Review

Environmental Management, Human Resource Management and Green Human Resource Management: A Literature Review

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Abstract: The main purpose of this paper is to integrate the literature on human resource management (HRM) and environmental management. Moreover, the paper shows the role that green human resource management (GHRM) plays in environmental management activities. This article examines the main relationships between human resource management and environmental strategy, emphasizing reciprocal influences. Moreover, the main human resource practices used in the literature are examined. In addition, methodological approaches that can be appropriate to advance the study of the link between human resource management and environmental strategy are proposed. Ideas for future research are also provided. As the role of human capital in implementing environmental management is a mature field of research, a new topic known as green human resource management has emerged. We examine studies that analyze both the relationship between general human resource management and environmental strategy and between green human resource management and environmental strategy.

Keywords: human capital; human resource management; green human resource management; environmental management; environmental strategy; literature review

1. Introduction

A relevant topic in the management field is environmental management. Due to important environmental problems (e.g., climate change, pollution, overconsumption of natural resources, deforestation, etc.), companies are integrating environmental issues into their corporate and competitive strategies (Bansal and Gao 2006; Hoffman and Bansal 2012). Moreover, the relationship between voluntary environmental practices (e.g., environmental management systems), competitive advantage and financial performance has received increasing attention not only from academics but also from practitioners, with an important debate on environmental management and firm competitiveness (Dwyer et al. 2009; Albertini 2013; Martín-de Castro et al. 2016).

In this regard, human capital, and therefore the role of managers and employees, is considered a key determinant of environmental management. Human resource management may help in the better implementation of environmental management (Claver-Cortes et al. 2007; Chen 2008; Lopez-Gamero et al. 2011; Yong et al. 2019). Then, it would be interesting to conduct studies that examine the linkages between human resource management and environmental strategy.

The main purpose of this article is to examine the reciprocal relationships between human resource management (HRM) and environmental management (EM) through a literature review. An important aspect of the paper is to consider a relevant emerging topic that integrates HRM and EM: green human resource management (GHRM) (Amrutha and Geetha 2020). In this regard, we have distinguished between papers that use HRM variables in general and papers that consider GHRM-specific variables.

We can indicate the differences between HRM and GHRM. HRM focuses on the recruitment, management and direction of all people who work in the organization. Therefore, HRM refers to general practices. GHRM is defined as the alignment between traditional human resource practices (such as training and performance appraisal) and environmental policies and objectives (Teixeira et al. 2016). GHRM is considered to be equivalent to HRM when selection, recruitment, job positions, training, performance assessment, teamwork and other HRM practices include environmental arguments (Jabbour et al. 2010). For instance, in the case of training, HRM involves general training of employees while GHRM involves environmental training. Another example is performance evaluation. Thus, HRM involves employees' performance evaluation and rewards for their dedication to firm aims; and GHRM involves including the environmental dimension in performance evaluation and rewards for employees.

This article tries to answer four main questions: (1) what are the relationships between HRM, GHRM and EM (antecedent, consequence, mediator and moderator variables)? (2) what are the main human resource practices analyzed in the linkage between HRM/GHRM and EM? (3) which methodological approaches can be appropriate to advance the study of the relationships between HRM/GHRM and EM? and (4) what future lines of research are interesting?

We can highlight the following contributions of this paper. First, there is an absence of studies that distinguish between HRM and GHRM in their relationship with EM. As noted above, HRM refers to HR practices in general and GHRM includes environmental issues in HR practices. We consider that this distinction between HRM and GHRM is relevant. An analysis of how HRM and GHRM have been considered and their relationship with EM was carried out in our paper. Second, different relationships between HRM, GHRM and EM were found and examined. Previous studies have not discussed whether HRM, GHRM and EM are antecedents, consequences, moderators, mediators or if there are other relationships between them and with other variables. Our article provides this analysis, which may offer interesting and relevant insights for future studies of human capital and environmental management. Third, specific HRM/GHRM practices (environmental behavior, commitment of managers, leadership, empowerment, recruitment and selection, teams, training and development, job analysis and description, performance management, employee performance evaluation, compensation) that contribute to EM and how EM influences human capital are highlighted.

In the following section, we present the methodology used. Then, we indicate the main results, emphasizing the relationship between HRM/GHRM and EM, the HRM/GHRM practices contributing to ES and how the implementation of EM can also influence human capital. Finally, we indicate conclusions, including ideas for future research.

