

HPWSs and employee performance in KIBS companies: a mediating–moderating analysis

HPWSs and employee performance in KIBS companies

345

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Abstract

Purpose – The purpose of this paper is to discuss relationships between high-performance work systems (HPWSs) and productive/counterproductive behaviours initiated and performed by employees. Using the ability, motivation and opportunities (AMO) theoretical framework, the authors described how an HPWS influences employee behaviours. The authors suggest that HPWSs could increase productive work behaviour and decrease counterproductive behaviours by mediating employees' affective commitment and moderating their self-efficacy.

Design/methodology/approach – This study is based on data from 563 questionnaires, which were completed using the computer-assisted telephone interview method. The respondents were knowledge workers, representing companies of various sizes in the Knowledge-Intensive Business Service (KIBS) sector in Poland. Statistical verification of the mediation and moderation analyses was conducted with macro PROCESS (ver. 3.3).

Findings – This research confirmed a significant statistical relationship between all examined variables. It has been shown that HPWSs influence productive and counterproductive behaviours both directly and indirectly through mediation of affective commitment. The statistical analysis also confirmed the study's hypothesis that self-efficacy moderates relationships between an HPWS and employee behaviours.

Research limitations/implications – This study has two limitations: its cross-sectional design and the use of self-reported questionnaire data.

Originality/value – This study is the first to explore mediating mechanisms between HPWSs and employee performance in the context of the KIBS companies in Poland. The results indicate that HPWSs are important antecedents of productive and counterproductive behaviours among knowledge workers.

Keywords High performance work system, Productive work behaviours, Counterproductive work behaviours, Affective commitment, Self-efficacy, Mediated–moderated analysis

Paper type Research paper

Introduction

The increased significance of innovativeness justifies growing interest in business services companies in the Knowledge-Intensive Business Service (KIBS) sector. Companies in this sector are distinguished by several key characteristics, including intangibility and perishability of developed services, simultaneousness of creation and consumption of services and heterogeneity in delivering them to clients (Biege *et al.*, 2013). The operations of these companies involve accumulation, production or distribution of knowledge in order to develop solutions aimed at adaptation of services or products to meet customers' needs (Bettencourt *et al.*, 2002).

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Considering the specificity of the KIBS companies, we need to emphasise the importance of pro-efficiency HR management tools, such as high-performance work systems (HPWSs) (Becker and Huselid, 1998; Posthuma *et al.*, 2013). The usefulness of HPWSs in HR management processes of knowledge-intensive companies is expressed in its systemic nature and their “innovativeness”. These attributes differ from those of HR management (HRM). HPWS “can be broadly understood as a range of innovative HR practices and work design processes that, when used in certain combinations or bundles, are reinforcing one another and produce synergistic benefits” (Hefferman and Dundon, 2016, p. 212). Increases in organisational performance due to the bundling of specific HR practices into HPWSs result from appropriate matching of implemented HR practices. Thus, research has shown the usefulness of HPWSs and the importance of appropriate integration of specific practices (Posthuma *et al.*, 2013). Although there is no consensus among researchers about which specific practices constitute HPWSs (Boxall and Macky, 2009; Posthuma *et al.*, 2013), some of the most frequently cited practices include selective hiring, extensive development and training, performance feedback, performance-linked compensation and employees’ participatory mechanisms.

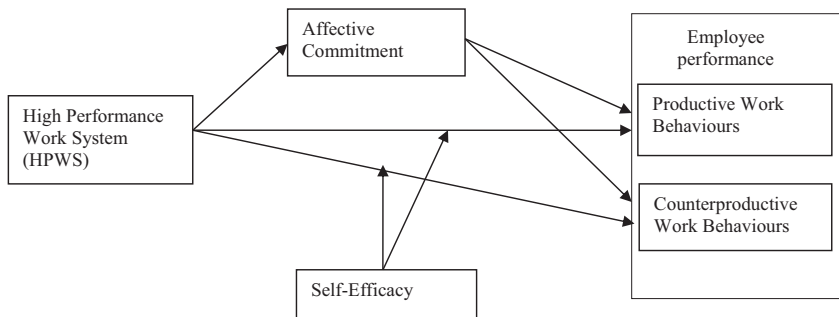
The *ability, motivation and opportunities* (AMO) model is recognised as being a useful theoretical framework for analysing the relationship between an HPWS and employee performance (Appelbaum *et al.*, 2000; Jiang *et al.*, 2012b; Jiang and Messersmith, 2018). The AMO model assumes that a cohesion of various elements, such as employees’ abilities (e.g. via staff training), motivation (e.g. through performance appraisals) and opportunities (e.g. with team work), can help achieve the desired behavioural effects (Ogbonnaya and Valizade, 2018).

Recent research on the relationship between HPWSs and performance is quite convincing. Thus, many scholars have shifted their attention to understanding how HPWSs affect performance outcomes and explaining the “black box” issue in the strategic HRM literature (Messersmith *et al.*, 2011; Jiang *et al.*, 2013; Jiang and Messersmith, 2018). However, the underlying mechanisms through which these practices influence performance outcomes require further investigation (Tzabbar *et al.*, 2017).

To fill in these gaps, this study draws on well-established theoretical approaches to construct relevant research hypotheses. Based on the AMO framework, we suggested that HPWSs are related to employees’ performance (productive and counterproductive behaviours). However, a set of practices by itself may be insufficient for individuals to display performance. Therefore, relationships between HPWSs, and productive and counterproductive work behaviours may also play indirect roles, with affective commitment serving as a mediator among them. Recent research showed that HPWSs affect performance through affective commitment (Rainieri, 2017; Ogbonnaya and Messersmith, 2019). This is because the motivational role played by practices encourages employees to exert their best efforts to perform.

While analysing how HPWSs impact employee behaviours, it is also worth considering the potential moderators of these relationships. They may help to explain when and under what circumstances interrelations exist between HPWSs, and productive and counterproductive behaviours. Our research considered self-efficacy as the moderator, because self-efficacious employees show greater confidence in dealing with situational constraints and complexity job tasks (Speier and Frese, 1997). The relationships conceptualised in this study are presented in Figure 1.

