16. Providing input into the firm's strategy
17. Providing HR systems that support the business strategy
18. Making a value added contribution to the firm
19. Contributing to the firm's competitive position
20. Contributing to bottom-line profitability