2. Methods

In order to identify papers, an electronic search in several databases (Web of Science, EBSCO-host, ProQuest, Emerald and Science Direct) was conducted. We looked for studies with the words "environmental strategy", "environmental management", "green management", "environmental performance", "ISO 14001" or "sustainab*" combined with "human resource", "behavior", "employee", "psychology", "microfoundations", "multi-level", "individual" or "cognitive" in the title, abstract and/or keywords. We also reviewed the reference lists in the studies that were obtained.

We identified articles covering the period from 1996 to 2020. The predominant individuals analyzed were managers, often combined with employees. Papers rarely considered other stakeholders, such as students. The review of levels of the analysis showed that the organization was the main unit of analysis. Less attention was paid to the individual level. In most cases, the individual level was related to cognitive and psychological factors linked to employees' individual decisions. Most topics studied were related to employees' beliefs, attitudes and awareness and the theory of planned behavior (Afsar et al. 2016; Benn et al. 2015; Cantor et al. 2012). The organizational level was related to

factors that are part of the organizational context and that may condition the success of any behavior change initiative. Some of the organizational factors studied included environmental infrastructure, management support and organizational culture (Gholami et al. 2016; Ortiz-de-Mandojana and Aragón-Correa 2015; Shatouri et al. 2013).

Regarding the number of HRM/GHRM practices, several papers analyzed only one practice. In this case, most practices studied were related to the commitment of managers (Sardianou et al. 2016), leadership (Kim et al. 2016), empowerment (Namagembe et al. 2016), recruitment and selection (Grolleau et al. 2012), employee involvement and satisfaction (Markey et al. 2016), teams (Jabbour 2011), training and development (Teixeira et al. 2016), job analysis and description (Jabbour 2011), performance management (Martínez-del-Río et al. 2012), employee performance evaluation (Sharma 2009) and compensation (Gholami et al. 2016). Many papers also considered several HRM/GHRM practices or created one HRM/GHRM construct (Harvey et al. 2013; Zibarras and Coan 2015).

With regard to environmental variables, the studies identified used different environmental measures, which may be classified into the following categories: environmental management and environmental performance. Environmental management and environmental performance are two different concepts that are not automatically linked. On the one hand, environmental management variables are the organizational and technical initiatives carried out by organizations in order to reduce their environmental impacts. Most papers used environmental strategy variables. These mostly refer to environmental management (Carmona-Moreno et al. 2012), organizational and technical environmental practices (Paillé et al. 2014), environmental policies (Ramus and Steger 2000), environmental innovation (Antonioli et al. 2013), environmental standards (Wagner 2013) and green supply chain management (Teixeira et al. 2016).

On the other hand, the output of environmental management is environmental performance and is related to specific environmental impacts (Markey et al. 2016). Some papers used environmental performance variables. They evaluated environmental impact in physical terms. The most used indicators were the consumption of water, energy and other materials, emissions, spills and waste.

3. Results

In this section, following our research questions, first, we indicate different relationships between HRM, GHRM and EM and provide some references as examples. Our analysis focuses on quantitative and mixed papers that have empirically tested the relationships between HRM/GHRM and EM. Next, we highlight specific HRM/GHRM practices that contribute to EM. Finally, some insights on the appropriate methods to advance research on the link between human capital and environmental strategy are indicated. In the conclusions section, we indicate ideas for future research.

3.1. HRM/GHRM and EM Relationships

Table 1 shows the different relationships found between GHRM, HRM and EM, including some exemplar articles. The review showed that HRM was both a means to realize a firm's environmental strategic objectives and an end in itself. As a means, HRM practices contribute to employees directing their actions to achieve the environmental objectives established by the organization (Ortiz-de-Mandojana and Aragón-Correa 2015). As an end, environmental principles are included in HRM practices that favor the social, physical and economic well-being of employees in the long term (Jabbour 2015).

Table 1. Relationships between human capital and environmental strategy.

