Leveraging green human resource practices to achieve environmental sustainability

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A B S T R A C T

The topic of green human resource management has attracted considerable attention during this last decade. Despite this interest little research has been conducted with the aim to explore the effect of practices in achieving workplace goals in environmental sustainability. Using conditional process analysis (n = 221), this study tested a moderated-mediation model in which employee environmental satisfaction was expected to increase the indirect effect of green human resource management practices on individual environmental performance through perceived organizational support for the environment. The results reveal that (1) training is the best green human resource management practice in predicting individual environmental performance and (2) perceived organizational support for the environment only increases the effect of individual environmental performance when employees are highly environmentally satisfied with organizational environmental engagement. Through findings this study contributes to the emerging literature on green human resource management and has practical implications for organizations seeking to achieve environmental performance.

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1. Introduction

The capacity to mobilize staff is now widely acknowledged as a key factor of successful corporate greening (Jackson et al., 2012). The topic of green human resource management (GHRM) has grown in popularity among scholars interested in examining how environmental sustainability practices work within organizations, because the implementation of greening process cannot succeed without the integration of human resources practices devoted to environmental issues (Jabbour and de Sousa Jabbour, 2016).

GHRM provides competitive advantage (Zaid et al., 2018) in achieving environmental performance (Masri and Jaaron, 2017). Prior literature indicates that very little is known about the processes by which GHRM practices lead employees to behave eco-friendly. Kim et al. (2019) make an important step by reporting findings showing that GHRM practices positively influence employee green behaviour. Ramus and Steger (2000) show that

employees are more likely to embrace organizational environmental sustainability efforts when their organizations demonstrate environmental supportiveness (POS-E). Research finds that POS-E (Lamm et al., 2015) shape a working context facilitating the condition of individual environmental performance through environmental employee attitudes and behaviors (Ramus and Killmer, 2007).

Discussing individual motives for environmentally responsible behavior, DeYoung (2000) claim that a systematic error is to assume "that once people know what they should do and why they should do it, they will automatically know how to proceed" (p. 521). Environmental performance depends on the staff ability to behave in an environmentally responsible way. It is consistent to assume that individual willingness results from POS-E and that individual ability is set through GHRM. Through GHRM and POS-E the organization shapes a green climate that has the potential to likely stimulate employee satisfaction (Ahmad, 2015). Bissing-Olson et al. (2015) indicate that employee satisfaction is sensitive to day-to-day work experience too, so that staff willingness to behave responsively toward the environment may be profoundly affected. The degree to which employees feel satisfied by the combined effect of GRHM and POS-E on their individual environmental performance

provides an interesting insight, because it is recognised that satisfaction reflects the positive or negative evaluation stemming from how individuals experience their organizational context (Cheung et al., 2009).

Some details remain to be clarified. This literature raises the question of whether the combined positive effect of GHRM and POS-E on individual environmental performance is contingent to the feeling of environmental satisfaction. The main purpose of this study is to address this question by testing a model (see Fig. 1) in which GHRM, POS-E and employee satisfaction with the organizational environmental engagement (SOEE) are identified as important antecedent variables in achieving individual environmental performance. This research seeks to contribute to, and extend, the GHRM literature in several ways. While it has been found that GHRM positively influences individual environmental performance (Kim et al., 2019), it remains difficult to evaluate which specific GHRM practices have the capacity to influence employee environmental performance. This study extends this prior literature by taking into account GHRM practices in isolation. When they are coupled GHRM practices and POS-E improve the prediction of individual environmental performance. With the notable exception of Cantor et al. (2012), who report that organizational environmental support conveys the effect of green training on environmental work-related outcomes, prior research has not investigated most other GHRM practices. This study goes beyond prior literature by examining the indirect effect of GHRM practices (overall and in isolation) on individual environmental performance through POS-E. Scant research has empirically examined the role of employee environmental satisfaction in the context of sustainability, whereas this variable is theoretically recognised to be influential on employee decisions to engage in eco-friendly efforts in the job. This investigation adds to knowledge by showing that all of the indirect effects of GHRM practices (overall, and in isolation) on individual environmental performance through POS-E are contingent only at a high level of employee environmental satisfaction, whereas no conditional effect is found at a low level of such satisfaction.

The next sections of this article outline the theoretical background, method and results, which are supplemented by a discussion of the findings and their theoretical and practical implications.

2. Literature and theoretical background

2.1. Theoretical framework

This study is framed with the tenets of social exchange theory (SET). Following Blau, (1964) SET refers to "the voluntary actions of individuals that are motivated by the returns they are expected to bring and typically do in fact bring from others" (p. 91). Since the 1970s, SET has been used in numerous domains, including among others knowledge management, sociology, marketing, social psychology, and management. Craddock et al. (2012) were among the first to detect the potential of SET in investigating environmental sustainability issues. Relying on results from a systematic review, Yuriev et al. (2018) reported that SET has become a framework of interest in studying how individuals behave in an environmental sustainability context.

Jackson et al. (2011) argue that "the intersection of strategic HRM and environmental sustainability presents new opportunities to find win-win management approaches that yield benefits to shareholders, employees, customers and communities, as well as other organizational stakeholders" (p. 111). A win-win context emerges when partners align their efforts in achieving environmental sustainability, and when this context is based on fair exchange relationships. A fair exchange is set when something is given and something is returned (Mitchell et al., 2012). Recent findings can be found in the environmental literature indicating that individuals who perceived environmental supportiveness from their organization tend to be more prone to reciprocate by engaging in efforts to help the employer to achieve environmental performance (Temminck et al., 2015).

