



# Developing ambidexterity and resilience: The predictive role of high-performance work systems



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**Orientation:** Organisations and employees face crises at a point in time that may disrupt their normal work activities. High-performance work systems (HPWSs) help develop and enhance individuals' and firms' ability to respond to crises effectively.

**Research purpose:** This study examined the differential impact of HPWS on employee resilience, employee ambidexterity and organisational resilience during crises in pharmaceutical manufacturing firms in Ghana.

**Motivation for the study:** Limited studies have examined how HPWSs predict employee ambidexterity and employee and organisational resilience in separate studies. Nevertheless, knowledge regarding the differential impact of these outcomes in a single study is sparse, particularly during crises.

**Research approach/design and method:** A quantitative research approach was used in this study. Data for this study were gathered through a cross-sectional survey utilising a structured online questionnaire. A total of 324 participants formed the sample for data collection. The measure and structural models were assessed using Partial Least Squares Structural Equation Modeling (PLS-SEM).

**Main findings:** The results show that HPWS positively and significantly affects employee and organisational resilience and ambidexterity during crises within the research context.

**Practical/managerial implications:** The outcomes from the study provide helpful information for pharmaceutical firms' managers to enhance their employees' resilience and ambidexterity and the organisations' resilience.

**Contribution/value-add:** This study contributes to the HPWS literature by enriching the understanding of its effects on employee resilience, employee ambidexterity and organisational resilience in the context of an emerging economy.

**Keywords:** high-performance work systems; resilience; exploitation; exploration; ambidexterity.

## Introduction

Today's work environment is characterised by uncertainties that cause disruptions in work and business processes (Ikhide et al., 2022; Senbeto & Hon, 2020). External environmental factors such as economic declines, environmental challenges and political instabilities create many setbacks and distractions for individuals and organisations (Herbane, 2019; Senbeto & Hon, 2020). The coronavirus disease 2019 (COVID-19) pandemic, for instance, disrupted the business processes of countless firms and employees (Agyekum et al., 2021; Atiku & Ganiyu, 2022; Bussin & Swart-Opperman, 2021). In addition, industries such as aviation, construction and hospitals struggled to subsist during the COVID-19 pandemic (Agyekum et al., 2021; Rai et al., 2021).

Organisations and employees face crises at a point in time that may drain personal and organisational resources and disrupt their normal work activities. However, how individuals and firms respond to crises differs (Cooper et al., 2014). While some individuals and organisations quickly adapt or survive a crisis, others fail. Resilient organisations maintain their functions by mobilising and utilising resources to prepare for, handle, recover and learn from crises (Hepfer & Lawrence, 2022; Hillmann & Guenther, 2021). Similarly, employees who can consistently adjust or thrive and flourish in challenging times or quickly bounce back after crises are said to be resilient (Hillmann & Guenther, 2021; Linnenluecke, 2017; Näswall et al., 2015).

Crises signal the need for organisations to develop the ambidextrous capacity of their employees to cope during crises and maintain continuous competitive performance. Ambidexterity describes employees' aptitude to utilise their existing skills and simultaneously venture into new possibilities (Kumkale, 2022; Mu et al., 2022). In recent decades, organisations value and seek ambidextrous employees. Thus, organisations seek employees who can exploit their current capabilities to cope and adapt to challenges while exploring new opportunities out of crises (Birkinshaw & Gupta, 2013; Mu et al., 2022). To that extent, some scholars have proposed and encouraged the design of ambidextrous human resource management systems to facilitate and enhance employee ambidexterity (Garaus et al., 2015; Patel et al., 2013) as all employees can add value to their organisation while effectively adapting to changes in their work environment (Mu et al., 2022).

The literature reveals that scholars and practitioners continue to show an interest in how human resource management (HRM) practices influence individual- and organisational-level resilience and employee ambidexterity (Kuntz et al., 2016; Näswall et al., 2019). For example, Näswall et al. (2015) suggest that organisations must use their resources to facilitate and support the resilience of their employees. While studies on the effect of individual human resource practices on organisational and individual resilience (Kim et al., 2022; Rodríguez-Sánchez et al., 2021) and individual ambidexterity (Gürlek, 2021; Úbeda-García et al., 2022) are steadily growing, other researchers have called for investigating the influence of high-performance work systems (HPWSs) on enhancing employee ambidexterity and individual and organisational resilience. High-performance work system is 'a group of separate but interconnected HR management practices designed to enhance employee and firm performance outcomes through improving workforce competence, attitude and motivation' (Takeuchi et al., 2009, p. 1).

Limited studies have examined the influence of HPWS on individual ambidexterity (Gürlek, 2021; Úbeda-García et al., 2018), employee resilience (Branicki et al., 2019; Wang et al., 2021) and organisational resilience (Meddour et al., 2020; Zhou et al., 2019) in separate studies. Additionally, previous studies suggest that the outcomes of HPWS on individuals and firms differ because of varying organisational characteristics and environments (Datta et al., 2005). However, there is a scarcity of studies exploring how HPWSs distinctively influence employee ambidexterity and individual and organisational resilience within a homogenous environment during crises. Thus, there is a need to provide empirical insight into the predictive role of HPWS on these endogenous constructs in a single study within a specific environment during crises. Hence, this study investigates the differential impact of HPWS on employee and organisational resilience and individual ambidexterity in pharmaceutical manufacturing firms in Ghana by drawing on job-demand resource theory. Given that the global business environment continues to be disruptive, it is crucial to fill this knowledge

gap by examining the extent to which HPWS influences employee resilience, organisational resilience and employee ambidexterity within the pharmaceutical manufacturing sector of Ghana.