HRM/GHRM–EM Relationships	References of Example Studies
HRM–EM	Alcaraz et al. (2019); Antonioli et al. (2013); Cordeiro and Sarkis (2008); Glass et al. (2016); Jabbour et al. (2012, 2013); Ortiz-de-Mandojana and Aragón-Correa (2015)
HRM–EM and other mediator/moderator variables	Alaati et al. (2016); Aragón-Correa et al. (2013); Cho (2006); Ortiz-de-Mandojana and Aragón-Correa (2015); Martín-Tapia et al. (2008); Paillé et al. (2014); Roxas et al. (2017)
HRM mediator/moderator variable	Delmas and Pekovic (2013); Wolf (2013)
ES–HRM	Grolleau et al. (2012); Roy et al. (2001); Wagner (2011)
ES–HRM and other mediator/moderator variables	Berrone and Gomez-Mejía (2009)
Only GHRM	Chan et al. (2014); Cummings (2008); Egri and Herman (2000); Gholami et al. (2016); Jabbour (2011); McCoy et al. (2012); Sardianou et al. (2016); Shaw et al. (1999)
GHRM and ES without relationship between them	Egri and Hornal (2002)
GHRM–EM	Daily et al. (2007); Del Brío et al. (2007); Ervin et al. (2013); Jabbour (2015); Ji et al. (2012); Kaur (2011); Kim et al. (2019); Markey et al. (2016); Namagembe et al. (2016); Wagner (2013)
GHRM–ES and other mediator/moderator variables	Alt et al. (2015); Branzei et al. (2004); Raineri et al. (2016); Shatouri et al. (2013); Sharma (2009, 2014); Wagner (2015)
GHRM mediator/moderator variable	Aragon-Correa et al. (2004); Daily et al. (2007); Ji et al. (2012); Kim et al. (2016); Liu et al. (2014); O'Donohue and Torugsa (2016); Sarkis et al. (2010); Sharma (2000); Vidal-Salazar et al. (2012); Walls and Hoffman (2013)
EM–GHRM	Bauer and Aiman-Smith (1996); Yusof et al. (2016)
EM–GHRM and other mediator/moderator variables	Anderson and Bateman (2000); Guerci et al. (2016); Norton et al. (2014)
GHRM–OCBE	Anwar et al. (2020); Kim et al. (2019); Pham et al. (2019); Pham et al. (2020); Raineri and Paillé (2016); Temminck et al. (2015); Yusoff (2019)
GHRM–OCBE and other mediator/moderator variables	Chaudhary (2020); Chou (2014); Pinzone et al. (2016); Temminck et al. (2015)
EM–OCBE and other mediator/moderator variables	Yoon et al. (2016)
OCBE–EM	Boiral et al. (2015)
EM mediator/moderator variable	Benn et al. (2015)

The review found evidence of the positive impact of HRM on environmental strategy. Several papers analyzed the direct link between a specific HRM practice and environmental strategy. For example, Jabbour et al. (2012) observed that human resource management practices had a statistically significant relationship with environmental management at studied firms. Some papers considered an indirect relationship between HRM and environmental strategy including, as mediating and/or moderator variables, firm size (Martínez-del-Río et al. 2012), interlock diversity (Ortiz-de-Mandojana and Aragón-Correa 2015), shared vision, commitment to learning, knowledge sharing and open-mindedness (Feng et al. 2014).

HRM was also included in some studies as a mediator and/or moderator variable. For example, Delmas and Pekovic (2013) studied whether interpersonal contacts and training mediated the relationship between environmental standards and labor productivity. Wolf (2013) analyzed the influence of the structural implementation of sustainability on firm performance, examining whether employee integration moderated this relationship.

Several papers analyzed how environmental strategy may influence HRM practices. For instance, Wagner (2011) found that environmental practices were positively related to employee satisfaction and recruitment/retention. Grolleau et al. (2012) also showed

that voluntary environmental standards increased the recruitment of professional and non-professional employees.

With regard to GHRM, we found several papers that analyzed only GHRM. Most of those papers employed an individual level of analysis. For example, Egri and Herman (2000, p. 571) found that "the personal values of leaders in nonprofit environmentalist and for-profit environmental product and service organizations were more eco-centric, open to change, and self-transcendent than those of managers in other types of organizations".

Egri and Hornal (2002) included GHRM and EM variables in their study but they did not establish any relationship between them. Specifically, they tested whether a strategic environmental human resource management system and environmental proactivity enhanced perceptions of organizational performance.

The review found a positive and significant impact of GHRM on environmental strategy. In this regard, some papers analyzed the direct link between specific GHRM practices and environmental strategy. For example, Jabbour (2015) showed that there is a positive relationship between environmental training and the environmental management maturity of firms. Namagembe et al. (2016) indicated that the effect of employee empowerment on the adoption of green supply chain practice was positive.

Several papers considered an indirect relationship between GHRM and environmental strategy including, as mediating and/or moderator variables, industry practices (Sharma 2009), country-level factors (Wagner 2015), green organizational climates (Chou 2014) and organizational culture (Shatouri et al. 2013). Moreover, in some studies, GHRM was included in the model as a mediator and/or moderator variable. For example, O'Donohue and Torugsa (2016) found that the link between proactive environmental management and financial performance was moderated positively by GHRM.

Moreover, some papers analyzed how environmental strategy may influence GHRM practices. For instance, Bauer and Aiman-Smith (1996) studied the effect of an environmentally friendly attitude on recruitment efforts. Findings indicated that there was a positive relationship between an environmentally friendly attitude and the perceived attractiveness of the firm, job search specifically in that firm and acceptance of a job offer. Yusof et al. (2016) studied the link between the environmental management of construction firms and the environmental behavior of employees.

