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Disentangling the relationship between high-involvement-work-systems and job satisfaction

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Abstract

Purpose – The purpose of this paper is to study how high-involvement work systems (HIWS) affect job satisfaction, and tries to disentangle the mechanisms through which the effect occurs.

Design/methodology/approach – The authors use data for a representative sample of 10,112 Spanish employees. In order to test the mediation mechanism implied by the hypotheses, the authors follow the procedure outlined in Baron and Kenny (1986). Given the nature of the dependent variables, ordered probit models were estimated to study the effect of HIWS on the mediating variables (job interest, effort and wages), and regression models were estimated to analyze the effect of HIWS on the final attitudinal variable (job satisfaction).

Findings – Empirical results show that HIWS results in higher levels of effort, higher wages and perceptions of a more interesting job. Moreover, greater involuntary physical effort reduces job satisfaction while higher wages, greater voluntary effort, involuntary mental effort and having an interesting job increase job satisfaction. The net effect of these opposing forces on job satisfaction is positive.

Research limitations/implications – The use of secondary data posits some constrains in aspects such as the type of measures or the failure to control for personal traits. Additionally, the non-longitudinal nature of the data set implies that some relationships cannot be considered causal in the intended direction.

Practical implications – Managers should implement HIWS since in general they increase job satisfaction. A significant portion of this positive effect is channeled through perceptions of interesting job, higher wages and increased effort demands. Managers should pay attention to implementation issues.

Originality/value – The paper contributes to enrich the understanding of the relationship between the HIWS and job satisfaction, proposing a model that aims to disentangle the mediating mechanisms through which HIPWS affect job satisfaction. Unlike previous attempts, this model integrates opposing views about the positive or negative effects associated with HIWS.

Keywords Wages, Effort, Job satisfaction, High-involvement work systems, Interesting job

Paper type Research paper

Introduction

Employee satisfaction with a job (i.e. job satisfaction) is a critical attitudinal variable to reach a good understanding of how human resource management (HRM) practices may influence firm performance (Wood *et al.*, 2012). Indeed it has been associated with relevant behaviors and outcomes at the employee level (Meyer *et al.*, 2002) and has been proved to mediate the influence of certain HRM practices on several firm performance indicators (Wood *et al.*, 2012). A significant amount of the research on employee responses to HRM practices in general, and on job satisfaction in particular, has focussed

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its attention on the impact of high-performance work systems (HPWS) (e.g. Appelbaum *et al.*, 2000; Wood and de Menezes, 2011).

Although the effects of HPWS on job satisfaction have been less analyzed than their effects on performance, there seems to be some consensus on a positive global impact of HPWS on job satisfaction (Wood and de Menezes, 2011). In spite of that, there are relevant studies where mixed results have been found. For example, Wood *et al.* (2012) documented that increasing job autonomy (i.e. enriched job design) improves job satisfaction, whereas practices that promote workers' involvement reduce it. While there may be different reasons that explain these mixed results, two, close related reasons, are particularly relevant. First, HPWS may not constitute the homogeneous set of mutually reinforcing practices that once was assumed (Boxall and Macky, 2009; Wood and de Menezes, 2011). Consequently, calls have been made to pay attention to meaningful subsets of the practices included in the HPWS rather than considering them as a single additive construct (Boxall and Macky, 2009; Jiang *et al.*, 2012).

Second, it is also recognized that the theoretical underpinnings that link HPWS with job satisfaction "remain underdeveloped" (Wood and de Menezes, 2011, p. 1586). In this matter, Boxall and Macky (2009, p. 7) note that "to make genuine theoretical progress, researchers must […] identify the processes and mediating variables which a set of practices is supposed to influence." This highlights the convenience of further research aimed at disentangling the mediating mechanisms that link both concepts. For example, there are studies that have shown that HPWS may intensify work (e.g. Gallie *et al.*, 2012). However, the existing theoretical models (e.g. Appelbaum *et al.*, 2000; Guest, 1999; Lawler, 1986) have largely focussed on the positive side of HPWS and have leave unattended their possible negative effects. If positive consequences outperform negative ones the final net effect on satisfaction may be positive, but if that is not the case the final judgment of the employee about the job (i.e. job satisfaction) may be even negative. Hence, any failure to account for both positive and negative effects of these practices will certainly limit our capacity to understand how their implementation may finally influence job satisfaction. Therefore, more complete models that consider the mediating mechanisms that connect HPWS and job satisfaction are necessary.

The present paper seeks to contribute to solve these two shortcomings of the existing literature in order to enrich our understanding of this relationship between HPWS and job satisfaction. On the one hand we focus our attention in a key subset of the HPWS: high-involvement work systems (HIWS). Boxall and Macky (2009) note that instead of focussing on the traditional monolithic HPWS construct, progress will be achieved by focussing on more specific and clearly defined subsets of practices. More specifically these authors consider that researchers should pay attention to HIWS since its "terminology is best connected to critical workplace changes in high-wage countries and the one most useful for constructing theoretical models of high-performance work systems" (Boxall and Macky, 2009, p. 4).

On the other hand, we extend the theoretical foundation on the influence of HIWS on job satisfaction by proposing a model that aims at contributing to our understanding of the mechanisms through which that effect occurs. Specifically, our model proposes that an interesting job, effort and wages mediate the effect of HIWS on job satisfaction. Unlike previous attempts, this model integrates opposing views about the positive or negative effects associated with HIWS (e.g. Appelbaum *et al.*, 2000; Green, 2004; Hackman and Oldham, 1976; Harley *et al.*, 2007; Kalmi and Kauhanen, 2008), thus shedding further light on the longstanding debate about the value of implementing

HIWS. Consistent with previous literature (Boxall and Macky, 2014) as well as with economic models of individual satisfaction (e.g. Clark *et al.*, 2010), our model addresses both positive (increased wages, voluntary effort and interesting job) and negative (increased involuntary effort) consequences, and balances them so as to predict a positive net effect on job satisfaction.