## Literature review and hypothesis development

### High-performance work system

The extant literature on strategic human resource management acknowledges the roles of human resource practices in improving organisational and individual outcomes (e.g., Hauff et al., 2022; Meijerink et al., 2021). In addition, studies in strategic human resource management also emphasise the use of HR systems in achieving employee performance instead of concentrating on a distinct HR practice (Boon et al., 2019). Human resource systems encompass interconnected HR practices that work harmoniously and support one another to attain desired outcomes (Lepak et al., 2006). It refers (Huselid, 1995) to:

[C]omprehensive employee recruitment and selection procedures, incentive compensation and performance management systems, and extensive employee involvement and training that can improve the knowledge, skills, and abilities of a firm's current and potential employee. (p. 635)

It describes 'a set of HR practices designed to enhance employee's skills, commitment, and productivity in such a way that employees become a source of competitive advantage' (Datta et al., 2005, p. 135).

Researchers have identified dimensions of HPWS as ability-motivation-opportunity enhancing practices, herein referred to as the AMO model (Cai et al., 2020; Fu et al., 2015). The AMO model suggests that 'performance in any role is some function of the individual's abilities, motivation, and their opportunity to perform in the specific context' (Boxall & Purcell, 2011, p. 190). Thus, employees require ability, motivation and opportunity as essential resources to augment their capacities for effective task performance (Boxall & Purcell, 2003; Cai et al., 2020; Mat et al., 2021).

The ability-enhancing element is skewed towards improving the knowledge and skills of employees towards achieving anticipated performance. Therefore, it involves meticulous and scientific recruitment and selection processes, job rotation, training and continuous development strategies (Meddour et al., 2020; Miao et al., 2020; Nadeem & Rahat, 2021; Zhang et al., 2020) to acquire the talents, skills, knowledge and experiences that an organisation requires and for which potential and existing employees must possess (Alqudah et al., 2022; Cai et al., 2020; Miao et al., 2020; Nadeem & Rahat, 2021).

Motivation-enhancing practices comprise performance growth orientation, pay for performance, incentives, benefits, rewards, job security and career advancement (Nadeem & Rahat, 2021; Zhang et al., 2020). These elements are intended

and activated to stimulate the efforts and behaviours of employees towards accomplishing specific unit and organisational goals (Ujma & Ingram, 2019). Researchers have noted that even if employees have the expected skillset to do their work, organisations must still motivate them to align their skillsets and interests with organisational needs (e.g., Boxall & Purcell, 2011; Eib et al., 2022). This alignment enables the implementation of HR practices that enhance motivation and ensure employees' sustainable work performance (Bhatti et al., 2021). Chang et al. (2012, p. 929) state that opportunity-enhancing practices involve 'the search and utilisation of resources and opportunities through social relationships to solve difficulties in transferring knowledge'.

Opportunity-enhancing practices encompass a range of strategies, such as involving employees in decision-making, teamwork, flexible job design, innovative information knowledge sharing, employee involvement, goal setting, decentralisation and increased job autonomy (De Reuver et al., 2021; Zhang et al., 2020). Such opportunity-enhancing practices provide employees with essential support, increase their confidence levels, facilitate employee voice opportunities and enable employees to exercise discretion and autonomy in fulfilling their roles (Alqudah et al., 2022; Obeidat et al., 2016).

The literature emphasises that a well-designed HPWS has three mutually reinforcing dimensions, creating a synergistic effect of managing employee outcomes rather than distinct HR practices (Chung & Pak, 2021). No individual dimension can yield optimum employee and organisational outcomes (Alqudah et al., 2022; Shahzad et al., 2019).

## Employee and organisational resilience

Resilience is a multidisciplinary concept that has gained substantial and growing scholarly attention across several disciplines as the world continues to experience increasing complexities, disruptions and unpredictable events that inhibit continued individual and business performance (Ozdemir et al., 2022; Sharma et al., 2021). Generally, resilience is the ability of individuals, teams and organisations to adjust, subsist and thrive amid adversity or crises (Hillmann & Guenther, 2021; Kuntz et al., 2017; Lengnick-Hall et al., 2011). Thus, 'without the experience of difficulties, adversity, or hardship, there is nothing to be resilient against' (Fisher et al., 2019). Some scholars describe resilience as either an end or a process towards achieving an expected objective (see, e.g., Melian-Alzola et al., 2020). As an outcome, resilience becomes a target state for recovering from crises and is examined only after a crisis (Duchek, Raetze, & Scheuch, 2020; Melian-Alzola et al., 2020). In contrast, resilience as a process involves adequately preparing for, adapting to and recovering from crises (e.g., Hartmann et al., 2020; Lengnick-Hall et al., 2011). Process resilience focuses on mechanisms that enable reaching that target state (Melian-Alzola et al., 2020). This study conceptualised resilience as a

dynamic process rather than an end state. Investigating resilience, especially in an increasingly dynamic business environment, is essential for comprehending how employees and organisations succeed regardless of unstable or adverse conditions (Hartmann et al., 2020; Lengnick-Hall et al., 2011).

