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Green human resource management and the enablers of green organisational culture: enhancing a firm's environmental performance for sustainable development

Abstract:

Scholars have shown that Green Human Resource Management (GHRM) practices enhance a firm's environmental performance. However, existing studies fail to explain how GHRM initiatives can enable a green organisational culture or how such a culture affects the environmental performance and sustainable development of the firm. This paper examines the relationship between GHRM practices, the enablers of green organisational culture and a firm's environmental performance. We conduct a large-scale survey of 204 employees at Chinese manufacturing firms. Our findings suggest that pro-environmental HRM practices including hiring, training, appraisal and incentivisation support the development of the enablers of green organizational culture. We suggest the key enablers of green organizational culture include leadership emphasis, message credibility, peer involvement, and employee empowerment. Our paper contributes to HRM theory in terms of originality and utility of research by explaining that the enablers of green organisational culture positively mediate the relationship between GHRM practices and environmental performance. Managers are provided with a detailed understanding of the GHRM practices needed to enable an organisational culture of environmentally aware employees. Finally, we address potential implications of this work for teaching green organisational culture to future generations of responsible managers.

Keywords: green organisational culture, green human resource management, environmental performance, sustainable development

1. Introduction

Green Human Resource Management (GRHM) practices offer a practical way for organisations to develop human capital that can enhance the environmental performance and sustainable development of the firm (Jaramillo, Sossa, & Mendoza, 2018; Siebenhüner & Arnold, 2007; Wolf, 2013; Wong, Wong, & Boon-itt, 2018). GHRM refers to the HRM aspects of environmental management (Renwick, Redman, & Maguire, 2013 p. 1) and is defined as HRM activities that have positive environmental outcomes (Kramar, 2014 p. 1075). GHRM practices can be categorised into three primary activities: developing green employee abilities, motivating green employees and providing green opportunities (Renwick et al., 2013).

Developing an employee's green abilities involves integrating positive environmental thinking into the firm using Human Resource activities such as recruitment, selection, training and leadership development (Pellegrini, Rizzi, & Frey, 2018). Once recruited and trained, employees remain motivated through performance measurement and reward systems that are focused on providing opportunities for environmental performance improvement (Attaianesi, 2012; Renwick et al., 2013). Several scholars have investigated the relationships between GHRM practices and a firm's environmental performance (Jabbour & Jabbour, 2016; Jabbour & Santos, 2008; Renwick et al., 2013). These scholars find that GHRM practices positively influence a firm's environmental performance through activities such as waste reduction and organisational efficiency (Jabbour, 2015). Overall, GHRM practices can enhance employees' green behaviour to voluntarily improve a firm's performance (Kim, Kim, Han, Jackson, & Ployhart, 2014; Pham, Tučková, & Jabbour, 2019).

Yet, while the link between GRHM practices and environmental performance is well established, we suggest that any study of how environmentally conscious employees implement green initiatives, without a consideration of organisational culture, is incomplete.

Indeed, recent studies have highlighted the lack of research on the relationship between organisational culture and a firm's environmental performance (Dubey et al., 2017; Jackson, et al., 2011; Jackson, Schuler, & Jiang, 2014; Renwick et al., 2013). Daily et al. (2012) stress that the mediating role that organisational culture has on the relationship between GHRM and firm performance is under-researched (Daily et al., 2012). Aligned with this, Jackson et al. (2011) affirm that the interaction between GHRM and green organisational culture is one of the most relevant topics for investigation by today's scholars. To address these gaps, this paper aims to answer the following research question: *how do GHRM practices and the enablers of green organisational culture affect the environmental performance of the firm?*

We answer this question by first building a hypothetical model that proposes a relationship between GHRM practices, the enablers of green organisational culture and environmental performance. To test our model, we gather data from a large-scale survey of Chinese manufacturing firms. China's manufacturing industry is well suited to a study of environmental performance because this sector has a notoriously poor environmental record and is under increasing pressure from the Chinese government to lower harmful emissions (Li & Zhang, 2014). We then provide a justification for the research design and explain how the hypotheses were tested. Section four presents an analysis of the results and section five discusses the study's key findings. The paper concludes by outlining the study's contribution to theory and practices as well as some potentially fruitful avenues for future research.