In our review, an important research topic that was identified is organizational citizenship behavior for the environment (OCBE) and its relationship with HRM, GHRM and ES. Boiral et al. (2015, p. 532) indicated that "OCBE, which are based on individual, voluntary and informal initiatives, are increasingly considered to be an essential ingredient of corporate greening. The success of formal and organizational-level initiatives, such as the implementation of environmental management practices, depends on the individual, informal and discretionary behaviors of employees". Several papers analyzed the direct relationship between GHRM and OCBE. For instance Raineri and Paillé (2016) found that when a firm and line managers encouraged environmental protection, the likelihood that employees would be more involved with the environmental objectives of the firm increased through citizenship behaviors. Kim et al. (2019) and Pham et al. (2019) also found that employees' eco-friendly behavior improved through green human resource management in the hotel industry. Other papers considered an indirect relationship between GHRM and OCBE including, as mediating and/or moderator variables, green organizational climates (Chou 2014), affective organizational commitment (Temminck et al. 2015), collective affective commitment to EM (Pinzone et al. 2016) and organizational identification (Chaudhary 2020). Furthermore, Yoon et al. (2016) analyzed the link between EM and OCBE. These authors indicated that environmental management systems positively influenced organizational trust and commitment and that organizational trust and commitment affected organizational citizenship behavior. Moreover, the relationship between environmental management systems and organizational citizenship behavior was mediated by organizational trust and commitment.

Finally, one paper studied ES as a mediator variable in GHRM relationships. Benn et al. (2015) examined how GHRM practices might influence the attitude of employees and the organization towards the implementation of environmental practices. The authors observed that there was a positive relationship between participation in environmental practices and greater commitment in the employees. Greater the rating of environmental performance, lesser the intention to quit.

3.2. Specific HRM/GHRM Practices Studied

Some practices and relationships have been studied more than others in the empirical literature (Table 2). The most developed areas were those involving the commitment of managers, employee involvement and satisfaction and training and development.

Table 2. Examples of HRM/GHRM practices.

GHRM/HRM Practices	Main Research Results of Some Representative Studies
Commitment of managers	- "Significant impact of environmental performance on CEO compensation levels" (Cordeiro and Sarkis 2008, p. 304) - "Managers favor a centralized approach to decision making regarding the environment" (Cummings 2008, p. 16) - "Management's environmental behavioral intentions toward the environment influence the environmental actions carried out in the firm" (Martín-Peña et al. 2010, p. 297). - "The relationship between institutional pressure and corporate responsiveness to the pressure is enhanced when top management commitment to the environment is high" (Colwell and Joshi 2013, p. 73) - "Decision-makers' attitudes have a significant influence on the firms' environmental performance" (Oberhofer and Fürst 2013, p. 374) - "Women board members with interlinks to other firms are significantly associated with stronger environmental practices" (Glass et al. 2016, p. 495) - "Director interlocks are positively connected with environmental performance when the firm is linked to a larger parent company and in cases of low and high levels of interlock diversity" (Ortiz-de-Mandojana and Aragón-Correa 2015, p. 499) - "Younger entrepreneurs are more likely to favor sustainable tourism practices" (Sardianou et al. 2016, p. 857)
Employee perception/involvement/sa-tisfaction	- "The structural implementation of sustainability is positively related to firm performance. Employee integration moderates this relationship to some extent" (Wolf 2013, p. 92) - "Positive relationship between self-report task-related and proactive green behavior. This relationship is mediated by green work climate perceptions of co-workers" (Norton et al. 2014, p. 52) - "Employees who report greater environmental concern are found to engage in significantly more self-reported OCBE related behaviors" (Temminck et al. 2015, p. 408) - "A positive association of the level of employee satisfaction benefits with environmental management system implementation" (Wagner 2015, p. 379) - "Employee suggestions and information will only translate into environmental performance improvements if managers integrate these into firms' strategic planning and implementation" (Alt et al. 2015, pp. 177–78) - "Strong associations between organizational activities for the reduction of carbon emissions and employee participation in motivating, developing and/or implementing these measures" (Markey et al. 2016, p. 187)