At the individual level, resilience connotes employees' ability to adjust, succeed and recover from adversities (Kuntz et al., 2016; Linnenluecke, 2017; Seville, 2017). Luthans (2002, p. 702) defines employee resilience as 'the capability of individuals to cope successfully in the face of significant change, adversity, or risk' and as 'the positive psychological capacity to rebound, to bounce back from adversity, uncertainty, conflict, failure or even positive change, progress, and increased responsibility'. Näswall et al. (2015, p. 1) refer to resilience as 'employee capability, facilitated and supported by the organisation, to utilise resources to continually adapt and flourish at work, even if/when faced with challenging circumstances'. Drawing on the definition of Näswall et al. (2015), employee resilience is a personal resource that organisation can use their HR systems to develop or enhance that would enable employees to be responsive to challenges at work (Hartmann et al., 2020; Kim et al., 2022). Resilient employees are receptive to new challenges and exhibit emotional stability in times of difficulty (Tugade & Fredrickson, 2004).

Conversely, organisational resilience is 'the ability of an organisation to maintain functions and recover fast from adversity by mobilising and accessing the resources needed' (Hillmann & Guenther, 2021, p. 31). From a process view, a resilient organisation anticipates, prepares for, absorbs, adapts to and recovers from the effects of crises (Denyer, 2017; Hepfer & Lawrence, 2022; Lengnick-Hall et al., 2011). Thus, a firm that can maintain its functionality under challenging circumstances and emerge stronger and better is deemed resilient (Vogus & Sutcliffe, 2007). A review of the extant literature revealed that researchers operationalised resilience from planned and adaptive perspectives. Planned resilience uses existing, predetermined planning and capabilities to enhance organisational resilience (Prayag et al., 2020). A planned resilient approach means that managers must ensure preparedness for future challenges and strengthen their organisation's resistance against potential threats by designing measures that they can activate before, during and after a crisis (Kuntz et al., 2016; Meyer et al., 2021).

In adaptive resilience, organisations develop new capabilities by adopting unplanned measures to respond to changing situations or proactively reshape their business models ahead of anticipated needs (Cooper et al., 2014; Seville et al., 2015). Adaptive refers to 'a firm's ability to effectively absorb, develop situation-specific responses to, and ultimately engage in transformative activities to capitalise on disruptive surprises that threaten the firm's survival' (Lengnick-Hall et al., 2011, p. 244). As RuizMartin et al. (2018) noted, several organisations not only 'bounce back' but also manage to strengthen and grow by 'bouncing forward'. In achieving this feat, seminal studies have identified leadership, staff

engagement, situation awareness, and decision-making as the adaptive capacity dimension of building organisational resilience (Seville, 2017; Seville et al., 2008).

An increasing but limited body of research has explored the influence of HPWS on employee resilience (e.g., Bustinza et al., 2019; Cooke et al., 2019; Rehman et al., 2021; Khan et al., 2017; Nadeem et al., 2019; Rurkkhum, 2023). For instance, in a study conducted on employees in China's banking industry, Cooke et al. (2019) found that HPWS significantly and positively influenced employee resilience. Similarly, empirical evidence establishing the impact of HPWS on organisational resilience is rare (Al-Taweel, 2021; Kim et al., 2021; Obeidat et al., 2016; Zhou et al., 2019). Therefore, drawing on the given empirical outcomes, this study hypothesised the following:

**H<sub>1</sub>:** HPWS will positively and significantly affect employee resilience within Ghana's pharmaceutical industry.

**H<sub>2</sub>:** HPWS will have a positive and significant effect on organisational resilience within the pharmaceutical industry of Ghana.

## Employee ambidexterity

Scholars have begun investigating individual ambidexterity, citing its importance to employees and the firm (e.g., Mu et al., 2020; Rosing & Zacher, 2017). Researchers have conceptualised individual ambidexterity as behaviours that combine individual exploration and exploitation activities (e.g., Caniels & Veld, 2019; Mu et al., 2020). The most notable study on individual ambidexterity was conducted by Mom et al. (2009) when they studied the ambidextrous activities of individual managers. They described individual ambidexterity as 'a behavioural orientation towards combining exploration and exploitation-related activities within a certain time' (Mom et al., 2009, p. 812). Employees' explorative activities involve searching for, discovering, risk-taking, creating and experimenting with new opportunities (Mom et al., 2009; Rosing & Zacher, 2016). Thus, explorative activities require that employees depart from the status quo, try something new, learn from mistakes and seek unique means of successfully performing and accomplishing tasks (Rosing & Zacher, 2017). These activities enhance their creativity, innovation and adaptability to changing and challenging experiences (Mu et al., 2020:347). In contrast, exploitative behaviour includes choosing, applying and redefining current activities or processes (Caniels & Veld, 2019; Mom et al., 2009). Rosing and Zacher (2017, p. 696) refer to employee ambidexterity as 'relying on previous experience, putting things into action, and incrementally improving well-learned actions'. Employees who demonstrate exploitative activities depend on the status quo or their previous or current experience and methods to perform their tasks effectively.