We focused on three potential contributions in the presented research. First, we studied the psychological mechanism, namely, affective commitment, through which HPWSs influence both productive and counterproductive behaviours, assuming a positive influence of the former and a negative effect of the latter on employee practices. Thus far, empirical analyses have focused on isolated and specified groups of behaviours, mostly productive ones, while disregarding harmful behaviours. Second, we assessed how an individual factor, such as self-efficacy, moderates the studied relationships, thus shedding new light on the



Source(s): Author's own

Figure 1.
The hypothetical
model of examined
interrelations

interactions between an individual's and organisational variables. Notably, the number of articles testing the mediation–moderation relationship between HPWSs and their outcomes has grown in recent years (Jiang and Messersmith, 2018). Third, the model was tested in a specific organisational context, namely that of the KIBS sector companies, which create unique solutions for customers. Den Hartog *et al.* (2013) indicated that researchers should question which HPWSs are designed for manufacturing organisations and discuss their applicability to different HR practices, such as the creation of service workplaces, given the unique characteristics that emerge in different settings. It is worth noting that only a small number of studies have analysed HPWSs in the KIBS sector (Fu *et al.*, 2015; Tzabbar *et al.*, 2017), and research in the Polish context is lacking. Here, Poland may provide an interesting example for analyses and comparisons, because over the last 10–20 years, the country has observed a systematic transformation of its economic model from the predominantly mining- and manufacturing-based economy towards the model relying on services and human capital (World Bank, 2017). According to Eurostat data, the state of the KIBS sector in Poland can be described as fledgling compared to the EU countries, but at the same time offering great development opportunities in the coming years (Eurostat, 2019).

Conceptual framework and related literature

Relationships between HPWSs and employee performance

Previous research demonstrated that HPWSs are related with subjective and objective performance (Jiang *et al.*, 2012b; Rabl *et al.*, 2014; Tzabbar *et al.*, 2017). However, some researchers have also indicated the limits of these findings. For example, Katou *et al.* (2014) emphasised that HR systems designed by organisations may not suffice to positively affect employee performance if such systems cannot be perceived, understood and accepted by employees. It can therefore be concluded that positive perceptions and acceptance of practices translate into outcomes when employees' attitudes are activated and influence their behaviours. This study stresses that employees' perspectives should be considered when examining the HRM-performance relationship. Within research on employee perceptions of HR practices, some authors suggest that these perceptions should be separated into two types: descriptive and evaluative (Van Beurden *et al.*, 2021). Descriptive perceptions are employee reports of the actual HR practices in place. Evaluative measures refer to the positive or negative evaluation of HR practices that employees are exposed to. Our study considers the employees' evaluative perspectives and explores the relationship between HPWSs and their behaviours.

The adopted AMO model allows us to explain these features in a more precise way, namely, with regard to how the mechanism proceeds. For example, ability-enhancing HRM

practices (recruitment and selection, training and development) increase employees' abilities and competencies to achieve organisational goals (Jiang *et al.*, 2012a). Recruitment and selection are likely to enhance a highly skilled workforce by attracting and selecting those with higher levels of organisation-relevant knowledge and skills. On the other hand, training and development practices increase employees' abilities within the organisation by providing them with the appropriate knowledge and skills to perform their jobs.

Motivation-enhancing HRM practices involve the use of contingent rewards and performance management to increase employees' motivation to perform (Jiang *et al.*, 2012b; Raineri, 2017). Opportunity-enhancing HRM practices enhance employee involvement and increase their opportunities to engage (Jiang *et al.*, 2012b).

In this study, employee performance is defined as a set of behaviours that contribute to achieving organisational goals (Campbell, 2012). We included these behaviours and other activities, which are based on knowledge, in the conceptualisation of performance. Behaviours relevant for creating value for customers and related to knowledge are innovative, proactive and pro-social, and can be described as productive behaviours. The following two important facts related to these activities account for innovative behaviours in the conceptualisation of knowledge workers' performance: (1) they help fulfil personalised customer needs, and (2) they facilitate value creation by generating original and unique solutions with regard to services. Behaviours that are promoted with the customer in mind and that exceed the scope of employees' professional roles create the so-called proactive customer service performance (DuBrin, 2013). Pro-social behaviours play a similar role. In addition to the effects related to an employee's relationship with the customer, they create the potential for contextual performance and social activities aimed at task performance (e.g. knowledge sharing).

Counterproductive work behaviours are the opposite of productive behaviours (Sackett, 2002). The former are defined as employee activities involving a breach of organisational norms and/or sabotage of other employees, leading to decreased productivity for the entire organisation. Manifestations of counterproductive behaviours include abusing others, theft, deviation in production and shirking duties (Spector *et al.*, 2006). A common feature of counterproductive behaviours is that they hinder or prevent the achievement of individual and organisational performance due to the implementation of "deviant activities" in the workplace.

Some researchers (e.g. Sackett *et al.*, 2006; Spector and Fox, 2010) indicated that productive (extra role) and counterproductive behaviours do not form a single continuum but represent two distinct constructs. This is the consequence of the fact that employees may demonstrate both productive behaviours and counterproductive behaviours at the same time, or, in certain situations, their productive may lead to counterproductive behaviours, and *vice versa* (Spector and Fox, 2010). However, this most often takes place when employees function within specific job circumstances (e.g. competition for resources) or when they attribute the behaviours of other employees, which finally triggers their positive or negative emotions, influencing a change in the manner of behaviour (Spector and Fox, 2010). It has been pointed out that perceptions about HPWSs are positively associated with employees' psychological outcomes (e.g. job stress, anxiety, job burnout and role overload), resulting in increased negative employee behaviours in the workplace (Oppenauer and Van De Voorde, 2018; Ogbonnaya and Messersmith, 2019). Such results may be explained by the fact that competitive advantage may be gained at the cost of the employees who are excessively exploited and subject to high demands related to work specificity (e.g. complexity, high requirements for creativity and knowledge intensity and changeable work pace). A negative emotional state resulting from work overload, lack of suitable working conditions, poor organisational support or, more broadly, negative evaluations of the work environment and interpersonal interactions (lack of resources) may lead to counterproductive behaviours.