The hypotheses derived from the model are tested using a representative sample of salaried workers in Spain. This is an additional novelty of the present paper as most of the existing evidence on the consequences of HIWS for employees, particularly on satisfaction, has been obtained from samples obtained in Anglo-Saxon countries (Jiang *et al.*, 2012; Wood and de Menezes, 2011). Given the clear institutional and cultural differences between these countries and Spain (see, e.g. Bayo-Moriones *et al.*, 2013), our analysis provides some evidence as to whether the effect of HIWS on employee outcomes is to some extent dependent on country differences.

Theoretical background and hypotheses development

HIWS

HPWS have been understood as a homogeneous set of mutually reinforcing practices which can improve the abilities and motivation of a workforce, and offer them the opportunity to live up to their full potential, so that superior organizational performance is achieved. However, it is argued that HPWS are a fuzzy concept based on a list of practices whose high performing properties are not self-evident, and it is by no means clear that they will be adopted together on a widespread scale (Boxall and Macky, 2009; Wood and de Menezes, 2011).

HIWS represent the part of HPWS referring to work practices, that is, they have to do with the way the work itself is organized and any opportunities to engage in problem solving and change management regarding work processes (Boxall and Macky, 2009). They make up the core of the HPWS (Whitfield, 2000), since they are the best representation of the innovation and change involved, as compared with the Taylorist model. HIWS are a bundle of practices that entail alternative job design practices such as worker membership of work teams with the capacity to decide how to organize their job (i.e. autonomous teams) and to rotate tasks with co-workers (job rotation), thus allowing workers to take decisions in their jobs on issues such as methods or task order (i.e. job autonomy), creating communication channels to provide employees with information about the plans and goals of the firm (i.e. downward communication) as well as practices that give employees the chance to provide input on the decision-making process and to express their opinions to managers (i.e. upward communication) (Boxall and Macky, 2009; Wood *et al.*, 2012). Focussing on HIWS instead of HPWS has the benefit of allowing better theory construction as well as a more accurate identification of the practices desirable in specific contexts (Boxall and Macky, 2009).

HIWS and employee outcomes

Employee outcomes such as job satisfaction play a central role in relevant theoretical models applicable to HPWS and HIWS. For example, in the PIRK framework developed by Lawler (1986) and Vandenberg *et al.* (1999), HRM practices are linked to organizational effectiveness through two intermediate stages. The first intermediate stage includes the four high-involvement work processes that give name to the framework: power, information, reward and knowledge. From there a motivational path emerges that increases workers' satisfaction and other affective reactions, leading to higher return of equity and lower turnover.

Another widely used conceptual model is the AMO framework (Appelbaum *et al.*, 2000; Boxall, 2012). Under this framework the effects of HPWS on organizational performance take place by improving the abilities and the motivation of workers and by providing them with the opportunities to put them into practice (Bello-Pintado, 2015). As happens in the PIRK model, the AMO identifies an indirect path leading to improved performance by enhancing employee motivation and satisfaction (Batt, 2002).

The model formulated by Guest (1999) placing the psychological contract at the heart of the analysis of the impact of HIWS also includes employee outcomes such as job satisfaction. Human resource practice are expected to have a positive influence in the state of the psychological contract, leading to improved job satisfaction.

One weakness of these models is that they hardly address the relationship between HIWS and work intensity, which has significant implications for employee well-being (Boxall and Macky, 2014). This attention to potential negative consequences for workers has led to the incorporation to the study of HIWS of theoretical frameworks such as Karasek and Theorell's (1990) psychosocial model of job strain and the job-demands resources (JD-R) model (Demerouti *et al.*, 2001). Failure to include negative effects provides an incomplete picture of the mechanisms that connect HIWS with employee outcomes such as job satisfaction, and therefore impede to properly understand how and why HIWS may improve employee performance.

HIWS and job satisfaction

Job satisfaction is an attitude defined as a positive (or negative) evaluative judgment the worker makes about his job or job situation (Weiss, 2002). Job satisfaction has been regarded for decades as one of the central focusses of research in organizational psychology (Locke, 1976 identified over 3,000 studies on job satisfaction). The reason for this interest is twofold. From the perspective of workers, it is clear that job satisfaction is a central outcome to those employed in an organization. From the perspective of employers, there is evidence showing a pretty strong association (estimated correlation of 0.30) between job satisfaction and individual performance (Judge *et al.*, 2001). Moving to the organizational level, support has also been found for the satisfaction-performance relationship (Harter *et al.*, 2002). Hence, having satisfied employees is a central goal of management.

An overview of the literature dealing with the influence of work organization on job satisfaction reveals that in most cases higher implementation of HPWS is associated with better job satisfaction (e.g. Yanadori and van Jaarsveld, 2014). It has been argued that the greater autonomy, discretion, participation and information that are associated with the implementation of the previously described HIWS trigger feelings of achievement, responsibility, opportunity for personal control, self-esteem and meaningfulness at work which increase job satisfaction (Hackman and Oldham, 1976; Riordan *et al.*, 2005; Wood and de Menezes, 2011). Additionally it has been proposed that HIWS lead to increased job satisfaction because they improve social contact and social recognition, reduce uncertainty in the work environment, may lead to perceptions of improved career prospects and enhance a personal sense of coherence (Wood *et al.*, 2012). This expectation of a positive influence of HIWS on job satisfaction constitutes the starting point of our analyses and as such is summarized in the first hypothesis:

H1. Employees working under HIWS show higher levels of job satisfaction.

As interesting as the study of the main influence of HIWS on job satisfaction is the endeavor to understand the mechanisms through which the proposed positive effect is

produced. A clearer picture of how HIWS influences job satisfaction will help to accommodate, among other things, disputes about the beneficial or pervasive effects of the implementation of HIWS, as well as to provide insights to explain the empirical evidence on the effect of HIWS on job satisfaction. In what follows, the mediating role of three key variables (interesting job, employee effort and wages) is described.