Less emphasis has been put on the role of GHRM practices, whereas by adopting social exchange principles prior research in the broader management literature has demonstrated that HRM practices coupled to organizational support contribute to triggering individual willingness to repay favorable treatment from the employer (Tremblay et al., 2010). Examining the role of GHRM
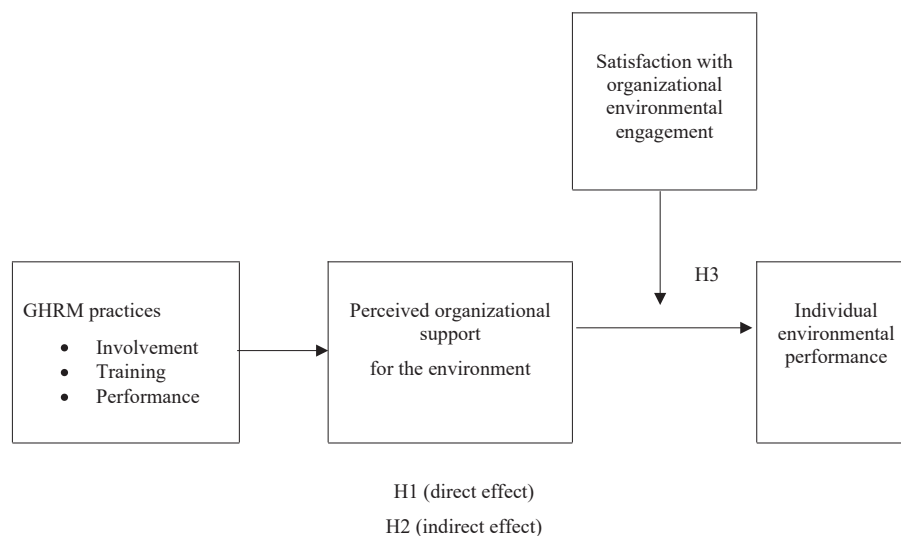

Fig. 1. Research model.

practices as an input is relevant to research applying SET in an environmental sustainability context.

2.2. Study variables

2.2.1. Green human resource management

Contemporary developments in human resource management have addressed in environmental issues in term of GHRM (Renwick et al., 2013, 2016). GHRM is implied throughout the employee life-cycle (Zibarras and Coan, 2015), and devoted to practices that play a key role at each stage from organizational hiring (Jabbour et al., 2010) to staff retention (Benn et al., 2015). The present study investigates actual, motivated employees working with their employer, rather those interested in joining organizations in the near future, or those who plan to resign. This research only stresses green HR practices that help employees in improving their abilities herein (i.e., training), those practices devoted in engaging them (i.e., involvement), and ones monitoring their daily actions toward the environment (i.e., performance management).

Green training and environmental education. GHRM training seems to enhance staff understanding of the ecological impact of organizational green schemes (Bansal and Roth, 2000), arm staff with skills on how to gain waste data (May and Flannery, 1995), and increase their level of 'eco-literacy' (Roy and Therin, 2008). A British CIPD/KPMG survey reports 42% of UK-based organizations train and educate staff in eco-friendly firm practices (Phillips, 2007), and to comprehend global warming threats (Felgate, 2006). Some $400m has been spent on Green job training under the US Obama administration (Barton, 2009), as such sophisticated environmental approaches appear 'people intensive' and derive from skill development via staff training (Brio et al., 2007). Firms often utilize training and education programs to embed ecological practices (Stalcup et al., 2014), and showcase their green values to update employees about initial change(s), new performance criteria and staff competencies (Jackson, 2012).

Green employee involvement. Full staff participation in environmental management (EM) is viewed as important to produce significant results (Remmen and Lorentzen, 2000), as employees are seen to drive organizations to address ecological concerns (Berry and Rondinelli, 1998). A study of Canadian organizations finds those with more active green commitment profiles correlate positively with staff as a source of pressure (Henriques and Sadorsky, 1999), while Belgian research on high-level polluters reveals significant relationships between organizations self-identifying as practicing eco-leadership and designating much importance to their employee stakeholders (Buysse and Verbeke, 2003). Employee Involvement (EI) in environmental management has impact via three processes: identifying employee tacit knowledge from close connections to production processes (Boiral, 2002); engaging and empowering staff to produce ecological improvements (Govindarajulu and Daily, 2004); and developing organizational culture(s) which support environmental improvement schemes (Renwick et al., 2013).

Green performance management and appraisal (PMA). Concerns using PMA in eco-management include how to measure green performance standards among differing firm-level departments/units, and gathering useful data on their environmental performance. Some organizations have incorporated firm-wide ecological performance standards and environmental information systems/audits to gather data on green performance (Marcus and Fremeth, 2009), and stimulate environmental PMA system development by producing performance indicators for every ecological risk item (TUSDAC, 2005). Challenges involved in green PMA include making managers accountable for environmental performance and wider performance objectives, PMA systems

with ecological objectives seeming to only belong to plant or division executives and managers (Milliman and Clair, 1996), and that negative reinforcements (suspensions, criticisms and warnings) are required to stimulate staff to deliver green improvements. The use of negative reinforcements does not always educate employees in best environmental practice (Chan and Hawkins, 2010). Such staff does not disclose ecological problems at source, as they adopt self-protective behaviours (Renwick et al., 2013, 2016).

2.2.2. Perceived organizational support for the environment (POS-E)

Ramus and Steger (2000) define POS-E as the extent to which employers promote employees' sustainable actions through appropriate practices (communication, rewards and empowerment) that help staff to understand and enact environmental policies. The topic of organizational support has resurfaced with growing interest in 'greening organizations' (Paillé et al., 2013). POS-E is typically outlined as employee beliefs that the organisation cares about environmental issues, and makes an effort to provide the resources needed to help staff engage in workplace environmental activities (Lamm et al., 2015). For employees POS-E is the expression by which organizations demonstrate they are committed by supplying adequate resources to help staff to behave in eco-friendly ways.

Lamm et al. (2015) also demonstrate that POS and POS-E are related but empirically distinct concepts, which suggests that employees clearly distinguish the form of support addressed by their employer. POS and POS-E are not the same because they fulfil different objectives. The source that delivers support is the same (i.e., the organization). POS and POS-E differ in regard to their nature (emotional and instrumental) and target (i.e., to take care of individuals vs. the environmental cause). This distinction introduces a substantial difference in the role they play when organizations address environmental issues. Through POS, the employer (i.e., organization) indicates the degree to which they take care of their employees by recognizing and respecting their engagement toward sustainability, even though the former is not especially concerned with the necessity to devote resources for the protection of the natural environment. Through POS-E, the employer not only defends sustainability as a sensitive cause, and promotes the protection of the environment as an issue of interest, but also allocates resources at all organizational levels to support such ecological objectives.

2.2.3. Individual environmental performance

Ciocirlan (2017) claims that workplace "sustainability at the macro level starts with individual action" (p. 64), meaning organizational environmental performance may derive from the aggregation of individual environmental performance (Wells et al., 2016). As the environmental literature indicates that environmental performance is construed differently according to the focus placed at the organizational- or individual level, Ones and Dilchert (2012a) suggest it is more appropriate to focus on organizational members and, more specifically, staff perceptions of corporate environmental performance because employees "will provide a more accurate picture of environmental performance" (p. 451).

Organisational environmental outcomes appear to depend on internal environmental initiatives that stem from efforts undertaken by organisational members at their own level to improve or render work/industrial processes more sustainable (Cordano and Frieze, 2000). Individual performance is set when individuals perceive that their efforts and work-related outcomes contribute to the achievement of organizational objectives (Ordu, 2016).

Individual environmental performance details the degree to which employees perceive they effectively perform green acts or gestures corresponding to what their organization expects from them to achieve in supporting its environmental objectives. Individual environmental performance is expressed through a wide variety of environmental behaviors (see Ones and Dilchert, 2012b). Depending on the job they hold, and through their actions, employees have the opportunity of minimizing environmental harm on behalf of their company. Each time such individuals choose virtual meetings instead of travel (Ones and Dilchert, 2012b), or suggest ways to improve environmental practices (Boiral and Paillé, 2012), they contribute to reducing pollutant loads or enhance energy efficiency (Di Norcia, 1996). The achievement of environmental performance stems from the aggregate decisions, actions and gestures that individuals perform in their daily work.

2.2.4. Employee environmental satisfaction

While the environmental literature has extensively regarded the physical dimensions of work as a source of environmental satisfaction (Bell et al., 2001), very little research has considered employee satisfaction stemming from how organizations manage the natural environment. No working definition has been found in the relevant literature to outline employee environmental satisfaction. It is suggested starting with the definition of citizen environmental satisfaction proposed by Pelletier et al. (1996), who refer to the "evaluation of the congruence between a person's life experience, and some particular standard regarding his or her environmental concern" (p. 9). Their definition points to an important aspect that is the function of individual appraisal regarding personal environmental expectations. The employee satisfaction literature states that staff (dis)satisfaction stems from the degree to which they estimate their job expectations are fulfilled. A positive evaluation triggers employee satisfaction and a negative evaluation leads to employee dissatisfaction (Bowling et al., 2006). It is proposed by extension to define environmental satisfaction in the organizational context as an employees' emotional state resulting from their appraisal that their organization's environmental engagement actually meets their own environmental expectations as organizational staff.

Pelletier et al. (1996) report findings indicating that individual dissatisfaction with environmental policies has significantly affected subsequent environmentally responsible behaviors, including a decrease in conservation and recycling. They assume that individuals dissatisfied with environmental policies are more prone to engage in environmentally responsible behaviors under their control. Relying on such research means that the existence of environmental policies does not ensure the individual feeling of environmental satisfaction. Research indicates that practices devoted to increasing staff abilities allowing individuals to achieve environmental sustainability determine the conditions of employee satisfaction toward decisions taken regarding environmental issues. DeYoung (2000) discusses nine studies undertaken within a period of ten years in which individual intrinsic satisfaction has been examined for outlining the motives of engaging in environmentally responsible behavior. Only two of these nine studies are relevant to this study, because they imply a sample of employees (office workers, and environmental protection agency employees), while the others concern places located outside the organizational setting. DeYoung (2000) reveals that employees are intrinsically satisfied and more likely to engage in environmental efforts when they feel that they possess competences leading them to complete required tasks, solve environmental problems, learn new ways in consuming less resources or use resources more efficiently.

2.3. Research model and hypotheses development

2.3.1. GRHM practices, organizational support for the environment and individual environmental performance

Recent research provides empirical support that green HRM practices and employee pro-environmental behaviour are positively related (Dumont et al., 2017; Kim et al., 2019), clearly indicating that green HRM practices may build, develop and enhance employee environmental capabilities and skills that in turn foster the conditions of individual environmental performance. Dumont et al. (2017), and Kim et al. (2019) consider GHRM practices as a whole. Zibarras and Coan (2015) regard GHRM practices in isolation to explore from the standpoint of HR managers their prevalence on employee environmental behavior. They found that training and education, management involvement and performance indicators/appraisal are perceived by managers as effective practices in engaging employees to behave in an eco-friendly way in the workplace.

Adopting an employees' standpoint instead of managers, it is proposed a direct positive relationship between GHRM practices and individual environmental performance.

Hypothesis 1. Green human resource management practices (overall and in isolation) and individual environmental performance are positively related.

Available research allows to predict a positive influence of GHRM practices and POS-E on individual performance, as case findings from Canadian-based smelting plants (oil and copper refineries) sees staff tacit knowledge as an important source in identifying pollution origins, coping with emergency situations and producing preventive solutions (Boiral, 2002). Staff participation in eco-initiatives at the US-based NUMMI automobile plant reveals employee involvement (EI) enhancing environmental performance, because staff there 'possess knowledge and skills that managers lack' (Rothenberg, 2003). Two key mechanisms for employee participation in green projects are problem-solving circles and a suggestion programme, so staff contributions such as contextual, processual and inter-organizational knowledge to eco-projects combine with the external knowledge of specialist technical and managerial staff to effectively solve environmental problems. Employee involvement in green management is seen as critical to improving green system outcomes, and is viewed as key to improving the outcomes of green systems, including: streamlined resource use (Florida and Davison, 2001); waste reduction (May and Flannery, 1995); and lower workplace pollution (Kitazawa and Sarkis, 2000). One study among Spanish ISO 14001 registered factories saw environmental management positively correlating with manager-rated environmental outcomes (Brio et al., 2007). Practices enhancing EI in ecological management include newsletters, suggestion schemes, problem-solving groups and 'low carbon champions' (Clarke, 2006), and stimulating staff to use tele/videoconferencing too (Renwick et al., 2013).

Ramus and Steger (2000) found that when employees perceive that their employer (i.e., organization) expresses encouragement and demonstrates environmental commitment through dedicated environmental policies, organizational staff are more likely to respond favorably by engaging effort to adopt environmentally responsible behavior in the specific form of eco-initiatives. Temminck et al. (2015) indicate a positive relationship between POS-E and individual environmental performance in the form of organizational citizenship behaviors for the environment.

Erdogan et al. (2015) report findings indicating that the positive influence of perceived management commitment to the environment on organizational citizenship behavior for the environment for employees is a function of the degree to which employees feel treated by their organization. Their findings mean that in

comparison with employees who feel less supported by their organization, staff who feel highly supported are more sensitive to the management environmental concern.

Little research has examined the extent to which the effect of GHRM practices on individual environmental performance is transmitted through POS-E. The broader management literature provides meta-analytic findings that establish the positive influence of HRM practices on perceived organizational support (POS) (Kurtessis et al., 2017), and the strong positive effect of POS on individual performance, including prosocial behaviors and extra-role behaviors (Riggle et al., 2009). This prior literature has led to the conclusion that HRM practices exert an indirect effect on individual performance through POS. It is consistent to expect that when employers signal to their staff that they are genuinely committed to the environmental cause, the effect of green human resources practices on individual environmental performance is conveyed by POS-E.

Hypothesis 2. Green human resource management practices have a positive indirect effect on individual staff environmental performance through POS-E

2.3.2. The moderating role of environmental satisfaction

The foregoing discussion predicts that GHRM practices and POS-E positively influence individual environmental performance. It is proposed that this positive effect is contingent to the degree to which employees are satisfied with their organizational environmental engagement (SOEE).

Reporting on research conducted on work environment facilities in UK local government buildings, Li et al. (2011) find that attributes of workplace environmental not under the control of office employees (heating) cause staff dissatisfaction, whereas those under their control (lighting) engender employee satisfaction too. Staddon et al. (2016) review the literature on interventions to change staff environmental behaviors in the workplace. They reveal that training has a positive effect on employee satisfaction when such staff experience that the improvement of their skills helps them to gain autonomy in saving energy.

This prior research suggests that SOEE stems from organizational efforts in developing, maintaining and improving employee environmental knowledge, competences and skills. These organizational efforts signal how staff can act in expected ways by the employer. If an employer allocates resources that encourage employees to use public transportation or carpooling to commute to work, staff will tend to feel supported if they perceive that the organization's actions are voluntary. This means that organizational actions may likely be a source of environmental satisfaction if they signal genuine concern for environmental matters, and that the transmission of the GHRM practices effect on individual environmental performance through POS-E may be a function of the degree to which employees feel environmentally satisfied.

Hypothesis 3. The indirect relationship of green human resource management practices on individual environmental performance through organizational support for the environment is conditioned by employee satisfaction with organizational environmental commitment, such that this indirect relationship is stronger at high levels of satisfaction with organizational environmental engagement.

3. Methodology

3.1. Sample and participants

The population targeted for the purpose of the study is that of nurses and auxiliary nurses. This population is targeted for two

reasons. Hospitals are particularly concerned by environmental risk and waste disposal in particular infection, fluid and nuclear contamination. Unlike industrial processes, this environmental risk is equally distributed among nurses and auxiliary nurses along the service production chain (Faure and Rizzo, 2003).

To access this population scattered within various organization, data collection method was in the form of a "targeted chain referral" type of "web survey." Callegaro et al. (2015) web surveys include those based on a "computerized self-administered questionnaires, stored on a specific computer connected to the internet." The "targeted chain referral sampling" draws on informants recruiting participants in their social network (Salagnick and Heckathorn, 2004). This study was undertaken in France, where obtained permission from the Regional Institute of Health Management to ask 42 nurses presently attending one of their continuing education courses to forward email comprising the link to the survey to the nurses and auxiliary nurses of their professional and personal networks. The survey questionnaire was introduced by a letter detailing the objectives of the study and a guarantee of respondent and organizational anonymity.

Web surveys have become more common over the past 15 years (Callegaro et al., 2015), and present major advantages that makes them adequate regarding the goals of the present study. They present major challenges. A key issue concerns the sampling method. Web surveys give access to widespread populations and can provide non-probability samples too (Duffy et al., 2005). This sampling method is adequate for causal research designs (Callegaro et al., 2015). The targeted population and sample was defined on two criteria: occupations including nurses and auxiliary nurses, and type of work place − that are public and private hospitals. These characteristics were controlled both in the recommendation provided to informants and through control questions included in the survey.

Drawing on the 42 informants, 244 nurses and auxiliary nurses responded, i.e. an average of 5.8 respondents by informants. Twenty-seven questionnaires were discarded because of incomplete responses. Their average age of respondents was 39.84 years old, with a standard deviation of 8.95 (average age in parent population = 42.08 years old). Auxiliary nurses represented 35,5% auxiliary nurses and 64,5% of nurses (auxiliary nurses were 41,6% and nurses 69,4% in the parent population). The majority of the sample were female: 68% versus 32% males (77,8% female versus 22,2% males in the parent population). The sample reaches the standard threshold number required for structural equation modeling (Kline, 2011), as it includes a sufficient sub-sample of different demographic categories. This provides a good representation of the parent population.

3.2. Measurement

Green human resource practices were measured using the scales developed by Tang et al. (2018). These scales measure green training (three items; $\alpha = .79$), green management performance (four items; $\alpha = .80$), and green employee involvement (six items; $\alpha = .91$).

Perceived organizational support for the environment was measured using the four-item scale ($\alpha = .91$) developed by Lamm et al. (2015).

Environmental satisfaction was measured using the initial scale developed by Pelletier et al. (1996), in which the four items were adapted to the theme of employee environmental satisfaction with organizational environmental commitment ($\alpha = .87$).

Individual environmental performance was measured using a selection of three items ($\alpha = .76$) from the initial scales developed by Boiral and Paillé (2012).

Table 1
Results of model comparisons (N = 221).

Models	χ^2	df	χ^2/df	CFI	NNFI	RMSEA	AIC
Null model	3947.3***	276	14.30	–	–	–	–
Measurement model with common factor	514.1***	236	2.10	.92	.91	.07	642.0
Six-factor model (Measurement model)	481.7***	237	2.01	.93	.93	.06	481.7
Four-factor model. All practices together	491.4***	246	1.99	.93	.92	.06	599.4
Five-factor model 1 (Training and perf. together)	486.5***	242	2.01	.93	.92	.06	602.5
Five-factor model 2 (Training and involvement together)	484.2***	242	2.00	.93	.92	.06	600.2
Five-factor model 3 (Perf and involvement together)	489.3***	242	2.02	.93	.92	.06	605.3

Note. ***p < .001.

All the items appear in Table 2, and were measured using a five-point Likert scale (1, completely disagree; 2, slightly disagree; 3, neither agree nor disagree; 4, slightly agree; 5, completely agree).

3.3. Analysis

A confirmatory factor analysis (CFA) was performed to assess the dimensionality of the data, using Amos 19 and the maximum likelihood method of estimation. To assess the fit of the research model, Chi-square, comparative-fit index (CFI), root-mean-square error of approximation (RMSEA) are used. Values lower than 0.08 for the RMSEA and greater than 0.90 for CFI are expected to reflect a good and acceptable fit to data (Medsker et al., 1994). The difference Akaike's Information Criterion (AIC), was also used as a base-line comparison.