This study extends our knowledge of GHRM and organisational culture because its findings have implications for both theory and practice. First, the paper fulfils the two necessary elements of theory contribution, originality and utility. According to Corley and Gioia (2011), research has theory contribution when it is considered original and useful for improving organisational issues. This research is original because it adds empirical evidence of the relation between GHRM and organisational culture. Previously published works have

only addressed this relation in a conceptual fashion (Daily & Huang, 2001; Jabbour & Santos, 2008; Jackson et al., 2011), without an in-depth consideration of the key enablers of green organisational culture. Finally, this research fulfils the second criteria for theory contribution (Corley & Gioia, 2011) due to its discovery of how managers can help improve their firm's green organisational culture by paying attention to four key enablers of green organizational culture including leadership emphasis, message credibility, peer involvement, and employee empowerment. We believe that the originality and utility of this research can also be useful for teaching green organisational culture with a richer level of details and understanding on key enablers of green culture, which can contribute to teaching future generations of responsible managers (Marcus & Fremeth, 2009; Peoples, 2009).

2. Literature Review and Hypothetical Model

2.1 Green Human Resource Management and Environmental Performance

Numerous studies have investigated how pro-environmental HRM activities improve the environmental performance of the firm (Arda, Bayraktar, & Tatoglu, 2018; Daily et al., 2012; Jabbour & Santos, 2008). Environmental performance is defined as the commitment of firms to protect the environment and to demonstrate measurable operational parameters that are within the prescribed limits of environmental care (Paillé, Chen, Boiral, & Jin, 2014). A comprehensive measure of environmental performance is provided by Montabon et al. (2007), which includes: incident reduction, continuous improvement, recycling performance, stakeholder perception, independent audits, waste reduction, resource consumption and cost savings. HR managers play an essential role in achieving these environmental performance objectives through the recruitment, training, appraisal and incentivization of an environmentally conscious workforce (Harvey, Williams, & Probert, 2013; Jabbour & Santos, 2008; Renwick et al., 2013).

Many HR managers actively promote their company's environmental credentials to recruit job seekers that are in search of organizations that reflect their values and beliefs (Renwick et al., 2013). University students in particular are entering the job market in search of organizations with pro-environmental images (Backhaus, Stone, & Heiner, 2002). Some HR managers are embedding environmental awareness criteria in job descriptions and interview protocols to ensure future employees are willing to strive for the achievement of the company's environmental objectives (Renwick et al., 2013).

HR managers also play an important role in training employees on the environmental priorities of the firm (Bansal & Roth, 2000; Daily et al., 2012; Daily & Huang, 2001). Training staff about the ecological impact of organizational activities is said to heighten employee concern about environmental issues (Bansal & Roth, 2000). Often, the aim of training is to develop the green abilities of staff so they are focused on reducing activities that generate unnecessary pollution and waste (Simpson & Samson, 2010). As many employees will be working in operational positions, they are well-placed to identify and eliminate the processes that generate waste and harmful effluents (Renwick et al., 2013). A training program centred on environmental awareness increases employee skills in eradicating process and material waste and enhances their emotional involvement in improving the environmental performance of the firm (Fernández, Junquera, & Ordiz, 2003).

HR managers not only train operational employees but also oversee management and leadership development programs. The HR function plays an important role in selecting and promoting environmentally aware candidates into leadership positions (Egri & Herman, 2000). Leaders in environmentally focused organizations frequently need to perform both transformational and transactional managerial roles (Egri & Herman, 2000). This means that HR managers need to recruit and retain leaders with the ability to quickly switch between strategic and operational decision-making activities (Egri & Herman, 2000). Once in positions

of authority, leaders will champion ecologically focused initiatives that are focused on enhancing the environmental performance of the firm (Bansal & Roth, 2000).

HR managers also play a key role in evaluating employee performance based on the achievement of environmental objectives. HR managers can develop and implement companywide pro-environmental performance indicators and evaluation systems (Marcus & Fremeth, 2009). During performance appraisals, HR managers can discuss with employees whether they have achieved their environmental objectives and any ideas for waste reduction and performance improvements they may have (Renwick et al., 2013).

While employees are often motivated by doing less environmental harm, their behaviour can be further influenced through pay and incentive systems (Cordeiro & Sarkis, 2008; Marshall, Cordano, & Silverman, 2005). Studies have shown a link between executive compensation and the environmental performance of the firm (Berrone & Gomez-Mejia, 2009; Cordeiro & Sarkis, 2008; Stanwick & Stanwick, 2001). In a study of 207 firms, Cordeiro and Sarkis (2008) found that companies with an explicit link between CEO compensation levels and the achievement of environmental objectives had higher levels of environmental performance, than those without. Similarly, Fernandez et al. (2003) found that companies that had senior managers working with remuneration contingent upon delivering environmental objectives had higher environmental performance compared to companies with fixed salaries.