However, when organisational system is evaluated positively and provides employees with necessary work resources, as well as reinforces their skills and motivation, positive relationships with productive behaviours, and negative relationships with counterproductive behaviours may be expected. Previous research confirms this conviction. It has been demonstrated that personnel activities limit deviance (Woodrow and Guest, 2014; Shamsudin *et al.*, 2014).

We thus proposed the following hypotheses:

H1a. HPWSs are positively and directly related to productive work behaviours.

H1b. HPWSs are negatively and directly related to counterproductive work behaviours.

HPWS, affective commitment and employee performance

As mentioned, the impact of HPWSs on employee performance is indirect. Many research showed that the relationship between HRM and performance may be mediated by employees' attitudes (Boxall and Macky, 2009; Den Hartog *et al.*, 2013; Kooij and Boon, 2018). Camelo-Ordaz *et al.* (2011) concluded that effective implementation of HRM systems improves performance by enhancing employees' affective commitment. Raineri (2017) showed that many practices, such as personnel selection, performance evaluation and training, job descriptions, and empowerment, increase affective commitment, eventually influencing performance. Employees' attitudes are therefore a link between HPWSs and individuals' outcomes.

This research suggests that there is a relationship between HPWSs and affective commitment – defined as employees' emotional attachment to identification with and involvement in the organisation (Allen and Meyer, 1996), and also between affective commitment and individual behaviours (Stanley and Meyer, 2016). From the theoretical perspective, this relationship indicates that HPWSs help select competent and creative employees and assist in ensuring that employees are provided with opportunities to contribute to KIBS companies. In this manner, greater commitment is fostered, and this ultimately enhances motivation within the human resources in the unit. Increased commitment is likely to result in behaviours that are beneficial to the department, which will ultimately enhance organisational productivity (Messersmith *et al.*, 2011).

Thus far, research has shown, however, that affective commitment is only a partial mediator between HPWSs and employee productive behaviours (Raineri, 2017; Ogbonnaya and Messersmith, 2019). Therefore, the following hypothesis is plausible:

H2a. Affective commitment partially mediates between HPWSs and productive work behaviours.

Consequently, as many scholars have claimed that affective commitment directly contributes to employees' productive behaviours, it is logical to assume a negative relationship with counterproductive behaviours. Such an inference is admissible given that some studies have confirmed the negative relation between employee commitment and counterproductive actions (Marcus, 2016). It is worth noting, however, that a lack of commitment does not cause counterproductive behaviours in all situations. For instance, Cohen and Diamant (2019) showed that no relationship exists between these variables. Thus, we concluded that the context of organisational functioning may significantly neutralise the discussed phenomenon.

While explaining how affective commitment might be related to counterproductive behaviours, Marcus (2016) indicated the complexity of the relationships between these variables and the necessity to account for additional factors (emotions and manner of perception), which are ultimately responsible for the destructive behaviours manifested by an

individual. In accordance with the AMO model, it can be indicated that if HRM practices effectively form the abilities of employees, increase motivation and create opportunities to participate in professional tasks, employees' tendencies to behave counterproductively decrease.

H2b. Affective commitment partially mediates between HPWSs and counterproductive work behaviours.

HPWS, self-efficacy and employee performance

Self-efficacy is a person's belief in their ability to have a causative influence on the course of action (Bandura, 1997). It is a key element of motivation and determines the course of action, one's perseverance, the amount of effort put in given endeavours, accompanying emotions and resilience to obstacles and failures. It also influences the mobilisation of cognitive resources needed to perform tasks. Therefore, self-efficacy plays a self-regulatory role, as it allows individuals to undertake challenges related to a task over an extended period of time, which is important from the viewpoint of the final result (Stajkovic and Luthans, 1998; Chen *et al.*, 2001; Judge *et al.*, 2007).

Researchers treat self-efficacy as a mediator of the relationship between organisational practices and employee behaviours (Wojtczuk-Turek and Turek, 2015; Beltrán-Martín *et al.*, 2017), simultaneously as a mediator and moderator (Speier and Frese, 1997), or only as a moderator of the relationship between these variables (Joti and Dev, 2016; Lloyd *et al.*, 2017). Each of these approaches has its theoretical justification. Following Bandura (1997), self-efficacy is defined as state-like, and thus open to development. HPWSs appropriately implemented *via* application of HR practices enhancing AMO may in the long run create employee self-efficacy. Beltrán-Martín *et al.* (2017) showed that HPWSs both boost employee confidence and feeling of competence, and stimulate decision-making, which finally contributes to reinforcing self-efficacy. However, shaping self-efficacy requires a specific organisational context in which managers perform micro-interventions consisting in modelling employee behaviours, social persuasion and positive feedback (Bandura, 1997; Stajkovitch and Luthans, 1998). Organisational practices may, thus, be insufficient by themselves.

Treatment of self-efficacy as a moderator of the relationship between HPWSs and employee behaviours also results from Bandura's analyses (1997). The author stresses that people's judgements of their self-efficacy influence the initiation, intensity and persistence of the behaviours that they undertake. Specifically, if people believe in their ability to perform a specific task, then they will activate sufficient effort that, if executed well, will lead to a successful task completion. For example, Bandura (1997) explained that when people have high levels of self-efficacy, they will feel more able to cope with difficult situations and tasks – which are characteristic for work in the KIBS sector (e.g. new projects, relations with customers) – and will feel less disturbed by them. Such persons perform effectively even with little external input for extended periods of time. They do not wait for challenging goals to be set for them, and thus do not display the behaviour which is often referred to as “discrepancy reduction”. Bandura and Locke (2003) showed that self-doubt, scepticism, negative feedback, social criticism, obstacles and setbacks, and even repeated failure have little impact on their behaviours. Therefore, they operate to a significant extent independently from stimulation coming from the environment.