According to Patel et al. (2013), achieving ambidexterity is contingent on an organisation's HRM systems. Consequently, Garaus et al. (2015) proposed an HRM system that embodies ambidexterity, enabling seamless incorporation of exploration

and exploitation to achieve performance. Furthermore, the ambidexterity literature has reported the predictive role of HPWSs on organisational ambidexterity (e.g., Chang, 2016; Gürlek, 2021; Úbeda-García et al., 2018). Additionally, a burgeoning body of evidence also demonstrates the influence of HPWS on individual ambidexterity in different contexts (Patel et al., 2013; Prieto-Pastor & Martin-Perez, 2015; Úbeda-García et al., 2022). As an illustration, Chang (2015) confirmed the effect of HPWS on employee ambidexterity among employees and managers from 58 banks in Taiwan, while Garaus et al. (2015) established that the effect of HPWS leads to employee ambidexterity based on an empirical study of high-tech manufacturing firms in Austria. Consistent with these empirical outcomes, this research posits the following:

**H<sub>3</sub>:** HPWS will positively and significantly affect employee explorative ambidexterity within the pharmaceutical industry of Ghana.

**H<sub>3b</sub>:** HPWS will have a positive and significant effect on exploitative employee ambidexterity within the pharmaceutical industry of Ghana.

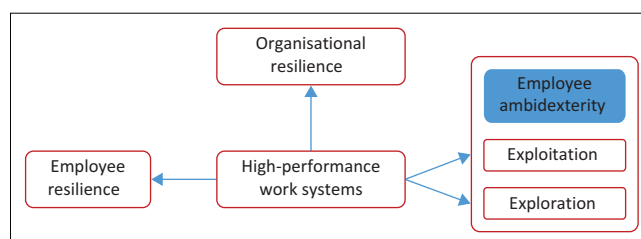
## Conceptual framework

As depicted in Figure 1, the research model illustrates the link between the exogenous variable (HPWS) and the endogenous variables (employee resilience, organisational resilience and exploitation and exploration ambidexterity). Previous studies have reported that both dimensions of employee ambidexterity are distinct and measured separately (e.g., Hanu et al., 2022; Karani et al., 2021; Mom et al., 2009). Therefore, drawing on related literature, this study posits that HPWS will positively and significantly influence employee and organisational resilience. Furthermore, the study also suggests that HPWS will have a distinct influence on the exploitation and exploration of ambidexterity. Thus, this study proposes and tests four hypotheses.

## Research design

### Research approach

This study followed the positivist paradigm and quantitative research approach. Hence, a cross-sectional and online survey was used to gather data. The quantitative approach permits extensive data collection and objectively tests hypotheses (Hair et al., 2019).



Source: Hanu, C. (2023). *The role of high-performance work systems and resilience in employee well-being in the pharmaceutical industry of Ghana*. PhD thesis, Durban University of Technology, Durban, South Africa

**FIGURE 1:** Proposed research model. The research model illustrates the link between the exogenous variable and the endogenous variables (employee resilience, organisational resilience and exploitation and exploration ambidexterity).

## Research respondents

The target respondents were the employees of the 40 pharmaceutical manufacturing firms in Ghana registered with the Pharmaceutical Manufacturers Association of Ghana (PMAG). The PMAG has an estimated 2000 employees. This study follows the conventional formula provided by Gill et al. (2010) to determine a minimum sample of 322 respondents. The sample size in this study ensures a 95% confidence level and a 5% margin of error, commonly employed in management research (Taherdoost, 2017). A random selection process was used to choose the respondents as the target population congregates on the WhatsApp platforms of their respective organisations. This means that every member on the platform had an equal chance to access the web link and participate in the survey (Taherdoost, 2017).

## Measuring instrument

A structured online questionnaire was developed using Google Forms to collect data for this study. The questionnaire elicited data on the primary constructs and the respondents' biographic profiles. The number of items used to collect data on each construct and where the items were sourced are shown in Table 1. The indicator loading and the data quality criteria are presented in Table 3. The items were based on a five-point Likert scale, where respondents could indicate their level of agreement or disagreement, spanning from 'strongly disagree (1)' to 'strongly agree (5)'.

Table 1 illustrates that HPWS was measured using a set of 22 items adapted from Bhatti et al. (2020). Within the HPWS framework, seven items related to ability-enhancing practices, six focused on motivation-enhancing practices and nine were associated with opportunity-enhancing practices. Only seven items were modified by rewording the items to fit the study context. For example, the initial item, 'There are formal training programmes to teach new hires the skills they need to perform their task', was modified to 'There are formal training programmes to teach new employees the skills they need to perform their task'.

Additionally, the nine-item Employee Resilience Scale developed by Näswall et al. (2019) was used to assess employee resilience within the research context. None of the items were modified. A sample item is 'I often re-evaluate my performance and continually improve how I do my work'.