A review of the GHRM literature makes it clear that activities such as recruitment, retention, appraisal and incentivization positively influence the environmental performance of the firm. We therefore propose the following:

H1: Green HRM activities positively influence a firm's environmental performance

Yet, while the connection between GHRM practices and environmental performance is well known, we suggest that organizational culture is a key missing link in this relationship.

2.2 *Green Human Resource Management and Green Organizational Culture*

Organisational culture encompasses the values, beliefs and behaviours of organisational employees (Schein, 1992). Values correspond to what individuals think can be done and relate to moral and ethical codes (Holt & Stewart, 2000). Beliefs refer to individuals' perceptions that can be regarded as either true or false (ibid). Behaviours are the pattern of activities carried out by individuals based on their values and beliefs (Schein, 1992). Values, beliefs and behaviours become embodied in an ideology, or organisational philosophy, which serves as a guide to dealing with the uncertainty of uncontrollable or difficult events that occur in organisational life (Schein, 1992). The ideologies of the organisation manifest in the behaviours of individual employees and, over time, these behaviours form into habits that are embedded in the day-to-day running of the company, thereby shaping an organisation's culture (Schein, 1992).

An organisation's culture can be considered 'green' when employees go beyond profit seeking objectives to minimize the negative, and maximise the positive, impact of organisational activities on the environment (Sroufe, Liebowitz, & Sivasubramaniam, 2010). A 'green' organisational culture can therefore be defined as the values, beliefs and behaviours of organisational members concerning the natural environment.

The HRM department plays a key role in enabling a green organizational culture because it shapes the values, beliefs and behaviours of employees through the processes of hiring, training, appraisal and incentivization (Amini, Bienstock, & Narcum, 2018; Dyllick & Hockerts, 2002; Madsen & Ulhøi, 2001). In fact, a recent study by Pellegrini et al (2018) identified the importance of designing HR practices to enhance employee commitment and behaviour in order to support organisational change for long-term sustainable development. An earlier study by Attaianesi (2012) found that employees trained and incentivised to engage in

pro-environmental activities ultimately helped to develop and promote a green culture throughout the firm.

Srinivasan and Kurey (2014) found that four factors brought about a significant change in the culture of 60 U.S. multinational companies: leadership emphasis, message credibility, employee empowerment and peer involvement. While these factors prompted a shift towards a culture of quality management (Srinivasan & Kurey, 2014), we argue they can also enable a green organizational culture. This argument is supported by Arda et al. (2018) who found that quality management and environmental management are two interdependent systems, that once integrated can positively affect firm performance. Importantly, we argue that Green HRM activities play an essential role in the development of the four enablers of green organizational culture.

Pro-environmental leadership emphasis refers to making the environment a leadership priority, where leaders exemplify pro-environmental behaviours in their daily work and evaluate employees on the basis of environmental performance (Bowen, 2000; Sharma & Vredenburg, 1998). HR managers are responsible for recruiting environmentally conscious employees and promoting these individuals into leadership positions (Egri & Herman, 2000). Moreover, HR can incentivize leaders to implement environmental initiatives through remuneration contingent upon environmental performance improvement (Fernández et al., 2003). A pro-environmental incentive system targeted at organizational leaders then trickles down through the company as leaders set environmental priorities for each department and its employees (Cordeiro & Sarkis, 2008).

Message credibility refers to messages delivered by respected sources that are consistent, easy to understand and appeal personally to workers (Srinivasan & Kurey, 2014). HR managers are well-placed to shape pro-environmental messages that speak to employee concerns about reducing wasteful and environmentally harmful activities in their daily roles (Chow, 2012; Lin

& Ho, 2011). Pro-environmental messages can be communicated by the HR department to employees during training sessions as well as performance appraisal meetings (Renwick et al., 2013).

Peer involvement relates to employee participation and mutual involvement in environmental initiatives (Jabbour, 2011; Srinivasan & Kurey, 2014). HR can nurture a culture of peer involvement in environmental activities through training and reward systems (Pellegrini et al., 2018). Specifically, HR can work with managers to develop key performance indicators (KPIs) for teams involved in the delivery of pro-environmental projects. The KPIs can be linked to waste reduction activities, recycling improvements, and reductions in resource consumption (water, electricity and raw materials) (Jabbour, 2011). By tying financial rewards to the delivery of KPIs, HR managers can encourage employees to work with their peers to deliver environmental initiatives (Daily et al., 2012; Pellegrini et al., 2018).