On the other hand, when people have low levels of self-efficacy, they will feel less able to cope with difficult situations and tasks, will dwell more on obstacles and their own deficiencies and as a result will experience more negative emotions, which finally lead to lower job performance. Speier and Frese (1997) indicated that individuals with low self-efficacy require stronger stimulation in order to maintain a high level of personal initiative

(a type of extra role behaviours). [Lloyd et al. \(2017\)](#) emphasised that employees with low levels of work-related self-efficacy responded more negatively to difficult situations and work overload, than did the employees with high levels of work-related self-efficacy.

In sum, theory and research suggest that employees with low levels of work-related self-efficacy may be more vulnerable to the impact of HPWSs. In general, it can be stated that self-efficacy complements the efforts of HPWSs, as employees with strong self-efficacy have higher motivation, make greater efforts, persist longer and achieve more, which, in turn, boosts their performance ([Joti and Dev, 2016](#)).

Conversely, an examination of the relationships between self-efficacy and counterproductive behaviours showed that self-efficacy may relieve the negative effects of work-related stress ([Panatik et al., 2011](#); [Fida et al., 2015](#)). It also influences the manner in which employees perceive a challenge (e.g. mental overload) and hindrances (e.g. lack of control) ([Ventura et al., 2015](#)). Moreover, research have showed that employees who believe in their own abilities to manage work activities have a lower propensity to act counterproductively ([Fida et al., 2015](#)). Self-efficacy plays also a protective role in curbing antisocial behaviours and promoting pro-social ones ([Bandura et al., 2001](#)).

Thus, in the present study, we examined whether work-related self-efficacy moderated the impact of HPWSs on productive and counterproductive behaviours.

H3a. Self-efficacy moderates the relationship between HPWSs and productive work behaviours.

H3b. Self-efficacy moderates the relationship between HPWSs and counterproductive work behaviours.

Method

Sample and research procedure

Our survey involved 563 employees of companies, diversified in terms of size and line of business, from the KIBS sector in Poland. This research was conducted from March 2018 to June 2018. Our survey used the computer-assisted telephone interview (CATI) method. We applied the random sampling strategy to identify companies that fulfilled the criteria for belonging to the KIBS sector. The survey covered only medium-sized and large companies in which scientific and technical knowledge is extensively used (T-KIBS). The sampling frame, in accordance with NACE classification (Classification of Economic Activities in the European Community), included companies from section J (Information and Communication) and section M (Professional, Scientific and Technical Activities).

The selection procedure for survey respondents was initially based on reaching out to HR managers in the organisations by telephone. Subsequently, the HR managers indicated persons suitable for the survey. The recruitment criterion for the interviewees was whether they held specialist positions which require specialised knowledge and performance of tasks connected with creation of services for clients. On the basis of the contact data collected from the representatives of the companies, a database was created. The database made it possible to conduct the survey with respondents who fulfilled specific recruitment criteria. The fact that the respondent held a specialist position was confirmed once more during the interview itself.

The quantitative study was conducted in accordance with the standardised procedure, with the use of statements aggregated into a single diagnostic tool. The average duration of a CATI interview was approximately 20 minutes.

The employees who participated in our survey represented corporations (7%), large-sized companies (26%) and medium-sized organisations (67%). The surveyed companies were associated with academic research and development (code 72 NACE) (8%),

telecommunications (code 61 NACE) (3%) companies, software/IT consulting and related organisations (code 62 NACE) (13%), information services companies (code 63 NACE) (12%), head office operations and management consultants (code 70 NACE) (17%), architecture and engineering companies (code 71 NACE) (17%), organisations performing technical research and analyses (code 73 NACE) (10%) and companies involved in other professional, academic and technological operations (code 74 NACE) (21%). The respondents were employees aged from 26 to 35 (43%), 36–45 (30%) or 46–55 (24%) years. The majority had a university education (91%) and work experience of over 5 years (88%). Moreover, 53% of the respondents were female and 47% were male.

Measures

This study expressed all measures via a 5-point Likert scale, where 1 = strongly disagree/never and 5 = strongly agree/always. All scale reliabilities (Cronbach's alpha values) exceeded 0.7 and were thus deemed to be acceptable (Table 1).

Productive work behaviours. This variable was measured using a 12-statement questionnaire, which was designed to diagnose the three main dimensions of productive behaviours: innovative behaviours, proactive behaviours and pro-social behaviours. To measure innovative behaviours, five items were used from the questionnaire developed by Kleysen and Street (2001) (e.g. *I am looking for opportunities to improve an existing process, technology, product, service or work relationship*). To diagnose proactive and pro-social behaviours, we used four items (e.g. *If a work procedure needs modifying, I will take it upon myself to do it*), and three items (e.g. *I often support others in solving problems related to the tasks assigned to them*) were adopted from DuBrin's (2013) questionnaire. The results of the confirmatory factor analysis (CFA) justified our measurement of the productive behaviours via the three-factor approach ($\chi^2 = 65.591$, $df = 48$, $p = 0.046$, RMSEA = 0.026, CFI = 0.987, TLI = 0.982, SRMR = 0.025).

Counterproductive work behaviours. This variable was measured with an eight-statement questionnaire based on Bennett and Robinson's (2000) work (e.g. *violating workplace health and safety rules or principles, and intentionally disturbing other employees in the performance of their work*).

HPWS. This variable was measured using a 25-statement questionnaire based on tools designed by Huselid (1995) and Fu *et al.* (2015) (e.g. *I regularly participate in specialised training; primarily people with highly specialised skills and knowledge are recruited to work in my company; my company always rewards employee creativity and initiative*). The impact of HR practices is best understood by examining the system as a whole instead of analysing individual practices (Liao *et al.*, 2009; Jiang *et al.*, 2012b).

We categorised all 25 items into 3 bundles based on the AMO framework. Skill-enhancing HR practices included recruitment, selection and training. Motivation-enhancing HR practices consisted of performance appraisal, compensation, benefit, promotion and career development. In addition, opportunity-enhancing HR practices covered job design, work teams, employee involvement and information sharing.

Then, we verified the reliability of the tool and conducted the CFA. The results of the CFA showed a good fit to the data of our three-factor approach ($\chi^2 = 138.998$, $df = 85$, $p = 0.026$, RMSEA = 0.045, CFI = 0.974, TLI = 0.955, SRMR = 0.049).