The research model shown in Fig. 1 suggests testing a moderated mediation. The appropriate technique of conditional processes analyses (CPA) was selected. It performs mediation and moderation at the same time. Hayes (2018) indicates that this technique helps testing "the phenomenon in which the product of X and a moderator of X's effect (W) on Y carries its effect on Y through M" (p. 467), with a rule of thumb that the effect carried should be different from zero. CPA was performed using a SPSS macro process. Model 14 (for details, see Hayes, 2018, p. 591) is used, which automatically creates the interaction variable and provides the low satisfaction level (1 standard deviation below the mean), and the high satisfaction level (1 standard deviation above the mean). The index of moderated mediation is computed (see Table 6), which is akin to an inferential statistical test, to assess "whether the proposed moderator variable has a nonzero weight in the function linking the indirect effect of X on Y through M to the moderator" (Hayes, 2015, p. 3), and to be significant, the weight should be different from 0.

4. Results

4.1. Checking common method variance (CMV)

Before testing the research model, it is important to determine whether bias due to common method variance (CMV) could have affected the data. Two techniques were used. A marker into the research model in controlling the method variance has been included. Lindell and Whitney (2001) indicates that CMV may be assessed through a marker by "the inclusion of a theoretically un-related, proximally located MV marker variable likely to provide a satisfactory proxy" (p. 116). The marker used is the degree to which

the immediate manager is him- or herself committed toward the environment in the form of support given[1], because a substantial literature has revealed the paramount role of leaders in influencing subordinates' eco-friendly behaviors (Robertson and Barling, 2015). For all variables the value is 0.435 and is significant (t = 11.58). The squared value of 0.435 is 0.189, reflecting the computed variance (18.6%), which is significantly below 50% (Eichhorn, 2014). The use of a common marker strongly suggests that the study data are not inflated by common method variance.

CMV was also estimated through the common latent factor technique, akin to a single-common method approach (for details see Podsakoff et al., 2003). This technique requires the inclusion of a common factor latent variable that is loaded onto all of the indicators of the measurement model (Marler et al., 2009). The measurement model including six factors (POS-E, the three GHRM practices, satisfaction with organizational environmental engagement, and individual environmental performance) was compared to the measurement model with common factor, which involves adding a first-order factor (see Podsakoff et al., 2003). If the measurement model provides a better fit, it may be concluded that study findings are not inflated by common method variance. It is expected that the common factor accounts for less than 50% of variance once the square of all of the indicators is calculated.

Table 1 reports a baseline comparison indicating that the measurement model offered a better fit than the measurement model with latent common factor, as the Chi-square difference test (Bentler and Bonnett, 1980) was significant ($\Delta\chi^2$ = 32.4, p. < 0.001). The measurement model has the lowest AIC (ΔAIC = 160.3), leading to the conclusion that it was more parsimonious (Hu and Bentler, 1995) and should be preferred (Burnham and Anderson, 2002). The latent factor accounts for less than 50% because the weight of the indicators are 0.646 (the square of 0.646 = 0.41), indicating a variance of 41%. It is concluded that common method variance is not a significant issue.

4.2. Measurement model

Having checked for common method variance, and before testing the hypotheses, the next step was to assess the measurement model, to ensure distinctiveness among the variables of this research. The aim here was to evidence convergent validity, internal consistency and discriminant validity.

CFA was performed to assess the dimensionality of data. To avoid misinterpretation, the six-factor model was before compared with alternative models to detect possible nested ones which might provide a better fit with the data. This base-line comparison is based on $\Delta\chi^2$ and ΔAIC. Table 1 reports that the six-factor model has the best fit to the data than other competing models.

Table 1 also shows the results for CFA. The measurement model yielded a good fit to the data, χ^2 (237) = 514.1, p < .001, NNFI = .93, CFI = .93, RMSEA = .06. As all indicators loaded significantly (p < .001) on their respective factor (see Table 2), convergent validity was evidenced.

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[1] Podsakoff et al. (2003) indicate that "if a variable can be identified on theoretical grounds that should not be related to at least one other variable included in the study, then it can be used as a marker in that any observed relationships between it and any of the other variables can be assumed to be due to common method variance" (p. 893). The degree to which the immediate manager is environmentally committed met this recommendation.

Table 2
Measurement model (N = 221).

GHRM (Tang et al., 2018)	loadings	ρ	A.V.E.
Involvement		.90	.62
Our company has a clear developmental vision to guide the employees' actions in environment management	.844		
In our firm, there is a mutual learning climate among employees for green behavior and awareness in my company	.726		
In our firm, there are a number of formal or informal communication channels to spread green culture in our company	.795		
In our firm, employees are involved in quality improvement and problem-solving on green issues	.729		
We offer practices for employees to participate in environment management (newsletters, suggestion schemes, problem-solving groups, …)	.755		
Our company emphasizes a culture of environmental protection	.881		
Training		.80	.57
We develop training programs in environment management to increase environmental awareness, skills and expertise of employees	.755		
We have integrated training to create the emotional involvement of employees in environment management	.789		
We have green knowledge management (link environmental education and knowledge to behaviors to develop preventative solutions)	.728		
Performance management		.81	.53
We use green performance indicators in our performance management system and appraisals	.633		
Our firm sets green targets, goals and responsibilities for managers and employees	.873		
In our firm, managers are set objectives on achieving green outcomes included in appraisals	.789		
There are dis-benefits in the performance management system for non-compliance or not meeting environment management goals	.584		
POS-E (Lamm et al., 2015)		.91	.71
I feel that I am able to behave as sustainably as I want to at the organization where I currently work.	.806		
My organization does not care about whether I behave in a sustainable manner or not. (reverse-scored)	.861		
My organisation values my environmental contribution	.897		
My actions toward sustainability are appreciated by my organization.	.857		
Environmental satisfaction (Pelletier et al., 1996)		.87	.63
For the most part, the programs developed by my employer have	.799		

Table 2 (continued)

GHRM (Tang et al., 2018)	loadings	ρ	A.V.E.
addressed the most important environmental problems			
In my opinion, the amount of attention given to the environment by my employer has been satisfactory	.858		
So far, I am content with the state of the environment in my area	.699		
The employer policies developed to deal with the environment are excellent	.814		
Individual environmental performance (Boiral and Paillé, 2012)		.76	.53
I voluntarily carry out environmental actions and initiatives in my daily work activities	.567		
I volunteer for projects, endeavours or events that address environmental issues in my organization	.825		
I stay informed of my company's environmental initiatives	.769		

Notes. ρ, Jöreskog's rhô; AVE.

Table 3 reports correlations among the variables, means and standard deviations. Table 3 also indicates for each relevant variable the average variance extracted (AVE) which gives the proportion of total variance explained by the latent variable, and Jöreskog rho (ρ), which provides internal consistency. As the standard cut-off for AVE and ρ are 0.50 (Hair et al., 2010) and 0.70 (Fornell and Larcker, 1981), this requirement was met for AVEs (which ranged from 0.52 to 0.71). Given that ρs ranged from 0.81 to 0.96, the internal consistency was satisfactory for each construct of the study too.

Discriminant validity was assessed by comparing, for each pair of constructs, the average of their respective AVE and their shared variance reflected by the squared correlations. Discriminant validity is evidenced if, for two given constructs, the average AVE is higher than the shared variance (Fornell and Larcker, 1981). By crossing results that appear in Table 3 (i.e., AVEs, and values within brackets), it can be shown that, for each pair of constructs, this requirement was met. Results indicate that discriminant validity was evidenced.

CFA results (above) provide support in demonstrating the reliability, convergent and discriminating validities for each construct.

Before testing the hypotheses, the Kolmogorov-Smirnov (K−S) normality test was performed to verify if the variables examined met the criteria of normal distribution. The K−S test indicated that all distributions were significantly non-normal (green management $D(221) = .10$, p < .001; green training $D(221) = .13$, p < .001; green involvement $D(221) = .08$, p < .001; POSE, $D(221) = .09$, p < .001; environmental satisfaction, $D(221) = .08$, p < .001; and individual environmental performance, $D(221) = .08$, p < .001). Data were analyzed through the maximum likelihood method of estimation (ML estimation). Chou and Bentler (1995) argue that estimations calculated with this method "have been found to be quite robust to the violation of normality. That is, the estimates are good estimates, even when the data are not normally distributed" (p. 38). The subsequent analyses were performed by utilizing applied bootstrapping procedures (5000 bootstrap resampling) since it is the most appropriate technique when data are non-normally distributed (Edwards and Lambert, 2007).

Table 3
Correlation matrix.

	1	2	3	4	5	6	Mean	SD	AVE	ρ
1. Gender	—						—	—	—	—
2. Age	-.20(.04)**	—					39.1	9.1	—	—
3. GHRM	.09(.00)	-.09(.00)	—				2.3	0.9	.62	.90
4. Support	.13(.01)	.01(.00)	.64(.40)**	—			2.9	1.0	.71	.91
5. Satisfaction	.11(.01)	-.07(.00)	.63(.40)**	.63(.40)**	—		2.9	0.8	.63	.87
6. Individual performance	-.01(.00)	.02(.00)	.42(.17)**	.33(.10)**	.26(.06)**	—	3.1	0.9	.52	.75

Note. **p < .01, *p < .05; SD, Standard deviation; Shared variances are given by the values in brackets.

4.3. Hypotheses testing

Hypothesis 1 predicted a direct effect of GHRM practices on employee environmental performance, and results in Table 4 indicated that GHRM practices considered overall (b = .08, $t = 3.77$, p = .0002) and in isolation, i.e., employee involvement (b = .15, $t = 3.88$, p = .0001), training (b = .27, $t = 3.54$, p = .0005), and performance management (b = .15, $t = 2.49$, p = .0135) positively influence individual environmental performance.

Hypothesis 2 predicted an indirect effect of GHRM practices on employee environmental performance through POS-E. Results are reported in Table 4. As predicted mediation effect using 5000 bootstrap resamples is demonstrated since the indirect effect was not significant (b = .017), because 0 is included in the (95%) confidence interval (-.005, 0.041).

Table 4 reports that when GHRM practices are considered in isolation, the findings indicate that indirect effects were significant for training (b = .08, boot SE = .04, 95%CI = .002, 0.181), and performance management (b = .09, boot SE = .05, 95%CI = .024, 0.160), since none of their respective confidence interval straddles 0, whereas the indirect effect was not significant for employee involvement because the confidence interval includes 0 (b = .03, boot SE = .04, 95%CI = -.011, 0.085).

Hypothesis 3 predicted that satisfaction with organizational environmental engagement moderates the indirect effect of GHRM practices on employee environmental performance through POS-E. Table 5 reports findings for Hypothesis 3. Results are set out as follows. The findings relating to the interaction effect between the product term (POS-E x satisfaction) and the outcome (individual performance) are presented. The results indicating whether the interaction effect is contingent on the indirect effects of GHRM practices on employee environmental performance through POS-E are also set out.

The product terms (POS-E x satisfaction) interacted positively and significantly in the prediction of individual environmental

performance (b = .039, SE = .01, t = 3.41, p. < 0.001), and accounted for an additional variance of 4.2% ($F_{(1, 216)}$ = 11.65, p. < 0.001). To further examine the interactive effect of POS-E and satisfaction with individual environmental performance, lines representing the relationship between POS-E and individual performance were plotted at high and low levels of satisfaction (+/− 1SD). Fig. 2 shows that the slope for high satisfaction is steeper and significant, whereas those for low satisfaction is flat and not significant, meeting expectations. The relationship between POS-E and individual environmental performance is stronger for employees who are highly environmentally satisfied compared to those who are weakly environmentally satisfied.

The contingent effect of satisfaction with organizational environmental engagement on the indirect effect of GHRM practices on employee environmental performance through POS-E is now examined. As expected in Hypothesis 2, this indirect effect was significant at a high level of satisfaction because CI does not include 0 (0.05, boot SE = .01, 95%CI = .021, 0.085), while not significant at a low level of it since CI contains 0 (-.01, boot SE = .02, 95%CI = -.040, 0.024). The significance of the contingent effect is demonstrated, since the index of moderated mediation did not include 0 (Index: 0.008, Boot SE = .002, 95% CI = .003, 0.014).

Table 6 shows results for inferential statistical test, and reports the model summary.

4.4. Additional analysis

Additional analysis is performed with the aim to assess if SOEE interacts with GHRM practices (overall and in isolation) in predicting individual environmental performance. The intention is to avoid discussing findings from a misleading baseline. A different MACRO process was used that is model 58 (Hayes, 2018, p. 597). Model 58 is a variation of model 14. It tests if the moderator (SOEE) interacts both with the focal predictor (GHRM practices) and the mediator (POS-E). The same rule of thumb occurs that confidence

Table 4
Results for direct and indirect effects (Hypothesis 1, and 2).