Employee empowerment refers to the level of employee autonomy for making effective decisions involving situations and requirements that are beyond formative rules (Srinivasan & Kurey, 2014). Daily et al. (2012) suggest that environmental empowerment improves the environmental awareness of employees. Managers and employees become empowered through HR led initiatives including training and assessment (Daily et al., 2012). Empowered managers that lead by example are likely to have employees that can embrace environmental change and proactively reduce harmful organizational processes (Daily et al., 2012; Daily & Huang, 2001). Workers that go beyond what is expected can receive additional compensation during performance appraisals (Daily & Huang, 2001). Moreover, HR can encourage employees to address environmental problems through mechanisms such as green teams where team members play important roles in identifying and resolving issues through teamwork (Daily et al., 2012).

Here, we see how green HRM practices support the development of the enablers of green organisational culture. The HRM department hires environmentally conscious employees and moulds pro-environmental values and beliefs using training, leadership and incentive programmes. These values and beliefs manifest as pro-environmental behaviours in an employee's daily tasks. As employees interact and cooperate to tackle environmental challenges, over time, these behaviours become habits and a pro-environmental culture emerges in the organisation. Based on this understanding, we suggest that green HRM practices positively influence the development of leadership emphasis, message credibility, peer involvement and employee empowerment; the enablers of a green organisational culture. This leads us to hypothesize that:

H2: GHRM practices are positively related to the enablers of green organisational culture

2.3 The Enablers of Green Organizational Culture and Environmental Performance

We go on hypothesize that the enablers of green organizational culture can lead to environmental performance improvements at the firm. Specifically, we suggest that leadership emphasis, message credibility, employee empowerment and peer involvement can positively influence Montabon's (2007) criteria for environmental performance improvement.

For example, a proactive stance on environmental issues (*leadership emphasis*) has been shown to help staff better understand environmental issues and gives employee's the ability to implement positive environmental solutions, such as recycling and stakeholder engagement programs (Bowen, 2000; Sharma & Vredenburg, 1998). Pagell and Wu (2009) suggest that environmentally conscious management teams can proactively implement environmental initiatives by aligning environmental and financial goals. Proactive environmental initiatives are disseminated by senior leaders to operational employees and, over time, will become

embedded in their day-to-day roles (Bowen, 2000). Therefore, making the environment a leadership priority reflects in the pro-environmental behaviours of employees, allowing staff to focus on improvement initiatives such as removing wasteful activities from the production process (Simpson & Samson, 2010). In turn, reducing and reusing raw materials improves recycling performance, limits resource consumption and cuts costs (Bansal & Roth, 2000).

Furthermore, credible pro-environmental messages (*message credibility*) from senior management encourages environmentally conscious employees to act in an environmentally responsible manner (Lin & Ho, 2011). Specifically, messaging that fits with an employee's desire to reduce environmental harm can shape how staff communicate pro-environmental performance to stakeholders (Madsen & Ulhoi, 2001; Madsen & Rodgers, 2014). Enhancing stakeholder perceptions of the firm's environmental performance can assist with rankings in sustainability indices such as the Dow Jones Sustainability Index and attract further investment (Amini et al., 2018).

Peer involvement can shape teamwork efforts around the delivery of the environmental objectives of the firm (Daily & Huang, 2001). Environmentally conscious teamwork is said to substantially reduce waste and enhance the environmental performance of a firm's operation (Daily et al., 2012). For example, Jabbour et al. (2011) argue that only when teams incorporate pro-environmental thinking can organizations reach the proactive stage of environmental management. Similarly, Glover et al. (2011) argue peer involvement and environmentally conscious teamwork is a vital element for green integration. Teams can focus on continuous improvement initiatives aimed at reducing harmful emissions and unnecessary waste in the production process or programs that reduce the number of harmful environmental incidents in an operation (Simpson & Samson, 2010).

When employees are empowered (*employee empowerment*) to make their own decisions, they are given the autonomy to identify and quickly rectify harmful activities in a company's

operation. For example, employees can be given the freedom to identify processes that are consuming excessive raw materials and proactively design recycling programmes to reduce overall usage rates (Simpson & Samson, 2010). Moreover, employees can be given the authority to carry out audits of their own processes and those of their peers to encourage a culture of continuous pro-environmental improvement. Indeed, Daily et al (2012) has shown that employee empowerment improves the environmental awareness of employees and can positively influence the environmental performance of the firm (Daily et al., 2012).

