

Fostering three types of green behavior through green HRM in the energy sector: the conditional role of environmental managerial support

Fostering three types of green behavior

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Abstract

Purpose – Drawing on the social exchange theory (SET) and the self-determination theory (SDT), the present study aims to examine the impact of green human resource management (GHRM) on three types of employee green behavior (EGB) – green in-role, innovative and extra-role – in the presence of environmental managerial support (EMS) as a conditional factor.

Design/methodology/approach – The research model was verified based on data from 419 respondents employed in companies operating in the energy sector in Poland (Europe’s “coal heartland”). PLS-SEM was used in the statistical analyses.

Findings – This study shows that GHRM positively impacts three types of EGB. EMS positively moderates the relationships of GHRM with both green extra-role behaviors and innovative work behaviors; however, EMS does not play a moderating role in the relationship between GHRM and green in-role behaviors.

Originality/value – This study, being one of a kind, enriches the literature by exploring the conditional role of EMS on the integrated relationship of GHRM practices with in-role, extra-role and innovative behaviors and offers evidence from the rarely examined energy sector, which plays a vital role in the transformation of nations toward sustainable development.

Keywords Sustainable development, Environmental sustainability, Extra-role green behaviors, In-role behaviors, Innovative behaviors

Paper type Research paper

1. Introduction

Modern organizations are under pressure from stakeholders to limit their negative impact on the natural environment. The energy industry has been found to be a major contributor to climate change. For this reason, companies in that sector are expected to implement environmental management practices in their daily operations (Piwowar-Sulej, 2022). Interest in environmental issues may be found in many business areas, including green operations, green marketing, or green accounting.



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Although employees constitute a factor that bridges the green activities in the abovementioned areas, their green behavior (EGB) has attracted less research attention than green behavior that individuals present outside the workplace (Dumont *et al.*, 2017). In short, EGBs are those employee behaviors that contribute to environmental sustainability (Ones and Dilchert, 2012a). As Katz *et al.* (2022) emphasized in their meta-analysis of the literature on EGBs, previous studies have adopted various conceptual definitions and operationalizations of EGBs. Some authors treat EGBs as a unidimensional construct (e.g. Graves *et al.*, 2013). In turn, Norton *et al.* (2015) categorized green in-role and extra-role behaviors. Green in-role behaviors (GIRBs) can be described as environment-oriented activities demanded by employers, included in the job description, controlled and rewarded (Pham *et al.*, 2020). Green extra-role behaviors (GERBs) are elective and exceed organizational expectations (Cantor *et al.*, 2015). Both in-role and extra-role behaviors can be traditional, i.e. not innovative. For example, waste sorting or double-sided printing can be treated as traditional EGBs. Stoner *et al.* (2011) stated that behaviors in the extra-role category include demonstrating effort, volunteering, helping others, following rules and supporting organizational objectives. The list of non-innovative GERBs is also demonstrated in the scale created by Lamm *et al.* (2013). Therefore, as Aboramadan (2022) argued, special attention should be given to an additional type of EGBs in the form of green innovative behaviors (GIBs), because they have a positive impact on value creation and thus stimulate organizational outcomes (Aboramadan *et al.*, 2021; Dumont *et al.*, 2017). They can be defined as “employees’ behaviors devoted toward the generation, promotion and realization of green ideas” (Aboramadan, 2022, p. 9). Another important aspect is that, while in traditional industries EGBs are understood in terms of GERBs, in a green industry they can take the form of GIRBs because they are part of one’s duties (Ones and Dilchert, 2012b).

The integration of green issues in HR functions has been implemented in the form of green human resource management (GHRM). As Ren *et al.* (2021) stated, GHRM aims to develop environmental awareness and create supportive cultures for environmental management. It is usually discussed in terms of green hiring, HR appraisal, training, compensation and promotion (Piwowar-Sulej, 2021). The impact of GHRM on EGBs may be explained based on the social exchange theory (SET), which is seen as one of the most influential theories that help explain employee behavior. In general, social exchanges involve a set of interdependent interactions that result from the actions of another party and lead to high-quality relationships (Cropanzano *et al.*, 2017). In this case, the social exchange process begins when an employer shows their environmental concern while simultaneously treating employees in a positive manner, providing them with different resources such as knowledge (through green training), money (through green rewarding) and professional development (through green promotion). In response, the employees reciprocate preferable green behaviors.