Table 2. *Cont.*

GHRM/HRM Practices	Main Research Results of Some Representative Studies
Training and development	- "Management support for EMS, EMS training, employee empowerment, and EMS rewards are related to perceived environmental performance" (Daily et al. 2007, p. 95) - "Environmental training mediates the relationship between stakeholder pressures and various environmental practices" (Sarkis et al. 2010, p. 170) - "The relationship between a firm's environmental attitude and its performance in sustainable development is moderated by employee training" (Ji et al. 2012, p. 2995) - "The adoption of environmental standards is associated with increased employee training and interpersonal contacts, which in turn contribute to improved labor productivity" (Delmas and Pekovic 2013, p. 245) - "The better the employee training is, the stronger the relationship between business environmental commitment and sustainable development performance" (Liu et al. 2014, p. 195) - "Environmental training relates positively and significantly with the environmental management maturity of the firms" (Jabbour 2015, p. 331) - "Green training is positively correlated with the adoption of green supply chain practices in green purchasing and cooperation with customers" (Teixeira et al. 2016, p. 170)
Recruitment and selection	- "Environmental activities have a significant positive association with satisfaction and recruitment/retention" (Wagner 2011, p. 157) - "Voluntary environmental-related standards improve the recruitment of professional and non-professional employees" (Grolleau et al. 2012, p. 74) - "A green reputation has an impact on attracting applicants, but information on the recruitment website about firm environmental concerns does not" (Guerci et al. 2016, p. 278)
Teams	- "Top management teams who experienced large turnover in membership tend to have broader scope of environmental scanning" (Cho 2006, p. 1142) - "Environmental management system (EMS) teamwork plays a mediating role between management support for EMS, EMS training, employee empowerment and EMS rewards and perceived environmental performance" (Daily et al. 2007, p. 103) - "Human dimension variables (teams, culture and learning) show high level of agreement indicating that they are aligned and support environmental management, especially by including environmental issues in the organizational culture" (Jabbour 2011, p. 104) - "Environmental training for employees is positively related to environmental performance through environmental teamwork" (Daily et al. 2012, p. 642) - "The strategic human resource components like training, performance-based reward and team development have impacts on green technology innovation" (Shatouri et al. 2013, p. 71) - "Organizations with more advanced environmental management systems use green teams more intensively than organizations with less advanced environmental management systems" (Jabbour et al. 2013, p. 65) - "The creation of employee green teams positively affects both environmental performance and environmental reputation" (Dangelico 2015, p. 735)
Reward systems	- "Management support for EMS, EMS training, employee empowerment, and EMS rewards are related to perceived environmental performance" (Daily et al. 2007, p. 95) - "In polluting industries, pollution prevention strategies affect executive compensation more than end-of-pipe pollution control. Firms with an explicit environmental pay policy and an environmental committee do not reward environmental strategies more than those without such structures" (Berrone and Gomez-Mejía 2009, p. 103) - "The environmental effectiveness of reward systems is positively related to perceived organizational benefits of environmental management practices" (Egri and Hornal 2002, p. 228) - "The evolution of environmental management for the standards of excellence requires systematic contribution of the performance evaluation and rewards dimensions to the environmental dimension" (Jabbour et al. 2010, p. 1084) - "There are strong relationships between culture and supportive climate, pay and reward systems, selecting, training and development and environmental management" (Gholami et al. 2016, p. 159)

The commitment of managers was empirically studied as a fundamental element of the success of an organization and the implementation and maintenance of environmental management (Cummings 2008; Martín-Peña et al. 2010; Oberhofer and Fürst 2013). Younger entrepreneurs (Sardianou et al. 2016) and women board members (Glass et al. 2016) were more likely to favor environmental practices. Daily et al. (2007) indicated that an environmental management system might be successful through the support of managers. Management support could focus on encouraging the empowerment of employees to make changes, providing incentive and reward systems, giving information and promoting environmental training to all members of the organization. A few papers focused on the ES–HRM/GHRM relationship. Specifically, Berrone and Gomez-Mejía (2009) and Cordeiro and Sarkis (2008) found a significant impact of environmental performance on CEO compensation levels.

Papers showed that employee satisfaction was positively affected by environmental management (Wagner 2015). When firms perceived the profits of environmental management, they increased the motivation and implication of the employees and, as a consequence, the firm performance also improved (Wolf 2013). Consistent with this approach, Temminck et al. (2015) found that there was a positive relationship between employee involvement and citizenship behavior in firms. Employee perceptions are important to promote their participation in environmental behaviors of the organization and to identify how firms may modify their internal structure to support the environmental attitude of the organization (Cantor et al. 2012).

The study of environmental training has also been very important. Several papers indicated that training and development were relevant to environmental management (Daily et al. 2007; Delmas and Pekovic 2013; Jabbour 2015). More specifically, Teixeira et al. (2016) showed that environmental training was positively related to environmental supply chain practices (such as environmental purchasing and collaboration with customers). Green training mediated the relationship between environmental management and improved labor productivity (Delmas and Pekovic 2013) and sustainable development performance (Liu et al. 2014).