Based on this argument, we hypothesize that leadership emphasis, message credibility, peer involvement, and employee empowerment act as the key enablers of a green organisational culture. In addition, we propose that the enablers of green organizational culture mediate the relationship between Green HRM practices and environmental performance. This leads us to hypothesize the following:

H3: The enablers of green organisational culture can positively influence a firm's environmental performance

H4: The enablers of green organizational culture mediate the relationship between GHRM practices and a firm's environmental performance

We now advance a hypothetical model of the relationships between GHRM practices, the enablers of a Green Organizational Culture (EGC) and a firm's environmental performance (See Figure 1).

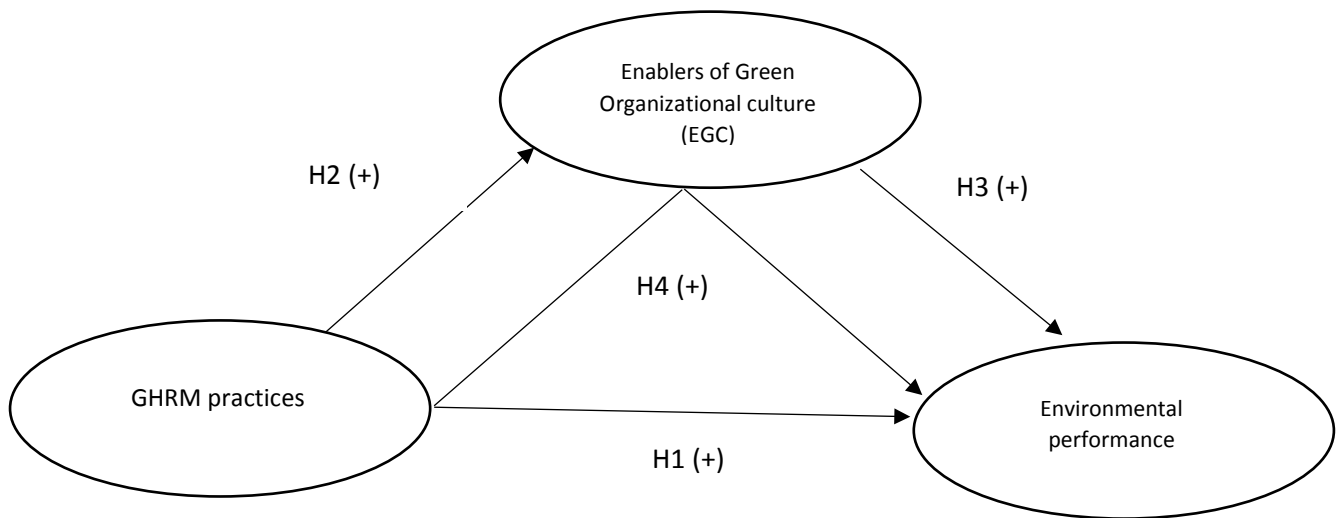


Figure 1: Hypothetical model

The next section provides a justification for our research design, data collection and analysis methods.

3. Research Design

3.1 Sample selection

Our sample population included employees of China’s manufacturing sector. Our sample is comprised of employees from manufacturing firms that employ more than twenty staff members and are located in various geographic regions of China, specifically, Shanghai, Zhejiang Province, Jiangsu Province and Anhui Province. The majority of survey respondents were from the Yangtze River Delta region (Shanghai, Zhejiang and Jiangsu Province), which is a highly developed economic zone in east China and an area known for high levels of pollution emissions (Li & Zhang, 2014).

We selected China’s manufacturing industry as the context of study because this sector has a notoriously poor environmental record (Li & Zhang, 2014). Less than 1% of China’s major cities meet the air-quality standards recommended by the World Health Organization,

and seven of China's cities are among the ten most polluted cities in the world (Asian Development Bank, 2016). These environmental challenges are due to China's rapid industrialisation over the last three decades, which has resulted in high growth in the manufacturing sector and a dramatic increase in pollution (Li & Zhang, 2014). In response to public concern, the Chinese government enacted stringent regulation to reduce the level of inhalable particulate matter to less than 10% by 2017, and has called for manufacturing firms to limit coal use, enforce green practices and eliminate major sources of pollution (Li & Zhang, 2014).

