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STRATEGIC HUMAN RESOURCE MANAGEMENT: SCALE DEVELOPMENT AND VALIDATION

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With escalating challenges of the business environment, the corporate world is fast realizing the worth of human resource for attaining sustainable competitive advantage. This has given place to the ideology that Human Resource Management (HRM) needs to be aligned to the Strategic Management (SM) process of the organization. This integration of the above two fields is termed as Strategic Human Resource Management (SHRM). Despite the increasing importance of SHRM, there is a paucity of valid instruments for measuring such integration in the Indian context. Keeping in mind the fact that India is one of the fastest growing markets today, there is a need to develop a reliable and valid instrument for measuring SHRM in the Indian context. The volatile and changing business environment of India offers a good testing field for a study on SHRM. On the basis of an extensive literature review, four constructs of SHRM were identified and developed, collectively called as SHRM Inventory henceforth. The scales were empirically tested in the Indian context to establish unidimensionality, reliability and validity using Structural Equation Modelling capabilities of LISREL version 8.50. The study is pioneering in the sense that it provides a reliable and valid instrument for measuring HRM-strategy integration that has been empirically tested in the Indian context.

Keywords: HRM-strategy fit, HR roles-position fit, HRM-intra-functional fit, HRM-cross-functional fit, structural equation modelling

I. INTRODUCTION

HRM in organizations has often appeared to be incoherent and haphazard, without any linkage with the organization's strategy. Debates in the mid 1980s suggested the need to explore the relationship between HRM and strategic management more extensively (Guest, 1991). The need to integrate HRM with the SM process led to the emergence of SHRM. Starting roughly from the late 1980s, the literature shows an increasing emphasis on SHRM (Budhwar & Sparrow, 1997; Hendry & Pettigrew, 1992; Lengnick-Hall & Lengnick-Hall, 1988; Schuler & Jackson, 1987; Storey, 1992; Wright & McMahan, 1992).

The concept of SHRM became popular in the 1980s with the development of two models viz. the Matching model and the Harvard model that proposed integrating strategy and HRM. Fombrun, Tichy & Devanna (1984) through their Michigan model emphasised the importance of designing HR strategies to suit organisational strategy. Beer, Spector, Lawrence, Mills & Walton (1984) in their Harvard model, advocated the need for a more

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comprehensive and strategic perspective regarding HR.

SHRM is basically concerned with the integration of HRM with corporate strategy (Bennett, Ketchen & Schultz, 1998; Cook & Ferris, 1986; Storey, 1992). However, there is divergence of view on the nature of integration. Definitions of SHRM range from it being a human resource system that is tailored to the demands of the business strategy (Miles & Snow, 1984) to it being the pattern of planned human resource activities intended to enable an organization to achieve its goals (Wright & McMahan, 1992). Where in the first definition, HRM is a reactive management field; in the latter definition it has a proactive function.

Several scholars (e.g., Dyer, 1985; Fombrun, et al., 1984; Schuler & Jackson, 1987) opine that the basic premise underlying SHRM is that organizations adopting a particular strategy require HR practices that suit that strategy. These scholars tend to emphasize its implementation role. On the other hand, several scholars (e.g., Bennett, et al., 1998; Wright & McMahan, 1992) believe that in order for SHRM to be effective, human resource practices must be effectively integrated with all phases of the strategic planning process. Boxall and Purcell (2003) state, "HRM should play a major role in improving the quality of strategic management" (p. 41).

Despite differences in definitions, most authors (e.g., Huselid, Jackson & Schuler, 1997; Schuler, 1992; Wright, 1998) agree that the essence of the SHRM lies in gaining competitive advantage by managing human assets through an integrated, synergistic set of HR practices that both complements and promotes the overall business strategy. SHRM is largely concerned with 'integration' and 'adaptation'. Its purpose is to ensure that HRM is fully integrated with strategy, HR policies are coherent and HR practices are accepted by line managers (Schuler, 1992).

Carroll and Schuler (1983) presented, starting from 1900, a summary of the major HRM innovations in each decade up to 1980. Personnel management is listed as the major innovation, while SHRM is not mentioned at all. However, in a more recent edition of his textbook on HRM, Schuler (1995) extends this summary to the 1990s and lists SHRM as one of the major innovations. Increasingly, SHRM is becoming more popular. Today, HR is seen as "potential contributors to the creation and realization of the organization's mission, vision, strategy and goals" (Jackson & Schuler, 2000, p. 37). It is interesting to note that HR managers are the front-runners today in the organization's strategic management process.

II. RESEARCH GAP AND OBJECTIVES

SHRM is an area that continues to evoke a lot of debate. The field is still in its evolutionary phase and it is difficult to identify any crystal clear framework to retrofit the existing scattered perspectives. Becker and Gerhart (1996) noted that the body of work in SHRM is relatively small, and most of the key questions are sorely in need of further attention. It is fashionable to raise questions about the viability of SHRM because the research stream has had mixed results (Chadwick & Cappelli, 1999). One of the most common complaints is that empirical studies lag far behind SHRM's theoretic underpinnings.

Most studies on SHRM generally focus on normative frameworks on how HRM should fit with business management processes (Baird & Meshoulam, 1988; Lengnick-Hall & Lengnick-Hall, 1988; Miles & Snow, 1984; Schuler, 1992). Surprisingly, there are few studies that look beyond what the 'fit' actually comprises (Bennett, et al., 1998; Golden & Ramanujam, 1985; Truss &

Gratton, 1994; Wright & Snell, 1998). Thus, we know relatively little about what variables determine this fit. There have been no significant efforts to develop a reliable and valid instrument to measure this fit. Despite the increasing importance of SHRM, there is still a paucity of reliable and valid research instruments to measure the various dimensions of SHRM. Most scales used by scholars (e.g., Budhwar & Sparrow, 1997; Green, Wu, Whitten & Medlin, 2006; Huselid, et al., 1997; Teo, 2000) focus on SHRM narrowly, taking a rather limited view of SHRM. Many of these scales, as discussed above, center around a 'reactive' perspective to SHRM. One noticeable limitation of prior work in this area has been their failure to take a comprehensive view of HR function. Most scales in the area of SHRM concentrate on strategically linking of single or few HR practices. Studies that are conducted with respect to single HRM practices may be biased (Becker & Gerhart, 1996).