	Coeff.	SE	95% CI	
			LL	UL
Direct effect (Hypothesis1)				
GHRM practices (overall) → Individual environmental performance	.08	.01	.037	.118
GHRM practices (In isolation):				
Employee involvement → individual environmental performance	.15	.03	.077	.235
Training → Individual environmental performance	.27	.07	.122	.427
Performance management → Individual environmental performance	.15	.06	.032	.281
Indirect effect (Hypothesis 2)				
GHRM practices (overall) → POS-E → Individual environmental performance	.01	.01	-.005	.041
GHRM practices (In isolation):				
Employee involvement → POS-E → individual environmental performance	.03	.02	-.011	.085
Training → POS-E → Individual environmental performance	.08	.04	.002	.181
Performance management → POS-E → Individual environmental performance	.09	.03	.024	.160

Table 5
Results for conditional indirect effects at values of Satisfaction (Hypothesis 3).

	Coeff.	Boot SE	95% CI	
			LL	UL
GHRM practices (overall) → POS-E → individual environmental performance				
Low satisfaction (-1SD)	-.01	.01	-.04	.02
High satisfaction (+1SD)	.05	.01	.02	.08
GHRM practices (in isolation)				
Employee involvement → POS-E → individual environmental performance				
Low satisfaction (-1SD)	-.01	.03	-.08	.04
High satisfaction (+1SD)	.10	.03	.04	.16
Training → POS-E → individual environmental performance				
Low satisfaction (-1SD)	-.03	.06	-.17	.08
High satisfaction (+1SD)	.21	.06	.09	.34
Performance management → POS-E → individual environmental performance				
Low satisfaction (-1SD)	-.01	.05	-.10	.09
High satisfaction (+1SD)	.18	.04	.09	.28

Note. SD, Standard deviation; LL, Lower Limit; UL, Upper Limit.
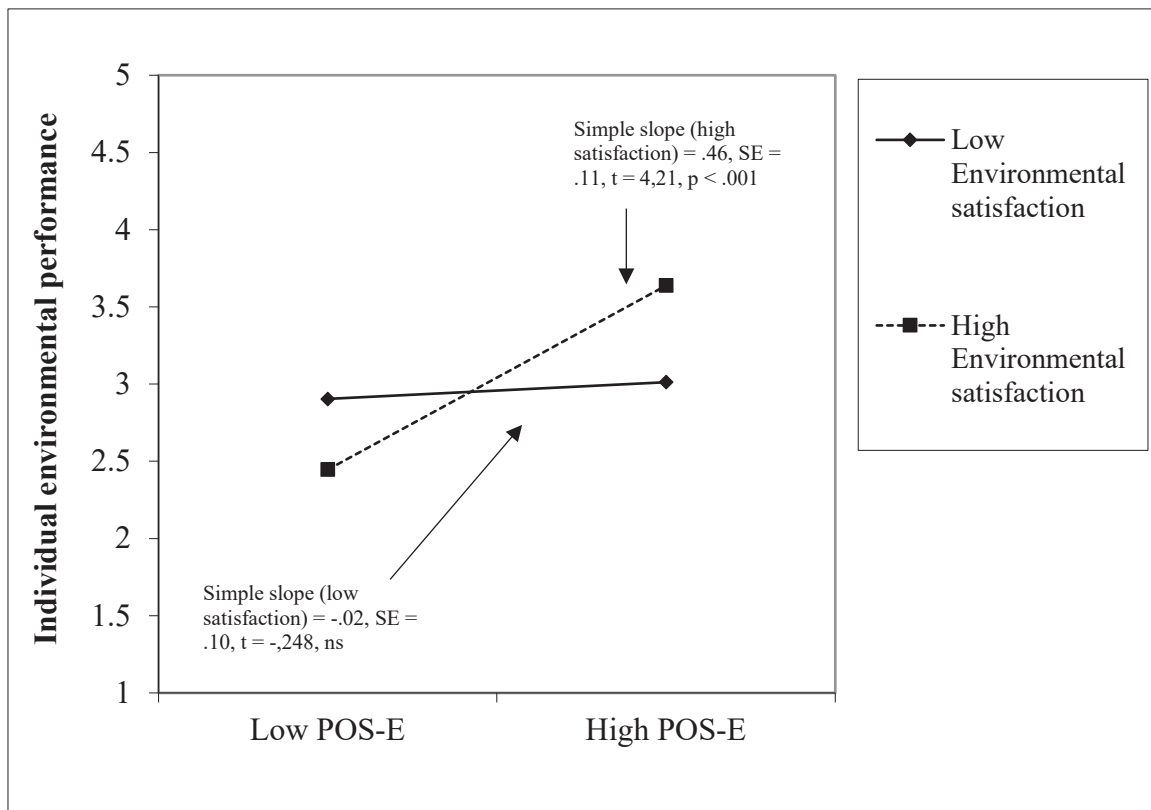
Fig. 2. Effects of perceived organizational support for the environment on individual environmental performance at high and low values of satisfaction.

intervals should not contain 0. Results indicate that IEP is not a function of the moderating effect of SOEE when GHRM is the focal predictor either in overall (coeff. = .005; SE = .004; t = 1.11; p = .265; 95%CI = -.004; 0.014), or when practices are considered in isolation (green training: coeff. = .015, SE = .019, t = 0.79, p = .427, 95%CI = -.023, 0.054; green involvement: coeff. = .016; SE = .009; t = 1.76; p = .078, 95%CI = -.001, 0.035; and green performance management: coeff. = .007; SE = .015; t = 0.508; p = .611, 95%CI = -.022, 0.038). These results clearly indicate that SOEE only interacts with POS-E (and not with GRHM practices) in the prediction of individual environmental performance.

Table 6
Summary of the moderated mediation.

Moderator: satisfaction with organizational environmental engagement	Inferential test: Index	SE	95% CI	R^2	Test F	p <
GHRM practices (Overall) → POS-E → IEP	.008	.002	(.0032, 0144)	.229	$16.0_{(1,219)}$	.001
GHRM practices (In isolation):						
Employee involvement → POS-E → IEP	.016	.005	(.0062, .0276)	.232	$16.3_{(4, 216)}$	.001
Training → POS-E → IEP	.035	.011	(.0150, .0578)	.223	$15.5_{(4,216)}$	.001
Performance management → POS-E → IEP	.027	.008	(.0112, .0454)	.201	$13.6_{(4,216)}$	.001

Note. IEP, individual environmental performance.

5. Discussion

5.1. Findings

This study adds to literature by examining the direct and the indirect effect of GHRM through distinguishing practices when they are considered in aggregate or in isolation.