Affective commitment. Affective commitment was measured with a six-item tool based on Allen and Meyer's questionnaire (1996) (e.g. *I would be very happy to continue working with this organisation for the remainder of my career*).

Self-efficacy. Self-efficacy was measured with a six-item tool based on Bandura's items and recommendations for measure selection (2006) (e.g. *I believe that I can achieve my goals effectively, and I have confidence in my own ability to perform the tasks assigned to me*).

Variable	M	SD	1	2	3	4	5	6	7	8
1. Productive behaviours	3.78	0.51	(0.79)							
2. Counterproductive behaviours	1.77	0.55	-0.14**	(0.79)						
3. HPWSs	3.50	0.46	0.45**	-0.21**	(0.87)					
4. Affective commitment	3.22	0.79	0.36**	-0.18**	0.47**	(0.83)				
5. Self-efficacy	4.21	0.52	0.49**	-0.13**	0.30**	0.12*	(0.75)			
6. Sex	1.53	0.5	0.06	-0.01	0.10*	0.07	0.08*			
7. Education	1.92	0.29	-0.03	0.07	0.01	-0.05	-0.04	-0.02		
8. Age	2.75	0.98	0.17**	-0.10*	0.10*	0.24**	-0.05	-0.05	-0.13**	
9. Job seniority	2.85	0.37	0.22**	-0.06	0.08*	0.28**	0.05	0.07	0.01	0.37**

Note(s): HPWSs – high-performance work system. In brackets, reliability Cronbach's; sex: 1 – males, 2 – females; N = 563; * $p < 0.05$, ** $p < 0.01$

Source(s): Authors' own

Table 1.
Descriptive statistics
and inter-correlations

While selecting the control variables, we followed the recommendations offered by [Becker et al. \(2016\)](#). We considered the following control variables: education, sex, age and job seniority.

Results

The results of the inter-correlations and the descriptive statistics (means and standard deviations) are presented in [Table 1](#). Statistical analyses were performed using SPSS software (ver. 25). The results showed that employees’ perception of HPWSs was positively significantly correlated to affective commitment ($r = 0.47, p < 0.01$), self-efficacy ($r = 0.30, p < 0.01$) and productive ($r = 0.45, p < 0.01$), and negatively significantly correlated to counterproductive behaviours ($r = -0.21, p < 0.01$). Further, affective commitment was positively associated with productive ($r = 0.36, p < 0.01$) and negatively associated with counterproductive behaviours ($r = -0.18, p < 0.01$). Self-efficacy was also positively significantly associated with productive ($r = 0.49, p < 0.01$) and negatively significantly correlated to counterproductive behaviours ($r = -0.13, p < 0.01$).

As our research used CATI questionnaires, using the same data source may induce a systematic response bias, which could either inflate or deflate the responses ([Podsakoff et al., 2003](#)). To avoid this bias, we applied Harman’s single factor and the common latent factor (CLF) tests. The results of the former showed that a single factor of each variable explains less than the suggested threshold of 50% variance. The results of the CLF analysis showed that the regression weights of models with and without CLFs exhibited Δ values much lower than 0.20, a commonly used threshold. None of the results revealed any common method bias.

The postulated model ([Figure 1](#)) suggested the existence of both direct and indirect relationships between HPWSs and productive/counterproductive behaviours. The mediator for these variables was affective commitment, and the moderator of these relationships was self-efficacy. To test the research hypotheses, we studied a series of nested models. We used AMOS software (ver. 25) to verify research models. The results are shown in [Table 2](#). This study used a baseline (five-factor) model and estimated all of the theorised relationships between the stated constructs. The measurement model was assessed through confirmatory factor analysis ([Kline, 2011](#)), which comprised five latent variables. Different indices, namely RMSEA, CFI, TLI, SRMR and χ^2 , were employed to calculate the model fit ([Hu and Bentler, 1999; Kline, 2011](#)). The values of these fit indices ($\chi^2 = 956.391, df = 632, p = 0.075, RMSEA = 0.045, CFI = 0.994, TLI = 0.971, SRMR = 0.020$) indicated that the measurement model was the best fit with the data.

Model	Structure	χ^2	df	CFI	TLI	SRMR	RMSEA
Baseline model	Five-factor	956.391	632	0.994	0.971	0.020	0.045
Model 1	Four-factor; combining HPWS, AC, SE, PWBs + CWBs	1131.382	635	0.945	0.922	0.056	0.088
Model 2	Four-factor; combining HPWS, AC + SE, PWBs, CWBs	1234.402	636	0.874	0.880	0.119	0.129
Model 3	Three-factor; Combining HPWS + AC + SE, PWBs, CWBs	1311.059	637	0.811	0.815	0.179	0.158
Model 4	Two-factor; combining HPWS + AC + SE, PWBs + CWBs	1443.112	637	0.755	0.799	0.191	0.161
Model 5	One-factor	1659.658	639	0.711	0.762	0.198	0.188

Table 2. Comparison of measurement model

Note(s): PWBs – productive work behaviours; CWBs – counterproductive work behaviours; HPWS – high-performance work system; AC – affective commitment; SE – self-efficacy; + = variables combined
Source(s): Authors’ own

For the verification hypotheses, we conducted a regression-based analysis in SPSS macro PROCESS (ver. 3.3). We tested the mediation and quantified the effect of interaction with the recommended 5,000 bootstrap sampling with 95% confidence intervals (Hayes, 2018).