Despite the importance of SHRM, there is dearth of literature in the Indian context. Indian research (e.g., Amba-Rao, 1994; Bordia & Blau, 1998; Mathur, Aycan & Kanungo, 1996) has focused more on traditional HRM rather than on the interaction between HRM and strategy. More recently, dramatic changes have been witnessed in terms of changing corporate mindsets and HRM practices in Indian companies. Expectedly, there has been a marked shift towards valuing HR in Indian organizations as they become increasingly strategy driven (Budhwar & Boyne, 2004; Chatterjee, 2007). The volatile and changing business environment of India offers a good testing field for measuring SHRM. Although a few instruments have been developed in the Western world, a need was felt to develop a reliable and valid instrument in the Indian context.

This research is a response to calls for developing theoretically and methodologically rigorous scales for measuring SHRM. The researcher was motivated by the fact that an empirical study of SHRM will help broaden our understanding of the concept and its practice. Thus, the objectives of the present study were to develop an instrument for measuring the various dimensions of SHRM and to empirically establish the reliability and validity of the scales. On the basis of an extensive literature review, four constructs of SHRM were identified and developed viz. *HRM-Strategy Fit* (Depicted by HSF), *HR Roles-Position Fit* (Depicted by HRF), *HRM-Intra-functional Fit* (Depicted by HIF), *HRM-Cross-functional Fit* (Depicted by HCF), collectively called as *SHRM Inventory* henceforth. The scales were empirically tested in the Indian context to establish unidimensionality, reliability and validity using Structural Equation Modelling capabilities of LISREL version 8.50.

III. SHRM CONSTRUCTS

The concept of SHRM is embedded in the notion of complementarity or integration or 'fit'. Wright and Snell (1998) opine that fit is the degree to which the needs, demands, goals, objectives and/or structure of one component are consistent with the needs, demands, goals, objectives and/or structure of another component. The theories of fit are based on the premise that organizations are more efficient when they achieve fit (Lengnick-Hall & Lengnick-Hall, 1988; Milliman, von Glinow & Nathan, 1991).

On the basis of extensive literature review, four types of fit were identified vis-à-vis SHRM: fit between HRM and corporate strategy; fit between HR roles and position;

fit within HRM function and fit between HRM and other functional areas. These various types of fit serve as measures or constructs of SHRM. Various studies have explored fit between HRM and corporate strategy (e.g., Baird & Meshoulam, 1988; Lengnick-Hall & Lengnick-Hall, 1988; Truss & Gratton, 1994). Similarly there are several studies on dimensions of fit between HRM and other functional areas (e.g., Casco´n-Pereira, Valverde & Ryan, 2006; Welbourne & Cyr, 1999) or on fit between HR roles and position. However, there is hardly a study that explores all these types of fit together. The following constructs were thus considered for the study:

- **HRM-Strategy Fit (depicted by HSF):** A number of studies have focused on the idea of HRM-strategy fit (Baron & Kreps, 1999; Becker & Huselid, 1998; Dyer, 1985; Golden & Ramanujam, 1985; Green, et al., 2006; Lengnick-Hall & Lengnick-Hall, 1988; Miles & Snow, 1984; Schuler, 1992; Truss & Gratton, 1994). An important dimension of SHRM is to ensure that HRM is integrated with strategic management. This construct focuses on issues like alignment of HR strategies with business strategies, integration of HRM with company vision, HR inputs in corporate strategy, top management's interest in HR issues, importance given to HR in strategic issues and so forth.
- **HR Roles-Position Fit (depicted by HRF):** Another important dimension of SHRM viz. significance of HR roles and position of HR departments can be identified from the works of Baron and Kreps (1999), Budhwar and Sparrow (1997), Chang and Huang (2005), Hope-Hailey, et al. (1997), Kelly and Gennard, (1996), Sheehan (2005), Truss (2003). This dimension of SHRM reflects on the status of HRM departments and the position of HR function in strategic affairs. It focuses on issues like representation of HR department at board, participation of HR managers in top-executive teams, position and responsibility of HR managers, general managerial training to HR executives and so forth.
- **HRM-Intra-functional Fit (depicted by HIF):** Internal consistency of HR policies or practices is another important dimension of SHRM (Guest, 1991; Milliman, et al., 1991; Schuler & Jackson, 1987; Wei, 2006; Wright & McMahan, 1992; Wright & Snell, 1998). This construct measures how integrated the various sub-functions of HRM are. It focuses on issues like presence of HR vision, existence of a coherent HR strategy, information-sharing among HR managers, linkages between HR sub-functions, allocation of budget for HR sub-functions and so forth.
- **HRM-Cross-functional Fit (depicted by HCF):** The fourth dimension of SHRM relates to ensuring fit between HRM function and other functional areas (Becker & Gerhart, 1996; Wei, 2006; Welbourne & Cyr, 1999) as well as devolving HR responsibility to line (Baird & Meshoulam, 1988; Budhwar & Sparrow, 1997; Casco´n-Pereira, et al., 2006; Green, et al., 2006). It measures whether the HR function is integrated with other functional areas. It covers issues like linkages between HR and other functions, information-sharing between HR managers and other functional areas, devolvement of HR responsibility to line managers and so forth.

