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Integrated and isolated impact of high performance work practices on employee health and well-being: A comparative study

Abstract

We investigate the positive relationships between High Performance Work Practices (HPWP) and employee health and well-being, and examine the conflicting assumption that high work intensification arising from HPWP might offset these positive relationships. We present new insights on whether the combined use (or integrated effects) of HPWP has greater explanatory power on employee health, well-being, and work intensification compared to their isolated or independent effects. We use data from the 2004 British Workplace Employment Relations Survey (22,451 employees nested within 1733 workplaces) and the 2010 British National Health Service Staff survey (164,916 employees nested within 386 workplaces). The results show that HPWP have positive combined effects in both contexts, and work intensification has a mediating role in some of the linkages investigated. The results also indicate that the combined use of HPWP may be sensitive to particular organizational settings, and may operate in some sectors but not in others.

Key words: High performance work practices, human resource management, employee health, well-being, and work intensification.

Introduction

High Performance Work Practices (HPWP) are a set of unique but interdependent Human Resource Management (HRM) practices aimed at developing a more effective organization. They typically include training, team working, job autonomy, and practices that optimize employees' skills, motivation, and opportunity to exert discretionary effort (Appelbaum, Bailey, Berg & Kalleberg, 2000). The mainstream view holds that HPWP promote positive employee outcomes such as job satisfaction, commitment, trust, and psychological health (Van De Voorde, Paauwe & Van Veldhoven, 2012); however, studies investigating the ways in which HPWP might be detrimental to employees are generally scarce. Researchers have paid little attention to understanding the relationship between HPWP and work intensification (i.e., the feeling that work is more intense), and how this might offset any positive link between HPWP and employee health and well-being. Thus, the question of whether HPWP impact positively on employees' experiences of work, or are used as a managerial ploy to exploit employees, is unclear. The present study seeks to address these issues by examining data from the 2004 British Workplace Employment Relations Survey (2004 WERS), and comparing findings to data from the 2010 British National Health Service (NHS) Staff survey. The study investigates the extent to which employees' reaction to HPWP as described in the context of a nationally representative sample is comparable to a more specific context, the public healthcare sector.

A common theme in HPWP research is that individual HRM practices should be used together in coherent bundles (integrated effects), rather than independently (isolated effects), to achieve a better impact on outcomes. But is there strong analytic evidence for this assumption? In fact, little progress has been made since Ichniowski, Shaw and Prennushi's (1997) seminal study in gathering evidence on whether HPWP have greater explanatory power on outcomes if analyzed in combination, rather than in isolation. To our knowledge, no study

has systematically compared the integrated and isolated effects of HPWP on employee health and well-being in a single analysis. This is unsatisfactory as one cannot identify best practices in the HPWP–employee health or well-being relationship without examining whether their combined use accounts for variance in employee outcomes over their independent effects. Our study presents a model that systematically examines the integrated and isolated effects of HPWP in respect of employees’ health, well-being, and experience of work intensification. The implication of this is to enhance our knowledge of how best to operationalize HPWP, and inform the debate on whether changes in individual HRM practices have little or no significance for occupational health and well-being.

The first section of this paper provides an overview of the HPWP framework and introduces two approaches to operationalizing HPWP – the integrationist (integrated effects) and isolationist (isolated effects) perspectives. We then outline the nature of the relationships between HPWP and employee health and well-being, with emphasis on the mutual gains and critical perspectives, and describe the debate on whether HPWP mainly have combined and/or separate effects. We present our analytical procedure and discuss our findings.

High performance work practices

The HPWP framework was welcomed in the mid-1990s as an innovative managerial approach to the design of high-quality jobs (Arthur, 1994; Delery, 1998; Ichniowski, et al., 1997). The framework is consistent with the resource-based view (RBV) of an organization, the notion that employees are a primary source of competitive advantage (Beltrán-Martín, Roca-Puig, Escrig-Tena & Bou-Llusar, 2008). Despite being at the center of many studies of human behavior in occupational settings, there are inconsistencies regarding the nature and types of practices that should be included in the HPWP framework. The consensus among researchers, however, follows the ability-motivation-opportunity (AMO) model of HRM (Appelbaum et al., 2000; Jiang, Lepak & Baer, 2012). The AMO model indicates that an

effective HPWP regime should be designed to enhance employees' work-related *abilities*, improve employees' *motivation* to perform well, and provide *opportunities* for employees to exercise discretionary effort. In keeping with the AMO model, our measurement of HPWP covers a range of practices that reflect its three dimensions: staff training and selective hiring (ability); career development, performance-related pay, performance appraisal, supportive management (motivation); job autonomy, flexible working, grievance systems, team working, information sharing, and participative decision-making (opportunity).

Much of scholarly debate on how best to operationalize HPWP has been centered around the combined (the integrationist perspective) and/or independent (the isolationist perspective) impact of individual HRM practices (Ichniowski et al., 1997; Jiang et al., 2012). In the integrationist perspective, individual HRM practices are presumed to have mutually supportive properties, and organizations can benefit by integrating these practices into coherent bundles to drive organizational growth (MacDuffie, 1995). The integrationist perspective is often hinged on the principle of 'internal fit' or 'horizontal fit', a prominent concept in Strategic HRM (Delery, 1998). This principle suggests that once the corporate objectives are set for the human resource domain of an organization, HRM policies should be integrated into a coherent system directed towards achieving these corporate objectives (Delery, 1998; Macky & Boxall, 2007). This implies that organizations can achieve large gains by integrating an extensive range of HRM practices into a coherent framework that captures existing complementarities among such practices.

Contrary to this is the isolationist perspective, the more traditional approach to operationalizing HPWP. This perspective underscores the need to investigate the unique and independent effects of individual HRM practices on outcomes (Bryson & White, 2008; Kalmi & Kauhanen, 2008). Each practice may account for variance in organizational outcomes; therefore their unique or independent properties should be investigated (Jiang et al., 2012).

When individual HRM practices are examined together in an integrated framework, their unique and independent characteristics are usually underplayed, leading to partial estimation of their true effects on outcomes (Bryson & White, 2008; Kalmi & Kauhanen, 2008).

The literature seems more inclined, however, towards the integrationist perspective as HPWP are commonly examined through the combined effects of individual HRM practices. There is ample evidence to show that such integrated systems may lead to superior organizational performance (Beltrán-Martín et al., 2008; Guerrero & Barraud- Didier, 2004; Ichniowski et al., 1997; MacDuffie, 1995). Nevertheless, some uncertainties still exist about employee-level outcomes of HPWP (Kehoe & Wright, 2013); hence, the reason why the present study is focused on employees' workplace experiences.

At least two competing views may inform our understanding of employee outcomes of HPWP. The first, the mutual gains perspective, stipulates a 'win-win' situation in which HPWP are associated with positive effects on both organizational performance and employee outcomes (Macky & Boxall, 2008; Van De Voorde et al., 2012). Organizational performance in this light includes measures of labor productivity, profitability, and low staff turnover, whereas employee outcomes relate to workers' subjective experiences at work – including measures of work engagement, organizational commitment, employee trust in management, and positive psychological health (e.g., job satisfaction, contentment, and, enthusiasm) (Van De Voorde et al., 2012, p. 394). These outcomes fall under the umbrella term 'employee health and well-being', which represent the overall quality of employees' functioning at work. They reinforce employees' sense of dedication towards their job and provide a vital source of sustained competitive advantage for an organization. The latter is among the compelling reasons for increased research interests in employee health and well-being. The second, more critical perspective, holds that the organizational benefits of HPWP usually occur through the transfer of greater work demands and pressure to employees, leading to poor employees'

quality of work life (Ramsay, Scholarios & Harley, 2000). This perspective portrays HPWP as occupational stress factors that encourage a ‘win-lose’ situation (i.e., positive outcomes for the organization, but negative outcomes for employees).

The mutual gains perspective

Research on the mutual gains perspective suggests a positive relationship between HPWP and employee job satisfaction (Macky and Boxall, 2007), organizational commitment (Paré and Tremblay, 2007), trust in management (Whitener, 2001), and job contentment (i.e., lower anxiety) (Jensen, Patel & Messersmith, 2013). These health and well-being measures are crucial for the effective functioning of an organisation. They positively influence employees’ job performance and enhance employees’ willingness to go beyond their personal interests for the benefit of the organization (Van De Voorde et al., 2012). HPWP enhance employee health and well-being because they communicate consistent signals about the extent to which employees are valued by the organization (Van De Voorde & Beijer, 2015). These signals are transmitted via the main components of HPWP – workplace practices that develop employees’ abilities, improve employees’ sense of motivation, and provide opportunities for employee to exercise discretionary effort (Appelbaum et al., 2000). Employees perceive these signals as fair treatment from the organization, and based on the norm of reciprocity, may respond through greater levels of organizational commitment and trust in management (Macky and Boxall, 2007; Paré and Tremblay, 2007).

As part of their positive signalling effects, HPWP foster the development of organizational justice and support, thereby creating a workplace environment where employees feel motivated and catered for (Van De Voorde & Beijer, 2015). Such an environment encourages employees’ positive attributions for HRM structures within the workplace (Nishii, Lepak & Schneider, 2008), leading to improved employees’ job satisfaction, health and psychological well-being. For example, employees in such environments are able to optimize

their work-related skills through training, team working, and information sharing activities. They are given autonomy over their job tasks and allowed to participate in workplace decision-making activities. These job characteristics influence employees' sense of work empowerment such that HPWP are perceived as reflecting a legitimate concern for employee welfare (Van De Voorde & Beijer, 2015). Along these lines, one would expect employees in workplaces adopting an extensive range of HPWP to experience better work-related health and well-being than employees in workplaces adopting a lower range of HPWP.

Hypothesis 1: HPWP are positively related to employee health and well-being such that employees in workplaces with higher adoption of HPWP are more likely to experience job satisfaction, commitment, trust in management, and job-related contentment than employees in workplaces with lower adoption of HPWP.

The critical perspective

Critics of the mutual gains perspective have raised doubts about the benefits of HPWP for employees. They portray HPWP as an exploitative managerial model designed to promote organizational performance at the expense of employees' quality of work life (Godard, 2001; Kroon, Van de Voorde & Van Veldhoven, 2009; Ramsay et al., 2000). The rationale for this is that organizations are often faced with stiff competition in a harsh economic environment that increases employers' need to maximize labor productivity. Because the primary aim of HPWP is to increase employee involvement and productivity, so as to drive organizational performance, employers may enact such practices to elicit greater work effort from employees, but, at the same time, expose employees to higher work intensification (Jensen et al., 2013; Ramsay et al., 2000). Employees are compelled to work too hard and undertake too many job tasks, leading to greater experiences of stressful work. In this light, work intensification (defined as the feeling that work is more demanding and intense) is seen as an important variable explaining the possible adverse consequences of HPWP on employees.