The results of the regression analysis showed that HPWSs can explain the increase in productive and the decrease in counterproductive behaviours, both directly and indirectly. For productive behaviours, HPWS ($\beta = 0.10, p < 0.01$), affective commitment ($\beta = 0.10, p < 0.01$) and self-efficacy ($\beta = 0.34, p < 0.01$) were more strongly explained in productive than in the case of counterproductive behaviours. The percentage of the explained variance for productive behaviours (ΔR^2) was 0.47, while that for counterproductive behaviours was only 0.08. Moreover, as shown in Table 3, HPWS affects productive behaviours through the mediating role of affective commitment ($\beta = 0.05$, lower 95% CI = 0.03, upper 95% CI = 0.06). We concluded that HPWSs trigger higher affective commitment among employees, thereby increasing the displayed productive behaviours. Simultaneously, due to such practices, individuals show lower readiness to display harmful behaviours. HPWSs additionally increase affective commitment ($\beta = 0.45, p < 0.01$), an important element limiting the intent to display harmful behaviours ($\beta = -0.09, p < 0.05$). The relationship between affective commitment and employee behaviour was statistically relevant.

The above-mentioned results can be applied to Hypotheses 1a, 1b, 2a and 2b. Given the empirical support provided to these hypotheses by the results, we can safely confirm their veracity.

In the case of Hypothesis 3a and 3b, we suggested that individuals possessing higher self-efficacy will respond differently to HPWS activities via their behaviours. Our results confirmed this assumption and also revealed some interesting phenomena. It appears that individuals with higher initial levels of self-efficacy are not strongly influenced by HPWSs with regard to their productive behaviours (Figure 2). They are capable of maintaining their performance regardless of the absence or presence of an HPWS. On the other hand, individuals with lower initial self-efficacy levels are strongly influenced by HPWS activities and show considerable improvements in their performance. The interaction effect of self-efficacy and HPWSs on productive behaviours was significant, as indicated by the bootstrapping confidence interval, which did not comprise zero ($\beta = -0.09$, L95% CI = -0.14, U95% CI = -0.04, $p < 0.01$).

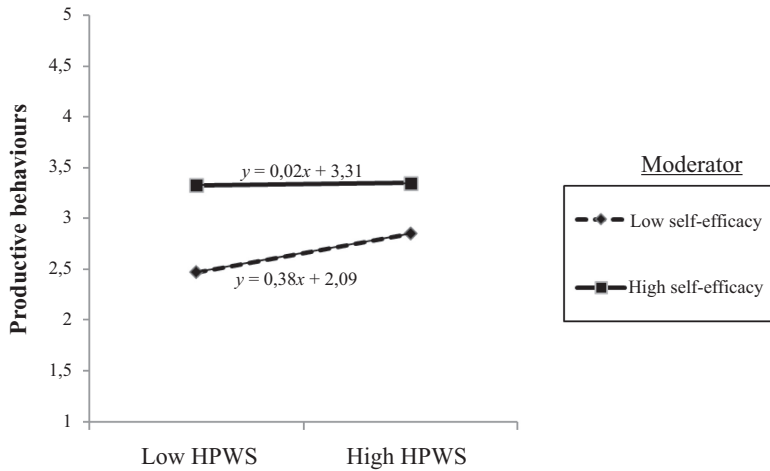
	β	Productive behaviours			Counterproductive behaviours			
		SE	<i>t</i>	95% CI	β	SE	<i>t</i>	95% CI
Constant	3.15	0.16	20.27***	2.85; 3.46	1.72	0.21	8.25***	1.31; 2.124
HPWS	0.10	0.02	5.20***	0.06; 0.14	-0.08	0.03	-2.86**	-0.12; -0.03
Affective commitment	0.10	0.02	5.62***	0.07; 0.14	-0.09	0.04	-2.76*	-0.10; -0.01
Self-efficacy	0.34	0.03	11.23***	0.28; 0.39	-0.10	0.05	2.02*	-0.19; -0.08
Education	-0.01	0.05	-0.15	-0.12; 0.11	0.10	0.07	1.48	-0.03; 0.22
Sex	-0.01	0.02	-0.36	-0.07; 0.05	0.05	0.04	1.18	-0.03; 0.13
Age	0.03	0.02	1.71	-0.04; 0.06	-0.03	0.02	-1.13	-0.07; 0.02
Job seniority	0.10	0.04	2.43*	0.02; 0.18	-0.01	0.06	-0.08	-0.12; 0.11
Mediatory role of AC	0.05	0.01	-	0.03; 0.06	-0.03	0.01	-	-0.05; -0.03
HPWS × SE	-0.09	0.03	-3.32***	-0.14; -0.04	-0.08	0.04	-2.02*	-0.15; -0.02
R^2	0.47				0.08			
<i>F</i>	72.84	(8,554)***			6.05	(8,554)***		

Note(s): HPWS – high-performance work system; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source(s): Author's own

Table 3.
Results of regression
model for employee
performance

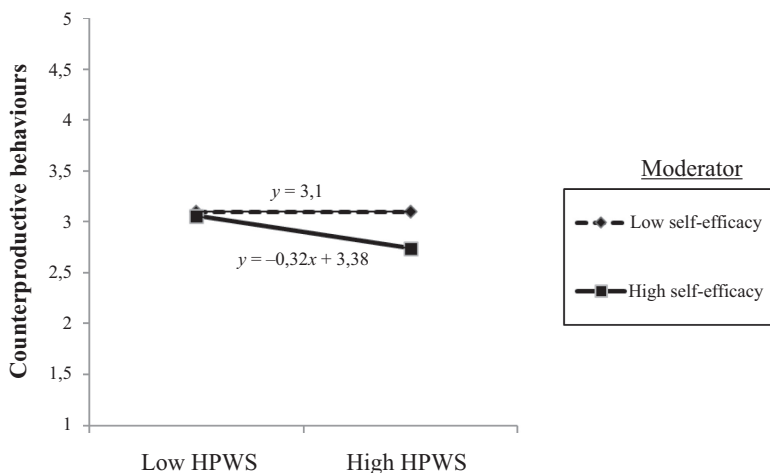
Figure 2.
Interaction between
HPWS and self-
efficacy predicting
productive work
behaviours



Source(s): Authors' own

We observed the opposite tendencies when analysing counterproductive behaviours in connection to the self-efficacy level. Individuals with low self-efficacy levels do not alter their harmful organisational behaviours even when the organisation implements strong HR practices directed at work performance (Figure 3). However, for individuals with high self-efficacy levels, HPWS activities play a significant role in limiting counterproductive behaviours ($\beta = -0.08$, L95% CI = -0.15 , U95% CI = -0.01 , $p < 0.05$). In this case, the interaction effect of self-efficacy and HPWS on counterproductive work behaviours was also significant, as indicated by the bootstrapping confidence interval.