IV. RESEARCH METHODOLOGY

There are various methodological issues that confront SHRM research. For instance, the sample size and response rates in different studies have been very low. Of the 25 studies reviewed by Wall and Wood (2005), the sample size in nine studies was very small. Chand and Katou, (2007) also identified that most researchers have focused on the manufacturing sector while the services sector has been largely ignored. At the same time, most research on strategic HR issues has focused on private sector entities (Teo & Crawford, 2005). There are few empirical studies on the public sector undertakings.

The present research tried to reduce any discrepancy with the help of a rigorous methodology, which is mandatory for the development of a reliable and valid instrument. In order to empirically test the scales, primary data were obtained from companies in India through a single cross-sectional design based on survey methodology.

The sampling frame for the study was derived from the ranking of Top 450 companies in India published in *Business World*[1]. Taking such organizations that are high performing, researchers could assume that HRM is at least nominally supported (Sheehan, 2005). Other researchers in the area have also followed a similar methodology believing that top performing companies were supposed to have some HR system in place and, thus, fulfilled the requirements for the study (e.g., Chan, Shaffer & Snape, 2004; Wan, Kok & Ong, 2002).

With respect to the spread of the study, Cook and Ferris (1986, p. 445) have opined, "we must examine organizations which operate under different environmental conditions and have different strategies". Use of multiple industries can help extend the generalizability of the findings (Purcell, 1999). Since the present study was conducted on top 450 organizations across industries, it covered a wide range of business sectors (including both public and private sectors, as well as manufacturing and service industries) so as to allow generalizations. In order to collect data from the companies that comprised the sample frame, a census approach was used. Thus, all 450 companies were contacted.

The respondents for the study were senior HR managers. These are the 'subject matter experts' and believed to be in a good position to provide the required information (Chan et al., 2004). Senior HR executives have been used as respondents in other studies too (e.g., Budhwar & Sparrow, 1997; Chand & Katou, 2007; Huselid, et al., 1997; Karami, Analoui & Cusworth, 2004; Teo, 2000). Several scholars (e.g., Huselid & Becker, 2000; Arthur & Boyles, 2007; Becker & Huselid, 2006) have supported the appropriateness of the use of a single 'key' informant since it provides researchers more valid and reliable data than that gathered from multiple respondents.

V. DEVELOPMENT OF RESEARCH INSTRUMENT

In order to collect primary data, a research instrument- the *SHRM Inventory* – was designed which contained items relating to the four dimensions/constructs of SHRM:

- HRM-Strategy Fit (HSF) scale: Twelve-items
- HR Roles-Position Fit (HRF) scale: Eleven-items

- HRM-Intra-functional Fit (HIF) scale: Eight-item
- HRM-Cross-functional Fit (HCF) scale: Fourteen-item

The *SHRM Inventory* utilized a 5-point Likert scale anchored with end points labeled as strongly agree (5) and strongly disagree (1). Five-point scale has been commonly used in HR research (e.g., Ahmad & Schroeder, 2003; Budhwar & Sparrow, 1997; Khilji & Wang, 2007). Efforts were made to keep the items as simple, unambiguous and objective as possible to avoid bias as suggested by Huselid and Becker (2000). During instrument development, face and content validity were ensured as suggested by Ahire, Golhar & Waller (1996) and Anderson and Gerbing (1988).

A scale is said to have face validity if it 'looks like' it is going to measure what it is supposed to measure (Ahmad & Schroeder, 2003). On the basis of extensive literature review, a preliminary draft questionnaire was prepared. Face validity of the questionnaire was insured by having two different researchers suggest items for the questionnaire; a method suggested by Ahmad and Schroeder (2003). In light of the above, some minor modifications were made in the questionnaire. Thereafter, two other researchers in the area were then asked to review the questionnaire items and guess what the questionnaire was intended to measure in order to ensure that the questionnaire appeared reasonable and acceptable.

While face validity relates to whether a test appears to be a good measure or not, content validity indicates that a scale is assessing all domains of a certain criterion. An instrument has content validity if its items representatively sample the domain of the construct it is intended to measure. If items corresponding to various constructs are derived from a comprehensive review of extant literature and discussed with experts, content validity can be ensured (Shin, Collier & Wilson, 2000). Since there is no formal statistical test for content validity, researcher judgment and insight must be applied (Garver & Mentzer, 1999). The four scales viz. HSF, HRF, HIF and HCF were developed by the researcher on the basis of an extensive literature review and were then assessed by a panel of HR practitioners during pilot study.

Pilot Testing and Data Collection

The questionnaire was administered on a panel of HR practitioners who were asked not only to give their responses but also provide their comments on the instrument and its items. The respondents were asked to critique the questionnaire and its items. After pilot testing, some of the items were refined, re-worded or changed to be more representative of the intended constructs, thus enhancing its content validity.

Final data was collected from the selected organizations through mail methodology (both postal and e-mail). This methodology has been used by other researchers in the area too e.g., Budhwar and Sparrow (1997), Takeuchi, Wakabayashi & Chen (2003) and Wood (1995). In order to collect data, a three-wave mail methodology was adopted. Since budget and time constraints did not allow more than three mailings, several measures were taken to improve the response rate. The covering letter was personalized, assured anonymity and offered an executive summary. In case of postal mails, a self-addressed, stamped return envelope was enclosed.

The study received a 24 percent response rate, which is relatively high as compared to similar researches. The response rates in similar studies have generally been low (mean rate 17.4 percent) as reported by Becker and Huselid (1998). Harmon, et al. (2002) report a 10.8 percent response rate from a mail methodology. Given the Indian context, postal surveys result in poor response rates (Budhwar & Sparrow, 1997).

In addition to the survey response rate, item completion rate can be used as another measure of survey effectiveness (Klassen & Jacobs, 2001). The item completion rate was 99 percent, suggesting high survey effectiveness.