Disentangling the process: mediating variables

Recent research on the impact of HPWS on employee outcomes in general, and job satisfaction in particular, has been more focussed in the "how" and "when" than in the direction and magnitude of the relationship (Boxall, 2012; Boxall and Macky, 2009; Jiang *et al.*, 2013). Regarding the "when", the age of the workers (Kooij *et al.*, 2013), task proficiency (Boon and Kalshoven, 2014) and trust in the employer (Alfes *et al.*, 2012) have been proposed as moderators of that relationship. As far as the "how" in the effects on job satisfaction is concerned, mediators such as skill utilization and intrinsic motivation (Boxall *et al.*, 2015), work intensification (Boxall and Macky, 2014), psychological empowerment (Butts *et al.*, 2009) have been analyzed. As it has been already pointed, these previous analyses about how the effect occurs have provided a narrower view of the mediating variables, focussing most of them in a single mediator. More importantly, these analyses have not considered the simultaneous positive and negative influence of HIWS. In our paper we attempt to advance in the knowledge of the process of HIWS influencing job satisfaction by studying three mediators: interesting job, effort and wages. These variables summarize potentially important positive and negative influences of HIWS previously suggested in the literature. It is worth noting that our approach is consistent with economic models of individual satisfaction (Clark *et al.*, 2010).

Interesting job

As noted above, job satisfaction has been the subject of many studies in the organizational psychology literature. A highly influential work in this extensive literature is that authored by Hackman and Oldham (1976), who drew attention to the perceptions engendered by work organization. One perception which has received little attention in the literature, and which we believe to be an important mediating factor, is the employee's perception of how interesting her/his job is (i.e. interesting job). The idea of an interesting job, also referred to as job attractiveness by some researchers (e.g. Christen *et al.*, 2006), captures the extent to which the job entails a challenge and provides the worker with a sense of accomplishment.

HIWS have the potential to enable workers to perceive their job as more interesting. Under HIWS, employees perform a greater number and variety of tasks and enjoy greater levels of autonomy and participation in decision making at different levels. Such jobs will be perceived as more interesting or attractive by employees as they will appear to be more exciting and challenging than tightly defined jobs with a limited set of tasks and limited capacity to make decisions. Hackman and Oldham (1976) noted in their model that when the degree of autonomy and the number of tasks given to the worker increases, which usually requires the use of a greater variety of skills, employees experience meaningfulness in the work they do and responsibility for work outcomes. These two critical psychological states imply that such employees experience work as meaningful, valuable and worthwhile, and feel personally accountable and responsible for the results of the work they do. These workers are

more likely to feel the "degree of accomplishment" which is associated with and interesting job. Although Oldham and Hackman (2010) recognize the importance of the broader organizational context in this process and the possibility that certain job designs may be more appropriate in certain circumstances, the key conceptual relationships in their model have been found to hold in very different contexts. In this regard Eriksson and Ortega (2006) observed that the implementation of job rotation was associated with positive perceptions of job interest.

Having an interesting job is also positively associated with job satisfaction (Aamodt, 2004). Hulin *et al.* (1985) described the interestingness of a job as one of the work-role outputs that affects job satisfaction. In this vein, Sousa-Poza and Sousa-Poza (2000) showed that an interesting job was one of the key determinants of job satisfaction. Likewise, Christen *et al.* (2006) observed that interesting jobs were positively associated with the degree of job satisfaction reported by store managers.

In light of the arguments outlined above, we predict that:

H2. An interesting job mediates the influence of HIWS on job satisfaction, so workers under HIWS perceive their job as more interesting and this perception results in a higher level of job satisfaction.

Employee effort

Employee effort refers to the physical and cognitive input from the worker (Green, 2004). A distinction can be made between voluntary effort and involuntary effort. Effort is understood as involuntary when the worker is obliged to make it, so that not doing it would have immediate negative consequences for him (Mitchell and Albright, 1972). The effort produced by job demands, for example, can be considered as involuntary. On the contrary, voluntary effort can be defined as "the behaviors beyond the specific requirements of the work and that contribute to the global objectives of the organization" (Needham, 2005).

The application of HIWS will result in greater employee involuntary effort. This idea has been central in the debate around the impact of HPWS on work intensification (Boxall and Macky, 2014). As has been described, HIWS increase the number of tasks and responsibilities over those tasks for employees and may lead to work overload. They also demand employees participate and be involved in information-sharing and decision-making processes. Consequently it is expected that employees working under these systems will be required to input more involuntary effort, both physical and mental, into the process. This greater pressure caused by some of the work practices included in HIWS such as task discretion and self-managing teams is consistent with findings in studies such as the ones by Kalleberg *et al.* (2009) and Gallie *et al.* (2012). Kroon (2002) also found that job demands increase with the implementation of HPWS.

In addition, the employee may be willing to volunteer physical and cognitive input beyond the minimum amount a worker has to provide to avoid negative consequences such as dismissal (i.e. voluntary effort) (Ollo-López *et al.*, 2010). As it has been noted before, HIWS are likely to generate positive psychological states (Hackman and Oldham, 1976) which will result in greater motivation and employee voluntary effort. In this vein HIWS may be perceived by employees as actions that benefit them and their career prospects (Wood and de Menezes, 2011; Wood *et al.*, 2012) and, according to social exchange theory (Blau, 1964), consequently trigger a moral obligation to reciprocate with more positive attitudes and actions which may result in greater effort. HIWS create a supportive work environment that satisfies the employees' needs and

induce them to reciprocate by exerting higher levels of discretionary behaviors (McClean and Collins, 2011).

Moreover, employee effort significantly affects job satisfaction. Effort is one of the two key variables in economic models of human behavior within organizations (e.g. Lazear and Gibbs, 2009). In this tradition, effort is seen as involuntary. Within economic models of behavior job satisfaction, a surrogate of the workers' utility or well-being (Clark, 1997) improves with decreasing effort. In this matter, there is evidence supporting the idea that greater involuntary effort may lead to increased fatigue and stress (Kalmi and Kauhanen, 2008), which may raise negative feelings about the job leading to a decrease in job satisfaction. In this line the JD-R model (Demerouti *et al.*, 2001; Conway *et al.*, 2015) posits that job demands (e.g. intensified work or involuntary effort) will lead to a negative experience of work for the employee. Boxall and Macky (2014) also find that job fatigue is negatively related to job satisfaction.