Figure 3.
Interaction between
HPWS and self-
efficacy predicting
counterproductive
work behaviours



Source(s): Authors' own

These results point to an important conclusion: employees possessing a strong sense of self-efficacy display lower amounts of harmful behaviours in reaction to positive activities and support on the part of the HR system than individuals with low self-efficacy, despite all other circumstances.

Discussion and conclusions

Our research assessed how productive and counterproductive work behaviours correlate with HPWSs, self-efficacy and affective commitment. While mapping out interrelations between HPWS and productive and counterproductive work behaviours, we expected both direct and indirect influences. This study demonstrated that a direct relationship exists between these variables, which accords with earlier research (Jiang *et al.*, 2012b). The expected indirect influence of HPWS on individual performance via a mediator was also confirmed. This result corresponds with those of other studies, and suggests that affective commitment mediates between typical HR systems as well as individual employees' behaviours (Rainieri, 2017; Ogbonnaya and Messersmith, 2019).

While studies on the relationships between HPWS, affective commitment and productive employee behaviour extend additional empirical support to our ideas (Stanley and Meyer, 2016), the relationships between HPWS and counterproductive behaviours uncovered in this work provide a new contribution to the field. Most recent research on the interrelations between these variables indicated that HRM systems may limit counterproductive work behaviours in the context of interpersonal relationships, job satisfaction and reward satisfaction (Shamsudin *et al.*, 2014). The analyses presented in this paper indicate that this may also occur in situations where an increased sense of affective commitment and a positive evaluation of self-efficacy prevail.

When treating self-efficacy as a moderator of the relationships between an HPWS and employee behaviours, our results regarding counterproductive behaviours were particularly interesting. It appears that individuals with a low level of self-efficacy do not respond to HPWS activities and continue committing actions harmful for the organisation. In contrast, individuals with a high level of self-efficacy respond positively by displaying higher affective commitment in response to organisational activities and manifesting counterproductive behaviours less often.

Theoretical implications

Our study has theoretical implications for HRM research. First, we demonstrated that AMO framework may form a useful perspective for explaining both productive and counterproductive behaviours. Thus far, research has most often assumed a different theoretical perspective for these two types of behaviour included in the job performance (Van Beurden *et al.*, 2021). Admittedly, our results show that productive behaviours are better explained by organisational practices than counterproductive behaviours; however, both relationships are statistically relevant. Similar conclusions also appeared in the studies of Ogbonnaya and Messersmith (2019), who indicated that HPWSs better explain innovative work behaviours than stress experienced by employees. In our opinion, it results from the fact that in the relationship between HPWSs and counterproductive behaviours, other variables are also present, apart from affective commitment and self-efficacy that were tested by us. The authors exploring negative consequences of HPWSs for employee behaviours (Oppenauer and Van De Voorde, 2018; Ogbonnaya and Messersmith, 2019) point out the significant role of job demands, organisational constraints and variables related to well-being (e.g. job stress or emotional exhaustion) in explaining employee performance.

Thus, it appears that two parallel, complementary processes may be taking place between HPWSs and various behaviours forming a part of job performance – the first one, related to employees' attitudes (e.g. emotional commitment or engagement), and the second, to a sense of emotional overload, resulting in exhaustion and, in effect, negative organisational behaviours (Ogbonnaya and Messersmith, 2019). However, it is worth pointing out that other variables may also play a significant role in this configuration, for instance perceived organisational politics or incivility (Turek, 2019), explaining the situations in which employees display counterproductive behaviours. Further research should broaden the knowledge on the relationships between these variables and explain these relationships more fully. Theoretical perspective offering a possibility to explain both productive and counterproductive behaviours may be provided by social exchange theory (SET), as well as HR attribution theory, or job demands-resources (JD-R) model (Van Beurden *et al.*, 2021).

Second, the authors who call for a fuller explanation of the “black box” between HRM and employee performance (Jiang *et al.*, 2013; Jiang and Messersmith, 2018) stress the need to establish further factors explaining the relationships between these variables. Our research offers theoretical contribution to the existing knowledge, because it demonstrates that an HPWS influences employees who have strongly established self-efficacy differently than it influences people with low self-efficacy.

Self-efficacy is an important variable, as it not only explains employee behaviours and the circumstances in which some of them may act to harm their organisations, but it also describes productivity. Although this relationship has already been observed in previous studies (Stajkovic and Luthans, 1998; Chen *et al.*, 2001; Judge *et al.*, 2007), our work provides a broader perspective regarding the significance of this variable for HRM. It appears that individuals with higher self-efficacy display productive behaviours more often in companies with HPWSs directed at employees who do not display a high level of self-efficacy. Moreover, previous studies showed that employees with higher self-efficacy are able to maintain high performance even in situations of lack of stimulating influence on the part of the environment and organisational practices (Speier and Frese, 1997; Joti and Dev, 2016; Lloyd *et al.*, 2017). Our work thus provides a better understanding of why employees may be productive in companies without specialised HR systems. This result could be attributed to employees possessing certain key convictions that allow them to behave proactively and creatively even in a less favourable work environment. Researchers tried to explain situations wherein the same HRM practice leads to different results for particular employees with regard to position and status in the organisation or differences in perceptions of HPWSs (Liao *et al.*, 2009).