Keeping in mind the above, a response rate of 24 percent can be considered to be high as it provides a substantial number of respondents in absolute terms to yield reliable statistical outcomes. For proceeding with SEM with LISREL, the suggested sample size is a minimum of 50 and preferably 100-200 (Lindquist, Vida, Plank & Fairhurst, 2001). Since the present study had a sample of 108 companies, SEM procedure could be conveniently adopted.

VI. METHOD OF ANALYSIS

Following the approach of Anderson and Gerbing (1988) and Gerbing and Anderson (1988), the measurement model for the four scales was estimated. Measurement model estimates the unidimensionality, reliability and validity of each construct (Green, et al., 2006). Measurement model describes how well the observed indicators measure the latent variables. For determining the measurement model, we used exploratory factor analysis as well as the more advanced approach of confirmatory factor analysis. Specifying the measurement model consists of assigning indicators (e.g., questionnaire items) to a latent variable or construct (Garver & Mentzer, 1999). Separate measurement models were estimated for each construct within the *SHRM Inventory,* following the suggestions of Jöreskog and Sörbom (2002).

Once the unidimensionality of the scales is established, an assessment of the statistical reliability is necessary before further validation analysis is performed (Anderson & Gerbing, 1991; Mentzer, Flint & Kent, 1999). Both indicator and scale reliability were estimated. Communalities or indicator reliability are the squared factor loadings for an indicator. It is measured for every single indicator. Scale reliability is operationalized as internal consistency or the degree of inter-correlations among the scale items (Nunnally & Bernstein, 1994). It reflects the scale's ability to consistently yield the same responses. Cronbach's alpha as well as construct-reliability and variance-extracted measures were used as assessing scale reliability. Various forms of construct validity i.e., convergent, discriminant and nomological validity were also assessed. Structural Equation Modeling (SEM) capabilities of LISREL 8.50 were deployed in order to test the scales.

VII. ASSESSING SCALE UNIDIMENSIONALITY

Unidimensionality refers to the extent to which items on a scale estimate one construct. Unidimensionality is a necessary condition for reliability and validation (Anderson & Gerbing, 1991). To assess unidimensionality, Exploratory Factor Analysis (EFA) was first performed.

Exploratory Factor Analysis (EFA)

EFA was performed on each scale separately to check as to whether all items load on a single construct. A principal components factor analysis with VARIMAX rotation was conducted on all items and no

restrictions were placed on the number of components to be extracted. Before proceeding with EFA, in order to determine if the data are likely to factor well, Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Tests of Sphericity were performed. KMO measure quantifies the degree of correlations among the variables. If value of KMO is greater than 0.50 one can proceed with factor analysis (Malhotra, 2005). The KMO values of the scales were found to be meritorious (HSF=0.91; HRF=0.83 HIF=0.79, HCF=0.88) signaling that data was suitable for factor analysis.

Bartlett's Test of Sphericity measures the presence of correlations among the variables. It tests whether some significant correlations exist among the variables being studied. Thus, a significant Bartlett's Test of Sphericity is required to proceed with factor analysis (Malhotra, 2005). It was found that for all scales, p =0.000 (its associated probability is less than 0.05), thus signaling that we could proceed with factor analysis.

On the basis of the eigenvalue greater than 1 heuristic, EFA on the HSF, HRF and HIF scales yielded two principal components accounting for 66.49 percent, 62.32 percent and 61.40 percent of the total variance respectively. EFA on HCF scale yielded three principal components accounting for 67.22 percent of the total variance. The results of EFA showed that the scales were not unidimensional. Hence, the researcher proceeded with Confirmatory Factor Analysis (CFA).

Confirmatory Factor Analysis

Since the results of EFA showed that the scales were not unidimensional, the researcher proceeded with scale refinement to obtain unidimensional scales. This warrants purifying the scale by removing those items that reduce unidimensionality. The primary approach for scale purification, when theory guides survey development, is to rely on CFA (Mentzer, et al., 1999). CFA procedure using LISREL 8.50 was performed on the scales with the objective of determining the fit of the one-factor model. A measurement model consisting of the scales, each defined according to a weighted linear combination of the items, is first specified.

When using LISREL, fit indices should ideally correspond to the recommended values (for the recommended values of fit indices and their description see Table 1). These recommended values have been pointed out by several researchers (e.g., Garver & Mentzer, 1999; Hu & Bentler, 1999; Jöreskog & Sörbom, 2002; Schumacker & Lomax, 2004). When examining the measurement model, it is important to note that all indices are not important. At the same time, it is not possible to achieve perfect values for all indices (Garver & Mentzer, 1999). Thus, as suggested by Garver and Mentzer, (1999), Jöreskog and Sörbom (2002) and Lindquist, et al. (2001) the areas of greater focus were Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI) and Non-Normed Fit Index (NNFI), Root Mean Square Error of Approximation (RMSEA), chi-square/d.f. ratio and standardized residuals. GFI and AGFI are indications of how well the model fits the data with values of 0.90 or higher for the model suggesting that evidence for unidimensionality exists (Jöreskog & Sörbom, 2002). NFI and NNFI are used to examine the proportion of total variance accounted for by a model. The values should ideally be greater than 0.9. RMSEA measures the discrepancy between the observed and estimated covariance matrices per degree of freedom. RMSEA values run on a continuum from 0 to 1, with values falling between 0.06 to 0.08 deemed as acceptable (Garver and Mentzer, 1999).

When the measurement model was estimated for the original scales, the fit indices were not satisfactory. The measurement model was estimated based on

standardized solutions. Since, none of the scales viz. HSF, HRF, HIF and HCF were found to be unidimensional; it was decided to obtain purified scales with the help of item reduction. This is a well documented practice in business research (Bawa, 2004). The method of standardized residuals was used to delete items from the scales and achieve unidimensionality, as recommended by Anderson and Gerbing (1988), Mentzer, et al. (1999) and Yelkur, Chakrabarty & Bandyopadhyay (2006). A residual is an observed minus a fitted covariance (variance). A standardized residual is a residual divided by its estimated standard error. Standardized residuals provide a 'statistical' metric for judging the size of a residual. Such residuals exist for every pair of items.

During each iteration in CFA, one item was reduced based on highest standardized residuals till no standardized residual was more than 2.58 and *p* value became greater than 0.05 (i.e., there was no statistically significant difference between items signifying that unidimensionality was attained). As each item deleted affects all others, a very cautious approach was taken, deleting only one item per run. The iterative process helped obtain stronger fitting single-factor model. The fit indices improved after scale refinement, indicating a better fitting model. The fit indices for the original and purified scales are given in Tables 1 and 2 respectively.

Table 1
CFA Model Fit Indices for the Original Scales

Fit indices*	Ideal Value	Original HSF Scale (12 Items)	Original HRF Scale (11 Items)	Original HIF Scale (8 Items)	Original HCF Scale (14 Items)
GFI	**>0.90**	0.826	0.751	0.822	0.739
AGFI	**>0.90**	0.748	0.627	0.679	0.644
NFI	**>0.90**	0.931	0.854	0.814	0.881
NNFI	**>0.90**	0.946	0.852	0.789	0.898
CFI	**>0.90**	0.956	0.882	0.849	0.914
Chi-Square /d.f.	**<3**	2.51	4.42	4.63	3.44
RMSEA	**<0.08**	0.119	0.179	0.184	0.151
S R	**<2.58**	Largest = 5.41	Largest = 7.01	Largest = 4.53	Largest = 5.32

*Note: * GFI= Goodness of Fit Index; AGFI= Adjusted Goodness of Fit Index; NFI=Normed Fit Index NNFI=Non-Normed Fit Index; CFI=Comparative Fit Index; RMSEA=Root Mean Square Error of Approximation; SR=Standardized Residual*

Table 2
CFA Model Fit Indices for the Refined Scales

Fit indices*	Ideal Value	Refined HSF Scale (8 Items)	Refined HRF Scale (5 Items)	Refined HIF Scale (6 Items)	Refined HCF Scale (7 Items)
GFI	**>0.90**	0.933	0.973	0.970	0.972
AGFI	**>0.90**	0.879	0.919	0.930	0.943
NFI	**>0.90**	0.965	0.967	0.962	0.977
NNFI	**>0.90**	0.979	0.979	0.993	1.000
CFI	**>0.90**	0.985	0.989	0.996	1.000
Chi-Square /d.f.	**<3**	1.54	1.47	1.10	0.78
RMSEA	**<0.08**	0.0710	0.0669	0.0312	0.0
S R	**<2.58**	Largest = 2.48	Largest = 2.47	Largest = 1.71	Largest = 1.42
T-value range	**>2**	7.27-11.35	6.51-9.26	4.66-9.15	5.65-9.35

*Note: * GFI= Goodness of Fit Index; AGFI= Adjusted Goodness of Fit Index; NFI=Normed Fit Index NNFI=Non-Normed Fit Index; CFI=Comparative Fit Index; RMSEA=Root Mean Square Error of Approximation; SR=Standardized Residual*

The improved fit indices and p value in the refined scales support the case for unidimensionality of the scales. The cumulative measurement model based on standardized solution for the refined scales viz. HSF, HRF, HIF and HCF are shown in Exhibit 1.

Exhibit 1
Measurement Model with Correlations

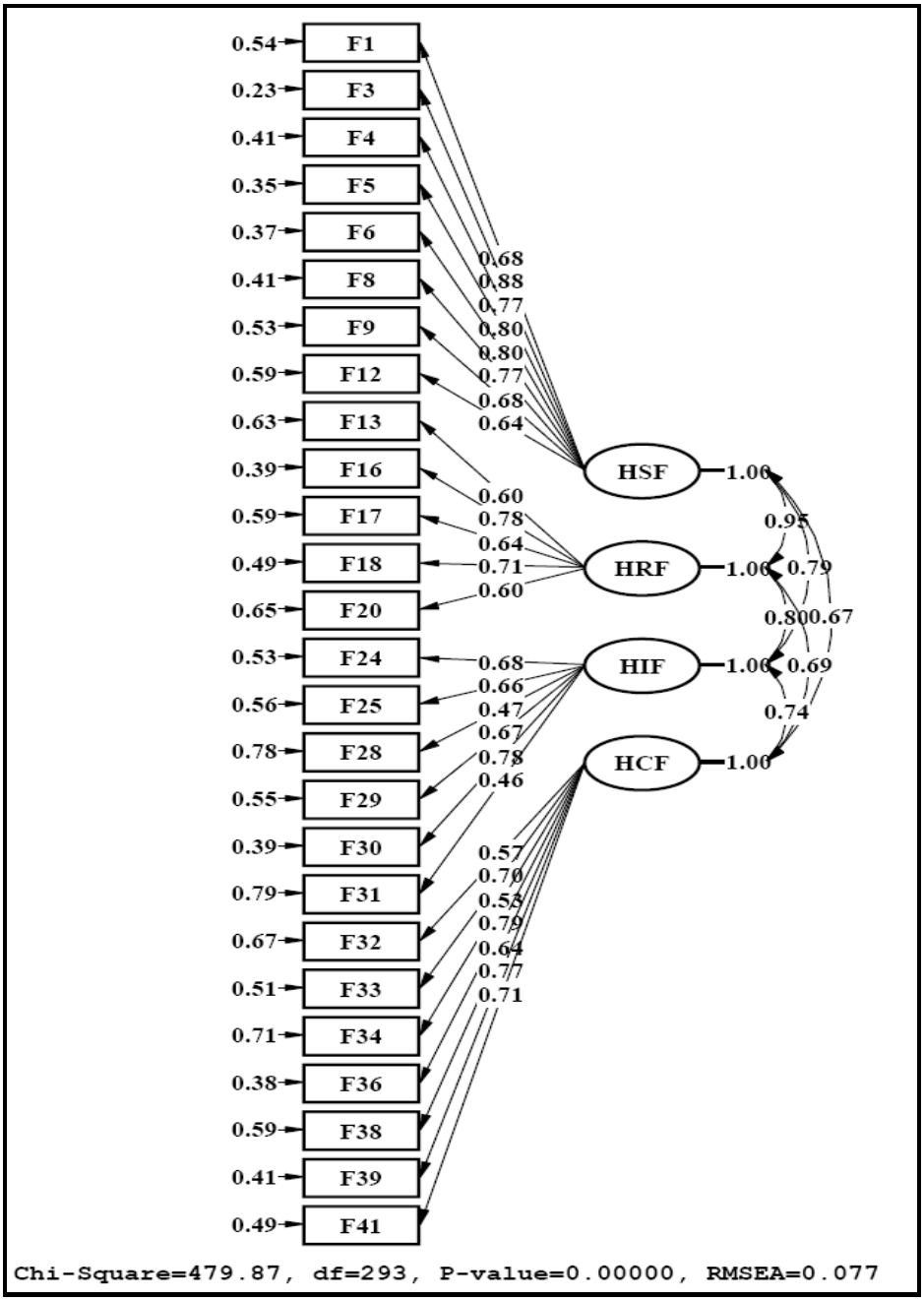

Table 3 depicts the standardized residuals and p values for the scales arrived at during each iteration. The last iteration for each scale is where the standardized residual is less than 2.58 and p value is no longer significant, thus denoting unidimensionality.

Table 3
Standardized Residuals and *p* Values for Scales

No. of Iterations	S.R. & p Values	HSF	HRF	HIF	HCF
I Iteration	Largest S.R.	5.41	7.01	4.32	5.32
	p value	0.00	0.00	0.00	0.00
II Iteration	Largest S.R.	5.26	4.04	4.53	4.69
	p value	0.00	0.00	0.00	0.00
III Iteration	Largest S.R.	2.94	3.93	1.71	4.75
	p value	0.00	0.00	0.35	0.00
IV Iteration	Largest S.R.	2.58	3.37	-	3.77
	p value	0.00	0.00	-	0.00
V Iteration	Largest S.R.	2.48	3.19	-	2.84
	p value	0.05	0.00	-	0.00
VI Iteration	Largest S.R.	-	2.91	-	3.56
	p value	-	0.00	-	0.00
VII Iteration	Largest S.R.	-	2.47	-	3.72
	p value	-	0.19	-	0.03
VIII Iteration	Largest S.R.	-	-	-	1.42
	p value	-	-	-	0.68

After unidimensionality was established, the scales were subjected to tests of reliability as well as validity.

VIII. ASSESSMENT OF RELIABILITY

Two types of reliability estimates were calculated in this study: (1) Indicator reliability and (2) Scale reliability.

Indicator Reliability

In SEM terms, the reliability of an indicator is defined as the variance in that indicator that is not accounted for by measurement error. It usually ranges from 0 to 1 (Jöreskog & Sörbom, 2002). By convention, indicator reliability should preferably be 0.5 or greater. Even values close to the recommended are considered acceptable (Schumacker & Lomax, 2004). In the present case, except for a few indicators, indicator reliability was more than 0.5 or close to it in most cases.

Scale Reliability

The most popular method to assess the reliability of a construct is by computing the Cronbach's alpha which should ideally be more than 0.7 (Nunnally & Bernstein, 1994). Reliability assessment of the four scales returned high Cronbach alpha values suggesting high reliability.

However, coefficient alpha tends to underestimate and sometimes overestimate

scale reliability (Garver & Mentzer, 1999). Thus, apart from Cronbach's alpha, Garver and Mentzer (1999) recommend computing the SEM construct-reliability and variance-extracted measures for scale reliability. SEM construct reliability values do not assume that the individual items have equal reliabilities. Fornell and Bookstein (1982), Garver and Mentzer (1999) have described construct-reliability and variance-extracted measures as:

Construct Reliability (CR). Construct reliability is a LISREL-generated estimate of internal consistency analogous to Cronbach's alpha. It is calculated by a formula. Let sl_i be the standardized loadings for the indicators for a latent variable. Let e_i be the corresponding error terms, where error is 1 minus the reliability of the indicator. The formula for CR is:

$$CR = \frac{\left[\sum_{i=1}^{n} sl_i\right]^2}{\left[\sum_{i=1}^{n} sl_i\right]^2 + \sum_{i=1}^{n} e_i}$$

Variance Extracted (VE). A complementary measure of construct reliability is the variance extraction measure. Variance extracted estimates assess the amount of variance captured by a construct's measure in relation to variance due to random measurement error. Its formula, which is a variation of construct reliability, is:

$$VE = \frac{\sum_{i=1}^{n} sl_i^2}{\sum_{i=1}^{n} sl_i^2 + \sum_{i=1}^{n} e_i}$$

Fornell and Bookstein (1982) stated that CR value higher than 0.6 implies that there is high internal consistency. Variance extracted at 0.5 or higher is considered acceptable (Fornell & Bookstein,1982). In the study, the CR and VE values exceeded or were close to the recommended values. The indicator and scale reliability estimates for all scales are given in Table 4.