An association in the opposite direction is expected to apply to voluntary effort. Considering that motivation, the cause of voluntary effort is a positive work-related experience; this is expected to lead to positive outcomes for the employee. Prior studies confirm this argument and find employees who are highly engaged in their work and showing proactive behavior report being more satisfied (Saks, 2006). Therefore, voluntary effort is expected to have a positive effect on job satisfaction.

In sum, in line with the arguments above:

H3a. Involuntary effort mediates the influence of HIWS on job satisfaction, in such a way that HIWS make employees increase their involuntary effort and this increase results in a lower level of job satisfaction.

H3b. Voluntary effort mediates the influence of HIWS on job satisfaction, so that workers under HIWS increase their voluntary effort and this increase results in a higher level of job satisfaction.

Employee wages

We expect employee wages to mediate the influence of HIWS on job satisfaction. Specifically we argue that HIWS increase wages and this increment leads to greater job satisfaction. This positive effect of wages on job satisfaction is an explicit element included in the core economic model of human behavior in organizations (e.g. Lazear and Gibbs, 2009). There are a number of reasons to expect higher wages for employees working under HIWS. First, a higher salary may be a way to compensate employees for the greater effort they exert (Rosen, 1986). Second, HIWS require more skilled workers to efficiently perform the various tasks and cope with the increased responsibility associated with HIWS. More skilled workers are more valuable in the market, and therefore firms may need to pay higher salaries in order to attract and retain them. Third, participation and successful idea generation may be encouraged through incentive compensation schemes (Jones *et al.*, 2010) which, if targets are achieved, may result in a greater compensation package. Existing evidence seems to be consistent with the prediction that HIWS adoption tends to have a positive influence on workers' wages (Kalmi and Kauhanen, 2008).

Wages will be positively related with job satisfaction. From equity theory (Adams, 1965), the positive relationship between pay level and job satisfaction can be understood by employees' reactions to organizational justice (Schreurs *et al.*, 2014). Adequate and fair compensation may engender feelings of procedural and distributive justice among

employees, which in turn improve job satisfaction (Williams *et al.*, 2006). Also from discrepancy theory (Scarpello and Carraher, 2008), it is expected that high wages, although leading to discrepancy between the perceived amount of pay that should be received and perceived amount of pay received, may make people more satisfied.

In addition, according to Akerlof (1984) and Drago and Perlman (1989), salaries above the market wage can be seen as a gift the firm gives to its employees in exchange for their work and loyalty. Bayo-Moriones and Larraza-Kintana (2009) explained that employees perceive the adoption of profit-sharing plans as a positive discretionary action by the organization and that workers feel the need to respond with more affective commitment. This sense of reciprocity and mutual recognition will engender greater job satisfaction among workers. Not surprisingly, actual pay has been empirically found to correlate well with pay-level satisfaction (Heneman, 1985).

H4 summarizes the ideas developed above about the mediation role of employee wages in the relationship between HIWS and job satisfaction:

H4. Wages mediate the influence of HIWS on job satisfaction; thus workers under HIWS receive higher wages and higher wages increase job satisfaction.

The overall model underpinning the present analysis is shown in Figure 1.

Method

Participant characteristics

The data set to test the model and the hypotheses described in the previous section comes from the 2001 to 2004 Quality of Working Life Survey. This survey is conducted

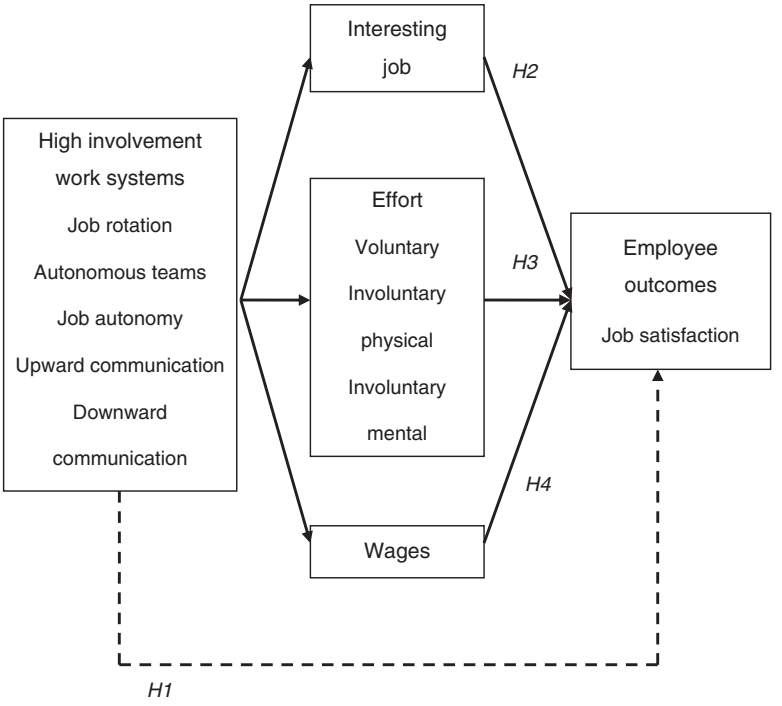

Figure 1.
Theoretical model and hypotheses

by the Spanish Ministry of Work and Social Affairs on a representative sample of working Spanish individuals who are 16 or older, for the purpose of obtaining information about their characteristics, work and family situation, attitudes to work, the organization of work, working hours, salaries and other firm-related issues.

Given the objective of the paper, observations from self-employed workers have been excluded from our analysis. It should be noted that the sample is renewed completely each year. Observations were weighted by region, size of municipality, age and gender. Data from the four years were pooled as a means to increase the significance and generalizability of the empirical estimations. Pooling data collected over the four-year period is reasonable, as in the 2001 to 2004 period there were no significant changes in the legal provisions that regulate labor relations in Spain. Significantly, it should be noted that the main conclusions of the paper do not change if the models are run on a yearly basis. In addition, conclusions remain also when data are pooled using different year groupings. As displayed in Table I, our sample consists of 10,112 Spanish salaried workers who are 16 or older. The demographic characteristics of the individuals in this representative sample appear in Table II.