Third, previous analyses indicated a need for a precise definition of the manner in which an HPWS is studied – descriptively or evaluatively (Van Beurden *et al.*, 2021). This is because it has significant consequences for the interpretation of the achieved results. Our research was conducted within the evaluative perspective, in which employees were evaluating the degree to which their expectations towards HR practices were met. The results showed in this article demonstrate that in the instances of a positive evaluation of HPWSs, employees display higher readiness to get involved in productive behaviours and a lower tendency to engage in counterproductive behaviours. Although we know from literature that there are situations when this two kind of behaviours may be demonstrated simultaneously (Spector and Fox, 2010), as our research shows, such a situation does not take place when the system of organisational practices is evaluated well by employees. Evaluative perspective on HPWSs allows thus to understand why organisational practices implemented by managers may frequently turn out to be ineffective. It is because employees' cognition and evaluation of the internal work environment are more important than objectively existing solutions. This conclusion serves to strengthen the conviction of other authors (Van Beurden *et al.*, 2021) about a necessity to clarify the way in which HRM practices are tested. In further studies, it might be worthwhile to apply both perspectives (evaluative and descriptive) simultaneously

and to use multilevel modelling in order to assess the extent to which both ways of studying HRM practices are complementary.

Finally, our research demonstrates that although KIBS companies most often employ highly specialised workers equipped with unique knowledge and skills, the system of organisational practices may additionally stimulate their job outcomes. In this respect, HPWSs' influence on KIBS companies does not have to differ significantly from how they affect other types of organisations, similarly as the practices which function in KIBS companies do not have to differ significantly from practices in manufacturing or industrial companies. Thus, it is possible to answer – while maintaining certain caution – the question posed by [Den Hartog *et al.* \(2013\)](#) about a need to develop a different set of practices for service companies. Our research demonstrates that there is no such need, assuming that an HPWS is examined as a system of integrated practices. However, if we give consideration to the significance and role of individual practices, it may be observed that in the KIBS sector certain practices (e.g. job design and job properties, as well as empowerment) are more important than others (e.g. training and development) for the sake of improving job outcomes ([Wojtczuk-Turek, 2017](#)). However, it would be worth to verify this more precisely in future studies via comparing the KIBS sector companies to companies representing other sectors of economy.

Managerial implications

Our results bear significant managerial implications. Our findings regarding the indirect influence of HPWSs on organisational behaviours are key to understanding personnel-related operations affecting employee attitudes and convictions. These operations include those conducted by specialised organisational HR departments as well as line managers responsible for personnel-related functions. The significance of this aspect stems from the fact that employees' attitudes toward the organisation as well as their convictions about themselves trigger a strong and relatively permanent intent to act, leading to expected behavioural outcomes (sometimes more effective than those resulting even from rewards). Moreover, strong employee identification with the company and a positive perception of the work environment, including HPWSs, are not related to commitment ([Raineri, 2017](#); [Ogbonnaya and Messersmith, 2019](#)) alone; they may also prevent counterproductive behaviours and the intent to leave the organisation ([García-Chas *et al.*, 2014](#)). Thus, HR practices well fitted to employees' needs will increase their affective commitment, which will finally lead to a higher level of job performance. Therefore, it is essential to monitor HPWSs activities on an ongoing basis, analyse employees' needs and introduce potential corrections to the system of practices in order to maintain a high level of employee performance.

In the context of knowledge-intensive work in KIBS companies and given the results of our work with regard to self-efficacy, it is also worthwhile to pay attention to another aspect; managers and HR specialists may be able to strengthen employee self-efficacy via evaluation, communication or crafting. This recommendation stems from studies that established that self-efficacy may increase efficiency when employees know the general goal and receive specific feedback connected with its realisation ([Jyoti and Dev, 2016](#)). Another significant recommendation is to provide employees with resources, support and job crafting, while considering the balance between control and autonomy, and specific tasks suited to knowledge workers together with the characteristics of their task functioning. It is worth pointing out that employees with a high level of self-efficacy perform their work without the need for strong support by HPWSs. Consequently, managers shaped general self-efficacy via modelling behaviours, setting out challenges, positive feedback, displaying support and providing work resources.

A more general recommendation for top managers pertains to planning to implement HPWSs; in order to achieve positive results, it is important to secure the support of the

managerial staff as well as employee trust (Yoon-Ho *et al.*, 2015). It is also crucial to remember that employees' sense of well-being and their outcomes rely on the significance that they attach to HPWSs (Van De Voorde and Beijer, 2015). Moreover, in favourable circumstances, the results attributed to HPWSs may be caused by the self-organisation of employees and elements such as championship culture, employee solidarity and highly meaningful work, in combination with task identity (Ingvaldsen *et al.*, 2014). Therefore, while planning HPWS initiatives, it is worthwhile to consider the non-formal work elements that promote autonomy, flexibility and commitment in organisations.

Last but not least, we also confirm the general conviction that when HRM practices are used in combination, they generate mutually supportive effects that shape the quality of employees' functioning at work (Jiang *et al.*, 2012b; Ogbonnaya and Valizade, 2018; Jiang and Messersmith, 2018; Ogbonnaya and Messersmith, 2019).

Limitations

While the research presented here contributes to new knowledge, it is not free from shortcomings. First, conclusions as to the influence of the variables included in the research model are indirect and cross-sectional in character, as the model did not include experimental research. Bearing these limitations in mind, it is recommended that the results be interpreted carefully. It is possible that employees' perceptions of HPWSs can be affected by reverse causality or reciprocal causality (i.e. past performance may affect the perception of HPWSs), thereby influencing their current accomplishments. Thus, the dynamic nature of an HPWS's influence on employees' behaviours needs to be further examined in the future by adopting a longitudinal design. Although a longitudinal design is desirable for empirical analysis of workplace performance outcomes, our predictions were grounded in theory that allowed useful comparison with the existing evidence base. Moreover, as pointed by Spector (2019), causality of longitudinal design has been usually overstated, and it offers limited advantages over the cross-sectional design.

Second, the tools we employed used self-description, which might result in doubts as to the control of the "social desirability" variable. In this context, future studies should use numerous sources of knowledge on the examined variables (e.g. supervisors' opinions (multi-source or multi-level), and not restrict themselves to the opinions of the employees included in the study).

Third, our research sample was restricted to employees from the KIBS sector in Poland, and thus the findings cannot be simply generalised to other contexts and countries. Although companies in the KIBS sector in different countries have rather similar work characteristics (e.g. requirement for employee creativity, cooperation with clients in the process of service creation), the specific cultural context (e.g. high degree of power distance) and legal context (formalism) which are present in Poland should be taken into account while making comparisons to results from other countries.

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