3.2 Survey instrument

The survey instrument was designed to capture the three major constructs of our study, namely the enablers of green organisational culture, GHRM practices and environmental performance. We received 204 valid responses to 500 questionnaires, representing a response rate of 40.8%. An advantage of the survey method is its versatility in covering a large geographic area (Cooper & Schindler, 2006). Forty-eight percent of the respondents were senior and mid-level managers, and 52% were operational employees. This sample fits our study well as it captures the perspectives of both managers and operational employees across a range of organizational departments.

For greater credibility and validity, we employed a 7-point Likert scale to measure each item in the three major constructs, with scores ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) (Preston & Colman, 2000). As per Renwick et al (2013) and Jabbour (2011) we identified six factors that comprise Green HRM practices including: job description, recruitment, selection, training, performance assessment and reward, as (see Table 2).

Table 2: Green Human Resource Management (GHRM) Measures

Constructs with measures	Sources
Job description	
JDv1 - Job positions in our company enable involvement in environmental management activities.	Renwick et al. (2013), Jabbour (2011), Jabbour et al. (2010)
JDv2 - Job positions in our company enable the acquisition of knowledge about environmental management.	
JDv3 - Job positions in our company demand knowledge about environmental management.	
Recruitment	
Rv1 - Environmental performance of the company attracts employees.	
Rv2- HR department of our company prefers to hire employees that have environmental knowledge.	
Selection	
Sv1 - HR department selects employees considering environmental motivation in our company.	
Sv2 - All selection steps consider environmental questions in our company.	
Training	
Tv1 - Environmental training is considered as an important investment in our company.	
Tv2 - Environmental training is a priority in our company.	
Tv3 - HR department provides continuous, relevant and effective environmental training programs.	
Performance Assessment	
PAv1 - HR department of our company establishes a clear and special objective of green practice for each employee.	
PAv2 – Our company assesses employees’ contributions to environmental management.	
PAv3 - Individual performance assessment results are recorded in our company.	
Reward	
Rewardv1- Public recognition rewards are established in our company for environmental performance.	
Rewardv2 – Monetary rewards are provided for environmental performance.	

The survey instrument comprised standard, validated statistical scales for measuring the enablers of green organisational culture (Preston & Colman, 2000). The items (leadership emphasis, message credibility, peer involvement and employee empowerment) are based on the work by Srinivasan and Kurey (2014) and the measures are informed from multiple literature sources, as shown in Table 3.

Table 3: Enablers of Green organisational Culture (EGC) measures

Constructs with variables	Sources
Leadership Emphasis	
LEv1 - Leaders encourage employees to learn green information.	(F. E. Bowen, Cousins, Lamming, & Faruk, 2001; Pagell & Wu, 2009; Sharma & Vredenburg, 1998; Srinivasan & Kurey, 2014)
LEv2 - Managers communicate the green and environmental policy with employees.	
LEv3 - Leaders can help me when face green problems.	
LEv4 - Manager's "walk the talk" on environmental issues and will review the green operations for progress.	
LEv5 - When evaluating employees, managers emphasize the importance of green.	
Message Credibility	
MCv1 - The information about environmental knowledge is delivered by respected sources.	Lin and Ho (2008); Lin and Ho (2011); Srinivasan and Kurey (2014)
MCv2 - It is easy to understand how to apply those green operations.	
MCv3 - It is unnecessary to have too many experiences of using green practices.	
MCv4 - Communications about that green practice appeal to employees personally.	
MCv5 - Company has already applied some related green knowledge.	
Peer Involvement	
Piv1 - It is easy to share green knowledge with my colleagues.	Daily et al. (2012); Glover et al. (2011); Jabbour et al. (2010); Srinivasan and Kurey (2014)
Piv2 - Most employees have a strong network of peers for guidance.	
Piv3 - We have a group discussion about green topic routinely.	
Piv4 - Employees are encouraged to exchange environmental issues with other department.	
Piv5 - Like members of a sports team, peers hold one another accountable.	
Employee Empowerment	
EEv1 - I clearly know how green operations fit with my daily job.	Daily et al. (2012); Glover et al. (2011); Srinivasan and Kurey (2014)
EEv2 - I feel a shared sense of responsibility for the work I do.	
EEv3 - I am free to make decisions regarding environmental issues.	
EEv4 - I have significant autonomy in deciding how to handle green issues in practices.	
EEv5 - I have a voice for green violations.	

The measures of environmental performance are based on Montabon et al. (2007) and include recycling, waste reduction, cost savings, resource consumption, environmental certification, incident reduction and continual improvement (see Table 4). