

‘The glue that binds’: Workplace climate, human resource systems and performance

*Donna Buttigieg, Monash University, and
Peter Gahan, Deakin University*

ABSTRACT

There is now a substantial body of research examining the relationship between human resources (HR) and organisational performance. During the last decade, this research has focused on the impacts of ‘bundles’ of HR practices. While researchers have consistently found a significant relationship between HR systems and performance, the mechanisms that give rise to this relationship remain poorly conceptualised. Building on the work of Barney (1998), Ferris *et al.* (1998) and Bowen and Ostroff (2004) we suggest the social context in which such practices are implemented provide the basis for specifying these transmission mechanisms. Workplace climate provides a key social context that induces high levels of effort and dynamic efficiency. Using a large sample we find workplace climate significantly influences the relationship between HR systems and performance.

Introduction

Over the last decade there have been numerous studies focused on empirically testing the impact of high performance work systems (HPWS) on performance outcomes, such as turnover, absenteeism, employee commitment, productivity, sales, customer satisfaction and profitability (Becker and Gerhart, 1996; Ichniowski *et al.*, 1996; Capelli and Neumark, 2001; Gerhart, 2000; Wright, Dunford and Snell 2001). Whilst the empirical evidence suggests that there is, indeed a link between HPWS and performance, the theoretical underpinnings of this research remain underdeveloped (Ferris, Hochwater, Buckley, Harrell-Cook and Frink, 1999). Indeed, a recent paper by Bowen and Ostroff (2004: 204) argues that the question ‘still left unanswered is the process through which this (HRM systems impact on performance) occurs.’ They argue that a key mediating factor in the HRM-performance relationship is climate. Where the HR system is high in characteristics such as distinctiveness, consistency and consensus, this improves shared meanings or collective responses that are consistent with organisational goals (climate). The shared understanding of appropriate behaviours related to strategic goals, in turn, has a positive impact on organisational outcomes (Bowen and Ostroff, 2004).

This paper attempts to test the proposition that workplace climate mediates the relationship between HPWS and several performance outcomes (quality, customer satisfaction and growth). Using survey data from drawn from a large sample of manufacturing and high technology establishments, we find that while HPWS have some direct effects on productivity, the relationship is significantly influenced by workplace climate.

The high performance workplace model

Much of the early work examining the impact of HR practices implicitly assumed a universalistic, rational model of work organisation yielded significant performance dividends. More recent research, however, has argued that the extent to which an HR system achieves both vertical and horizontal fit or congruence (Schuler and Jackson, 1997; Wright and Snell, 1991) determines positive performance outcomes. ‘Vertical fit’ refers to the extent to which HR strategy is aligned to broader management and business level strategies within the organisation, while ‘horizontal fit’ concerns the alignment among various HR practices and policies that are deployed (Wright and Snell 1998).

This approach has been increasingly complemented by the resource based theory of the firm (RBT) (Capelli and Singh 1992, Wright and McMahan, 1992; Boxall, 1996; Wright, Dunford and Snell, 2001). The standard RBT posited by Barney (1991) and others hypothesise that a firm’s competitive success will be determined by the extent to which they are able to develop internal resources that are inimitable, valuable, non-substitutable or rare. Human resources could represent a strategic resource on which sustainable competitive is built in any of these senses.

Ferris *et al.* (1998) and Bowen and Ostroff (2004) argue that the empirical literature examining the impact of HPWS on performance outcomes ignore the process through which these occur. In both models, a key mediating variable is organisational climate. In a model that explores the social context of how HR impacts on organisational effectiveness, Ferris, *et al.* (1998) argue that climate, along with attitudes and behaviour, mediate the effects of HR systems because employees interpret systems as a collective through work climate.

In this paper, we posit that climate mediates the relationship between HR systems and performance because of two reasons. The first is that HPWS are not of themselves inimitable resources, but can be readily created in a diverse set of organisational settings. In this sense they are unlikely to be found empirically to have lasting performance effects. Second, and more importantly, the discretionary role that HPWS provide workers in defining their own roles and work effort suggests that something in addition to the presence of these practices is required for them to have performance effects. RBT suggests that the quality of relations between management and employees – or workplace climate – may represent an inimitable asset that does provide the basis for such practices to have lasting performance effects. Workplace climate can be viewed as the means by which HPWS induce high levels of effort and improved performance.

Hypothesis

This provides us with our core hypotheses:

H1: Workplace climate mediates the relationship between HPWS and productivity

H2: Workplace climate mediates the relationship between HPWS and growth

H3: Workplace climate mediates the relationship between HPWS and customer satisfaction

H4: Workplace climate mediates the relationship between HPWS and quality

Data and procedures

The data used in this study combines data drawn from two companion surveys of workplaces manufacturing and 'the high technology sector'. The surveys were administered in January 2002 and July 2002, respectively. The manufacturing study consisted of a postal survey of human resource managers in a random sample of 1759 manufacturing workplaces in Victoria, Australia. The survey yielded a final sample of 286, representing a response rate of 16 percent. The high technology sector data was collected through a market research company that approached 3456 human resource managers from high technology workplaces with more than 5 employees. Of the 3456 workplaces approached, 438 workplaces participated, resulting in a 12 percent response rate.

MEASURES: Table 1 shows the number of items, definition, operationalisation and source of the questions used in the study. Exploratory factor analysis confirmed that all multiple item measures showed discriminant and convergent validity. Cronbach's alpha for final variables used ranged from .66 or above, indicating that most measures were reliable. The measurement of the variables will be discussed in turn.

Four separate measures of performance were included in the study: productivity; growth, customer satisfaction and quality. Productivity, customer satisfaction and quality were self report single items, measured on a five point likert scale. Growth was measured as the mean of a three item scale ($\alpha=.73$). Youndt *et al.* (1996) argues that self report measures are appropriate where the research is conducted in workplaces (as opposed to profit centres) where objective performance measures may not be available. HPWS was measured using an additive index of Z scores for scales used to measure 6 HR practices: contingency pay, communication, internal labour market, training, performance appraisals and percentage of workers in teams. Exploratory factor analysis determined that this factor displayed convergent and discriminant validity. Cronbach's alpha for this measure also indicated that the scale was reliable ($\alpha=.66$). Youndt, *et al.* (1996) suggest that an additive approach is conceptually and empirically superior to a multiplicative approach because the index is not reduced to zero where a single practice is not used in an organisation. Furthermore, this procedure has been commonly used in the literature (Arthur, 1994; Youndt,

Snell, Dean and Lepak, 1996). Workplace Climate is a single item measure that compares employee management relations at the workplace in the last 12 months with other organisations that do the same kind of work.

The study contained a number of single item control variables, which have been well established in the literature. Controls included the size of the workplace, ownership, age of the workplace, unionisation, export sales, multi site, competition, cost reduction strategy and industry. Larger, foreign owned and older workplaces are argued to have a positive relationship with performance as they have a greater capacity in terms of resources and organisational learning, to introduce work practices associated with HPWS (Guthrie *et al.*, 2002). Unionisation is expected to improve performance by facilitating better work practices and greater harmony in workplace climate (Guthrie *et al.*, 2002). Performance is also expected to vary with the level of export sales, competition, industry and business strategy (Huselid, 1995; Youndt, *et al.*, 1996; Guthrie, 2001).

TABLE 1
Definition of variables

Variable	No. of items	Definition/Operationalisation
1. Productivity	1	Comparison of productivity at workplace in the last 12 months with other organisations that do the same kind of work. Adapted from Delaney and Huselid (1996).
2. Growth	3	Mean score of items comparing growth in sales, profitability and market share at workplace in the last 12 months with other organisations that do the same kind of work. Adapted from Delaney and Huselid (1996).
3. Customer satisfaction	1	Comparison of customer satisfaction at workplace in the last 12 months with other organisations that do the same kind of work. Adapted from Delaney and Huselid (1996).
4. Quality	1	Comparison of quality at workplace in the last 12 months with other organisations that do the same kind of work. Adapted from Delaney and Huselid (1996).
5. HPWS	6	Additive index of Z scores for contingency pay, communication, internal labour market, training, appraisals and percentage of teams. Questions adapted from Huselid and Becker (2000); WERS; Delery and Doty, 1996 and AWIRS95.
6. Workplace climate	1	Comparison of employee/management relations at workplace in the last 12 months with other organisations that do the same kind of work. Adapted from Delaney and Huselid (1996).
7. Size (log)	1	Size of workplace (logged)
8. Ownership	1	1=greater than 50% foreign owned, 0=less than 50% foreign owned.
9. Age	1	Age of workplace (years)
10. % union	1	Percentage of non managerial employees that are members of a union.
11. % export	1	Percentage export of total sales in previous year
12. Multi	1	1=multi site organisation, 0=single site
13. Competition	1	Degree to which there are many competitors in the market for main product. Adapted from WERS.
14. Cost reduction	1	1=price is ranked as the most critical factor to determine market share, 0=otherwise
15. Manufacturing	1	1=manufacturing, 0=new economy sector

STATISTICAL ANALYSIS: The statistical technique used in the analysis was hierarchical multiple regression, testing for mediating effects. Whilst Baron and Kenny (1986) recommend structural equation modelling where there are multiple constructs, this methodology is less appropriate where there are single indicator measures. The procedure for testing mediation effects is to conduct the following three regressions: first, regress the mediator on the independent variable; second, regress the dependent variable on the independent variable and third, regress the dependent variable on the mediator and the independent variable (Baron and Kenny, 1986). Steps 2 and 3 are conducted in this study as part of a hierarchical regression. Baron and Kenny (1986) propose that for mediation to occur the independent variable should significantly impact on the mediating variable, the independent variable should significantly impact on the dependent variable (excluding the mediating variable) and the effect of the independent variable should be reduced when the mediator is included in the model. Sobel (1982) tests provide significance tests for the indirect effect of the independent variable on the dependent variable (via mediation).

Results

Table 2 to 6 show the results of the multiple regressions. These will be discussed in turn.

Our first hypothesis was that workplace climate would mediate the relationship between HPWS and productivity. Table 2 reports the results of regressing workplace climate on HPWS shows that HPWS had a positive and significant relationship with workplace climate ($p < .01$).

TABLE 2
*Determinants
of workplace
climate*

Variable	
HPWS	.32**
Size of workplace (log)	-.33**
Ownership	.01
Age of workplace	.02
% unionised workers	-.03
% export of total sales	-.01
Multiple workplace	-.13
Competition	.04
Cost reduction strategy	.06
Manufacturing	-.02
Adj R²	.16
F	4.01**
N	200
* $p < .05$ ** $p < .01$	

Step 2 in Table 3 reports on the direct relationship between HPWS and productivity and shows that the relationship is significant and positive ($p < .01$). Furthermore, step 3 in table 3 reveals that when controlling for HPWS, workplace climate has an impact on productivity ($p < .01$) and HPWS drops out of the equation. The results overall suggest that the relationship between HPWS and productivity is mediated by workplace climate. Sobel (1982) tests showed that the effects of HPWS via workplace climate was significant.

Support was also found for Hypothesis 2. Step 3 in the growth regressions reported in Table 3 shows that by adding workplace climate to the equation, the r^2 significantly increased by .05 compared with an equation where HPWS and the controls were regressed. Furthermore, workplace climate was positive and significantly associated with growth ($p < .01$). The mediated effects of HPWS through workplace climate was significant (Sobel, 1982). Support was also found for hypotheses 3 and 4 where the inclusion of workplace climate in an equation controlling for HPWS increased the r^2 by .15 and .06, respectively (see Table's 5 and 6). Workplace climate had a positive and significant impact on the variables of customer satisfaction ($p < .01$) and quality ($p < .01$). Whilst HPWS drops out as a predictor of customer satisfaction when workplace climate is entered into the equation, it remains a significant determinant of quality, suggesting that HPWS has direct and indirect significant effects on quality.

TABLE 3
Determinants of
productivity and
growth

Variable	Productivity			Growth		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Controls						
Size of workplace (log)	.08	.02	.13	.20**	.14	.22**
Ownership	-.04	-.04	-.04	-.07	-.07	-.07
Age of workplace	-.03	-.02	-.03	-.02	-.03	-.02
% unionised workers	-.05	-.01	-.00	-.15	-.11	-.11
% export of total sales	-.08	-.09	-.09	-.20**	-.21**	-.21**
Multiple workplace	-.03	-.06	-.02	-.03	-.05	-.02
Competition	-.18**	-.18**	-.20**	-.15*	-.16*	-.17**
Cost reduction strategy	.09	.10	.08	.08	.10	.08
Manufacturing	-.24**	-.18*	-.17*	-.06	-.00	-.00*
Step 2						
HPWS		.19**	.08		.18**	.10
Step 3						
Workplace climate			.34**			.24**
ΔR^2		.02	.09		.02	.05
R^2	.10	.13	.22	.10	.10	.15
ΔF		4.25*	18.00**		3.87*	8.22**
F	1.93*	2.20*	3.86**	1.93*	1.73*	2.39**
N	200	200	200	200	200	200
*p<.05 **p<.01						

TABLE 4
Determinants
of customer
satisfaction and
quality

Variable	Customer Satisfaction			Quality		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Controls						
Size of workplace (log)	-.17*	-.25**	-.10	.04	-.04	.04
Ownership	-.11	-.12	-.12*	-.02	-.03	-.03
Age of workplace	.05	.07	.06	.04	.05	.05
% unionised workers	.08	.13	.14	-.10	-.05	-.05
% export of total sales	-.15*	-.16**	-.16**	-.00	-.02	-.02
Multiple workplace	-.09	-.12	-.07	-.07	-.11	-.07
Competition	-.03	-.03	-.05	-.10	-.10	-.12
Cost reduction strategy	.05	.07	.04	.09	.12	.10
Manufacturing	-.20**	-.12	-.12	-.16	-.08	-.08
Step 2						
HPWS		.24**	.10		.24**	.16*
Step 3						
Workplace climate			.44**			.26**
ΔR^2		.04	.15		.04	.06
R^2	.12	.16	.32	.06	.10	.16
ΔF		7.37**	34.33**		6.93*	9.83**
F	2.40*	2.99**	6.42**	1.11	1.73*	2.56**
N	200	200	200	200	200	200
*p<.05 **p<.01						

- i Most of the questions were identical between the surveys. There were, however, minor variations in some of the questions because of the different methodologies used to collect the data.
- ii Direct and indirect effects were calculated for these regressions. Tables can be requested from the authors.

Discussion and conclusion

Our starting point was that the empirical work on the HR system-performance linkage assumed direct effects, but the mechanism by which HPWS translated into better performance were not adequately specified. We suggest that this mechanism is provided through climate in creating the basis on which practices are institutionalised into an inimitable asset for the organisation. This proposition is supported by other theoretical analysis in which the inherent political nature of work organisation are incorporated into the analysis.

By examining direct and indirect effects, our empirical analysis supported this proposition. With the exception of quality, HPWS were not found to have strong direct effects on performance outcomes. Rather workplace climate appears to act as a significant mediator between HR systems and performance.

Whilst a small number of studies have been conducted examining different forms of organisational climate as mediating constructs for the relationship between HPWS and various performance outcomes (Rogg, *et al.*, 2001; Stetzer and Morgeson, 1997; Gelade and Ivery, 2003), this is the only known study examining organisational climate in the form of workplace climate (as opposed to industrial relations climate). It should also be noted that there are few studies which empirical test for HPWS outside manufacturing, and even fewer Australian studies more generally. This paper adds this research both as a Australian test of the general proposition, and an extension of work to test the proposition outside of the manufacturing sector.

Our findings suggest that future research examining HR systems and performance linkages needs to further explore these intra-organisational climate linkages both conceptually and empirically.

References

- Arthur, JB (1994). Effects of human resource systems on manufacturing performance and turnover,' *Academy of Mgt J.*, 37(3): 670-687.
- Baron, R and Kenny, DA (1986). 'The moderator-mediator variable distinction on social sociological research: conceptual, strategic and statistical considerations,' *J. of Personality and Social Psychology*, 51: 1173-1182.
- Barney, JB and Wright, PM (1998). 'On becoming a strategic partner: the role of human resources in gaining competitive advantage,' *Human Resource Mgt*, 37(1): 31-46.
- Becker G and Gerhart, B. (1996) 'The impact of human resource management on organisational performance: progress and prospects,' *Acad of Mgt J.* 39(4): 779-801.
- Boxall, P (1996). 'The strategic HRM debate and the resource-based view of the firm,' *Human Resource Mgt J.*, 6(3): 59-75.
- Capelli, P and Neumark, D (2001). 'Do "high-performance" work practices improve establishment level outcomes?' *Ind and Lab Rel Rev*, 54(4): 737-775.
- Capelli, P and Singh, H (1992). 'Integrating strategic human resources and strategic management,' in D. Lewin, O.S. Mitchell and P.D. Scherer, editors, *Research Frontiers in Industrial Relations and Human Resources*, Madison, WI: Industrial Relations Research Association: 165-192.
- Delaney, JT and Huselid, MA (1996). 'The impact of human resources management practices on perceptions of organisational performance,' *Acad of Mgt J.*, 39(4): 949-969.
- Delery, JE and Doty, DH (1996). 'Modes of theorising in strategic human resource management: tests of universalistic, contingency and configurational performance predictions,' *Acad of Mgt J.*, 39(4): 802-835.
- Ferris, GR, Arthur, MM, Berkson, HM, Kaplan, DM, Harrell-Cook, G and Frink, DW (1998). 'Towards a social context theory of the human resource management-organisational effectiveness relationship,' *Human Resource Mgt Rev.*, 8(3): 235-264.
- Ferris, GR, Hochwarter, WA, Buckley, MR Harrell-Cook, G and Frink, DD (1999). 'Human resource management: some new directions,' *J. of Mgt.*, 25(3): 385-415.
- Gelade, G.A. and Ivery, M. (2003). 'The Impact of Human Resource Management and Work Climate on Organisational Performance', *Personnel Psychology*, 56: 383-404.
- Gerhart, B, Wright, PM, and McMahan, GC (2000). 'Measurement error in research on human resource management and firm performance: further evidence and analysis,' *Personnel Psychology*, 53: 855-872.

- Gerhart, B, Wright, PM, McMahan, GC and Snell, SA (2000). 'Measurement error in research on human resource management and firm performance: how much error is there and how does it influence effect size estimates?' *Personnel Psychology*, 53: 803-834.
- Guthrie, JP (2001). 'High involvement work practices, turnover and productivity: evidence from New Zealand,' *Acad of Mgt J.*, 44(1): 180-190.
- Guthrie, JP, Spell, CS, Nyamori, RO (2002). 'Correlates and consequences of high involvement work practices: the role of competitive strategy,' *Int J. of HRM*, 13(1): 183-198.
- Huselid, MA (1995). 'The impact of human resource management practices on turnover, productivity and corporate financial performance,' *Acad of Mgt J.*, 38(3): 635-672.
- Huselid, MA and Becker, BE (2000). 'Comment on "Measurement Error in Research on human resource s and firm performance,' *Personnel Psychology*, 53: 835-854.
- Ichniowski, C, Kochan, TA, Levine, D, Olson, C and Strauss, G (1996). 'What works at work: overview and assessment,' *Ind Rel.*, 35(3): 299-333.
- Ichniowski, C, Shaw, K and Prensushi, G (1997). 'The effects of human resource management practices on productivity: A study of steel finishing lines,' *Am Econ Rev*, 87(3): 291-313.
- Rogg, K. L. , Schmidt, D.B, Shull, C., Schmitt, N. (2001). 'Human Resource Practices, Organisational Climate, and Customer Satisfaction', *J. of Mgt*, 27: 431-449.
- Schuler, RS and Jackson, SE (1997). 'Technical and strategic human resource management effectiveness as determinants of firm performance,' *Acad of Mgt J.*, 40(1): 171-188.
- Sobel, ME (1982). 'Asymptotic intervals for indirect effects in structural equation models,' in S Leinhardt, editor, *Sociological Methodology*, San Francisco, CA: Jossey-Bass: 292-312.
- Stetzer, A and Morgeson, F.P. (1997). 'Organisational Climate and Ineffectiveness: Evidence From 25 Outdoor Crew Divisions', *J. of Quality Mgt*, 2(2): 251-263.
- Wright, PM and McMahan, GC (1992). 'Theoretical perspectives for strategic human resource management,' *J. of Mgt.*, 18(2): 295-320.
- Wright, PM and Snell, SA (1998). 'Toward a unifying framework for exploring fit and flexibility in strategic human resource management,' *Acad of Mgt J.*, 23(4): 756-772.
- Wright, PM, Dunford, BB and Snell, SA (2001). 'Human resources and the resource based view of the firm,' *J. of Mgt.*, 27: 701-721.
- Youndt, MA, Snell, SA, Dean, JW and Lepak, DP (1996). 'Human resource management, manufacturing strategy and firm performance,' *Acad of Mgt.*, 39(4): 836-866.