Sampling procedures

To guarantee sample representativeness, each target population is stratified according to region and size of municipality. A random walk procedure is then run in each census section to select the workers who will respond to the questionnaire. The data are collected by means of face-to-face interviews. Interviewers visit the homes of those in the sample between six and ten in the evening, in order to avoid localization problems among working people.

Measures

Job satisfaction. The dependent variable of the study is job satisfaction. This measure is generated from responses about satisfaction with various job aspects. Specifically, respondents expressed their degree of satisfaction with the job, pay, working conditions, working environment and the organization of work. A single factor emerged in which the five dimensions were equally weighted. The Cronbach α for this factor was 0.734. This single factor is consistent with the notion that job satisfaction is made up of different but interconnected facets. The specific items, mean and standard deviation of the dependent variable, as well as those of the independent and mediating variables can be seen in Table I.

HIWS. As per the theory above, the central independent variables of interest in this study are the HIWS. Specifically, job rotation, autonomous teams, job autonomy and communication (downward and upward) are measured. The items employed to measure those variables are similar to items employed in previous research (e.g. Kessler *et al.*, 2004; Ollo-López *et al.*, 2011).

Since all these practices are expected to generate a positive response on employee satisfaction at work, they are commonly analyzed as a bundle. However recent empirical results (e.g. Wood *et al.*, 2012) suggest that different elements may produce different outcomes. In addition nothing guarantees that all these practices will be adopted together. In order to determine the unidimensional or multidimensional nature of the HIWS, we performed a confirmatory factor analysis. The five-dimension model (job rotation, autonomous teams, job autonomy, downward communication and upward communication) showed a better global fit than any other alternative factor

Measure	All years ($n = 9{,}947$)	
Dependent variable	*M*	SD
Job satisfaction		
Are you satisfied with your … (1 = very unsatisfied to 10 = very satisfied)		
Job?	7.038	1.955
Work organization?	3.647	0.921
Work environment?	3.820	0.841
Working conditions?	3.815	0.910
Your pay?	3.205	0.998
Independent variables	*M*/%	SD/*n*
High involvement work systems		
Job rotation		
Do you always perform the same tasks in your firm? (1 = no, 0 = yes)	20.61	2,050
Autonomous teams		
Do you work in a team with certain autonomy to decide how to do the work? (1 = yes, 0 = no)	50.30	5,003
Autonomy	2.972	1.263
Can you choose or modify the order of tasks? (1 = never to 5 = always)	3.037	1.396
Can you choose or modify the working method? (1 = never to 5 = always)	2.935	1.394
Can you choose or modify the work place? (1 = never to 5 = always)	2.941	1.374
Upward communication	3.512	1.138
I can give my opinions about my job (1 = never to 5 = always)	3.649	1.208
My boss values my suggestions about my job (1 = never to 5 = always)	3.378	1.243
Downward communication	3.007	0.925
What is your knowledge of the organizational chart of your firm? (1 = no knowledge to 4 = know it very well)	3.005	0.987
What is your knowledge of the goals of your organization? (1 = have no knowledge to 4 = know them very well)	3.011	0.987
Mediating variables	*M*	SD
Interesting job		
My job is attractive and interesting (1 = strongly disagree to 5 = strongly agree)	3.732	1.148
Effort		
Involuntary physical effort		
Do you normally extend your working day by working more time than your normal schedule? (1 = never to 5 = always)	2.440	1.213
Involuntary mental effort		
At work, how frequently you get distracted by thinking about matters you consider interesting, such as the family (1 = always to 5 = never)	3.604	1.068
Voluntary effort		
I am willing to work beyond what I should for the success of my organization (1 = total disagreement to 5 = total agreement)	2.932	1.284
Wages	(%)	*n*
Your monthly net income for your work is		
1 less than €270	1.29	128
2 between €270 and 450	3.94	392
3 between €451 and 600	8.99	894
4 between €601 and 900	32.57	3,240
5 between €901 and 1,205	26.98	2,684
6 between €1,206 and 1,655	16.36	1,627
7 between €1,656 and 1,800	3.90	388
8 between €1,801 and 2,105	3.01	299
9 between €2,106 and 2,705	1.82	181
10 between €2,706 and 3,005	0.55	55
11 between €3,006 and 3,605	0.29	29
12 between €3,606 and 4,505	0.14	14
13 over €4,505	0.16	16

Table I. Dependent, independent and mediating variables

Measure	All years ($n = 9{,}947$) M/%	SD/n
Employee characteristics		
Gender (male)	63.01%	
Age	38.134	10.907
Seniority	9.354	10.045
Education		
No schooling	3.18%	316
Primary	41.72%	4,150
Secondary	33.23%	3,305
University	21.88%	2,176
Occupation		
Manager	1.54%	153
Professional and technician	24.53%	2,440
Clerical	7.59%	755
Service worker	18.09%	1,799
Skilled worker	22.57%	2,245
Blue-collar	10.63%	1,057
Non-qualified worker	15.06%	1,498
Employee activity		
Full time	90.61%	9,013
Temporary worker	27.49%	2,734
Profit-sharing	13.93%	1,386
Training	22.54%	2,242
Union member	19.77%	1,967
Firm characteristics		
Size		
1-9 employees	29.44%	2,928
10-49 employees	30.95%	3,079
50-99 employees	9.32%	927
100-499 employees	13.40%	1,333
500+employees	16.89%	1,680
Public sector	18.92%	1,882
Industry		
Manufacturing	21.05%	2,094
Agriculture	4.25%	423
Construction	13.40%	1,333
Services	61.29%	6,097

Table II. Characteristics of the sample

specification (single factor, three-factor or four-factor). Global fit indexes for the five-dimension model were as follows: Bentler-Bonett normed fit index = 0.997, the Bentler-Bonett non-normed fit index = 0.996, the CFI = 0.998, the IFI = 0.998 and the RMSEA = 0.020. As per the items, only in the five-dimension specification all standardized factor loadings were above the standard 0.7 cut-off (they ranged from 0.82 to 0.89). In addition, all error variances were positive. Together, all these values support the accuracy of the construct measurement in the five-dimension model. The acceptable Cronbach's α values for the multi-item factors should also be highlighted: job autonomy (0.897), upward communication (0.831) and downward communication (0.843).

Interesting job. Following previous research (e.g. Sousa-Poza and Sousa-Poza, 2000) interesting job is measured through a single item on a one to five scale.

Effort. Effort is a multidimensional variable (Ollo-López *et al.*, 2010). On the one hand, as mentioned in the theoretical section, there is the distinction between involuntary and voluntary effort. In addition, it can be divided into physical or mental effort. Using items employed in previous research (e.g. Ollo-López *et al.*, 2010), we differentiate between voluntary effort, involuntary physical effort and involuntary mental effort.

Wages. Wages are measured by means of a categorical variable that considers the net monthly income that the individual reports he/she receives in exchange for her/his work.

Finally, and based on the existing literature, three sets of control variables are taken into account in our analyses: employee characteristics, employee activity and several characteristics of the organization (Appelbaum *et al.*, 2000; Harley *et al.*, 2007; Kalmi and Kauhanen, 2008; Ollo-López *et al.*, 2010). Table II shows the mean and standard deviation for these control variables.

Common method variance (CMV)

Given the fact that all the variables were collected from the same respondents, concerns regarding CMV may arise. However, there are some features in the survey that may have mitigated this problem. As suggested in the literature (Podsakoff *et al.*, 2003), one way to avoid CMV is to use different scale endpoints and formats for the independent and dependent measures. Moreover, dependent and independent variables were separated into different sections of the questionnaire. Anonymity was also fully guaranteed, which reduces respondent evaluation apprehension and makes respondents less likely to edit their responses to be more socially desirable. In addition, we have performed Harman's one-factor test. The unrotated exploratory factor analysis on the items of the dependent, independent and mediating variables shows five factors with eigenvalues greater than one. The variance explained by the first factor is around 30 percent. A CFA on the same items shows that the single factor model has a much poorer global fit than a model that groups the items according to the measurement structure described above. Further, additional CFA analyses confirmed that the variables included in the model are all separate constructs and that any alternative factor structure provides worse standardized loadings. Finally, the second smallest correlation between the primary responses (Malhotra *et al.*, 2006) is 0.017, and is not significant. Consequently, we are confident that CMV is not a major limitation. In this regard, it is interesting to note that recent research suggests that CMV may be much less of a problem than previously thought (see Spector, 2006).

The correlation coefficients between the core variables of the study are shown in Table III.

Methodology

In order to test the mediation mechanism implied by our hypotheses, we follow the procedure outlined in Baron and Kenny (1986). First, the effect of the HIWS on the mediating variables (interesting job, effort and wages) is estimated. Then, the effects of these practices on job satisfaction are analyzed. In more specific terms, we start with a model that regresses job satisfaction on the control variables and the HIWS. This equation allows us to test *H1*. The effect of the mediating variables is then added. Partial mediation occurs when, in the presence of the mediating variables, the relationship between HIWS and job satisfaction is reduced in size and significance. Full mediation occurs when that previous relationship becomes insignificant and is essentially reduced to zero.

Table III.
Correlations matrix

	1	2	3	4	5	6	7	8	9	10
Job satisfaction (1)										
Job rotation (2)	−0.025**									
Autonomous teams (3)	0.116***	0.147***								
Autonomy (4)	0.282***	0.057***	0.209***							
Upward communication (5)	0.401***	0.070***	0.231***	0.554***						
Downward communication (6)	0.195***	0.047***	0.146***	0.320***	0.390***					
Interesting job (7)	0.447***	0.084***	0.202***	0.320***	0.397***	0.276***				
Involuntary physical effort (8)	−0.072***	0.099***	0.097***	0.124***	0.091***	0.083***	0.059***			
Involuntary mental effort (9)	0.121***	0.063***	0.106***	0.107***	0.136***	0.140***	0.202***	0.015		
Voluntary effort (10)	0.368***	0.061***	0.116***	0.218***	0.311***	0.192***	0.317***	0.100***	0.100***	
Wages (11)	0.138***	0.094***	0.182***	0.208***	0.207***	0.252***	0.232***	0.114***	0.120***	0.118***

Notes: $^{**}p < 0.01$; $^{***}p < 0.001$

Given the nature of the dependent variables, ordered probit models were estimated to study the effect of HIWS on the mediating variables (job interest, effort and wages), and regression models were estimated to analyze the effect of HIWS on the final attitudinal variable (job satisfaction). All the multivariate models include the above-described control variables. In addition, it should be mentioned that variance inflation factors show values below the usual thresholds of 5 in our variables of interest (Judge *et al.*, 1988), indicating that multicollinearity is not a problem in our models. Moreover, in order to avoid any potential problem due to non-normality or heteroscedasticity in the residuals of the regression model, we estimate the regressions with robust standard errors.

Results

HIWS and mediating variables

As noted, we start our empirical analyses by estimating a series of models in which the mediating variables are regressed on the HIWS. Table IV summarizes the results of these estimations. The amount of variance explained by the models in Table IV including only the control variables is 13.82 percent for interesting job, 6.46 percent for voluntary effort, 7 percent for physical involuntary effort, 5.04 percent for mental involuntary effort and 54.21 percent. When the HIWS variables are included in the estimations, these R^2 increase to 25.29, 14.67, 8.73, 6.40 and 55.61 percent, respectively.

The results indicate that in general HIWS are significantly associated with more interesting jobs, involuntary and voluntary effort, and wages. The few exceptions to this general pattern are the non-significant effect of communication variables on involuntary physical effort, the lack of a significant effect of autonomy on involuntary mental effort, and the lack of relationship between job rotation and wages.

HIWS and job satisfaction

The next step is to test a model in which job satisfaction is regressed on the HIWS. The results are displayed in Model I in Table V. The amount of variance explained by the

	Interesting job	Voluntary effort	Physical involuntary effort	Mental involuntary effort	Wages
Job rotation	0.116 (0.028)***	0.090 (0.028)***	0.199 (0.027)***	0.103 (0.027)***	0.034 (0.027)
Autonomous teams	0.173 (0.023)***	0.093 (0.023)***	0.124 (0.023)***	0.116 (0.023)***	0.136 (0.023)***
Autonomy	0.097 (0.012)***	0.042 (0.011)***	0.068 (0.011)***	0.003 (0.011)	0.064 (0.011)***
Upward communication	0.256 (0.013)***	0.227 (0.013)***	−0.015 (0.013)	0.052 (0.013)***	0.063 (0.012)***
Downward communication	0.097 (0.014)***	0.095 (0.014)***	0.035 (0.014)**	0.060 (0.014)***	0.073 (0.013)***
Log-likelihood	−12,868.172	−14,679.211	−14,346.473	−13,885.656	−13,890.61
R^2	25.59%	14.67%	8.73%	6.40%	55.61%
R^2 with control variables only	13.82%	6.46%	7.00%	5.04%	54.21%
n	9,947	9,947	9,947	9,947	9,947

Notes: Table shows unstandardized β coefficients. Robust standard errors in parentheses. All estimations include the control variables listed in Table II. **$p < 0.01$; ***$p < 0.001$

Table IV.
Ordered probit models for mediating variables

	Model I	Model II
Job rotation	−0.128 (0.024)***	−0.150 (0.022)***
Autonomous teams	0.054 (0.019)**	−0.007 (0.018)
Autonomy	0.061 (0.009)***	0.035 (0.008)***
Upward communication	0.297 (0.011)***	0.184 (0.010)***
Downward communication	0.054 (0.012)**	0.011 (0.011)
Interesting job		0.270 (0.010)***
Voluntary effort		0.158 (0.008)***
Involuntary physical effort		−0.113 (0.008)***
Involuntary mental effort		0.026 (0.008)**
Wages		0.074 (0.007)***
R^2	18.99%	34.64%
R^2 with control variables only	4.66%	4.66%
n	9,947	9,947

Table V.
Ordinary least squares models for job satisfaction

Notes: Table shows unstandardized β coefficients. Robust standard errors in parentheses. All estimations include the control variables listed in Table II. **$p < 0.01$; ***$p < 0.001$

control variables is 4.66 percent. This R^2 increases to 18.99 percent if we add the HIWS variables as independent variables.

These models disclose that all HIWS except job rotation have a positive association with job satisfaction. Job rotation shows a negative significant association with job satisfaction. Upward communication shows the strongest effect. Taken globally, these results provide support for *H1*, according to which employees working under HIWS show higher levels of job satisfaction.

HIWS, mediating variables and job satisfaction

As the HIWS are significantly associated with job satisfaction and the mediating variables, the next and final step in the Baron and Kenny (1986) procedure to test mediation is to estimate a model in which job satisfaction is regressed on both HIWS and the mediating variables, with all control variables included. This corresponds to model II on Table V.

First, it is worth noting that the explanatory power of the model increases with the introduction of the mediating variables. The amount of variance explained in Model II increases from 18.99 percent in Model I to 34.64 percent. Comparing Models I and II we can see that the coefficients of HIWS decrease in almost all cases. This provides evidence on the partial mediating role of interesting job, effort dimensions and wages. That is, when these mediating variables are not included in the model, HIWS absorb their effect on job satisfaction. Furthermore, after accounting for the mediating effects, job rotation still shows a negative significant association with job satisfaction which is not explained by the effect of job satisfaction on the mediators. Job autonomy and upward communication also maintain their positive direct links with job satisfaction. However, autonomous teams and downward communication do not show a significant association once mediation is taking into account.

With regard to the effects of mediating variables on job satisfaction, we can see that, as expected, the estimated coefficient of interesting job on job satisfaction is positive. With regard to effort dimensions, we can see that not all effort dimensions have the same effect on job satisfaction. Thus, while involuntary physical effort shows a negative association with job satisfaction, voluntary and involuntary mental show a

negative one. Finally, we can see that wages positively relate with job satisfaction in all estimations. In sum, our results provide support *H2*, *H3a*, *H3b* and *H4*.

Even if HIWS have smaller coefficients in Model II than in Model I, it is important to test whether the mediation is statistically significant. The approach proposed by Preacher and Hayes (2008a) is the common one for single-step multiple mediator models like the model in this paper. According to this approach, mediating variables explain 37.97 percent of the total effect that job rotation has on job satisfaction, 85.10 percent of the total effect that autonomous teams have on job satisfaction, 52.12 percent of the total effect that job autonomy has on job satisfaction, 43.65 percent of the total effect that upward communication has on job satisfaction, and 74.11 percent of the total effect that downward communication has on job satisfaction. All these mediating effects are statistically significant. Additionally, in order to further gauge the statistical significance of these indirect effects, we applied the procedure proposed by Preacher and Hayes (2008b) and, using the indirect macro provided by these authors, we obtain bootstrap confidence intervals. The results are consistent with those obtained using the causal approach advocated by Baron and Kenny (1986).

Effect sizes

We have computed f^2 measures for effect sizes (Cohen, 1988) for all the models estimated. The values they take for models in Table IV are 0.158 for interesting job, 0.096 for voluntary effort, 0.018 for physical involuntary effort, 0.014 for mental involuntary effort and 0.031 for wages. Regarding models in Table V, f^2 measure for Model I is 0.176 and 0.239 for Model II. Therefore, effect sizes are larger for job satisfaction than for the mediating variables. According to the cut-offs suggested by Cohen (1988), the effect sizes can be classified as small and medium.