Findings indicate that GHRM practices in aggregate directly influence individual environmental performance, which is similar to prior research by Kim et al. (2019) that reported a positive direct influence of GRHM on employee green behavior. When examining GHRM practices in isolation, it is found that employee involvement, training and environmental performance all positively influence individual environmental performance. Based on the magnitude of coefficient of the three practices (Table 4), training appeared as the best direct predictor. This result is consistent with the relevant prior GHRM literature (Renwick et al., 2013), and with more recent findings by Zibarras and Coan (2015), who found that education and training is considered by HR managers as the most effective practice in encouraging employee pro-environmental behaviors. This research confirms that employees also conceive environmental training as a key green HR practice for helping their organization achieve environmental sustainability.

Regarding the indirect effect of GHRM practices when they are considered in isolation, findings show that an indirect effect through organizational support is demonstrated for training and environmental performance, whereas not for employee involvement. This means that not all GHRM practices seem to be perceived by employees as form of environmental support. How can we explain that employee involvement is perceived by staff as a non-supportive green practice in achieving individual environmental performance? One possibility is that employees may face internal barriers inhibiting them to perceive the supportiveness of such involvement practices. This contention is consistent with the theoretical analysis by Fernández et al. (2003) and recent findings by Jabbour et al. (2016) that limited participation of employees in decision-making and a lack of communication within the workplace as internal obstacles in predicting staff green performance. This assumption deserves more investigation in future research.

The second result of interest concerns the role played by employee satisfaction with organizational environmental engagement, as while prior research has considered employee satisfaction in the context of environmental sustainability. Reviewing the literature, Norton et al. (2015) report mixed findings leading them to raise the question of the genuine function of job satisfaction in an environmental sustainability context. This lack of consistency may be explained by the conceptual approach adopted concerning employee satisfaction. Researchers in the field of environmental sustainability (Lamm et al., 2015; Paillé and Boiral, 2013) typically use scale measurement capturing an overall assessment of job satisfaction that gave the possibility of taking into account the specificity of environmental topic, whereas research has shown the distinctiveness between job satisfaction and dimensions of work environmental

satisfaction (Lee, 2006). The measurement of Pelletier et al. (1996) has been used and adapted for capturing employee appraisal of environmental efforts undertaken by the employer. Findings give consistency to expectation. Employee environmental satisfaction being contingent upon the conveying indirect effects of green HRM practices on employee environmental performance through POS-E. Fig. 2 helps interpret the role of employee environmental satisfaction. Individual environmental performance increases as a function of perceived organizational support for the environment only for employees highly satisfied with organizational environmental engagement, while no interaction effect is found for those who felt weakly satisfied. The high employee environmental satisfaction condition has strengthened perceived organizational supportiveness, while the low condition has had a neutral effect on it, an observation consistent with the previous literature on the role of employee job satisfaction in relationships between organizational support and individual performance (Kurtessis et al., 2017). This research shows that the positive effect of GRHM practices upon POS-E best predict individual environmental performance when employees feel satisfied with environmental management decisions.

5.2. Practical implications

This research has interesting practical implications. Manika et al. (2015) claimed that the achievement of organizational environmental performance in aggregate starts with individual environment performance. Prior research has enabled top management decision-making, as managers were sensitized to the importance of genuine supportiveness (Lamm et al., 2015), and to set HR practices that focus on organizational greening (Renwick et al., 2013). Linking organizational support and GHRM, this research study enables managers to enhance such decision-making. Managers should be aware that if the existence of GHRM practices strongly signal that their employer is environmentally committed, these organizational efforts are evaluated by employees through their own environmental satisfaction lenses.

Managers may consider employee environmental satisfaction as a facilitator in achieving individual environmental performance. Based upon research of employee job satisfaction (Alegre et al., 2016), it could be assumed that low employee environmental satisfaction reflects a negative judgement that should predict a decreasing relationship between POS-E and individual environmental performance. This study shows a non-significant effect that suggests a neutral role when employee environmental satisfaction is weak. This interesting result may be interpreted through the analogy proposed by Wehrmeyer (1996) in his seminal book linking environmental and human resources practices. He indicates that in an environmental sustainability context, individuals feel dissatisfied in the absence of hygiene factors and not in their presence, and that they also feel satisfied in the presence of motivator factors, but not in their absence. GHRM practices are akin to motivator factors, because these findings indicate no contingent effect under a low level of environmental satisfaction.

5.3. Limitation and future research

The research is not without limitations and assumes that additional research is needed. Data has been collected at only one point of time using a cross-sectional design, meaning two issues arise: possible bias due to social desirability, and the sense of causation among variables. Such bias has been tackled through performing rigorous techniques, where results clearly indicate that potential bias due to common variance is not a serious issue. The question relating to the sense of causation has also been addressed by following the relevant literature associating HRM practices and POS in predicting work-related outcomes. This literature examines HRM practices as distal variables, and organization support and employee job attitude as focal predictors (Kurtessis et al., 2017). It should be noted that data have certain limitations.

Consistent with the prior environmental literature, GHRM practices have been examined as key determinants. The lack of influence of involvement practices is surprising. It may be explained by the employee perception that related practices interact with a hidden factor playing a key role in the transmission of employee involvement effect on individual environmental performance. Ramus and Steger (2000) claim that behavioral supervisory support may have an influence on organizational politics leverage employee environmental behaviors. Future research might replicate this study by considering the role of behavioral supervisory support.

Employee satisfaction may be greatly affected by emerging events during a working day (Bissing-Olson et al., 2015), and this characteristic should not be ignored. This suggests that future studies take into account variables acknowledged to interact with employee satisfaction in predicting such individual performance.

From the study limitations, other possible ideas for relevant future research also emerge. No studies exist concerning the impact of GHRM systems on either environmental outcomes such as waste reduction or wider organizational performance metrics. The exception is the conceptual piece provided by Jackson (2018), which scholars can build upon. The individual GHRM activities identified could be seen as interdependent, reinforcing activity 'bundles' with a synergistic link between practices, where the impact of each element is enhanced when the others are enacted (Combs et al., 2006). Studies examining the impact of GHRM systems would be useful.

6. Conclusion

This study tests an original model that demonstrates how managers could leverage green human resource practices to achieve employee environmental performance. The main conclusion of this research is that the transmission of effect of green human resource practices in individual environmental performance through organizational support for the environment is strengthened when employee environmental satisfaction is high. It is shown that green training is the most effective human resource practice to empower staff to commit effort to achieve environmental objectives. Through this research, it is expected that organizations which seek to become greener will improve their sustainable practices.

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Declaration of competing interest

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