The critical perspective, and particularly, the nature of the relationship between HPWP and work intensification, has seldom been the main focus in occupational health psychology. In one of few studies to examine the HPWP–intensification relationship, Kroon et al. (2009) showed a positive relationship between HPWP and work intensification among 393 employees working in 86 Dutch organizations. Kroon et al. used multilevel analysis, with HPWP measured at the organizational level and both work intensification and employee well-being measured at the employee level, to demonstrate how HPWP might increase employee experience of burnout and emotional exhaustion by means of intensified job demands. Kroon et al. identified HPWP as stress factors that provoke continuous feelings of heightened work demands and pressure, leading to perceptions of endured job strain. Similarly, Godard (2001), in their study of 508 Canadian employees, showed how the use of HPWP might increase employees’ experience of work intensification. Godard (2001, p. 778) argued that HPWP (in their terms alternative work practices) could marginally increase employees’ experience of task involvement and empowerment, but that these effects are usually “obtained through an intensification of the work process.” Our second hypothesis is therefore based on the expectation that HPWP is positively related to work intensification.

Hypothesis 2: The use of HPWP is associated with employees’ experience of work intensification.

The question then is whether the experience of work intensification arising from HPWP might offset the positive impact of HPWP on employee health and well-being, as assumed in Hypothesis 1. It could be that high work intensification, particularly in work environments where management has an increased interest to maximize labor productivity, may prompt employees to feel that they are being exploited, and this may contribute to poor employee health and well-being. This assumption is consistent with Wood et al.’s (2012, p. 425) counteracting effects model, which posits that the feeling of high work demands and pressure associated with

employee involvement practices (such as HPWP) “may cancel out or reduce” any positive impact on employee outcomes. The rationale is that HRM systems can be misapplied if enacted primarily to drive organizational performance at the expense of employee well-being (Kroon et al., 2009). Employees may consider such systems as a managerial ploy to control the workforce and take as much advantage of employees as possible. Consequently, employees may have doubts that management will reciprocate its demands on employees with incentives such as pay increases or job security. Such doubts may not only distort employees’ perceptions about HPWP, but also undermine the desired effect of HPWP on employee health and well-being. Therefore, if HPWP increase employees’ experience of work intensification (i.e., Hypothesis 2), we might expect work intensification to offset the positive impact of HPWP on employee health and well-being.

Hypothesis 3: The experience of work intensification arising from HPWP mediates a negative relationship between HPWP and employee health and well-being.

The integrationist versus isolationist perspectives of HPWP

The integrationist perspective is the most common approach to operationalizing HPWP. As mentioned earlier, it is based on the idea of ‘internal fit’, which entails combining individual HRM practices into bundles or systems to maximize their complementary properties and accrue large organizational gains. Advocates of the integrationist perspective have criticized the more traditional approach, the isolationist perspective, on the basis that HRM practices are driven from a common philosophy and one may not fully understand the mechanisms by which such practices influence organizational performance without taking into account their interdependencies (Beltrán-Martín et al., 2008; Guerrero & Barraud- Didier, 2004; MacDuffie, 1995). Moreover, by isolating the effects of individual HRM practices, the true nature of work may be overly simplified, and the complex reality of organizational processes reduced to a handful of separate HRM variables (MacDuffie, 1995).

Despite such criticisms, the isolationist perspective is relevant for ascertaining whether specific workplace practices have tangible benefits for an organization (Delery, 1998). Individual HRM practices may explain additional variance in outcomes through their unique characteristics, and accentuate possible discrepancies where ‘internal fit’ is presumed without thorough assessment of underpinning operations of HRM systems. For example, not all combinations of individual HRM practices are beneficial for an organization: see Becker et al.’s (1997) explanation of a ‘deadly combination’ and Delery’s (1998) report on ‘substitution effects’. Moreover, the idea of ‘internal fit’ is challenged by the fact that there are multiple goals in HRM, and specific workplace practices may influence more than one goal differently (Toh, Morgeson & Campion, 2008). This may give rise to a range of strategic tensions and cause components of the HPWP system to pull in conflicting directions. The occupational health literature will therefore benefit from an investigation of how specific workplace practices influence the relationships between HPWP and outcomes.

In the meta-analytic study by Combs, Liu, Hall and Ketchen (2006), it was revealed that only two studies (i.e., Ichniowski, et al., 1997 and Guerrero & Barraud- Didier, 2004) out of a total of 92 studies had examined whether the integrated effects of HPWP have stronger explanatory power on outcomes compared to their isolated effects. This suggests that criticisms of the isolationist perspective in favor of the integrationist perspective have relied on theoretical assumptions with little direct support from empirical evidence. Moreover, considering that Ichniowski et al. (1997) and Guerrero and Barraud-Didier (2004) had focused on organizational-level outcomes, no study so far has simultaneously compared the integrationist and isolationist perspectives using employee-level outcomes. Even if researchers are drawing toward a conclusion that integrated systems of HPWP are beneficial for the organization, questions remain as to whether the story is similar for employee health and well-being. With these in mind, our final hypothesis illustrates how the integrationist and isolationist

perspectives of HPWP can be examined in parallel to identify active ingredients in the assumed employee-level effects of HPWP.

Hypothesis 4: The integrated (or combined) effects of HPWP account for variance in employee health, well-being and experience of work intensification, over and above their unique independent effects.

The present study

The hypotheses are examined using secondary data from two sources: the British 2004 WERS and the British 2010 NHS Staff survey. Our aim is to ascertain the extent to which employee outcomes of HPWP as described in the context of the general British workforce are replicable within the specific context of the British public healthcare sector. Drawing on the ‘universalist’ principle of HRM, researchers contend that HPWP represent the ‘one best approach’ to organizational effectiveness because they promote generalizable outcomes across organizational contexts, size, culture, and corporate strategies (Delery & Doty, 1996; Hughes, 2002). Other scholars, however, argue that the impact of HRM practices as described in the context of a particular sector may not generalize across other contexts due to differences in HRM strategies (Ordiz & Fernández, 2005; West, Guthrie, Dawson, Borrill & Carter, 2006). For example, HRM strategies adopted in private sector organizations may vary from those in public sector organizations as private sector organizations function primarily to accrue profits for stakeholders, whereas public sector organizations are usually non-profit oriented. Therefore, any inferences made in terms of cross-sectoral applicability of HRM outcomes between the private and public sectors may be misleading, unless such inferences are supported by empirical evidence.

These contrasting views on cross-sectoral applicability of HRM have been neglected in both the HRM and occupational health literatures. Many studies have relied on data from private sector institutions – manufacturing companies (see Arthur, 1994; Appelbaum et al.,

2000; Combs et al., 2006), industrial and service companies (Beltrán-Martín et al., 2008); little attention is paid to HPWP outcomes in highly institutionalized public sector organizations (Bonias, Bartram, Leggat & Stanton, 2010) such as the British NHS. The present study aims to explicate cross-sectoral applicability of HPWP through exploring the role of sector-specific characteristics in employee outcomes of HPWP.

Method

Study 1

The 2004 WERS is a large nationally representative survey of all establishments in the United Kingdom. The survey contains a wide range of information regarding various managerial strategies to work organization and corresponding employee experiences of these strategies. Data for the 2004 WERS management survey were gathered via a face-to-face interview with a single manager or a senior person whose role is related to employment relations and HRM. Each management interview lasted about two hours and was undertaken on-site by a trained interviewer. The interviews were successful in a total of 2,295 workplaces, representing a response rate of 64 per cent. Employee-level data for the 2004 WERS were collected using an eight-page, self-completion questionnaire randomly distributed in 1,733 of the 2,295 workplaces where the management interviews were carried out. Around 37,000 questionnaires were initially distributed but some 22,451 questionnaires were completed, representing a fieldwork response rate of 60 per cent. To accommodate the nested structure of the 2004 WERS, the management sample was matched with the sample of workplaces from which employee responses were elicited, thereby reducing the overall sample from 2,295 to 1,733 organizations. The organization is the nesting variable. The median number of employees in sampled organizations is 13 (range is 2 to 24).

Study 2

The 2010 NHS Staff survey is the eighth in a series of annual surveys first conducted in 2003. The survey covers employees of all NHS Acute Trusts, Ambulance Trusts, Mental Health/Learning Disability Trusts, Care Trusts and Primary Care Trusts in England. NHS Trusts are corporations or authorities that provide services on behalf of the British NHS in England and Wales. The survey provides information regarding staff perspectives on various HRM issues ranging from the organization of work, to matters of occupational health and safety management within the NHS. Data were gathered via self-completion questionnaires. The questionnaires were distributed to a selection of NHS staff by an external survey contractor appointed by the Care Quality Commission. A total of 164,916 questionnaires from 386 NHS Trusts in England were completed and returned, representing a fieldwork response rate of 54 per cent. The median number of employees in sampled NHS Trusts is 419, and the range is 44 to 833.

Measures

HRM practices (organizational-level variables). Our selection of HRM practices was guided by previous research (Beltrán-Martín et al., 2008; Bonias et al., 2010; Combs et al., 2006; Guerrero & Barraud- Didier, 2004; Ichniowski et al., 1997) and the three dimensions of the AMO model (Appelbaum et al., 2000). We derived ten HRM practices for Study 1, four from the 2004 WERS management survey – team working, performance-related pay, selective hiring, grievance systems, and six from the employee survey – job autonomy, staff training, flexible working, participative decision-making, information sharing, and supportive management. Ten HRM practices were derived for Study 2 – job autonomy, team working, staff training, career development, flexible working, performance appraisal, grievance systems, supportive management, information sharing, and participative decision-making. In selecting items for these variables, we followed the precedents in previous analysis of the 2004 WERS

data (Guest & Conway, 2007; Wood & De Menezes, 2011; Wood et al., 2012) and the 2010 NHS Staff survey (Powell et al., 2014). See Appendices 1 and 2 for full details of all HRM practices in Studies 1 and 2, respectively.

All HRM practices were measured by multiple-item scales except staff training in Study 1, and flexible working and performance appraisal in Study 2, which are single-item variables. Despite the pitfalls of single-item variables (e.g., they are statistically less stable than multiple-item variables), we have included them to achieve a more comprehensive representation of HPWP. Also, five HRM variables in Study 1 – team working, performance-related pay, flexible working, selective hiring, and grievance systems – were measured by binary items. The use of binary items for HRM variables is not uncommon in organizational research (e.g., Bryson & White, 2008; Guest and Conway, 2007; Toh et al., 2008).

To ensure discriminant validity for our HRM measures, we examined two confirmatory factor analysis (CFA) models, one each for Studies 1 and 2. The factor loadings of the single-item scales were fixed at one and their residual variances at a non-zero estimate of unreliability equal to '(1– reliability) multiplied by sample variance' (Hayduk, 1987). We did this to minimize measurement error problems associated with the use of single-item scales (Williams, Vandenberg & Edwards, 2009). The CFA models yielded adequate model fit for Study 1 (Chi-square [X^2] = 1390.219; degrees of freedom [df] = 280; p-value < 0.001; Root Mean Square Error of Approximation [RMSEA] = 0.014; Comparative fit index [CFI] = 0.960; Tucker-Lewis Index [TLI] = 0.950; Standardized Root Mean Square Residual [SRMR] = 0.039) and Study 2 (X^2 = 440.109; df = 78; p-value < 0.001; RMSEA = 0.006; CFI = 0.960; TLI = 0.935; SRMR = 0.036). All factor loadings were greater than 0.50 ($p < 0.001$).

Given that HPWP are conceptualized at the organizational level, the six HRM variables from the 2004 WERS employee survey in Study 1 (i.e., job autonomy, flexible working, participative decision-making, information sharing and supportive management) were

aggregated as mean scores that proxy organizational-level HRM practices. The remaining four variables were derived from the management survey, and are characteristically organizational-level measures. The 2010 NHS Staff survey contains only employee-level information; thus, all HRM practices for Study 2 were aggregated to the organizational level (i.e., the level of the NHS Trust). Prior to aggregation, two tests of Intraclass Correlation Coefficient (ICC1 and ICC2) were used to examine the degree of interrater reliability among raters of observed items (LeBreton & Senter, 2008). A third test, interrater agreement – r_{WG} for single-item measures and $r_{WG(j)}$ for multi-item measures – was used to determine the level of absolute consensus between ratings supplied by raters (LeBreton & Senter, 2008). All three tests provided sufficient justification for data aggregation. For Study 1, ICC1 values ranged from 0.07 to 0.20 and ICC2 values from 0.53 to 0.78. The mean $r_{WG(j)}$ values for Study 1 ranged from 0.80 to 0.98. For Study 2, ICC1 values ranged from 0.31 to 0.85, ICC2 values ranged from 0.98 to 0.99, and mean $r_{WG(j)}$ values from 0.50 to 0.98.

Employee health, well-being and work intensification. We followed the precedents in previous studies (Bryson & White, 2008; Guest & Conway, 2007; Macky & Boxall, 2008; Ramsay et al., 2000; Wood et al., 2012) in selecting items for employee health, well-being, and work intensification. Two sets of CFA models, one each for Studies 1 and 2, were examined to ensure discriminant validity for the employee-level measures. A five-factor CFA model yielded adequate model fit for Study 1 ($X^2 = 5912.232$; $df = 108$; p -value < 0.001; RMSEA = 0.050; CFI = 0.963; TLI = 0.954; SRMR = 0.048) and a four-factor CFA model in Study 2 yielded good model fit ($X^2 = 18700.762$; $df = 38$; p -value < 0.001; RMSEA = 0.055; CFI = 0.970; TLI = 0.953; SRMR = 0.032). All factor loadings were greater than 0.43 ($p < 0.001$).

A one-factor model was examined to see if all measurement items were reducible to a one-dimensional employee outcome factor. This model failed to fit the data in Study 1 (RMSEA = 0.175; CFI = 0.537; TLI = 0.465; SRMR = 0.140) and Study 2 (RMSEA = 0.218;

CFI = 0.400; TLI = 0.250; SRMR = 0.131). Furthermore, a two-factor model with job satisfaction and commitment loading on the first factor and other variables on the second factor failed to fit the data: Study 1 (RMSEA = 0.161; CFI = 0.611; TLI = 0.546; SRMR = 0.148) and Study 2 (RMSEA = 0.219; CFI = 0.406; TLI = 0.241; SRMR = 0.131). These models confirm discriminant validity of our constructs.

Four variables – job satisfaction, organizational commitment, employees’ trust in management and job-related contentment – from the 2004 WERS employee survey were used in Study 1 as proxies for employee health and well-being, and three variables – job satisfaction, organizational commitment, and occupational health – from the 2010 NHS Staff survey were used in Study 2. Van De Voorde et al.’s (2012, p. 396) review of the HRM, occupational health, and applied psychology literatures identified these variables among the most common indicators of employee health and well-being. All scales were coded such that high scores reflected positive employee health and well-being. Although some might be positively correlated (e.g., job satisfaction and commitment), they tend to have different antecedents and outcomes, and may be examined as separate employee-level measures (Guest and Conway, 2007; Macky and Boxall, 2007; Whitener, 2001). Work intensification in Study 1 was measured by three items from the 2004 WERS employee survey, whereas two items from the 2010 NHS Staff survey were used for work intensification in Study 2. Full details of the variables are provided in Appendices 1 and 2.

Data analysis

As one of the rare systematic studies on the integrated and isolated effects of HPWP, Ichniowski et al. (1997) was the benchmark for our analysis, although our approach differs in some unique ways. For example, Ichniowski et al.’s study was restricted to a very specific type of manufacturing production process, using data from around 60 American steel finishing mills which had very similar production procedures. By contrast, we looked more broadly at the

general British workforce in Study 1, using a very heterogeneous sample, and concentrated on the British public healthcare sector in Study 2. Our primary goal was therefore not to replicate Ichniowski et al., even though their analysis served as a point of reference for our own examination of the integrated and isolated effects of HPWP.

Ichniowski et al. operationalized HPWP as an integrated system that captures existing complementarities among individual HRM practices. They used cluster analysis to derive HPWP taxonomies or clusters based on a set of HRM practices. Organizations within the same cluster were considered to have similar orientations towards HPWP. As with Ichniowski et al., we used cluster analysis in Studies 1 and 2 to derive HPWP clusters based on standardized scores of the HRM practices. Standardized scores were used to account for differing metrics of HRM practices within and across Studies 1 and 2. Our clustering algorithm involved Ward's method with squared Euclidean distance, an agglomerative procedure in which observations are merged progressively into clusters in such a way as to minimize the error sum of squares (Burns & Burns, 2008). The Ward's method was preferred due to its effectiveness in producing consistent and interpretable cluster solutions. It has also been applied in organizational research (e.g., Arthur, 1994; Toh et al., 2008).

On interpreting the large distances between nodes on the dendrogram (i.e., a graph showing the proximity of observations before their fusion into clusters), we reached the conclusion that a three-cluster solution best described the patterns of HRM practices in both Studies 1 and 2. This conclusion was corroborated by the large 'jumps' in the agglomerative schedule, a table that provides numerical information about the cluster solutions. We then performed ANOVA (with Tukey Post Hoc test) to establish that the clusters were statistically different in respect of the HRM practices. The classification of HRM practices in Study 1 revealed a type of hierarchy from low to high adoption of HPWP, but did not identify a cluster with higher scores on all HRM practices. Thus, unlike Ichniowski et al., we could not make

claims of a most 'innovative' HPWP cluster. Indeed, the 2004 WERS sample is very diverse (including both private and public sector organizations) and differs markedly from Ichniowski et al.'s homogenous sample. Study 2, on the other hand, is less diverse and the classification of HRM practices was straightforwardly interpretable as low-medium-high. The cluster solutions are represented graphically in Figures 1 and 2 for Studies 1 and 2, respectively.

In Study 1, the first cluster or Cluster 1 (686 workplaces, 8165 employees) represents workplaces with higher scores on most HRM practices, except team working, staff training, selective hiring and grievance systems, for which they have low-average scores. We call this the 'extensive-use cluster', or workplaces adopting a wider range of HPWP. The second cluster or Cluster 2 (602 workplaces, 8823 employees) is characterized by high scores on team working, staff training, selective hiring and grievance systems, but lower scores on other practices. Workplaces in this cluster emphasize employee skills, offer little workplace support and incentives, and seem generally restricted in terms of HPWP utilization. We call this the 'restricted-use cluster'. The third cluster or Cluster 3 (445 workplaces, 5463 employees) is characterized by low scores across most HRM practices, except team working and grievance systems for which they have average scores. This cluster is the 'low-use cluster', the less innovative group in Study 1.

Cluster 1 in Study 2 (N = 159 Trusts, 69217 employees) represents the 'extensive-use cluster'. NHS Trusts within this cluster are characterized by higher scores on all ten HRM practices. Cluster 2 (N = 216 Trusts, 91875 employees) is characterized by average scores on all ten HRM practices, and is therefore the 'restricted-use cluster' for Study 2. NHS Trusts in Cluster 2 are moderately innovative in terms of their approach to HPWP. Cluster 3 (N = 11 Trusts, 3824 employees) is characterized by lower scores on all ten HRM practices. This cluster is the 'low-use cluster' for Study 2.

To cross validate our analysis, we randomly divided our samples in half five times, and applied the same clustering algorithm to each half (i.e., ten subsamples each for Studies 1 and 2). In Study 1, the three-cluster solution in six out of ten subsamples best described the data, and the patterns of HRM practices were similar to the three-cluster solution identified in the full sample. In Study 2, the three-cluster solution best described the data in all 10 subsamples with distinct ‘high’, ‘average’ and ‘low’ HPWP clusters.

Hypotheses testing

Hypothesized relationships were examined by multiple group analysis in the Mplus software program (version 7.1). Multiple group analysis belongs to the family of Mean and Covariance Structures (MACS) analyses, suited for simultaneous testing of individual and group mean differences (Byrne, 2012; Little, 1997). Our analysis was performed with latent variables, on the basis of multilevel analysis to account for non-independence of our data – HPWP and the HRM practices measured at the organizational level (Level-2), and employee health, well-being, and work intensification at the individual level (Level-1). We used the robust maximum likelihood estimator and applied the same analytical procedures to Studies 1 and 2.

Hypotheses 1, 2 and 3

Hypotheses 1 and 2 were examined by a single model in which the latent factor means of employee health, well-being and work intensification were estimated freely in the restricted-use and low-use clusters, but constrained at zero in the extensive-use cluster, the reference group. This model is analogous to an ordinary least-square (OLS) regression analysis in which a categorical variable with k mutually exclusive categories is represented by k–1 categories (i.e., one category is omitted from the model). The coefficients on the included categories can then be interpreted in relation to the omitted category (Huselid & Becker, 1997). Thus, if the latent factor means of employee health, well-being, and work intensification are significantly

lower in the restricted-use and low-use clusters, relative to the extensive-use cluster (the omitted category), then there is evidence for Hypotheses 1 and 2.