Although the direct relationship between GHRM and EGB seems to be evident, previous studies have claimed inconsistent empirical evidence; for example, Fawehinmi *et al.* (2020) concluded that there was a non-significant impact of GHRM on EGB in Malaysian higher education institutions. However, Ansari *et al.* (2021) and Sabokro *et al.* (2021) offered evidence in support of a substantial positive, direct impact of GHRM on the individual-level EGBs in the Pakistani and Irani context, respectively. The extant literature has mostly explored the relationship between a single HRM practice and EGBs (Ababneh, 2021). Moreover, there is a dearth of empirical studies about the antecedents of EGBs in the form of green in-role, extra-role and innovative behaviors (Islam *et al.*, 2021) and it is recommended to explore the factors stimulating such EGBs (Piwowar-Sulej and Kołodziej, 2022). Therefore, this paper first aims to examine the direct relationship between GHRM and employee green in-role, extra-role and innovative behaviors. It applies a holistic approach aimed at examining the synergistic effect of GHRM practices together, which is more reliable when it comes to explaining the contextual factors of pro-environmental employee behavior.

Improving environmental performance requires more than the adoption of GHRM practices (Ren *et al.*, 2021). Supervisors are responsible for overseeing the work of their subordinates and creating a suitable working atmosphere. The results of their actions should be employees' expected behaviors (Tuan, 2022). Therefore, this study follows Ramus and Steger (2000), who developed the concept of environmental managerial support (EMS). Cantor *et al.* (2012) define it as "the employee's belief that the supervisor provides subordinates with the resources and feedback needed to participate in environmental initiatives" (p. 35). As Tuan (2022) emphasized, scant attention has been paid to the impact of leaders' support specifically oriented toward stimulating EGBs. The impact of EMS on EGBs may be explained with the self-determination theory (SDT), which refers to circumstances such as work context or management style boosting or stifling individuals' motivation. The SDT assumes that satisfying the needs for competence, relatedness and autonomy are key drivers of employees' learning, well-being, motivation and job results (Deci and Ryan, 1985). EMS is directed toward the employees' needs (relatedness), promotes a collaborative and supportive work environment in which employees can learn (competencies), and provides the opportunity to create pro-environmental solutions (autonomy) (Singh *et al.*, 2020). Therefore, it is expected that EMS will interact with GHRM and amplify the impact of GHRM on EGBs. Surprisingly, no research to date has explicitly focused on EMS as a moderator of the relationships between GHRM and EGBs. Therefore, this study further aims to examine the moderating role of EMS on "GHRM–EGBs" relationships.

At this point, it is worth emphasizing that most studies examined the indirect impact of GHRM on EGBs (e.g. Al-Ghazali and Afsar, 2021; Li *et al.*, 2023). Only a few studies linking GHRM with EGBs have explored conditional variables such as individual green values (Li *et al.*, 2023), environmental knowledge (Saeed *et al.*, 2019), or gender (Chaudhary, 2020). As Aguinis and Glavas (2012) claim, knowledge about moderators is important for understanding the conditions under which GHRM is related to its outcomes. Therefore, this study aims to fill this gap by examining the conditional effect of EMS on the relationship between GHRM and EGBs.

The research model was verified based on data from 419 respondents employed in companies operating in the energy sector in Poland. This sector – although crucial to environmental sustainability – is an area seldom explored in research on GHRM (Alshaabani *et al.*, 2021). Therefore, this study also fills this contextual research gap. Furthermore, Poland is known as Europe's "coal heartland" (with coal accounting for 72.4% of total electricity generation in 2021) and hosts a significant number of old coal-fired power plants which need to be replaced (US International Trade Administration, 2022). Moreover, Poland is dealing with the risk of insufficient capacity in terms of the growing demand for energy (Polski Komitet Energii Elektrycznej, 2016). Transformation toward environmental sustainability will require innovative actions and Poland's indicators relating to infrastructure, business development and innovation are lower than those of Europe as a whole (World Bank Group, 2018). Poland – being a developed market, the sixth largest economy in the European Union, and the tenth largest in all of Europe (by nominal GDP) – has the potential to be a role model for under-developed and developing nations (Piwowar-Sulej and Kołodziej, 2022). Therefore, it is justifiable to assess the level of GHRM, EGB and EMS as well as the relationships between these variables in the companies which are the main players in Poland's energy sector and are responsible for energy generation, distribution and trading (including supply).

This article contributes to GHRM theory by developing and empirically examining the conceptual model presenting relationships between the set of GHRM practices and EGBs, divided into in-role, extra-role and innovative behaviors. This is also the first study to explore the moderating role of EMS on the relationship between GHRM and EGBs. It fulfills the postulate that more research should be conducted on the antecedents of these behaviors and should focus on industry (Piwowar-Sulej and Kołodziej, 2022). Likewise, it enriches the research which uses the SET and the SDT by providing evidence of the usefulness of these

theories in explaining EGBs. As [Fawehinmi et al. \(2020\)](#) revealed, a mixture of different theories to explain EGBs was only applied in a few studies. To increase the understanding of complex relationships between employees' behaviors and their antecedents, a multi-theoretical perspective should be used ([Iqbal and Piwowar-Sulej, 2023a](#)). Therefore, this study also contributes to the understanding of the interplay between the analyzed theories. Finally, it also offers valuable theoretical and practical implications for transforming the energy sector toward environmental sustainability.

2. Theoretical background and hypothesis development

2.1 The direct relationship between green human resource management (GHRM) and employees' green behaviors (EGBs) in the light of the social exchange theory (SET)

It has been proven that GHRM produces a set of positive outcomes related to EGBs ([Fawehinmi et al., 2020](#)). Incorporating criteria that reflect green competencies in the recruitment and selection process, as well as introducing green responsibilities in a job description, enable organizations to hire candidates who will be more likely to present green behaviors and performance ([Ababneh, 2021](#)). However, currently employed people should be further stimulated to act in an environmentally responsible manner. As [Aboramadan \(2022\)](#) demonstrated, employees usually repay the organization with desired – in this case, green – work behaviors in exchange for their employer's pro-environmental orientation. Considering the assumptions of the SET, one may state that GHRM further generates a sense of reciprocity in an employee to contribute to organizational green goals. This is because GHRM is associated with a set of employer's supportive practices which provide employees with multiple resources and opportunities to improve their skills, knowledge and attitudes ([Singh et al., 2020](#)).

For example, green training helps employees understand environmental issues and develops their green mindsets and the skills necessary for their commitment to the environment ([Fawehinmi et al., 2020](#)). The employer investments in HR training and provides resources in the form of environmental awareness; knowledge may be further reciprocated in GIBs and GERBs. Importantly, knowledge is needed for innovation. Therefore, providing the resource of knowledge increases the chance for GIBs.

In turn, setting green goals for employees and evaluating employees' pro-environmental behaviors in the HR appraisal system is supposed to positively influence their EGBs. During HR appraisal, employees receive supportive feedback which should evoke the desired behaviors. This feedback may be related to different types of EGB. Moreover, promotions and rewards based on green criteria are expected to motivate employees to become involved in green activities and accomplish sustainability-related goals ([Ababneh, 2021](#)). The implementation of GHRM can even extend the opportunities for career development in a company which offers employment in green jobs ([Piwowar-Sulej, 2022](#)). In summary, it can be stated that a company which sends a coherent signal of its environmental responsibility and which implements GHRM practices may expect that employees will demonstrate positive social exchanges in the form of EGBs ([Aboramadan, 2022](#)). This leads to the following hypotheses:

- H1a.* There is a positive relationship between GHRM and green in-role employee behaviors (GIRBs).
- H1b.* There is a positive relationship between GHRM and green extra-role employee behaviors (GERBs).
- H1c.* There is a positive relationship between GHRM and green innovative employee behaviors (GIBs).

2.2 Environmental managerial support (EMS) as a moderator – the perspective of the self-determination theory (SDT)

Many organizations simply assume that having a green management strategy and procedures is sufficient to engage employees in green behaviors. However, awareness and understanding of the organization's expectations in terms of environmental behaviors may differ among the employees. Therefore, EMS is needed to further stimulate EGBs (Pellegrini *et al.*, 2018).

The role of EMS in stimulating EGBs can be explained based on the SDT, which states that management style has a significant impact on the motivation of individuals. The SDT further argues that satisfying the needs for competence, relatedness and autonomy are key drivers of employees' learning, motivation and job performance (Deci and Ryan, 1985). Managers have the potential to satisfy employees' requirement for competence, relatedness and autonomy, which – in turn – should lead to EGBs. They can support employees in understanding and implementing green policies and procedures in day-to-day operations (Cantor *et al.*, 2012). Managers can also encourage employees to attend environmental training and can play the role of mentors, thus contributing to the employees' professional development. They provide employees with daily feedback on their achievements. Moreover, they can use employee participation in decision-making and engage employees in debates about environmental problems and proper solutions (Paillé *et al.*, 2019), thus increasing the employees' sense of being able to take direct action that will result in real change (autonomy). Through open communication and quality relationships with employees, managers can also involve individuals and teams in eco-oriented activities (e.g. projects) (Cantor *et al.*, 2015) and can build a community focused on a common environmental goal, giving the possibility to experience relatedness.

When employees are not motivated by external expectations, but rather by their own self-determination, they should be more apt to demonstrate GERBs and GIBs (Minbaeva *et al.*, 2009). However, managers also play an important role in enhancing the external motivation of their subordinates (not only through the distribution of bonuses, but also by providing employees with the information needed to effectively complete tasks), which corresponds to GIRBs (Gkorezis, 2015). As presented above, EMS is directed toward the employees' needs (relatedness), promotes a collaborative and supportive work environment in which employees can develop their potential (competencies), and gives the opportunity to create pro-environmental solutions (autonomy). Therefore, it is expected that EMS will amplify the impact of GHRM on EGBs, which is reflected in the following hypotheses:

H2a. EMS positively moderates the “GHRM–GIRBs” relationship.

H2b. EMS positively moderates the “GHRM–GERBs” relationship.

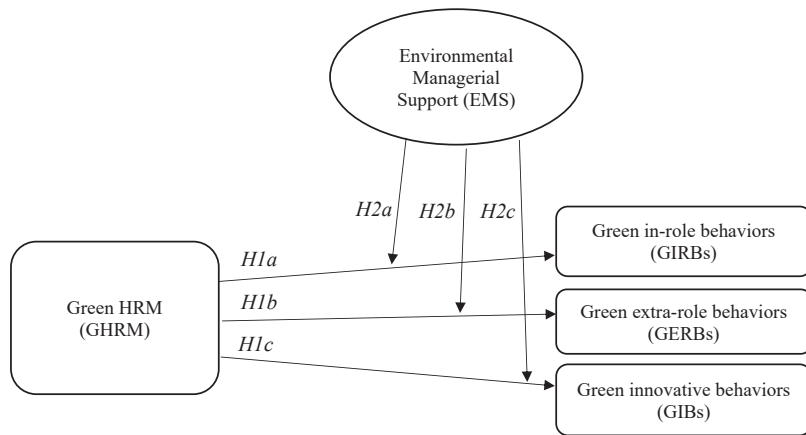
H2c. EMS positively moderates the “GHRM–GIBs” relationship.

Considering the theoretical background and hypotheses proposed above, the following research framework has been introduced (Figure 1).

3. Material and methods

3.1 Sample and procedure

The authors designed an online survey comprised of four sections, namely, demographic information, GHRM, EMS and dependent variables (GIRBs, GERBs and GIBs). Considering the time and cost constraints, the authors engaged the services of a research agency to collect data from energy firms in Poland. This research agency contacted the heads of HR departments of energy companies to ask for their assistance in the data collection process. A link to the web-based questionnaire was distributed among employees by representatives



Source(s): Own work

Figure 1.
Research model

of the HR departments via company e-mail along with a cover letter. Participants were asked to respond voluntarily and were assured that their completed forms would be kept private.

Approximately 300,000 employees work in the Polish energy sector (Polish Agency for Foreign Investment, 2012). By using a sample size calculator, the minimum sample size was determined to be 382 responses. The average response rate in social sciences research is 35.70% (Iqbal and Piwowar-Sulej, 2023a). The research agency contacted 829 employees working in the Polish energy sector and received a total of 419 completed survey forms, which constituted a larger sample for the study than required as a minimum. This relatively high response rate (50.54%) in comparison to the average statistics could have resulted from the involvement of the HR departments.

The sample was comprised of 64.44% men and 35.56% women. About one fifth (21.72%) of the participants held managerial positions, while the majority (78.28%) were line employees. Members of Generation Y (40.81%) and Generation X (36.99%) prevailed in the research sample. The remainder were Baby Boomers (12.89%) and Generation Z-ers (9.31%).

Data were recorded using SPSS Version 23 to conduct data screening, demographic analysis and descriptive analysis. Moreover, the authors conducted measurement model and structural model analysis with the use of SmartPLS 3.0.

3.2 Measures

GHRM was measured by means of the scale presented by Dumont *et al.* (2017) however, to improve the content validity of the scale, the authors along with an external expert conducted semantic analysis (Venkatraman and Grant, 1986), which revealed an overlap of two items that relate to HR training. Then, in order to increase the face validity of the scale, the law of parsimony was followed, i.e. using the minimum number of items necessary to obtain a reliable measurement (Diamantopoulos and Siguaw, 2006). In this way, the five items of the scale covered the HRM sub-functions of job description, HR appraisal, HR training, rewards and promotion. Following the recommendations of Hair *et al.* (2020), when adapting the items from a previous study, the authors also ran confirmatory factor analysis (CFA) to confirm the distinctiveness of GHRM based on these five items.

EGBs were measured with the use of a three-item scale for GIRBs, a three-item scale for GERBs, and a six-item scale for GIBs, as presented by Aboramadan (2022). Finally, EMS was assessed using the measurement scale of six items by Paillé *et al.* (2019). Because this study

was conducted in Polish, some items were slightly reformulated to make them more precise (based on the recommendations received during a pilot study with 13 respondents). All five continuous variables were measured with a five-point Likert scale (where 1 meant “I strongly disagree” and 5 meant “I strongly agree”).

Previous studies concluded that a firm’s size (number of employees) and a respondent’s age might affect innovation practices and employee behavior, respectively (Su *et al.*, 2020; Xuecheng and Iqbal, 2022). As such, they were considered control variables in this study. The firm’s size was categorized as 1 for fewer than 100 employees, 2 for 100–500, 3 for 501–1,000, and 5 for more than 1,000. The respondent’s age was coded as 1 for a year of birth between 1946 and 1964 (Baby Boomers), 2 for 1965–1980 (Generation X), 3 for 1981–1996 (Generation Y) and 4 for later than 1997 (Generation Z).

4. Results

4.1 Data screening and descriptive analysis

The authors examined the presence of both univariate and multivariate outliers based on the Z-score and the Mahalanobis distance test value. The analysis of Z-score values revealed 12 cases with values greater than 3.29, which made them univariate outliers (Tabachnick and Fidell, 2007); these cases were thus eliminated from the dataset. Moreover, 15 cases were also found in which the probability of the Mahalanobis distance value were less than 0.001, which similarly indicated that they were multivariate outliers to be removed from the dataset.

Harman’s one-factor test and a correlation matrix procedure were also applied to statistically assess common method bias. It was found that a single factor contributes to only 26.52% of the total variations lower than the cut-off value of 0.50%, which was a sign that there was no common method bias in the current study (Podsakoff *et al.*, 2012). Moreover, the highest correlation values between any two items in this study was 0.82, which was lower than the cut-off value of 0.90 (Podsakoff *et al.*, 2012). Thus, this study was free of common method biases.

Moreover, in order to assess the normality of the data, the authors assessed the kurtosis and skewness values of the continuous variables. They were within the range of ± 3 (DeCarlo, 1997), which showed the univariate normality of the dataset. According to Mardia (1970), a data set is of multivariate normality when both the skewness and kurtosis β values are greater than 0.05. However, in this study, the Mardia skewness value ($\beta = 2.631, \rho < 0.05$) was less than 0.05 and the kurtosis value ($\beta = 36.317, \rho > 0.05$) was greater than 0.05. Therefore, the current dataset did not show multivariate normality.

A proposed model is deemed to be a good fit if its comparative fit index (CFI) is ≥ 0.96 and its standardized root mean square residual (SRMR) is ≤ 0.09 . Regarding a two-index strategy, the current model – which is comprised of five factors, namely, GHRM, green in-role behaviors, green extra-role behaviors, green innovative behaviors and EMS – appeared to be a better fit (CFI = 0.966 $>$ 0.96, SRMR = 0.056 $<$ 0.09) than the alternative models. In addition, the authors also assessed the individual distinctiveness of all five continuous variables. The CFA confirmed the distinctiveness of GHRM, which was used in the current study based on the CFI value of 0.997 and the SRMR value of 0.01. The CFA also revealed the distinctiveness of all four other variables (EMS, GIBs, GERBs and GIRBs) adopted in this research.

According to Sekaran and Bougie (2016), the mean values of any variables ≤ 2.99 , ≤ 3.99 and > 4.00 on a five-point Likert scale indicate low, moderate and high presence, respectively. In terms of the current research, GHRM (M = 2.849) and GIBs (M = 2.774) had mean values lower than 2.99, which indicated their low level among the surveyed companies. The mean values of EMS (M = 3.414) and GERBs (M = 3.127) revealed their moderate levels in the research sample. Moreover, the employees in the surveyed companies exhibited GIRBs (M = 4.336) at a high level.

4.2 Measurement model analysis

In this study, all continuous variables are reflective. The authors have examined their indicator reliability, internal reliability and construct validity through measurement model analysis. The factor loadings of all measurement items were found to be greater than 0.586 and less than 0.827 (Table 1), which were indicators of their satisfactory reliability (Hair et al., 2020).

To examine construct reliability, the authors examined Cronbach's alpha (α) and composite reliability (CR). Compared to Cronbach's alpha, composite reliability is viewed as more authentic and valid because its findings are based on equal weightage and are given to each indicator of a construct (Diamantopoulos and Siguaw, 2006). In this study, the CR values of GHRM (0.825), EMS (0.901), GIBs (0.869), GIRBs (0.822) and GERBs (0.758) were greater than 0.70 (Table 1). Therefore, all continuous variables in the current study had an acceptable level of internal reliability.

Construct	Loadings
<i>Green human resource management (GHRM) ($\alpha = 0.734, CR = 0.852, AVE = 0.540$)</i>	
GHRM1. My company sets green goals for its employees based on their green duties included in job descriptions	0.626
GHRM 2. My company provides employees with green training in environmental issues (hazards, solutions)	0.595
GHRM 3. My company considers employees' workplace green behavior in performance appraisals	0.806
GHRM 4. My company relates to employees' workplace green behaviors to rewards and compensation	0.827
GHRM 5. My company considers employees' workplace green behaviors in a promotion	0.789
<i>Green extra-role behaviors (GERBs) ($\alpha = 0.639, CR = 0.758, AVE = 0.516$)</i>	
GERB1. I take initiatives to act in environmentally friendly ways at work	0.725
GERB2. I take a chance to get actively involved in environmental protection at work	0.824
GERB3. I do more for the environment at work than I am expected to	0.586
<i>Green innovative behaviors (GIBs) ($\alpha = 0.818, CR = 0.869, AVE = 0.526$)</i>	
GIB1. I search out new environmentally related technologies, processes, techniques and/or product ideas	0.721
GIB2. I generate green creative ideas	0.803
GIB3. I promote and champion green ideas with others	0.610
GIB4. I investigate and secure the funds needed to implement new green ideas	0.733
GIB5. I develop adequate plans and schedules for the implementation of new green ideas	0.758
GIB6. I am environmentally innovative	0.713
<i>Green in-role behaviors (GIRBs) ($\alpha = 0.676, CR = 0.822, AVE = 0.607$)</i>	
GIRB1. I adequately complete the assigned duties in an environmentally friendly way	0.768
GIRB2. I fulfill the responsibilities specified in my job description in environmentally friendly ways	0.800
GIRB3. I perform tasks that are expected of me in environmentally friendly ways	0.768
<i>Environmental managerial support (EMS) ($\alpha = 0.869, CR = 0.901, AVE = 0.604$)</i>	
EMS1. My supervisor encourages environmental initiatives	0.748
EMS2. My supervisor encourages employees to attend environmental training	0.796
EMS3. My supervisor makes sure that employees have environmental competences needed to do their jobs	0.772
EMS4. My supervisor openly engages in discussions around environmental topics	0.769
EMS5. My supervisor gives complete and accurate information regarding environmental issues	0.804
EMS6. My supervisor involves employees in environmental problems solving	0.772

Table 1.
Factor loadings,
reliability and validity

Source(s): Own work

The factor loadings of all items in the current study were greater than 0.70. The average variance extracted (AVE) of the constructs was greater than 0.50 and there was some indication of acceptable convergent validity (Hair *et al.*, 2020). A factor loading greater than 0.40 is also acceptable, provided the AVE is higher than 0.50 (Sarstedt *et al.*, 2019). In the present study, GHRM (0.540), GIRBs (0.607), GERBs (0.516), GIBs (0.526) and EMS (0.604) all presented AVE values greater than 0.50, along with their respective item loadings in the acceptable range. Thus, all these variables had acceptable convergent validity.

The inter-construct correlation values of GHRM, GERBs, GIBs, GIRBs and EMS were lower than the square root of their AVE values (see Table 2). Therefore, all these continuous constructs, in relation to the Fornell–Larcker criterion (Henseler *et al.*, 2015), had acceptable discriminant validity. As exhibited in Table 2, the correlation value between any two variables was also less than 0.90, so this study was free of common method bias (Bagozzi *et al.*, 1991). Moreover, following the interpretation of correlation coefficient values (Cohen, 1988), GHRM had a moderate association with GERBs (0.460 > 0.30), GIBs (0.428 > 0.30) and GIRBs (0.386 > 0.30) (see Table 2).

4.3 Hypothesis testing

In the first model, it was revealed that the firms’ size and respondents’ age did not significantly influence EGBs. Later, the authors introduced GHRM and EMS into the model. The statistical analysis revealed that GHRM significantly influenced GIRBs ($\beta = 0.283, p < 0.05$), GERBs ($\beta = 0.312, p < 0.05$) and GIBs ($\beta = 0.374, p < 0.05$) (Table 3). Therefore, Hypotheses H1a, H1b and H1c were accepted. Moreover, the coefficient of determinations or *R*-squared value indicated variance on the endogenous variable because of one unit change in its predictors in a model. The model prediction accuracy is substantial, moderate, or weak when its *R*-squared value is 0.75, 0.50 or 0.25, respectively (Sarstedt *et al.*, 2019). In this study, the *R*-squared values for GERBs (0.255) and GIBs (0.325) were greater than 0.25. Therefore, the current model predicted these endogenous variables at a moderate level. However, the *R*-squared value for GIRBs was 0.170, which is an indicator of its low prediction accuracy. Moreover, past studies have recommended also reporting effect size (f^2) along with *R*-squared values (Hair *et al.*, 2020). According to Cohen

Construct	1	2	3	4	5
GERBs	<i>0.718</i>				
GHRM	0.460	<i>0.735</i>			
GIBs	0.491	0.428	<i>0.725</i>		
GIRBs	0.288	0.386	0.282	<i>0.779</i>	
EMS	0.386	0.516	0.436	0.307	<i>0.777</i>

Note(s): *Italic values diagonally indicate the square root of AVE
Source(s): Own work

Table 2. Correlation and square root of AVE values

Relationship	β	S.D	<i>t</i> -value	<i>p</i> value	LLCI	ULCI
GHRM → GIRBs	0.283	0.067	4.241	0.000	0.137	0.400
GHRM → GERBs	0.312	0.067	4.666	0.000	0.180	0.431
GHRM → GIBs	0.374	0.057	6.554	0.000	0.250	0.479
GHRM*EMS → GIRBs	0.061	0.041	1.487	<i>0.138</i>	-0.021	0.137
GHRM*EMS → GERBs	0.097	0.039	2.488	0.013	0.023	0.176
GHRM*EMS → GIBs	0.084	0.037	2.295	0.022	0.011	0.157

Source(s): Own work

Table 3. Hypothesis testing

(1988), there is a large, medium, or small effect of the exogenous variable if the f^2 value is 0.35, 0.15, or 0.02, respectively. In this study, the f^2 values of GERBs (0.086), GIRBs (0.064) and GIBs (0.137) were found to be less than 0.15, so there was a weak effect.

The structural model analysis confirmed that the interaction term (the product of EMS and GHRM) did not significantly influence GIRBs ($\beta = 0.061, \rho = 0.138 > 0.05$) (Table 2). Therefore, EMS did not moderate the relationship between GHRM and GIRBs. Hypothesis H2a was rejected. Nevertheless, the interaction term significantly affected GIBs ($\beta = 0.084, \rho = 0.022 < 0.05$) and GERBs ($\beta = 0.097, \rho = 0.013 < 0.05$). This means that EMS significantly moderated the relationships between GHRM and GERBs and between GHRM and GIBs. Therefore, Hypotheses H2b and H2c were supported.

5. Discussion

The data collected among 419 employees of Polish companies from the energy sector led to the confirmation of five out of six hypotheses. This study provided evidence that GHRM stimulated all types of EGBs (H1a–H1c) and that EMS moderated the relationship between GHRM and GERBs (H2b) and between GHRM and GIBs (H2c). However, there was no empirical support for the moderating impact of EMS on the “GHRM–GIRBs” relationship.

The results complement previous studies on the antecedents of EGBs. They show the joint direct impact of GHRM practices on three types of EGB. This finding contradicts the results obtained by Fawehinmi *et al.* (2020), who showed no significant direct effect of GHRM on EGBs, and by Dumont *et al.* (2017), who reported only a direct effect of GHRM on GIRBs. However, this study confirms the research by Saeed *et al.* (2019) and Ababneh (2021), who provided evidence for a direct impact of GHRM on EGB (treated as a construct which covers both in-role and extra-role behaviors). It also supports Islam *et al.* (2021), who found that GHRM exerted an impact on green in-role and extra-role behaviors, and Aboramadan (2022), who reported a direct relationship between GRHM and innovative pro-environmental behaviors. Based on the SET, this study demonstrates that companies which implement GHRM provide employees with numerous resources (e.g. green knowledge, bonuses for showing environmental concern, or green career opportunities), thus making employees feel obliged to show reciprocal behavior and act in an environmentally responsible way.

Moreover, the study offers new insight into conditional variables that influence the relationship between GHRM and employee behaviors. Previous research focused on organization-level variables serving as moderators, such as CEO leadership (Ren *et al.*, 2021), managerial environmental concern (Song *et al.*, 2020) and green knowledge sharing (Iqbal and Piwowar-Sulej, 2023b). Although managers' behavior has been found to be an important factor that stimulates EGBs (Zhang *et al.*, 2021), to the best of the authors' knowledge, no study to date has been conducted using EMS as a conditional variable between GHRM and EGBs.

This study assumed that managers can strengthen both the external and the internal motivation of employees, which should result in expected behaviors (Rigby and Ryan, 2018). Internal motivation is at the center of interest of the SDT. According to the SDT, one can expect that managers spur EGBs through satisfying their employees' needs for competence, relatedness and autonomy. Previous research on environmental sustainability offered a rationale for the relationship between managerial support and pro-environmental orientation and the behavior of employees, influencing all types of EGB (e.g. Aboramadan *et al.*, 2021; Zhang *et al.*, 2021). However, this study found support only for the hypotheses pertaining to the moderating roles of EMS in shaping extra-role and innovative green behaviors. Surprisingly, it revealed that managerial support did not amplify the impact of GHRM on GIRBs. This may indicate that the surveyed companies describe GIRBs in job requirements and provide ample training for them, actions which lie in the domain of GHRM. If the GHRM

system of an organization provides employees with all the necessary resources, there is no need to engage managers in offering further support for employees. Nevertheless, EMS is of the utmost importance as far as GERBs and GIBs are concerned. Extra-role behaviors in particular are usually treated as secondary to in-role performance; therefore, they require that additional engagement and support be given to the employees (Davis *et al.*, 2020). In turn, innovative work behaviors are associated with high-intensity work demands, which require a leader's help in the form of feedback, established job autonomy and support (Choi *et al.*, 2021).

6. Conclusions

Considering the growing concerns about environmental problems, the interest in factors of EGBs has been growing among academics (Piwowar-Sulej and Kołodziej, 2022). While GHRM has received a great deal of attention, elaboration on and investigation of the influence of GHRM practices on employee behaviors is still rare (Islam *et al.*, 2021). In response to that, a model was proposed and a new conditional variable (EMS) was empirically examined in order to explain the relationship between GHRM and its consequences in the form of three types of EGB. The data collected among employees of Polish energy-sector companies revealed that GHRM was positively associated with all types of EGB and that EMS moderated the relationship between GHRM and GERBs and between GHRM and GIBs.

6.1 Theoretical contributions

This work extends the existing theory in several ways. Firstly, it extends research on the effective combinations of GHRM practices (Chen *et al.*, 2022) in terms of shaping EGBs. Moreover, it contributes to the GHRM literature by concluding that there is a positive direct impact of perceived GHRM practices on three types of EGB, which until now were underexamined (Islam *et al.*, 2021). Previous research examined the effects of GHRM mainly at the level of the organization (Obeidat *et al.*, 2020), whereas this study contributes to the understanding the “micro-foundations” of GHRM. This study also enriches the extant literature on the impact on EGBs of a leader's specific support (Tuan, 2022) through demonstrating the role of EMS in strengthening the impact of GHRM on GERBs and GIBs. It also explains green actions in the context of employees in the underexamined energy sector (Alshaabani *et al.*, 2021). Finally, it adds to the SDT, by empirically testing the effect of GHRM on employees' diverse behaviors and to the SET (by examining the conditional role of EMS). It also demonstrates how these theories complement each other and lead to EGBs.

6.2 Practical implications

Firstly, this study proves that investing in GHRM brings positive outcomes at the individual level. Employees who assess HRM practices highly in terms of their green focus are more willing to help colleagues and customers, put in extra effort if needed and improve products and procedures. The authors posit that in the case of companies operating in the energy industry, which exert a strong influence on the environment, GHRM must be an inherent part of environmental management.

GHRM is practiced at a low level ($M = 2.849$) in the surveyed companies. Therefore, this study strongly suggests that HR professionals working in these companies should implement GHRM practices to promote EGBs. They should embed environmental goals into work tasks and provide adequate training to employees in order to achieve green management goals. It is also important to properly appraise eco-friendly employee behavior and to offer promotional opportunities and rewards that will increase employee involvement in green initiatives. It is worth emphasizing that when HR departments build a strong GHRM system, this system is self-executing in terms of stimulating GIBs.

Organizations should be aware that GHRM practices are strengthened by EMS, which is of the utmost important in the case of GIBs, which were practiced at a low level ($M = 2.774$) in the surveyed companies. Thus, apart from designing and communicating GHRM practices, there is a need to ensure that supervisors support green issues in their day-to-day activities. For this reason, in order to foster green management, it is crucial to develop supervisors' skills aimed at supporting employees in building their knowledge base and taking pro-environmental initiatives which go beyond employees' formal duties.

This study also provides knowledge for global corporations that aim to invest in the energy sector in Poland. It shows how to leverage GHRM to create EGBs which are necessary in order to achieve sustainability goals. Finally, this study also has the potential to impact society in useful ways. Employees may learn some green behaviors at their workplace and then incorporate them into their private lives. Therefore, GHRM can be a starting point to form environmentally conscious practices in society.

6.3 Limitations and further research directions

The current study possesses certain limitations as well, which offer new horizons for future research. The first relates to the context of the research. The research model was tested in one industry and in a single country setting. More research is required to test the generalizability of the results across different firms and countries. Secondly, this is a cross-sectional study that may not fully capture the effect of GHRM. Any HRM practices may take time to exert the expected impact on employee behavior. To address this limitation, further research should apply a longitudinal approach and should explore the changes in the three types of EGB resulting from the adoption of GHRM and EMS. Thirdly, the model was verified using data collected only from employees. Future studies could include the opinions of supervisors regarding employees' behavior. Fourthly, only one moderator was included in the current study. Future studies may explore alternative factors that amplify the impact of GHRM on EGBs, such as trust in one's supervisor or individual green values, as well as multiple underlying mechanisms. Finally, this study used previously validated scales for measuring EGBs. The items related to GIBs do not explain whether GIBs are in-role or extra-role behaviors. Since GIBs can be included among job duties in green industry (Ones and Dilchert, 2012b), there is a need to develop a scale which includes both types of GIBs (in-role and extra-role).

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