Discussion and conclusions

The purpose of this paper was to contribute to further clarification of the longstanding debate about the value of implementing HIWS by studying their effect on a key employee-level variable: job satisfaction. Besides the net main effects, the aim has also been to disentangle the mechanisms through which that effect occurs. We have shown that, in line with previous literature (Appelbaum *et al.*, 2000; Guest, 1999; Macky and Boxall 2007; Boxall *et al.*, 2015), HIWS are associated with higher levels of employee satisfaction at work. Additionally, we confirmed that this positive effect is partially mediated by employee effort, wages and an interesting job. Specifically, we have observed that HIWS have a positive effect on those mediating variables, and that while employee voluntary effort, involuntary mental effort, wages and interesting job increase job satisfaction, involuntary physical effort decreases it.

In light of the caution required by the limitations related to single-item binary variables measuring some of the dependent and independent constructs and the usual causation caveats, the overall results are consistent with our theoretical predictions, with the exception of the effect of involuntary mental effort on job satisfaction. Based on the standard economic view regarding employee effort, our model predicted the negative influence of involuntary effort on job satisfaction. However, like voluntary effort, involuntary mental effort correlates positively with employee satisfaction at work. This positive impact on satisfaction may be due to elements that were not included in the model, such as the skills used at work or the existence of challenging performance objectives. Similar to the case of voluntary effort, these elements may

relate involuntary mental effort with employee motivation and explain the unexpected, at least on standard economic theoretical grounds, positive association.

Consistent with this idea of the existence of additional relevant factors, the analyses showed that the proposed model is a partial mediation model. That is, HIWS continue to influence job satisfaction even when the mediating effect of employee effort, wages and interesting job has been taken into account. This suggests that other mediating variables may be involved and that a more in-depth understanding of the mechanisms through which HIWS affect job satisfaction requires further research. Among the other possible mediators may be the indicators highlighted in Hackman and Olham's (1976) model: experienced meaningfulness of the work, experienced responsibility for work outcomes and knowledge of the actual results of work activities. Although interesting job may indirectly capture some of these other indicators, a good test of their mediating role requires specific measures that are not encompassed by the data set used here.

Managerial implications

Our results hold important implications for management practice. First, it should be stressed that since, in general, HIWS increase job satisfaction, managers should implement these practices because there is evidence that demonstrates a positive and significant effect of job satisfaction on employee-level performance (Judge *et al.*, 2001) and ultimately on firm performance (Harter *et al.*, 2002). Hence, managers can obtain better results if HIWS are implemented as more satisfied workers can be more productive (Godard, 2001), which in turn may translate into better firm performance (Wood *et al.*, 2012). Second, managers should also bear in mind that a significant portion of this positive effect is channeled through perceptions of interesting job, higher wages and increased effort demands. The mediating role of perceptions of interesting job calls the attention to the central role of employee perceptions in defining the success of HRM practices in general and HIWS in particular. Recent developments on HRM practice implementation point that employee perceptions about the practices strongly influence the subsequent success of those practices, and that these perceptions are affected by the attributions the employees make about the intentions of managers (Nishii *et al.*, 2008). Information about the HIWS and the goals the company pursues implementing them, and how that information is transmitted to employees becomes a central aspect to manage in order to obtain the proper employee outcomes.

Managers should also keep into account the implications of HIWS on employee effort, and remember that different effort types play different roles. In this vein managers are hinted that employee voluntary effort improves job satisfaction, and that even involuntary mental effort enhances the experience of job. Hence, stressing the challenging aspects of work as well as those directly linked with the significance of the tasks being performed (Hackman and Oldham, 1976; Oldham and Hackman, 2010) would be particularly beneficial. On the other hand physical involuntary effort erodes job satisfaction. In line with some of the postulates of the research on work intensification (Boxall and Macky, 2014) our results have also highlighted that the adoption of HIWS may carry some negative consequences for employees (i.e. increased involuntary physical effort). Although the net effect of HIWS on job satisfaction is positive, if the increased involuntary physical demands are not balanced by other positive experiences and perceptions, they may become a heavy burden for employees. This may lead to unexpected negative effects on employees and may ultimately

harm productivity and performance levels. Once again care should be placed on how the practices are explained and transmitted to employees, in order to feed positive perceptions.

Limitations and future research

Of course, our work is not free of limitations. First of all, we did not have the chance to participate in the design of the questionnaire. That is, we used a secondary data source. This limited the type of measures we could employ. Such constraint was more noticeable in the case of single-item measures. It is possible that some of the unexpected associations involving job rotation (i.e. negative effect on wages and job satisfaction) may simply reflect the fact that it is a poor measure. These results could also be interpreted as casting doubt on the inclusion of job rotation in the HIWS, since it could reflect an unplanned and disordered work organization and not a conscious effort to increase task variety. Second, in relation to the use of a secondary data source, we fail to control for traits. While we controlled for several personal characteristics, we did not have access to information about traits such as negative attachment, which may have a bearing on perceptions of job satisfaction. Furthermore, the non-longitudinal nature of the data sets used in the paper implies that the statistical relationships found in the paper cannot be considered causal in the intended direction. Moreover, our data were collected in a specific country. While Spain shares a lot of characteristics with other developed countries, we should necessarily be cautious with regard to the generalizability of the results. Specifically, according to several classifications that take into account cultural values, Spain is classified with other European countries in the Latin or Mediterranean cluster (Esping-Andersen, 1990; Northouse, 2007). Those countries are characterized by low-gender egalitarianism, low-future orientation, high-in-group collectivism and high-power distance (Jesuino, 2002). Moreover, Spain shares a lot of characteristics in terms of gender ideology, social changes and work-related characteristics with other Spanish-speaking countries (Arriagada, 2002; Idrovo *et al.*, 2012; World Bank, 2011). Further research conducted in other geographical settings is warranted. Finally, we should acknowledge that the omission of some other mediators and some important moderators may qualify our results.

To summarize, the present paper has showed the positive effect that the implementation of HIWS may have on employee satisfaction with the job. Further, it has provided a more fine grained analysis of the mechanism through which such impact occurs. Perceptions of interesting job, effort levels and wages, have appeared as key mediators.

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