Other human issues and practices that have been examined are recruitment and selection, reward systems and green teamwork. In general, findings showed that environmental activities had a significant positive association with satisfaction and recruitment/retention (Grolleau et al. 2012; Wagner 2011). Moreover, there was a positive relationship between environmental reputation and attraction to applicants, but there was no significant relationship between green reputation and the information on the recruitment website of the firm (Guerci et al. 2016). One reason may be that information is not available in the recruitment process. Applicants may use environmental reputation as a way of knowing what the firm's intentions may be. For this reason, when firms interview applicants, they should provide information on job characteristics, including environmental information, and should ask for information about the applicant's environmental knowledge.

Literature has verified that reward systems may stimulate employees to care about the environment (Egri and Hornal 2002; Daily et al. 2007; Jabbour et al. 2010; Gholami et al. 2016). Employee environmental commitment may be encouraged through rewards. Firms may develop a reward system in their performance evaluation and align it with environmental objectives. Employees will know the firm's environmental performance because of the rewards that are offered (Daily et al. 2007).

Although individual contributions to a firm's environmental management system are important, green teamwork is necessary to ensure system success (Jabbour 2011). Green teamwork makes it easier for individuals to work together to solve environmental problems that arise in the organization (Daily et al. 2007), which are generally considered complex and interdisciplinary.

There was little research examining leadership, performance management, empowerment, job analysis and description and employees' performance evaluation. More research in these fields is needed.

Martín-Tapia et al. (2008) indicated that adequate management of knowledge and skills related to human resources favored the development of environmental practices. High-involvement work practices (HIWPs) were not directly related to financial performance but could indirectly contribute to firm profitability as they facilitated other strategic options (Martínez-del-Río et al. 2012). As those authors showed in their study, it should be useful to identify contextual variables (e.g., resources and capabilities such as innovation and sector conditions) that might affect the relationship between HIWPs and environmental practices.

Employee empowerment involves employees' participation, involvement and decision-making, as well as the development of actions to implement their decisions and take responsibility for them (Namagembe et al. 2016). Research examining empowerment indicated a direct positive relationship between employee empowerment and environmental performance (Daily et al. 2007; Kaur 2011). Namagembe et al. (2016) observed a positive effect of empowerment on the development of environmental supply chain practices. Employees should be empowered and encouraged to take responsibility for environmental practices (Tariq et al. 2016).

Jabbour (2011) and Jabbour et al. (2010) studied the job analysis/description practice together with other HRM practices. Specifically, Jabbour et al. (2010) observed that the link between job analysis/description and environmental management was not significant. Moreover, firms might achieve proactive environmental management only if the job position includes environmental aspects (Jabbour 2011). The theoretical basis of the analysis of environmental jobs needs to be broadened. When a firm aims to continuously improve its environmental management system, the analysis and description of job positions should be based on job positions that encourage employees to improve their environmental knowledge and job positions that require employees to have knowledge of environmental practices, especially those related to the improvement of environmental performance (Jabbour 2011).

Based on a performance evaluation, Sharma (2000) found that the greater the degree to which a firm integrated environmental performance criteria into its control systems, the greater the likelihood that its managers interpreted environmental issues as competitive opportunities. Moreover, when a firm was aware of environmental impacts, the positive effect of performance evaluation on reducing environmental impact increased (Sharma 2009). In performance evaluation, managers may identify skills needed for new projects and develop an environmental training plan to provide employees with the environmental knowledge needed to develop new projects. This process may improve employee satisfaction and, hence, employee retention.

There are not many studies on the impact of HRM/GHRM practices as a whole on environmental strategy. HRM practices had a positive effect on environmental management (Harvey et al. 2013; Jabbour et al. 2012, 2013). Firms with a high level of HRM practices that developed pollution prevention technologies obtained advantages in costs and differentiation (Carmona-Moreno et al. 2012). The opposite conclusion was reached by Zibarras and Coan (2015) who indicated that HRM practices were not used to encourage employees to be more pro-environmental. It would be very useful if a larger number of studies were carried out to analyze the effect of HRM/GHRM as a whole, rather than each practice individually.

An important topic that has emerged has been the need to motivate employees to become involved in environmental behaviors (McDonald 2014). Several studies analyzed the relationships between employee attitudes and behaviors toward environmental management. Chou (2014, p. 436) showed that "personal environmental norms explained within-firm variance, but green organizational climates explained between-firm variance and moderated the effect of personal environmental norms on employees' environmental behavior". Cantor et al. (2012) found that support from managers and training contributed to the involvement of employees in environmental behaviors through the perceptions and

attitudes they fostered. Then, employees' environmental behavior is related to the perceptions that employees have about the extent to which the firm values their contributions.