As part of the above model, we specified an Mplus command to examine the indirect relationships between HPWP and employee health and well-being via work intensification (Hypothesis 3). This command was used to compute indirect effects based on the product-of-coefficients (ab) approach; where ab is equal to the product of a , the regression path between HPWP and work intensification, and b , the regression path between work intensification and employee health and well-being (MacKinnon, Fritz, Williams & Lockwood, 2007). We then used the distribution of the product method (MacKinnon et al., 2007) to calculate confidence intervals and validate our ab coefficients. This technique is suitable for multilevel analysis. It converts a and b parameters into z-scores, calculates the product, and compares the result to a table of critical values to allow statistical inference.

Hypothesis 4

To examine the integrated and isolated effects of HPWP, Ichniowski et al. (1997, p. 311) regressed organizational productivity on the HPWP clusters (integrated effects) and individual HRM practices (isolated effects), simultaneously. Ichniowski et al. then used F-test statistics (a model fit measure for OLS regression) to determine whether the HPWP clusters explained more variance in productivity compared to individual HRM practices. We adopted a similar approach, but used four model fit indices RMSEA, CFI, TLI and SRMR, rather than F-test statistics, to examine the amount of variance explained by the HPWP clusters compared to individual HRM practices. Our approach is based on model invariance testing in multiple group analysis that estimates whether measurement parameters (e.g., regression slopes, factor loadings, intercepts, and variances) are equivalent across specified groups (see Byrne, 2012, p. 247; Little, 1997, p. 56).

To illustrate, consider two clusters differentiated as male and female by gender, and assume that (1) both clusters have different levels of life satisfaction, (2) both clusters are determined by the same gender characteristics such as presence of facial hair, body shape and adrenaline levels, and (3) specific gender characteristics are significantly associated with life satisfaction. Model invariance can be used to determine whether any differences in life satisfaction are due to the gender factor (i.e., whether one is classified as male or female), or the specific gender characteristics associated with the clusters. At least two nested models can be examined – one in which key parameters (i.e., the regression coefficients between the gender characteristics and life satisfaction, and the intercepts of each gender characteristic and life satisfaction) are estimated freely across clusters, and the other in which the regression coefficients are estimated freely but the intercepts are constrained to be equal. By constraining the intercepts to be equal we are forcing the two clusters to be the same, regardless of their differences in life satisfaction. If no significant change in overall model fit is observed between the free and constrained models, we can infer that the difference in life satisfaction between males and females is influenced directly by the relationship between specific gender characteristics and life satisfaction. In the context of the present study, the male and female clusters are proxies for the HPWP clusters, whereas specific gender characteristics represent individual HRM practices.

The above procedure was used to examine whether the isolated effect of each HRM practice has a role in explaining differences in employee health, well-being, and work intensification across the HPWP clusters. We examined three nested models. In the first model, the regression slopes (i.e., the effects of each HRM practice on employee health, well-being, and work intensification, respectively) and cluster intercepts (i.e., the latent factor means of each HRM practice, employee health, well-being, and work intensification) were estimated freely across Clusters 1, 2 and 3. This model served as the baseline model against which

subsequent models were compared. In the second model, we constrained the regression slopes to be equal across Clusters 1, 2 and 3, whilst the cluster intercepts were still freely estimated. This served as a precautionary model to determine whether the same regression slopes apply across the three clusters. Adequate model fit at this stage would indicate that the regression slopes are not conditional on the varying orientations to HPWP across clusters. In the third model, we constrained the cluster intercepts to be equal across Clusters 1, 2 and 3, but the regression slopes were estimated freely. Poor fit for this model will establish that individual HRM practices do not directly influence the differences in employee health, well-being, and work intensification across the HPWP clusters. In other words, the integrated effects of HPWP accounted for variance in employee outcomes beyond the isolated effects of HPWP (support for Hypothesis 4).

There is no best or most robust model fit statistic for assessing goodness-of-fit in the above type of analysis. Researchers have tended to use the difference in Chi-square (ΔX^2) test, but this method has been criticized for poor performance, particularly with large samples (Byrne, 2012; Vandenberg & Lance, 2000). It is recommended that robustness in invariance models can be examined by using multiple model fit indices simultaneously (Byrne, 2012; Little, 1997; Milfont & Fischer, 2010; Vandenberg & Lance, 2000). Thus, an invariance model can be considered adequate if the overall goodness-of-fit, as assessed simultaneously by several fit indices (e.g., RMSEA, CFI, TLI and SRMR), is acceptable.

Results

The means, Cronbach's alphas, standard deviations and correlations between all study variables are provided in Table 1 (for Study 1) and Table 2 (for Study 2).

The results of Hypotheses 1 and 2 are presented in the upper portions of Tables 3 and 4, for Studies 1 and 2, respectively. As shown in Table 3, the latent factor means of employees' job satisfaction, commitment, trust in management, and job-related contentment were

significantly lower in both the restricted-use and low-use clusters, relative to the extensive-use cluster. This indicates that employees in workplaces adopting a wider range of HPWP were more likely to experience improved health and well-being compared to employees in workplaces with average and lower scores in HPWP. Hypothesis 1 is thus supported in Study 1. Table 3 also shows the latent factor mean of work intensification was higher in the restricted-use cluster and lower in the low-use cluster, relative to the extensive-use cluster. This implies that HPWP might increase employees' experience of work intensification, but especially if a restricted range of such practices were implemented. Hypothesis 2 is thus partially supported in Study 1.

For Study 2, the upper portion of Table 4 shows the latent factor mean of job satisfaction was significantly lower in both the restricted-use and low-use clusters, relative to the extensive-use cluster. This indicates that employees in NHS Trusts with high HPWP utilization were more likely to experience greater job satisfaction than employees in NHS Trusts with average and lower scores in HPWP. This result corroborates Study 1 with regard to job satisfaction. Table 4 shows the latent factor means of organizational commitment and employee health were not significantly different across the three NHS clusters. Thus, employees in all three NHS clusters seem to have had similar experiences of organizational commitment and occupational health. Table 4 also shows the latent factor mean of work intensification was higher in the restricted-use cluster and lower in the low-use cluster, relative to the extensive-use cluster. In all, Hypotheses 1 and 2 are partially supported in Study 2.

HPWP and the mediating role of work intensification

The lower portions of Tables 3 and 4 show confidence intervals for indirect effects of HPWP on employee health and well-being via work intensification (Hypothesis 3). The confidence intervals were derived from the distribution of the product method. Relative to the extensive-use cluster, the restricted-use cluster in Study 1 had negative indirect relationships

with employees' trust in management and job-related contentment via increased work intensification; whereas the low-use cluster had positive indirect relationships with employees' job satisfaction, trust in management, and job-related contentment via lower work intensification (Table 3). The low-use cluster also had a negative indirect relationship with organizational commitment via lower work intensification. These results indicate partial support for Hypothesis 3. We interpret the results to suggest, firstly, that restricted adoption of HPWP might be associated with higher work intensification, and this might offset any beneficial impact of HPWP on employees' trust in management and experience of job-related contentment. Secondly, higher work intensification arising from restricted adoption of HPWP may not offset the beneficial impact of HPWP on employees' job satisfaction and commitment. Thirdly, lower adoption of HPWP is associated with lower work intensification, and this in turn might increase employees' job satisfaction, trust in management and job-related contentment, but reduce employees' level of commitment.

For Study 2, the lower portion of Table 4 shows, relative to the extensive-use cluster, that the restricted-use cluster had negative indirect relationships with job satisfaction and employee health, and a positive indirect relationship with organizational commitment via increased work intensification. However, the low-use cluster had positive indirect relationships with job satisfaction and employee health, and a negative association with organizational commitment, via reduced work intensification. Thus, Hypothesis 3 is partially supported. Our interpretation of these results follows that restricted adoption of HPWP might increase work intensification, and this may detract from any positive impact of HPWP on job satisfaction and employee health. By contrast, higher work intensification arising from restricted adoption of HPWP is associated with increased organizational commitment. As with Study 1, however, lower adoption of HPWP is associated with reduced work intensification, and this might lead to higher job satisfaction and employee health, but lower organizational commitment.

The integrationist versus isolationist perspectives of HPWP

We report the results of three nested models used to examine systematically whether the integrated effects of HPWP accounts for variance in employee health, well-being, and work intensification over their isolated effects. In Study 1, the baseline model for which the regression slopes and cluster intercepts were estimated freely across the three clusters yielded adequate model fit (RMSEA = 0.016; CFI = 0.942; TLI = 0.930; SRMR = 0.046). The second model for which the regression slopes were constrained to be equal across the three clusters showed only a slight change in model fit compared to the baseline model (RMSEA = 0.016; CFI = 0.940; TLI = 0.931; SRMR = 0.046) and the patterns of means for outcomes were the same for both models. This implies that the isolated effects of each HRM practice were not conditional on the varying HPWP orientations across the three clusters. The third model for which the cluster intercepts were constrained to be equal returned poor model fit (RMSEA = 0.023; CFI = 0.878; TLI = 0.863; SRMR = 0.210). This indicates that the three clusters were distinct after taking into account the isolated effects of each HRM practice. Therefore, we found evidence that the integrated effects of HPWP have additional explanatory power on employee health, well-being, and work intensification above their isolated effects (support for Hypothesis 4).

In Study 2, the baseline model also yielded adequate model fit (RMSEA = 0.031; CFI = 0.972; TLI = 0.965; SRMR = 0.026). The second model for which the regression slopes were constrained to be equal across the three NHS clusters showed negligible change in model fit compared to the baseline model (RMSEA = 0.030; CFI = 0.972; TLI = 0.967; SRMR = 0.027) and the patterns of means for outcomes were relatively the same for both models. This indicates that the isolated effects of HPWP were not conditional on the broad approaches to HRM across the three NHS clusters. However, unlike Study 1, the third model for which the cluster intercepts were constrained to be equal yielded adequate model fit (RMSEA = 0.031; CFI =

0.970; TLI = 0.965; SRMR = 0.034). That means the explanatory power of the integrated effects of HPWP compared to their isolated effects was, at best, limited in Study 2. In other words, the unique properties of HRM practices have a role in explaining the integrated effects of HPWP on employee health and well-being. Hypothesis 4 is thus not supported in Study 2.