Furthermore, organisational resilience was measured using the Organisational Resilience Scale developed by Lee et al. (2013). The scale comprised 13 items. Five of the items were modified to suit the research context. For example, the original item, 'We build a strong and trusting relationship with others we might have to work with during a crisis', was modified to 'Our organisation builds strong and trusting relationships with other organisations it might have to work with during a crisis'.

**TABLE 1:** Summary of constructs, items and sources.

Constructs	Number of items	Source
HPWS	22	Bhatti et al. (2020)
Employee resilience	9	Näswall et al. (2019)
Organisational resilience	13	Lee et al. (2013)
Exploration ambidexterity	5	Mom et al. (2009)
Exploitation ambidexterity	6	Mom et al. (2009)

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HPWS, High-performance work system.

Finally, employee ambidexterity was measured with the 11 items Mom et al. (2007) developed to measure managers' ambidexterity. Exploration and exploitation activities were measured with five and six items, respectively. The initial items utilised a seven-point Likert scale from 'to a very large extent (7)' to 'to a very small extent (1)'. However, this study employed a five-point Likert scale ranging from 'strongly agree (5)' to 'strongly disagree (1)'. Hence, the items were modified to suit the scale of agreements. For example, an item on exploitation activities, 'To what extent did you, last year, engage in work-related activities requiring quite some adaptability of you', was modified to 'Since last year, I have engaged in work-related activities requiring that I adapt to changing situations'. Similarly, an item on exploration ambidexterity, 'To what extent did you, last year, engage in work-related activities requiring you to learn new skills or knowledge', was modified to 'Since last year, I have engaged in work-related activities that required me to learn new skills or knowledge'.

Despite the original development of the construct-specific items with a Western context in mind, it is important to note their adaptability and applicability to various contexts, such as the pharmaceutical industry in Ghana. Consequently, modifying these items for this study did not present any difficulties in accurately assessing the variables within the research framework.

## Research procedure

Scholars suggest that cross-sectional surveys are prone to common method bias (Podsakoff et al., 2003; Schwarz et al., 2017). Hence, this study adopted the ex-ante approach to mitigate the effect of common method bias (Podsakoff et al., 2003; Schwarz et al., 2017). For instance, some items were revised to make them easy to understand and mirror the research context. The items were also arranged to separate the predictor variables from the measuring constructs, and the data were collected in phases to reduce the predictability of relationships between the constructs. Specifically, the items on employee resilience, exploratory ambidexterity and ability-enhancing practices of HPWS were part of the first wave of data collected. In contrast, the items on organisational resilience, exploitation ambidexterity opportunity-enhancing practices and motivation-enhancing practices were part of the second wave of data collected.

The data for the study were collected online. In each focal firm, the hyperlink of the questionnaire was given to an HR officer, who was assigned to administer the web link on the company's official WhatsApp platform for the respondents to access. Thus, every member on the platform had the chance to access the web questionnaire on their smartphones or tablets. The introduction page of the questionnaire requested respondents to generate and enter a five-digit code as having read and agreed to participate in the survey. The respondents were also duly informed to secure the non-recoverable code as they would use it in the second round of data collection. The purpose of the digital consent code was to help merge both datasets. Many scholars have used the same or similar approach in collecting data (e.g., Greenbaum et al., 2012; Lai et al., 2021). Furthermore, the respondents were notified that their participation in the survey was optional, and they were free to withdraw at any point. Additionally, they were guaranteed the confidential and anonymous nature of the information they would provide.

## Ethical considerations

The authors obtained ethical clearance for this study from the Durban University of Technology Institutional Research Ethics Committee (No. IREC I09/22). Consequently, detailed attention was given to all ethical considerations in data collection and management.

## Statistical analysis

The data obtained were downloaded in an Excel format. The data processing and respondents' demographics were analysed using Statistical Package for Social Science (SPSS version 27). The data collected shows that 371 responses were received during Phase 1, and an additional 342 responses were obtained by the end of Phase 2. This accounts for a response rate of 35.65%. After mapping the two phases and validating the data, it was revealed that 29 respondents did not participate in the second phase of data collection, and a total of 324 responses were retained and used in this study. The respondents' biographic profiles are presented in Table 2. Additionally, the measurement and the structural models were assessed using Partial Least Squares Structural Equation Modeling (PLS-SEM) (version 3).

## Results

### Model assessment

The data quality was checked by evaluating the measurement model (Hair et al., 2020). The results (Table 3) show that Cronbach's alpha and the composite reliabilities for all the constructs exceeded the minimum threshold of 0.70 (Hair et al., 2020; Hair et al., 2018). Additionally, the average variance extracted for each construct exceeded the 0.50 threshold (Hair et al., 2017; Sarstedt et al., 2021). Hence, these results validate the constructs' reliability and validity.

**TABLE 2:** Respondents' biographical profiles.

Variable	Items	Frequency (n = 324)	Percentages
Gender	Male	189	58.34
	Female	135	41.66
Age groups	21–30	73	22.53
	31–40	192	59.25
	41–50	45	13.88
	51–60	14	4.32
Educational qualification	Diploma/HND	36	11.11
	First degree	155	47.83
	Postgraduate degree	108	33.33
	Others	25	7.72
Length of service	1–3 years	64	19.75
	4–6 years	109	33.64
	7–10 years	103	31.79
	11 years and above	48	14.81
Status	Managerial position	257	79.32
	Non-managerial position	67	20.67

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HND, Higher National Diploma.

**TABLE 3:** Construct reliability and convergent validity.

Constructs	Item	Loading	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted
HPWS			0.867	0.873	0.900	0.601
	AB3	0.814	-	-	-	-
	AB4	0.808	-	-	-	-
	MO4	0.795	-	-	-	-
	OP2	0.787	-	-	-	-
	OP3	0.719	-	-	-	-
EmRes			0.860	0.863	0.905	0.705
	EmR1	0.813	-	-	-	-
	EmR5	0.859	-	-	-	-
	EmR8	0.901	-	-	-	-
	EmR9	0.781	-	-	-	-
OrgRes			0.787	0.788	0.863	0.612
	OR3	0.861	-	-	-	-
	OR10	0.779	-	-	-	-
	OR11	0.706	-	-	-	-
ExpLAmb			0.852	0.888	0.911	0.773
	ExpL1	0.890	-	-	-	-
	ExpL2	0.938	-	-	-	-
ExpRAmb			0.859	0.890	0.904	0.703
	ExpR1	0.909	-	-	-	-
	ExpR3	0.915	-	-	-	-
	ExpR4	0.780	-	-	-	-
	ExpR5	0.736	-	-	-	-

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HPWS, high-performance work system; EmRes, Employee Resilience; OrgRes, Organisational Resilience; ExpLAmb, Exploitation Ambidexterity; ExpRAmb, Exploration Ambidexterity.

The discriminant validity of the data was assessed using cross-factor loading (Table 3), the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio (Table 4) (Henseler et al., 2015). The indicator loadings and cross-loadings exceeded the minimum threshold of 0.70 (Henseler et al., 2015). Moreover, the Fornell-Larcker criteria met the required threshold. Additionally, the HTMT ratio was below

**TABLE 4:** Discriminant validity.

Constructs	1	2	3	4	5
<b>Fornell-Larcker Criterion</b>					
Employee Resilience (1)	<b>0.840</b>	-	-	-	-
Exploitation Ambidexterity (2)	0.379	<b>0.879</b>	-	-	-
Exploration Ambidexterity (3)	0.497	0.663	<b>0.839</b>	-	-
HPWS (4)	0.623	0.461	0.550	<b>0.775</b>	-
Organisational Resilience (5)	0.550	0.585	0.439	0.699	<b>0.782</b>
<b>Heterotrait-monotrait ratio</b>					
Employee Resilience (1)	-	-	-	-	-
Exploitation Ambidexterity (2)	<b>0.447</b>	-	-	-	-
Exploration Ambidexterity (3)	0.554	<b>0.776</b>	-	-	-
HPWS (4)	0.712	0.511	<b>0.603</b>	-	-
Organisational Resilience (5)	0.650	0.695	0.511	<b>0.853</b>	-

Source: Hanu, C. (2023). *The role of high-performance work systems and resilience in employee well-being in the pharmaceutical industry of Ghana*. PhD thesis, Durban University of Technology, Durban, South Africa

HPWS, high-performance work system.

**TABLE 5:** Summary of the model path.

Constructs	$\beta$	M	S	T	p	Decision
HPWS -> Employee Resilience	0.718	0.722	0.065	10.955	0.000	H <sub>1</sub> = Accepted
HPWS -> Organisational Resilience	0.687	0.692	0.115	5.977	0.000	H <sub>2</sub> = Accepted
HPWS -> Exploitation Ambidexterity	0.524	0.517	0.105	4.993	0.000	H <sub>3a</sub> = Accepted
HPWS -> Exploration Ambidexterity	0.624	0.622	0.086	7.217	0.000	H <sub>3b</sub> = Accepted

Source: Hanu, C. (2023). *The role of high-performance work systems and resilience in employee well-being in the pharmaceutical industry of Ghana*. PhD thesis, Durban University of Technology, Durban, South Africa

NB, Original Sample ( $\beta$ ); M, Sample Mean; S, Standard Deviation; T, T-Statistics; p, P-Values; HPWS, high-performance work system.

the thresholds of 0.85 (Henseler et al., 2015; Hair et al., 2018) and 0.90 (Gold et al., 2001). Accordingly, these results confirm the distinct nature of the constructs.

## Hypothesis testing

To evaluate the proposed hypotheses, the structural model of the study was assessed based on bootstrapping procedure with a resample of 5000 (Hair et al., 2017). The model path analysis (Table 5) shows that HPWS had a positive and significant effect on employee resilience ( $\beta = 0.718$ ,  $t = 10.955$ ,  $p = 0.000$ ), thus, supporting H<sub>1</sub>. Similarly, HPWS had a positive and significant effect on organisational resilience ( $\beta = 0.687$ ,  $t = 5.977$ ,  $p = 0.000$ ), thus, supporting H<sub>2</sub>. Furthermore, the results also show that HPWS had a positive and significant effect on exploitative ambidexterity ( $\beta = 0.524$ ,  $t = 4.993$ ,  $p = 0.000$ ) and explorative ambidexterity ( $\beta = 0.624$ ,  $t = 7.217$ ,  $p = 0.000$ ), confirming H<sub>3a</sub> and H<sub>3b</sub>. Thus, the results imply that HPWS predicts employee resilience, organisational resilience and employee exploitative and explorative ambidexterity.

Furthermore, the variance inflation factor (VIF) analysis shows that the VIF for the items is below 0.3, meaning multicollinearity is not challenging for this study (Hair et al., 2020). A further assessment reveals the models' explanatory power, effect size and predictive relevance. The literature on the coefficient of determination (R<sup>2</sup>) recommends that acceptable values should be between 0 and 1 (Hair et al., 2020; Hamakhan & Taha, 2020). The R<sup>2</sup> revealed that HPWS

substantially affects individual and organisational resilience and exploration ambidexterity. However, its effect on exploitation ambidexterity is relatively weaker. Specifically, the R<sup>2</sup> value of 0.388 suggests a moderate positive effect of HPWS on employee resilience, explaining approximately 38.8% of the variance. Similarly, the R<sup>2</sup> value of 0.608 indicates a strong positive effect of HPWS and organisational resilience, explaining approximately 60.8% of the variance. High-performance work system also shows a moderately positive effect on exploration ambidexterity, explaining 30.3% of the variance (R<sup>2</sup> = 0.303) and a weak positive effect on exploitation ambidexterity, explaining 21.3% of the variance (R<sup>2</sup> = 0.213).

In addition, HPWS had a significant and large effect size on employee resilience (0.634) and exploration ambidexterity (0.435) and a significant and moderate effect size on organisation resilience (0.349) and exploitation ambidexterity (0.270). Furthermore, the f<sup>2</sup> values of 0.02, 0.15 and 0.35 indicate small, medium and large effects of an independent variable on specific dependent variables (Hamakhan & Taha, 2020). Finally, the models' predictive relevance was satisfactory and adequate because all the Q<sup>2</sup> values were more significant than the zero thresholds for the endogenous variables (Geisser, 1975; Hair et al., 2017).

## Discussion

The current research explored the differential effect of HPWS on employee resilience and ambidexterity and organisational resilience in pharmaceutical manufacturing firms in Ghana. Accordingly, four hypotheses (H<sub>1</sub>, H<sub>2</sub>, H<sub>3a</sub> and H<sub>3b</sub>) were developed and tested. The first hypothesis measured HPWS' effect on individual resilience. The results revealed that HPWS positively and significantly affects employee resilience in pharmaceutical manufacturing firms in Ghana, confirming H<sub>1</sub>. This outcome is consistent with prior research investigating the HPWS and employee resilience linkage (Bustinza et al., 2019; Cooke et al., 2019; Nadeem et al., 2019; Rehman et al., 2021; Rurkkhum, 2023; Wang et al., 2014). Thus, the results confirm that practices aimed at enhancing employee ability (such as identifying skills to improve performance), motivating employees (through methods such as pay for performance, incentives and rewards, job security and career development) and creating opportunities for employees (such as making work-related decisions) influence employee resilience (Nadeem & Rahat, 2021). Thus, the positive and significant effect suggests that when organisations in the pharmaceutical manufacturing sector of Ghana adopt and effectively implement HPWS, employees become resilient, such as adapting to crises by accepting and learning from change processes, responding to feedback and constructive criticism effectively and collaborating through teamwork and knowledge sharing.

The second hypothesis tested the effect of HPWS on organisational resilience. The outcome revealed that HPWS significantly and positively affects organisational resilience in Ghana's pharmaceutical manufacturing firms. This outcome supports H<sub>2</sub>, and it parallels earlier studies that

explored the influence of HPWS on organisational resilience (Al-Taweel, 2021; Kim et al., 2021; Meddour et al., 2020; Obeidat et al., 2016; Zhou et al. 2019). Furthermore, the results indicate that adopting practices aimed at enhancing ability, motivation and opportunity contributes to developing resilience in pharmaceutical manufacturing firms in the research context. The essence is that pharmaceutical firms that focus on designing and seamlessly implementing HR practices will boost employees' ability, motivation and opportunity to position their organisations to adapt or survive during a crisis and eventually bounce back if a crisis should limit their ability to maintain their core functions.

The third hypothesis ( $H_{3a}$ ) tested the influence of HPWS on individual exploration ambidexterity. The results confirm that HPWS positively and significantly affected employee exploration ambidexterity in pharmaceutical manufacturing firms in Ghana. Specifically, the beta coefficient ( $\beta$ ) of 0.624 suggests that a 1-unit increase in HPWS leads to a 62.4% increase in explorative ambidexterity. The  $t$ -value of 7.217 indicates that this relationship is also statistically significant ( $p < 0.001$ ). The result obtained is in tandem with other related empirical evidence (Patel et al., 2013; Prieto-Pastor & Martin-Perez, 2015; Rurkkhum, 2023; Tian et al., 2016; Úbeda García et al., 2022). These studies indicate that enhancing employee ability, motivation and opportunities enable them to take risks, be flexible and creative and explore new ideas and opportunities when confronted with challenges.

Finally, the predictive role of HPWS on employee exploitation ambidexterity was assessed ( $H_{3b}$ ). The results demonstrated a positive and significant effect of HPWS on exploitative employee ambidexterity in pharmaceutical manufacturing firms in Ghana. For exploitative ambidexterity, the beta coefficient ( $\beta$ ) of 0.524 suggests that a 1-unit increase in HPWS has a 52.4% effect or increase in exploitative ambidexterity. The  $t$ -value of 4.993 indicates that this relationship is statistically significant ( $p < 0.001$ ). This result supports  $H_{3b}$ , which is also consistent with related previous studies (Chang, 2016; Fu et al., 2015; Garaus et al., 2015; Gürlek, 2021; Patel et al., 2013; Prieto-Pastor & Martin-Perez, 2015; Úbeda-García et al. 2022). This suggests that HPWSs enhance the ability of employees within the research context to search for, discover, create and experiment with new opportunities associated with crises (Liu & Zhao, 2021; Mom et al., 2007). Thus, with the implementation of HPWS within the study context, employees can depart from routine activities, learn from their mistakes, try something new and seek new ways to achieve challenging tasks.

### Practical implication

The outcomes of this study offer many practical lessons for managers that will influence their HR decisions in enhancing organisational resilience as well as employee ambidexterity and resilience in pharmaceutical firms. Firstly, the findings revealed that HPWS has the most significant impact on employee resilience, followed by organisational resilience,

exploration ambidexterity and exploitative ambidexterity. The differential effect suggests that pharmaceutical firms are better at using HPWS to develop the resilience of their employees and organisations. As resilience fades with changing times, managers must proactively engage employees in tasks that enhance their ability, motivation and opportunity, thus reinforcing their employees' resilience. Secondly, managers need to prioritise organisational resilience by employing a combination of planned and adaptive approaches to build and strengthen organisational resilience. By actively addressing employee and organisational resilience, managers can ensure a robust and adaptive response to changing times.

The study further provides an opportunity for managers to use ability, motivation and opportunity-enhancing activities to support and improve their employees' ambidextrous behaviours. The study results show that HPWS has a relatively moderate influence on employees' exploration and exploitative activities. Therefore, there is a need to develop and nurture employees' ambidextrous behaviours by engaging in activities that would enable them to blend routine tasks with tasking that requires risk-taking, experimenting and finding novel means of accomplishing tasks (Mom et al., 2007; Mu et al., 2020; Rosing & Zacher, 2017).

### Limitations and recommendations

There are a few limitations to consider in this study. This study's results are drawn from respondents within a particular sector or industry, which makes the sample homogeneous. Organisations in different industries have varying characteristics that may influence employees' perceptions about the impacts and outcomes of HPWS on their employees, organisations and industry. For example, the competitive structure and demands of the pharmaceutical industry differ from those of other industries. Hence, it would become difficult to generalise the outcome of this study to other industries.

Additionally, the study was conducted within the context of Ghana only. Although Ghana and other countries within the subregion or emerging economies may share similar national and cultural characteristics, differences in distinctive national cultural characteristics may limit the generalisation of the study's outcome. Given this limitation, a future study may consider comparative studies by considering different industries and countries within sub-Saharan Africa or other developing economies. The alternative is to consider conducting the same study in a different industry from the same or similar geographical contexts. Such future studies will provide better and deeper insight into the model investigated in this study.

The research model only tested the direct effect of the independent variable on the dependent variables. Introducing a moderator may provide insight into factors that can strengthen the influence of HPWS on the dependent outcomes. Therefore, future studies may introduce factors that could moderate the present outcome. As a result, the



outcomes may yield better and more insightful results substantial for theoretical and managerial practice.

Although the data were elicited in phases using a 1-month time lag, the duration was not long enough to establish strong causal relationships between the constructs in the research framework. Therefore, future studies could employ longitudinal studies to investigate the research model. In addition, future studies should consider a mixed study to enhance the statistical outcomes. Finally, the dimensions of HPWS were measured and analysed as a composite. Future research could provide an intriguing avenue by exploring the distinct impacts of ability, motivation and opportunity-enhancing practices on the dependent constructs. This distinctive impact would provide invaluable information for managers about where to direct their resources and energies.

## Conclusion

This study developed and tested the distinctive impact of HPWS on employee resilience and ambidexterity, as well as organisational resilience, in pharmaceutical manufacturing firms in Ghana. The study provides an additional understanding of HPWS's influence in promoting employees' resilient and ambidextrous behaviour to manage crises effectively. The outcomes also offer lessons to guide HR decisions in promoting organisational resilience. The relatively lower effect of HPWS on employee ambidexterity suggests that managers should prioritise the implementation of HPWS to foster and cultivate the ambidextrous behaviours of their employees. This suggests the need for proactive efforts to nurture further and develop ambidextrous behaviours of their employees.

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The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

### Authors' contributions

The study was based on the PhD thesis of C.H., completed at the faculty of Management Sciences, Durban University of Technology, South Africa. C.H. wrote the manuscript under the direct supervision and guidance of N.K., the second author.

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### Data availability

The data that support the findings of this study are available from the corresponding author, C.H., upon reasonable request.

## Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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