Table 4
Indicator and Scale Reliability of the Four Scales

Scales	Indicator Reliability	Scale Reliability Estimates		
	Range	Cronbach Alpha	Construct Reliability	Variance Extracted
HSF	0.46-0.73	0.90	0.91	0.57
HRF	0.40-0.67	0.82	0.80	0.55
HIF	0.42-0.56	0.79	0.80	0.56
HCF	0.28-0.68	0.88	0.85	0.46

IX. ASSESSMENT OF VALIDITY

A scale has validity if it is measuring the concept that it was intended to measure (Bagozzi, 1981). Since unidimensionality and reliability have been established, the next step involved assessing validity as suggested by Gerbing and Anderson (1988). Various forms of validity (i.e., convergent, discriminant and nomological validity) were assessed.

Convergent Validity

Convergent validity is the extent to which items in a scale correlate positively

with each other. A construct is said to possess convergent validity if measures/items of a construct converge or highly correlate (Kaplan & Sacuzzo, 1993). In the one-factor model, the scale is unidimensional and, therefore, its indicators converge to represent a single construct. An interesting aspect is that internal consistency is a type of convergent validity (Kaplan & Sacuzzo, 1993). For a convergent validity check, Bagozzi, Yi & Phillips (1991) suggested that all items should load on their hypothesized dimensions and the estimates are positive and significant. Since unidimensionality and high internal consistency of the scales had already been established, evidence of moderate convergent validity already existed.

The convergent validity of a scale can also be measured using the Bentler-Bonett coefficient (Bentler & Bonett, 1980) in LISREL. Ahire, et al. (1996) and Green, et al. (2006) recommend assessing convergent validity using the Bentler-Bonett coefficient with values greater than 0.9 indicating strong validity. In the present case, refined scales have a Bentler-Bonett coefficient (i.e., NFI and NNFI) of greater than 0.9 as can be seen from Table 2, indicative of strong convergent validity.

Anderson and Gerbing (1988) stated that convergent validity is assessed through *t*-values for the factor loadings. If all *t*-values are over 2 (p=0.001) then this is viewed as evidence supporting convergent validity (Anderson & Gerbing, 1988). Mentzer, et al. (1999) recommend t values to be greater than 1.96 for convergent validity. The range of t-values of items in each scale is given in Table 2. It is to be noted that in all the scales, t-values were more than 2, thus indicating that convergent validity was high.

Discriminant Validity

Discriminant validity is the extent to which the items representing a latent variable discriminate that construct from other items representing other latent variables (Mentzer, et al., 1999). A scale exhibits discriminant validity if its constituent items estimate only one construct (Bagozzi, et al., 1991). For discriminant validity, we need to verify that scales developed to measure different constructs are indeed measuring different constructs. This is particularly important when constructs are highly correlated and similar. In essence, items from one scale should not load on a different scale (Garver & Mentzer, 1999). That is, despite correlation, each scale represents a distinct concept.

CFA is first run on the pair of scales fixing the correlation to one and then run a second time allowing for correlation between the constructs. The difference between chi-squares from the two factor analyses is computed and tested for significance (Ahire, et al., 1996). This suggests that in model 1 (MI), the estimated correlation parameter between the two constructs should be constrained (fixed) to 1.0. In model 2 (M2), the correlation should be unconstrained (freely estimated). Then, a chi-square difference test for these two models should be performed. A statistically significant difference in chi-squares indicates discriminant validity (Ahire, et al., 1996) and the latent variables are said to be distinct. To conduct a chi-square difference test, the difference in chi-square values and the difference in degrees of freedom for the two models should be calculated. In general, a significantly lower chi-square value for the model which specified an unconstrained correlation (not setting the correlation to 1) will signify discriminant validity. A significant chi-square difference implies that the model in which the correlation is set at 1 does not fit the data, that is, the indicators of both dimensions do not measure one single factor and show discriminant validity (Garver & Mentzer, 1999).

Chi-square difference tests were run on all possible pairs of scales. A statistically significant difference in chi-squares was found. All differences were significant at the

0.05 level. A significantly lower chi-square value for the model that specified an unconstrained correlation (not setting the correlation to 1) was found for all pair of scales, thus suggesting existence of discriminant validity. Table 5 shows the results of discriminant validity.

Table 5
Discriminant Validity of Scales

Scales	Chi Square	Df	P value
HSF- HRF (M1)	118.60	65	0.00006
HSF –HRF (M2)	114.40	64	0.00011
Difference	4.20	1	<0.05
HSF- HIF (M1)	169.80	77	0.00000
HSF –HIF (M2)	113.87	76	0.00322
Difference	55.93	1	<0.05
HSF- HCF (M1)	310.88	90	0.00000
HSF –HCF (M2)	137.95	89	0.00068
Difference	172.93	1	<0.05
HRF- HIF (M1)	117.96	44	0.00000
HRF –HIF (M2)	80.52	43	0.00046
Difference	37.44	1	<0.05
HRF- HCF (M1)	196.44	54	0.00000
HRF –HCF (M2)	109.56	53	0.00001
Difference	86.88	1	<0.05
HIF- HCF (M1)	191.27	65	0.00000
HIF –HCF (M2)	115.49	64	0.00009
Difference	75.78	1	<0.05

M1: Correlation constrained (fixed) to 1.0.
M2: Correlation unconstrained (freely estimated)

Nomological Validity

Ahire, et al. (1996) and Garver and Mentzer (1999) recommend assessing nomological validity by determining whether the scales of interest correlate as expected. Since the four scales are part of a larger construct SHRM, theoretically, they are expected to correlate. SEM was used to ascertain the correlation and determine nomological validity. SEM takes into account measurement error by estimating measurement error variances from the data and model specification, whereas traditional correlation techniques do not. The latter usually underestimates true correlations due to the inherent measurement errors (Ahire, et al., 1996). The correlation value between the scales was positive and significant, thus giving proof of nomological validity as presented in Exhibit 1. The curve between the two latent variables represents the correlation between these latent variables in the measurement model.

X. CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

The measurement model for the four scales viz. HRM-Strategy Fit (HSF) scale, HR Roles-Position Fit (HRF) scale, HRM-Intra-functional Fit (HIF) scale and HRM-Cross-functional Fit (HCF) scale showed that the scales were not unidimensional in nature. Hence, scale refinement was carried out to obtain better fitting scales with the help of CFA. The purified scales had improved fit indices and were established as unidimensional. Reliability and validity of refined scales ware then assessed. Indicator reliability for most indicators was found to be satisfactory. Scale reliability was measured in three ways (i.e., Cronbach's alpha, construct reliability and variance extracted measures). The scales exhibited acceptable scale reliability. Evidences of various forms of validity (i.e., convergent, discriminant and nomological) were also found. Table 6 presents a summary of items in the refined scales along with standardized loadings and t-values.

Table 6
Original and Retained Items in the SHRM Inventory

Scale	Item	Description	Loading	T-value
	F1	Human resource considered as a vital asset	0.68	7.78
	F2	Employees take part in decision making	**X**	**X**
	F3	Conscious effort to align business with HR issues	0.88	11.35
	F4	HRM activities designed to suit business strategy	0.77	9.29
	F5	HR inputs considered integral to business strategy	0.80	9.90
HSF	F6	HR activities consistent with organizational vision	0.80	9.78
	F7	Outsourcing of administrative HR activities	**X**	**X**
	F8	Top management take interest in HR issues	0.77	9.30
	F9	Top management trained in HR issues	0.68	7.90
	F10	Strategic viability of HR activities pre-tested	**X**	**X**
	F11	Contribution of HR activities is measured quantitatively	**X**	**X**
	F12	Information sharing between HR and top managers	0.64	7.27
	F13	HRM viewed as strategically important function	0.60	6.63
	F14	HR department viewed as performing vital functions	**X**	**X**
	F15	HR managers viewed as business partners	**X**	**X**
	F16	Top-level strategic teams include HR head	0.78	9.26
	F17	HR executives trained in general managerial skills	0.64	7.13
HRF	F18	HR department at par with other departments	0.71	8.18
	F19	HR Head's relationship with the CEO	**X**	**X**
	F20	HR function represented at the board level	0.60	6.51
	F21	HR function has a proactive role	**X**	**X**
	F22	HR executives encouraged to focus on strategic tasks	**X**	**X**
	F23	HR managers involved in top strategy formulation	**X**	**X**
HIF	F24	HRM activities linked to long-term HR vision	0.68	7.61
	F25	HR strategy clearly spelled out	0.66	7.32

Scale	Item	Description	Loading	T-value
	F26	HRM sub-area managers work in cooperation	**X**	**X**
	F27	Periodic meetings of HR sub-area managers	**X**	**X**
	F28	HR activities internally consistent	0.47	4.83
	F29	Corporate HR department for coordinated HR	0.67	7.44
	F30	Periodic budget for HRM activities	0.78	9.15
	F31	Information sharing between HR sub-areas	0.46	4.66
	F32	HR activities consistent with other functions	0.57	6.15
	F33	Functional area managers are trained in HR issues	0.70	7.93
	F34	HR issues are every manager's responsibility	0.53	5.65
	F35	Information sharing between HR and other departments	**X**	**X**
	F36	Staffing decisions taken jointly with line managers	0.79	9.35
	F37	Performance appraisal decisions taken with line managers	**X**	**X**
HCF	F38	Training decisions taken jointly with line managers	0.64	7.00
	F39	Pay-related decisions taken jointly with line managers	0.77	8.98
	F40	IR related decisions taken jointly with line managers	**X**	**X**
	F41	Line managers' involvement in IR activities	0.71	8.09
	F42	Line managers' involvement in staffing activities	**X**	**X**
	F43	Line managers' involvement in training activities	**X**	**X**
	F44	Line managers' involvement in performance management	**X**	**X**
	F45	Line managers' involvement in pay related activities	**X**	**X**

Note: X denotes items that were removed during scale refinement
For a copy of the questionnaire, please contact the author

The study has implications for both academicians and practitioners. The study intends to build on recent theoretical work aimed at extending the boundaries of how SHRM is defined and researched. The contributions of the study include development of a reliable and valid instrument viz. the *SHRM Inventory*. Since the existing scales in the area have been produced in developed countries, the present research contributes by drawing its sample from India. The present study contributes methodologically by deploying SEM, which is a rather less touched upon technique in the area. Since SEM is said to be superior to traditional statistical techniques (Anderson & Gerbing, 1988; Garver & Mentzer, 1999), the results can be relied upon.

As Garver and Mentzer (1999) opine, theory based research does not imply less managerial relevance. In fact, without a theoretical foundation for the propositions being tested and establishing construct validity for the measures, practitioners would have less confidence in the conclusions from any study. By adopting a rigorous methodology and ensuring reliability and validity, the study has sound basis for both theoretical and managerial implications.

The present study was intended at developing a reliable and valid instrument for measuring SHRM dimensions. However, the instrument has been tested in the Indian context only. Such scale modifications, which are empirically generated, must be cross-validated on other samples. Thus, it calls for more studies in different settings, cultures and countries to further test its unidimensionality, reliability and validity. The scales are tested based on the responses of a limited sample. Hence, the study might have suffered from sample size related problems. Future investigations may focus on larger sample sizes to give more representative results. Researchers can utilize the SHRM scale and relate them to objective

and subjective measures of organizational performance. Further, as suggested by Kohli, Jaworski & Kumar (1993), inclusion of the deleted scale items to reflect specific stakeholders may be a useful future direction to consider.

NOTE

[1] Business World is a leading business magazine in India that publishes annual rankings of companies operating in India.

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