Discussion

This study investigated the positive relationships between HPWP and employee health and well-being, and examined the conflicting assumption that higher work intensification arising from HPWP might offset these positive relationships. The study presented a model that examined systematically whether the integrated effects of HPWP explained more variance in employee health, well-being and experience of work intensification beyond the isolated effects of HPWP. Our hypotheses were examined using a large nationally representative sample of British workplaces (Study 1) and a context-specific survey of employment relations within the British NHS (Study 2).

HPWP, employee health and well-being

Study 1 found evidence that employees in workplaces adopting an extensive range of HPWP are more likely to experience higher job satisfaction, organizational commitment, trust in management, and job-related contentment than employees in workplaces adopting a narrower range of HPWP. This indicates that complementarities among HRM practices may be beneficial for a range of employee health and well-being measures. Our findings are consistent with prior HPWP studies where firms adopting a broad range of HRM practices accrued greater organizational gains compared to firms with weaker adoption of HRM practices (see Arthur, 1994; Huselid & Becker, 1997; Ichniowski et al., 1997). By incorporating a broad range of HRM practices into an integrated HPWP system, organizations are able to maximize the positive effects of some practices in the system, and offset the negative effects of others, leading to overall benefits for the organization (Beltrán-Martín et al., 2008;

MacDuffie, 1995). Within the limits of our analysis, Study 1 demonstrates that this may also apply when considering employee health and well-being.

The results of Study 1 were replicated in Study 2 with regard to job satisfaction. Employees in NHS Trusts with higher scores in HPWP might experience greater job satisfaction compared to employees in NHS Trusts with lower scores in HPWP. Thus, an integrated system of HPWP could even make a difference in employees' job satisfaction within the British NHS where workers tend to have pre-existing high levels of vocational commitment, both to the work itself and the organization as a whole. Some studies (e.g., Bonias et al., 2010; West et al., 2006) have linked systems of HPWP with positive work-related behaviors among healthcare workers. For example, West et al. (2006) in their study of 52 hospitals in England reported positive links between a measure of HPWP and effectiveness in patient care delivery. West et al. noted that systems of HPWP allow employees to optimize their work-related skills in ways that enhance job satisfaction and employees' ability to provide high-quality healthcare services. Our study extends these findings with evidence to suggest healthcare workers tend to be more satisfied in workplaces adopting an extensive range of HPWP.

Study 2 showed NHS employees' experience of organizational commitment and occupational health may not be contingent on the extent of HPWP utilization across the three NHS clusters. We provide two plausible explanations for this result. Firstly, healthcare professions such as medicine and nursing are often based upon an intrinsic commitment towards providing care and support for patients. A doctor's or nurse's level of organizational commitment and occupational well-being might not necessarily depend on the nature of work itself or how work is managed, but on their inherent desire to serve and help vulnerable members of society (Truss, 2003). Secondly, the institutionalized nature of work within the British NHS means that NHS Trusts across the UK would normally have similar policies in

terms of wages and allowances. Healthcare professionals who wish to transfer their service from one NHS Trust to another are more likely to retain the same salaries and inherit similar allowances. These factors, coupled with the emotional cost of adapting to a new working environment, may increase the healthcare professional's tendency to stay committed to his/her NHS Trust, irrespective of the nature of HRM structures within the workplace.

Studies 1 and 2 contribute theoretically to the 'universalist' principle of HRM (Delery & Doty, 1996; Hughes, 2002). We found evidence that integrated systems of HPWP might influence positive employee outcomes despite organizational and contextual differences between Studies 1 and 2. Our findings align therefore with reports that HPWP may generate positive effects in different settings such as the manufacturing sector (Appelbaum et al., 2000), services sector (Ordiz & Fernández, 2005), healthcare sector (West et al., 2006), and the hospitality and tourism sector (Hughes, 2002). Another theoretical implication of our findings concerns the mutual gains perspective of HRM (Van De Voorde et al., 2012). Our study has shown that HPWP might impact positively on employee health and well-being, in addition to their positive influence on organizational performance. Whilst our results convey a practical message to occupational health practitioners regarding favourable employee-level effects of HPWP, we caution that the effect size of HPWP is not large enough to give an overall best estimate of the practical importance in any given context.

HPWP, the critical perspective

Our analysis provides some evidence for the critical perspective, the assumption that workplace practices aimed primarily at maximizing labor input might increase employees' experience of work intensification (Kroon et al., 2009). First, in Study 1, we found that the low-use cluster was associated with reduced work intensification, and the latter mediated a positive relationship with job satisfaction, trust in management, and job-related contentment, and a negative relationship with organizational commitment. It appears that employees in the

low-use cluster may have experienced some enhancement in their well-being due to corresponding decreases in work intensification. This result makes sense as employers in the low-use cluster are less likely to take up innovative HRM activities, and their employees, consequently, might experience lower job demands and pressure. Low adoption of HPWP in this light indicates ‘absence’ of high work demands and pressure that would have otherwise increased employees’ workloads and reduced their job satisfaction and contentment.

On the contrary, employees in the restricted-use cluster experienced higher work intensification, and the latter offset the beneficial impact of HPWP on employees’ trust and perceptions of job-related contentment. We trace this to partial coverage of HPWP in the restricted-use cluster. Workplaces in the restricted-use cluster seemed to emphasize employee skills utilization (as indicated by high scores in selective hiring, staff training and team working), but offered little workplace support and incentives to ease possible consequences of high work demands and job strain. Thus, employers in this cluster did not implement a broad range of HPWP, and consequently, their HRM systems lacked adequate structure to ameliorate work intensification and its adverse impact on employee health. This finding strengthens the idea that partial coverage of HPWP may result in low ‘distinctiveness’, a situation in which HPWP are not readily observable or consistently applied to all employees (Van De Voorde and Beijer, 2015, p. 64). In such situations, HPWP might send ambiguous signals to employees, prompting them to make negative attributions about the intended outcomes of HPWP. Any experience of high work demands and pressure in such circumstances might be interpreted by employees as the employer’s ploy to take as much advantage as possible of employees, and this may undermine employee well-being.

Study 2 showed similar patterns of effects as Study 1. Employees in the low-use cluster experienced reduced work intensification, and this mediated a positive relationship with job satisfaction and employee health. Also, through decreases in work intensification, employees

in the low-use cluster reported lower levels of organizational commitment compared to employees in the other two clusters. As with Study 1, we trace these outcomes to relative ‘absence’ of innovative HRM activities within the low-use NHS Trusts, and consequently, fewer opportunities to actively engage employees with work.

As with Study 1, higher work intensification among employees in the restricted-use cluster detracted from the beneficial impact of HPWP on employees’ job satisfaction. This adds value to the notion that partial coverage of HPWP, and possibly, insufficient workplace structures to attenuate work intensification, may contribute to low ‘distinctiveness’ for HPWP and cause employees to experience lower job satisfaction. In contrast to Study 1, however, employees in the restricted-use cluster also reported increased organizational commitment due to higher work intensification. That is to say, their level of commitment was not influenced negatively by high work demands and pressure arising from partial coverage of HPWP. Although this result is somewhat surprising, it corroborates our earlier argument that healthcare workers’ level of commitment may not necessarily depend on the job itself, but their inherent desire to help vulnerable people.

In all, Studies 1 and 2 have shown similar patterns of outcomes regarding possible adverse effects of HPWP on employee health and well-being. Work intensification has, at least, a marginal role in explaining the HPWP–employee health or well-being relationship, and this may transcend organizational/sectoral contexts. Across the broad spectrum of approaches to HPWP in Clusters 1, 2 and 3 of both studies, employees in the low adoption clusters tended to experience lower levels of work intensification, whereas employees in the restricted adoption clusters tended to experience higher levels of work intensification. This implies that HPWP may, in fact, induce employees to expend more effort at work, and reduce their health and well-being, if some but not all components are implemented. Employers who do not implement an extensive range of HPWP are less likely to maximize the unique properties of such practices

to compensate for exacerbation of job strain and work intensification, and achieve positive occupational health outcomes. We maintain that systems of HPWP are not necessarily exploitative when a wide range of HRM practices are used together in a coherent manner (Van De Voorde and Beijer, 2015). Compared to low-use or less innovative HPWP systems, extensive use of HPWP may be associated with a degree of work intensification, but employees may benefit through potential improvements in their work-related health and well-being.

The integrationist versus isolationist perspectives of HPWP

In Studies 1 and 2, we used three nested models to systematically examine whether the integrated effects of HPWP have additional explanatory power on employee health, well-being and work intensification than their isolated effects. In Study 1, we found that the impact of HPWP on these employee outcomes was, at least, partially accounted for by an integrated combination of HRM practices, rather than each practice examined in isolation. That is to say, in heterogeneous samples of organizations, the unique independent properties of individual HRM practices do not in themselves play the only role in explaining the overall impact of HPWP on employee outcomes. This result is consistent with evidence from Ichniowski et al. (1997) and Guerrero and Barraud-Didier (2004), where integrated systems of HPWP were found to have greater explanatory power on outcomes over the independent effects of HPWP. Given that Ichniowski et al. (1997) and Guerrero and Barraud-Didier (2004) had examined the ‘integrationist–isolationist’ dyad in terms of organizational-level outcomes, the present study is the first to demonstrate similar effects on employee health, well-being, and work intensification.

Study 2 showed HPWP’s impact on employee health, well-being and work intensification may be accounted for by the unique effects of individual HRM practices, not necessarily their integrated combination. Individual HRM practices have varying and/or opposing independent effects on outcomes (Bryson & White, 2008; Kalmi & Kauhanen, 2008),

which are crucial in explaining the overall impact of HPWP on employee outcomes within the British NHS. The practical implication of this is to strengthen the idea that the very context of work (e.g., the institutionalized nature of work within the British NHS), as well as the unique independent properties of HRM practices should be taken into account when operationalizing systems of HPWP and anticipating their effects on employee health and well-being. If employers go beyond the integrated effects of HPWP to examine the respective contributions from each HRM practice in the system, they may find that the integrated effects of HPWP, in some contextual instances, do not explain more variance in employee outcomes compared to the unique properties of individual HRM practices.

Another important lesson drawn from our analyses is that using an extensive range of HRM practices in a complementary fashion might be beneficial for employee health and well-being, but this is likely to be sensitive to particular organizational settings; that is, complementarities amongst individual HRM practices may operate in some sectors but not in others. For example, we found different types of clustering solutions for the general workforce (Study 1) and the healthcare sector (Study 2). Whereas the latter cluster solution was straightforwardly interpretable as low-medium-high, for the general workforce a more content-related pattern was found. Moreover, results from the healthcare sector illustrate that the parts (i.e., the unique independent effects of individual HRM practices) are as important as the whole (the combined or integrated effects of HRM practices) when considering the impact of HPWP on employee health and well-being. A key policy priority for occupational health practitioners is to look more closely at the specific characteristics of individual HRM practices and the particular context of work when making decisions on how to operationalize systems of HPWP. As much as HPWP are thought to foster mutual gains for an organization, their utilization should be accompanied by sufficient scrutiny of what and how specific HRM practices are incorporated within the overall HPWP regime.