3.3. Research Methods

Most studies are quantitative, followed by conceptual/theoretical papers, qualitative studies and mixed methods studies (combination and integration of quantitative and qualitative methods in the same study). We consider that the use of mixed methods research and multilevel research may help advance the research on the relationship between human capital and environmental strategy.

Few papers have used mixed methods integrating several research methods in a single study. Through qualitative studies, researchers may obtain detailed information about participants' opinions and information about why a phenomenon happens. Through quantitative research, cause and effect HRM/GHRM–EM relationships may be examined (Molina-Azorín et al. 2012). Mixed methods are valuable for complementarity (search for elaboration, illustration, clarification and improvement of the results of one method with the results of the other method), development (the results of one method are used to help develop the other method), initiation (detection of contradictions that reframe the research questions) and expansion (related to increasing the breadth and scope of the research using different methods for different elements of the research) (Greene et al. 1989).

Therefore, the use of mixed methods may be an important and useful approach to the existing methodologies in the HRM/GHRM–EM linkage. In addition, important research issues in this field (use of appropriate measures and analysis of results and processes in the same study) may be adequately addressed through this methodological approach (Molina-Azorín et al. 2012).

Another interesting methodology is multilevel research. Multilevel studies emphasize the use of variables on different levels (individual, organizational and other possible levels) as well as the processes that relate them (Chou 2014; Kim et al. 2016; Raineri and Paillé 2016). For example, Kim et al. (2016) analyzed the relationship between conscientiousness, moral reflectiveness and voluntary environmental behavior in the workplaces of group leaders and individual group members. The authors observed a direct relationship between the leader's green behavior and the green behavior of individual subordinates. Outcomes of EM occur at the individual, team, organizational and industry levels. Therefore, future research aimed at making important contributions to the HRM/GHRM–EM relationship should develop multilevel designs constructing multilevel measurement. In our review, very few papers used multilevel statistical techniques.

4. Discussion, Implications and Conclusions

The purpose of this study was to present the main results of a literature review on the linkage between human capital and environmental management, examining HRM–EM relationships and GHRM–EM relationships. Reciprocal influences between human capital and environmental management were found, identifying antecedents, consequences, mediators and moderators. The main HRM and GHRM practices were also identified, and some methodological approaches that may help advance research on this important linkage human capital-environmental strategy were emphasized. Next, we present discussion and ideas for future research, implications for managers and limitations.

4.1. Discussion, Academic Implications and Future Research

The results show that more research is needed on the HRM/GHRM–ES relationship. Next, we indicate the main academic implications as ideas for future research.

First, few studies have analyzed the impact of HRM/GHRM practices as a whole on environmental strategy. It would be interesting if more papers study the effect of HRM/GHRM practices together instead of individual practices.

Second, most papers focused on HRM/GHRM practices from managers' or employees' points of view. Few papers used both (managers and employees). Considering issues

related to data reliability, new research should use multiple respondents. Researchers who have developed research at the organizational level may consider that a single respondent cannot be sufficiently representative of an organization. The choice of multiple respondents per organization can provide the average value of the team's response and signs of the team's variation in specific areas (Balloun et al. 2011). "Multiple respondents reflect the points of view of HRM system users (i.e., employees) and of the HRM system 'implementers' (i.e., line managers)" (Guerci et al. 2016, p. 282).

Third, with regard to levels of analysis, most papers framed their research on one level of analysis: individual level or organizational level. Some papers selected the unit of analysis at one level but included antecedents and/or consequences at another level (multilevel studies). The literature is making considerable progress on developing multilevel models and researchers need to test their multilevel conceptual models empirically using multilevel statistical analysis. However, few papers conducted multilevel analyses. Therefore, researchers need to know how multilevel analysis may be carried out and how multilevel analytical tools should be utilized. As noted above, the use of mixed methods (integration of quantitative and qualitative methods in the same study) will also help to advance research.

Fourth, studies should consider the perspectives of different countries, studying how external factors may contribute to or mitigate environmental behaviors in the workplace. There are economic, geographic and cultural influences and national cultures that may shape the greening of organizational cultures (Young et al. 2015). For example, it is argued that in individualistic cultures, the tendency to laze is greater than in collectivist cultures. When social relationships are valued, people work harder to achieve objectives that may favor the whole group rather than the individual. With this approach, it is to be hoped that in collectivist cultures, people should be more predisposed to participate in actions that deal with large-scale social problems, such as environmental issues, even when it does not directly concern the person or when it does not directly favor him/her (Schultz 2002).

Fifth, regarding the HRM/GHRM practices, some practices have been studied more than others. There was little research examining leadership, performance management, empowerment, job analysis and description and employees' performance evaluation. More research in these fields is needed.

Sixth, very few papers have studied whether there is a positive impact of ES on HRM/GHRM. Moreover, most papers have analyzed whether environmental activities are positively associated with HRM-related benefits in terms of job satisfaction and recruitment or retention (Grolleau et al. 2012; Wagner 2011). New research should be carried out to study the link between ES and other HRM practices. Another important issue to research is the possible two-way interaction between HRM/GHRM and ES.

Seventh, it is important to test conceptual models empirically. Many papers that were identified in our search were conceptual papers. Most of them presented frameworks related to HRM/GHRM. For instance, Jabbour and Santos (2008) suggested a model in which HRM aligned with the objectives of the organization, which were related to innovation management, cultural diversity management and continuous improvement of ES. Unsworth et al. (2013, p. 211), "through the union of articles in experimental social psychology, organizational behavior, environmental psychology, and organizational psychology, suggested that insofar as the intervention related to objectives were effective and attractive, self-concordant, conflicting with other objectives, and perceived as complete would affect the level and type of behavior change". Renwick et al. (2013) examined the existing GHRM literature based on the Ability-Motivation-Opportunity (AMO) theory and indicated that there was a relationship between how organizations carried out their environmental activities and involved employees and how GHRM practices affected the motivation of employees to participate in environmental actions. In addition, these authors indicated that the theoretical frameworks proposed in the HRM/GHRM–EM literature should be tested empirically in future studies.

Eighth, another important topic for future research is to examine individual factors and characteristics, such as gender, age, level of education and work experience. In our review, we observed that the probability that women are concerned with and act to protect the environment is greater than that of men (Glass et al. 2016). Sardianou et al. (2016) also show that entrepreneurs with higher education, work experience and young people are more likely to favor sustainable tourism. Consequently, future research should test whether gender, age, educational level and work experience are associated with differences in environmental decision-making. The microfoundations movement (Felin and Foss 2005; Foss 2011; Felin et al. 2015) and the human resources management area (Coff and Kryscynski 2011; Ployhart and Moliterno 2011; Wright et al. 2014) may be key elements in the progress of the environmental strategy.

Finally, there should be a focus at the individual level as well as the group level. At the individual level of analysis, environmental behavior includes the study of motivation, creativity, perception, learning and personality of the members of the organization. At the group level of analysis, environmental behavior includes the study of group gestures, intra-group and intergroup disputes and attachment. There are groups of all types and sizes, in different contexts, with different functions, different internal processes and external relationships at both organizational and institutional levels. To consider the individual and group level requires more resources but is more valid in some areas such as quality and safety (Young et al. 2015).

4.2. Implications for Managers

Our article shows that employees may influence the implementation of environmental management. It is important to know the perceptions of employees to promote the implication of environmental behaviors. Firms should analyze how they may modify their internal infrastructures to champion environmental behaviors (Cantor et al. 2012) and employees should be encouraged and made aware of environmental practices in the organization (Tariq et al. 2016). The analysis and description of job positions in a firm that has an environmental management system should be based on jobs that encourage employees to expand their knowledge of environmental practices as well as jobs that require environmental knowledge from employees (Jabbour 2011). Organizations should highlight job characteristics, including environmental aspects of the job, when they interview applicants and should ask for information about applicants' environmental knowledge and attitudes.

Firms that carry out environmental practices should integrate their rewards system into their performance evaluation. In addition, they should align their performance evaluation system with their environmental objectives. Employees may know the environmental performance of the firm through the rewards offered (Daily et al. 2007). Individual contributions to the environmental management of a firm are important, but green teamwork is also necessary to ensure the success of an environmental management system (Jabbour 2011). Green teamwork is the result of the union of individuals to find solutions to complicated problems related to the environment (Daily et al. 2007). In performance evaluation, managers may identify skills needed for new projects and develop an environmental training plan to provide employees with the environmental knowledge needed to develop new projects. This process may improve employee satisfaction and, hence, employee retention. Regarding environmental behavior, employees' perception of how firms value their contribution to the organization is linked to the behavior that employees display. These employee-level behaviors are reflected in job performance and employee involvement through the development of voluntary environmental practices (Cantor et al. 2012).

4.3. Limitations

The main limitation of this paper should be noted. Although the process of searching the literature was followed, it is possible that some papers were not identified.

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