Strengths and limitations

The key strength of our study lies in the use of two large nationally representative samples in examining the relationships between HPWP and employee health and well-being. Our study employed robust statistical analysis to address the rarely investigated proposition that HPWP have greater explanatory power on outcomes when analyzed in combination, rather than in isolation. Despite its uniqueness, the present study has some limitations. First, the cross-sectional nature of Studies 1 and 2 precludes making strong causal statements; therefore, caution is advised in terms of interpreting our findings. However, considering our predictions were grounded in theory, it is expected that the limitations of using cross-sectional data may have been offset to the extent that this allows comparison with existing evidence base. A second limitation of the present study is that measures selected for Studies 1 and 2, whilst very similar, were not exactly the same. We however compensated for this by ensuring that measures selected for the respective studies were consistent with the measures adopted in previous HPWP studies (e.g., Combs et al., 2006; West et al., 2006). Another plausible limitation of our study concerns the relatively low HPWP effect size. Although small effect sizes are quite common in organizational research, and especially, studies based on the British WERS (e.g., Guest & Conway, 2007; Ramsay et al., 2000; Wood & De Menezes, 2011; Wood et al., 2012), caution should be applied in interpreting our findings. However, a small effect across a large sample is potentially of great practical significance.

Recommendations for future research

Our analyses showed HPWP have useful integrated effects on employee health and well-being, and these effects operate differently for the general workforce compared to a large public healthcare organization. Employee health and well-being for the general workforce were explained by the isolated plus integrated combination of HPWP, whereas in the healthcare context, they were accounted for by the isolated operations of individual HRM practices, not

necessarily the integrated combination of HPWP. More research is however needed to better understand why the ‘integrationist–isolationist’ dyad may operate in some contexts but not others, and how these principles may influence approaches to HRM across organizational settings. Our analyses also showed work intensification partially mediates the HPWP–employee health and well-being relationships such that low adoption of HPWP is associated with higher job satisfaction and lower organizational commitment. By contrast, employees in workplaces with restricted adoption of HPWP experienced high work intensification, and correspondingly, poor health and well-being. Future studies may further examine the conditions under which different configurations of HPWP are related to greater or less work intensification, and how this may affect occupational health outcomes.

Conclusion

We have shown that systems of HPWP might promote positive employee health and well-being when an extensive range of HRM practices is implemented. We have also shown that partial implementation of HPWP may promote the feeling that work is too intense, and this might offset any positive effect of HPWP on employee health and well-being. On the other hand, extensive implementation of HPWP may, at least marginally, increase employees’ experience of work intensification; however, the negative consequences of work intensification in this case may be compensated for by increases in job satisfaction and improved employee well-being. Furthermore, we showed evidence that individual HRM practices have unique and independent properties that play a vital role in explaining the employee-level effects of HPWP in some organizational settings. When visualizing the impact of HPWP on employees, it is necessary to move away from a simple input-output model, and from a singular chain of events. Not only does the whole set of practices impact on employees, but so do the parts. Also, where practices are positively influencing some outcomes they may simultaneously be negatively influencing other outcomes. Therefore, occupational health practitioners and researchers would

benefit from building a system of HPWP while keeping a keen eye on the whole, the parts, and the possible trade-offs between benefits and costs to employees on several dimensions of well-being and performance.

References

- Appelbaum, E., Bailey, T., Berg, P., & Kalleberg, A. (2000). *Manufacturing advantage: Why high-performance work systems pay off*. Ithaca, NY: ILR Press.
- Arthur, J. (1994). Effects of human resource systems on manufacturing performance and turnover. *Academy of Management Journal*, 37, 670-687.
- Becker, B., Huselid, M., Pickus, P., & Spratt, M. (1997). HR as a source of shareholder value: Research and recommendations. *Human resource management*, 36, 39-47.
- Beltrán-Martín, I., Roca-Puig, V., Escrig-Tena, A., & Bou-Llusar, J. (2008). Human resource flexibility as a mediating variable between high performance work systems and performance. *Journal of Management*, 34, 1009-1044.
- Bonias, D., Bartram, T., Leggat, S., & Stanton, P. (2010). Does psychological empowerment mediate the relationship between high performance work systems and patient care quality in hospitals? *Asia Pacific Journal of Human Resources*, 48, 319–337.
- Bryson, A., & White, M. (2008). *Organizational commitment: Do workplace practices matter?* Discussion Paper No. 881, Centre for Economic Performance.
- Burns, R. and Burns, R. (2008). *Business research methods and statistics using SPSS*. Beverly, CA: SAGE Publications Ltd.
- Byrne, B. (2012) *Structural equation modelling with Mplus: Basic concepts, applications and programming*. New York: Taylor & Francis Group, LLC.
- Combs, J., Liu, Y., Hall, A., & Ketchen, D. (2006). How much do high-performance work practices matter? A meta-analysis of their effects on organizational performance. *Personnel Psychology*, 59, 501–528.
- Delery, J. (1998). Issues of fit in strategic human resource management: Implications for research. *Human Resource Management Review*, 8, 289-309.

- Delery, J., & Doty, H. (1996). Modes of theorizing in strategic human resource management: Tests of universalistic, contingency and configurational performance predictions. *Academy of Management Journal*, 39, 802–835.
- Godard, J. (2001). High performance and the transformation of work? The implications of alternative work practices for the experience and outcomes of work. *Industrial and Labor Relations Review*, 54, 776-805.
- Guerrero, S., & Barraud-Didier, V. (2004). High-involvement practices and performance of French firms. *The International Journal of Human Resource Management*, 15, 1408-1423.
- Guest, D., & Conway, N. (2007). *Human resource management, employee attitudes and workplace performance: An examination of the linkages using the 2004 Workplace Employment Relations Survey*. A report for the Department for Business Enterprise & Regulatory Reform (BERR), London.
- Hayduk, L. (1987). *Structural equation modeling with LISREL: Essentials and advances*. Baltimore, MD: Johns Hopkins University Press.
- Heinen, T. (1996). *Latent class and discrete latent trait models: Similarities and differences*. Thousand Oaks, California: Sage.
- Hughes, J. (2002). HRM and universalism: Is there one best way? *International Journal of Contemporary Hospitality Management*, 14, 221-228.
- Huselid, M., & Becker, G. (1997). *The impact of high-performance work systems, implementation effectiveness, and alignment on shareholder wealth*. Paper presented at the 1997 Academy of Management Annual Conference, Boston, Mass.
- Ichniowski, C., Shaw, K., & Prennushi, G. (1997). The effects of human resource management practices on productivity: A study of steel finishing lines. *The American Economic Review*, 87, 291-313.

- Jensen, J., Patel, P., & Messersmith, J. (2013). High-performance work systems and job control consequences for anxiety, role overload, and turnover intentions. *Journal of Management*, 39, 1699-1724.
- Jiang, K., Lepak, D., & Baer, J. (2012). How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms. *Academy of Management Journal*, 55, 1264-1294.
- Kalmi, P., & Kauhanen, A. (2008). Workplace innovations and employee outcomes: Evidence from Finland. *Industrial Relations*, 35, 430-459.
- Kehoe, R., & Wright, P. (2013). The impact of high-performance human resource practices on employees' attitudes and behaviors. *Journal of Management*, 39, 366-391.
- Kroon, B., Van de Voorde, K., & Van Veldhoven, M. (2009). Cross-level effects of high-performance work practices on burnout: Two counteracting mediating mechanisms compared. *Personnel Review*, 38, 509-525.
- LeBreton, J., & Senter, J. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods*, 11, 815-852.
- Little, T. (1997). Mean and covariance structures (MACS) analyses of cross-cultural data: Practical and theoretical issues. *Multivariate Behavioral Research*, 32, 53-76.
- MacDuffie, J. (1995). Human resource bundles and manufacturing performance: Organizational logic and flexible production systems in the world auto industry. *Industrial and Labor Relations Review*, 48, 197-221.
- MacKinnon, D., Fritz, M., Williams, J., & Lockwood, C. (2007). Distribution of the product confidence limits for the indirect effect: Program PRODCLIN. *Behavior Research Methods*, 39, 384-389.

- Macky, K., & Boxall, P. (2007). The relationship between 'high performance work practices' and employee attitudes: An investigation of additive and interaction effects. *The International Journal of Human Resource Management*, 18, 537–567.
- Macky, K., & Boxall, P. (2008). High-performance work systems and employee well-being: Does employee involvement really intensify work? *Asia Pacific Journal of Human Resources*, 46, 38-55.
- Milfont, T. & Fischer, R (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research*, 3, 111-121.
- Nishii, L. H., Lepak, D. P., & Schneider, B. (2008). Employee attributions of the “why” of HR practices: Their effect on employee attitudes and behaviors, and customer satisfaction. *Personnel Psychology*, 61, 503–545.
- Ordiz, M., & Fernández, E. (2005). Influence of the sector and the environment on human resource practices' effectiveness. *The International Journal of Human Resource Management*, 16, 1349-1373.
- Powell, M., Dawson, J., Topakas, A., Durose, J., & Fewtrell, C. (2014). Staff satisfaction and organisational performance: evidence from a longitudinal secondary analysis of the NHS staff survey and outcome data. *Health Services and Delivery Research*, 2
- Ramsay, H., Scholarios, D., & Harley, A. (2000). Employees and high-performance work systems: Testing inside the black box. *British Journal of Industrial Relations*, 38, 501 – 531.
- Toh, S. Morgeson, F. & Campion, M. (2008). Human resource configurations: investigating fit with the organizational context. *Journal of Applied Psychology*, 93, 864-882.
- Truss, C. (2003). Strategic HRM: Enablers and constraints in the NHS. *The International Journal of Public Sector Management*, 16, 48-60.

- Vandenberg, R. & Lance, C. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3, 4-70
- Van De Voorde, K., Paauwe, J., & Van Veldhoven, M. (2012). Employee well-being and the HRM–organizational performance relationship: A review of quantitative studies. *International Journal of Management Reviews*, 14, 391-407.
- Van De Voorde, K. and Beijer, S. (2015). The role of employee HR attributions in the relationship between high-performance work systems and employee outcomes. *Human Resource Management Journal*, 25, 62–78.
- West, M., Guthrie, J., Dawson, J., Borrill, C., & Carter, M. (2006). Reducing patient mortality in hospitals: The role of human resource management. *Journal of Organizational Behaviour*, 27, 983–1002.
- Whitener, E. (2001). Do “high commitment” human resource practices affect employee commitment? A cross-level analysis using hierarchical linear modelling. *Journal of Management*, 27, 515–535.
- Williams, L., Vandenberg, R., & Edwards, J. (2009). 12 Structural equation modeling in Management Research: A guide for improved analysis. *The Academy of Management Annals*, 3, 543-604.
- Wood, S., & De Menezes, L. (2011). High involvement management, high-performance work systems and well-being. *The International Journal of Human Resource Management*, 22, 1584–1608.
- Wood, S., Van Veldhoven, M., Croon, M., & De Menezes, L. (2012). Enriched job design, high involvement management and organizational performance: The mediating roles of job satisfaction and well-being. *Human Relations*, 65, 419-445.

Table 1
Means, Standard Deviations (SD), Cronbach's alpha (on the diagonal in bold), and Correlations of variables in Study 1

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Job autonomy	3.13	0.30	0.89														
2 Team working	0.61	0.39	-.03**	0.50													
3 Staff training	0.66	0.24	.02*	.02**	-												
4 Performance-related pay	0.34	0.40	-.01	.03**	.01	0.82											
5 Flexible working	0.36	0.20	.17**	-.04**	.35**	-.05**	0.75										
6 Selective hiring	0.83	0.27	.14**	.03**	.23**	-.02**	.05**	0.60									
7 Grievance systems	0.48	0.44	-.01**	.10**	.14**	-.03**	.06**	.07**	0.91								
8 Supportive management	3.50	0.46	.35**	-.09**	.29**	-.06**	.38**	.10**	-.11**	0.83							-
9 Information sharing	3.27	0.50	.28**	-.07**	.22**	-.04**	.29**	-.02**	-.12**	.79**	0.94						
10 Participative decision-making	3.10	0.52	.30**	-.05**	.20**	-.04**	.29**	-.02*	-.11**	.82**	.87**	0.97					
11 Job satisfaction	3.52	0.69	.23**	-.03**	.06**	-.05**	.08**	.03**	-.05**	.31**	.30**	.30**	0.83				
12 Organizational commitment	3.66	0.83	.18**	-.03**	.11**	-.04**	.08**	.06**	-.05**	.32**	.30**	.31**	.61**	0.85			
13 Employees' trust in management	3.35	0.98	.14**	-.05**	.05**	-.03**	.12**	-.02**	-.10**	.43**	.42**	.44**	.58**	.58**	0.92		
14 Job-related contentment	2.45	0.87	.02**	-.00	-.09**	-.03**	-.04**	-.04**	-.02**	.06**	.08**	.08**	.30**	.15**	.25**	0.85	
15 Work intensification	3.30	0.80	.02**	-.02*	.13**	-.01	.06**	.09**	.01	.04**	-.00	.01	-.07**	.05**	-.09**	.56**	0.70

SD = Standard Deviation

* $p < .05$; ** $p < .01$

Table 2
Means, Standard Deviations (SD), Cronbach's alpha (on the diagonal in bold), and Correlations of variables in Study 2

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Job autonomy	3.55	0.14	0.95													
2 Team working	3.85	0.08	.64**	0.85												
3 Staff training	3.70	0.09	.51**	.51**	0.96											
4 Career development	3.30	0.15	.75**	.67**	.71**	0.94										
5 Flexible working	0.57	0.11	.60**	.26**	.09**	.20**	-									
6 Performance appraisal	0.78	0.09	.29**	.28**	.17**	.33**	.09**	-								
7 Grievance systems	0.67	0.05	.60**	.46**	.26**	.47**	.57**	.32**	0.87							
8 Supportive management	3.66	0.14	.82**	.60**	.48**	.67**	.58**	.38**	.66**	0.96						
9 Information sharing	2.75	0.20	.81**	.58**	.53**	.75**	.43**	.25**	.58**	.67**	0.94					
10 Participative decision-making	2.93	0.20	.84**	.57**	.45**	.68**	.54**	.27**	.63**	.70**	.93**	0.92				
11 Job satisfaction	3.10	0.85	.15**	.10**	.08**	.13**	.11**	.05**	.12**	.14**	.14**	.14**	0.73			
12 Organizational commitment	2.60	1.08	.02**	-.05**	-.04**	-.06**	.07**	-.01**	-.01**	.01*	-.02**	-.02	-.49**	0.92		
13 Employee health	1.87	0.87	-.02**	-.01**	-.02**	.02**	-.01**	-.00	.01**	-.02**	-.01**	-.28**	.30**	.00	0.75	
14 Work intensification	3.21	0.99	-.00	.01**	-.01**	-.02**	.01**	.01**	-.01**	-.01**	-.03**	-.01**	-.25**	.26**	.21**	0.79

SD = Standard Deviation

* $p < .05$; ** $p < .01$

Table 3
Study 1 results, standardized regression coefficients and residuals

Direct effects of HPWP on employee health and well-being

	Job Satisfaction (residuals)	Organizational Commitment (residuals)	Employees' Trust (residuals)	Job-related contentment (residuals)	Work Intensification (residuals)
Work Intensification	-0.073*** (0.011)	0.039*** (0.010)	-0.129*** (0.010)	-0.753*** (0.007)	-
Cluster 1	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Cluster 2	-0.090*** (0.012)	-0.123*** (0.013)	-0.199*** (0.012)	-0.024*** (0.009)	0.033* (0.014)
Cluster 3	-0.233*** (0.013)	-0.264*** (0.013)	-0.313*** (0.013)	-0.072*** (0.009)	-0.070*** (0.013)

95% Confidence Interval (CI) for indirect effects of HPWP on employee health and well-being via work intensification

	Job Satisfaction CI (95%)		Organizational Commitment CI (95%)		Employees' Trust CI (95%)		Job-related Contentment CI (95%)	
	<i>DOPM</i>		<i>DOPM</i>		<i>DOPM</i>		<i>DOPM</i>	
	<i>Lower limit</i>	<i>Upper limit</i>	<i>Lower limit</i>	<i>Upper limit</i>	<i>Lower limit</i>	<i>Upper limit</i>	<i>Lower limit</i>	<i>Upper limit</i>
Cluster 1	-	-	-	-	-	-	-	-
Cluster 2	-0.005	0.000	0.000	0.003	-0.008	-0.001	-0.046	-0.004
Cluster 3	0.003	0.008	-0.005	-0.001	0.006	0.013	0.034	0.072

Model fit = $\chi^2 = 5851.605$; $df = 132$; p -value < 0.001; RMSEA = 0.045; CFI = 0.962; TLI = 0.951; SRMR = 0.043

DOPM = Distribution of the product method

Sample size (N) = 1733 workplaces, 22451 employees

Cluster 1 = Extensive-use cluster (686 workplaces, 8165 employees)

Cluster 2 = Restricted-use cluster (602 workplaces, 8823 employees)

Cluster 3 = Low-use cluster (445 workplaces, 5463 employees)

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

Table 4
 Study 2 results, standardized regression coefficients and residuals

<i>Direct effects of HPWP on employee health and well-being</i>						
	Job Satisfaction (residuals)	Organizational Commitment (residuals)	Employee Health (residuals)	Work Intensification (residuals)		
Work Intensification	-0.341*** (0.004)	0.286*** (0.004)	-0.260*** (0.003)	-		
Cluster 1	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)		
Cluster 2	-0.105*** (0.005)	-0.016 (0.009)	0.007 (0.005)	0.014* (0.006)		
Cluster 3	-0.122*** (0.021)	-0.004 (0.008)	-0.005 (0.007)	-0.019** (0.007)		
<i>95% Confidence Interval (CI) for indirect effects of HPWP on employee health and well-being via work intensification</i>						
	Job Satisfaction CI (95%)		Organizational Commitment CI (95%)		Employee Health CI (95%)	
	<i>DOPM</i>		<i>DOPM</i>		<i>DOPM</i>	
	<i>Lower limit</i>	<i>Upper limit</i>	<i>Lower limit</i>	<i>Upper limit</i>	<i>Lower limit</i>	<i>Upper limit</i>
Cluster 1	-	-	-	-	-	-
Cluster 2	-0.009	-0.001	0.001	0.007	-0.007	-0.001
Cluster 3	0.002	0.011	-0.009	-0.002	0.001	0.009
<i>Model fit = $X^2 = 14201.891$; $df = 52$; p-value < 0.001; RMSEA = 0.041; CFI = 0.970; TLI = 0.950; SRMR = 0.028</i>						
<i>DOPM = Distribution of the product method</i>						
<i>Sample size (N) = 386 NHS Trusts, 164916 employees</i>						
<i>Cluster 1 = Extensive-use cluster (159 NHS Trusts, 69217 employees)</i>						
<i>Cluster 2 = Restricted-use cluster (216 NHS Trusts, 91875 employees)</i>						
<i>Cluster 3 = Low-use cluster (11 NHS Trusts, 3824 employees)</i>						
<i>* = $p < .05$; ** = $p < .01$; *** = $p < .001$</i>						

Figure 1
Graphical representation of the HPWP cluster solutions in Study 1

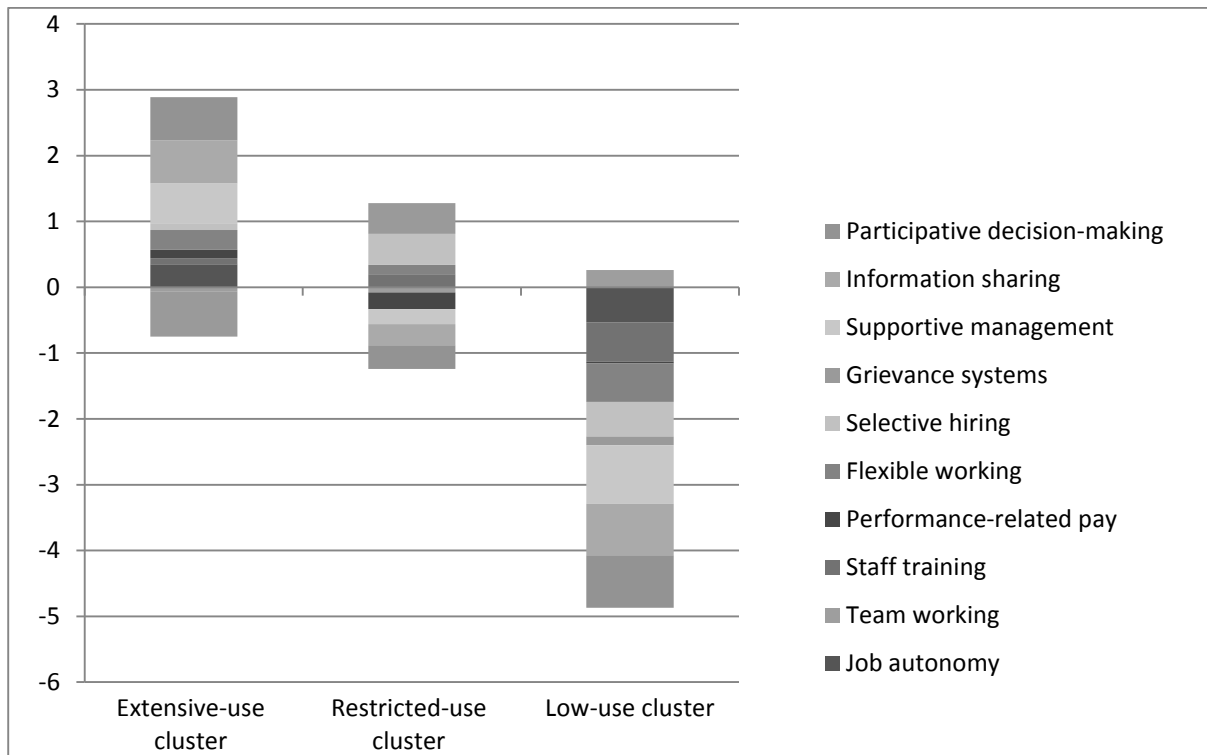
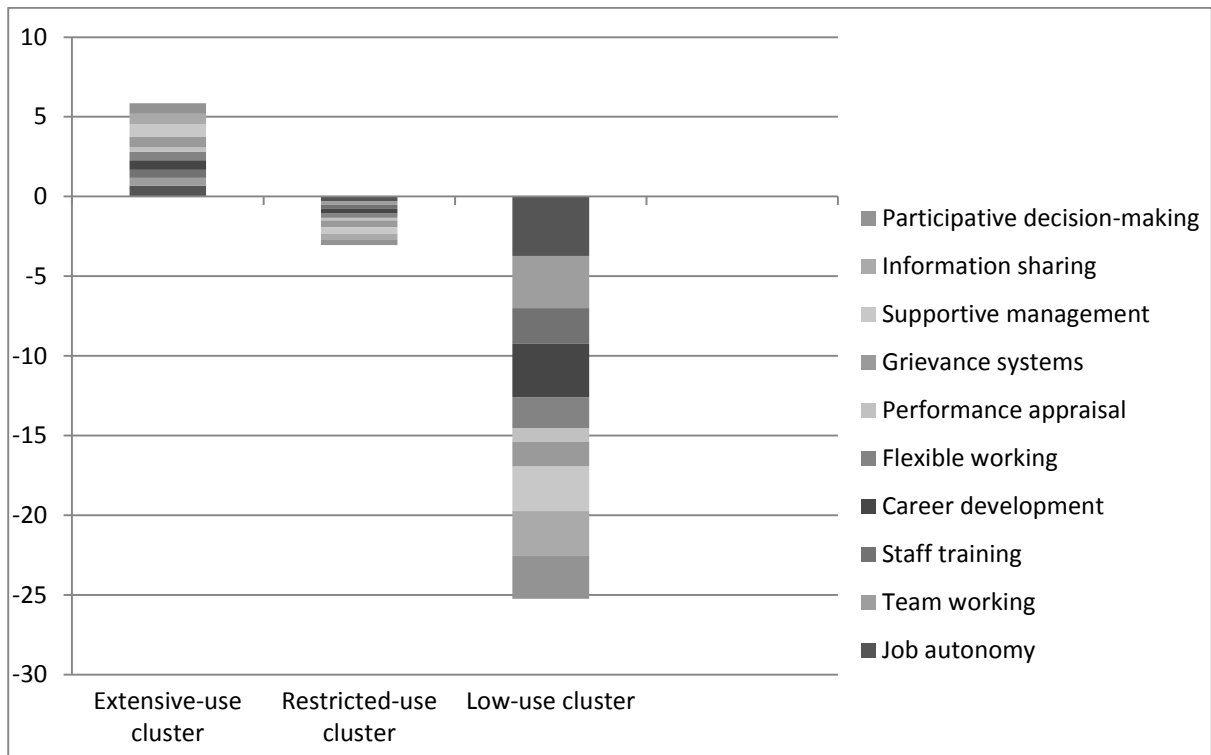


Figure 2
Graphical representation of the HPWP cluster solutions in Study 2



Appendix 1: Study 1 variables obtained from the 2004 WERS management and employee surveys

Variables	Observed Items	Response Scale
Job autonomy	How much influence do you have over what tasks you do	1 = 'None' to 4 = 'A lot'
	How much influence do you have over the pace at which you work	
	How much influence do you have over how you do your work	
	How much influence do you have over the order in which you carry out tasks	
Team working	Team members depend on each other's work to be able to do their job	0 = 'No' to 1 = 'Yes'
	Tasks or roles rotate among the members of the team	
Staff training	Training either paid for or organised by your employer during the last 12 months	0 = 'Have had no training' 1 = 'Have had some training'
Performance-related pay	Do any employees in this establishment get paid by results or results	0 = 'Otherwise' 1 = 'Merit or results'
	What proportion of employees are paid by merit or results	1 = '40% or more' 0 = 'Otherwise'
	What measures of performance are used to determine payments by merit or results	0 = 'Otherwise' 1 = 'Individual, team, workplace or organisation measures'
Flexible working	Are flexi-time arrangements available to you	0 = 'No' to 1 = 'Yes'
	Are job sharing arrangements available to you	
	Are chances to reduce your working hours available to you	
Selective hiring	Individuals' skill is important when recruiting new employees	0 = 'Not selected' to 1 = 'Selected'
	Individuals' qualification is important when recruiting new employees	
	Individuals' experience is important when recruiting new employees	
Grievance systems	Grievance procedures cover pay issues	0 = 'Not selected' to 1 = 'Selected'
	Grievance procedures cover redundancy issues	
	Grievance procedures cover organisation of work issues	
	Grievance procedures cover health and safety issues	
	Managers understand employee responsibilities outside of work	1 = 'Strongly disagree'

Supportive management	Managers encourage staff to develop their skills	5 = 'Strongly agree'
Information sharing	Managers keep employees informed about the way job is done	1 = 'Very poor'
	Managers keep employees informed about financial matters	5 = 'Very good'
Participative decision-making	Managers seek employee views	1 = 'Very poor' 5 = 'Very good'
	Managers respond to employee suggestions	
	Employees influence final decisions	
Job satisfaction	Satisfied with my sense of achievement at work	1 = 'Very dissatisfied' 5 = 'Very satisfied'
	Satisfied with using my own initiative at work	
	Satisfied with my level of influence on the job	
	Satisfied with my job security	
Organizational commitment	Satisfied with the work itself	1 = 'Strongly disagree' 5 = 'Strongly agree'
	I share the organizational values	
	I feel loyal to the organization	
Employee trust	I am proud to tell people about the organization	1 = 'Strongly disagree' 5 = 'Strongly agree'
	Managers can be reliable upon to keep their promises	
	Managers are sincere in attempting to understand employees' views	
Job-related contentment	Managers deal with employees honestly	1 = 'All the time' 5 = 'Never'
	How much of the time has your job made you feel tense	
	How much of the time has your job made you feel worried	
Work intensification	How much of the time has your job made you feel uneasy	1 = 'Strongly disagree' 5 = 'Strongly agree'
	My job requires that I work very hard	
	I never seem to have enough time to get my work done	
	I worry a lot about my work outside working hours	

Appendix 2: Study 2 variables obtained from the 2010 NHS Staff survey

Variables	Observed Items	Response Scale
Job autonomy	There are frequent opportunities for me to show initiative in my role	1 = 'Strongly disagree' 5 = 'Strongly agree'
	I am able to make improvements happen in my area of work	
Team working	Team members have a set of shared objectives	1 = 'Strongly disagree' 5 = 'Strongly agree'
	Team members communicate closely with each other	
Staff training	My training has helped to do my job better	1 = 'Strongly disagree' 5 = 'Strongly agree'
	My training has helped me to stay up-to-date with my job	
	My training has helped me to stay up-to-date with professional requirements	
Career development	I am supported to keep up-to-date with developments in my field	1 = 'Strongly disagree' 5 = 'Strongly agree'
	There is strong support for training in my area of work	
Flexible working	Do the following flexible work arrangements apply to you - flexi-time, reduced hours, work from home, working agreed hours and job sharing	0 = 'Not selected' to 1 = 'Selected'
Appraisal	Have you had an appraisal or Knowledge and Skills Framework (KSF) development review in the last 12 months	0 = 'No' to 1 = 'Yes'
Grievance systems	If concerned about fraud, malpractice or wrongdoing, do you know how to report it	0 = 'No' to 1 = 'Yes'
	Do you feel safe raising concerns about fraud, malpractice or wrongdoing	
	Do you feel confident that your Trust would address your concerns	
Supportive management	Managers can be counted on to help with a difficult task at work	1 = 'Strongly disagree' 5 = 'Strongly agree'
	Managers give clear feedback on my work	
Information sharing	Communication between senior management and staff is effective	1 = 'Strongly disagree' 5 = 'Strongly agree'
	Different parts of the Trust communicate effectively with each other	
Participative decision-making	Senior managers involve staff in important decisions	1 = 'Strongly disagree' 5 = 'Strongly agree'
	Senior managers encourage staff to suggest new ideas	
Job satisfaction	Satisfied with the recognition I get for good work	1 = 'Very dissatisfied' 5 = 'Very satisfied'
	Satisfied with the extent to which my work is valued	

	Satisfied with my level of pay	
Organizational commitment	I often think about leaving this Trust	
	I will probably look for a job at a new organisation	1 = 'Strongly disagree'
	I will leave this Trust as soon as I find another job	5 = 'Strongly agree'
Employee health	How would you rate your health during the past four weeks	1 = 'Very poor'
	I had difficulty doing my daily work because of my physical health	6 = 'Excellent'
	How much did personal or emotional problems keep you from doing your work	1 = 'Could not do daily work'
Work intensification	I cannot meet all the conflicting demands on my time at work	5 = 'None at all'
	I do not have time to carry out all my work	1 = 'Strongly disagree' 5 = 'Strongly agree'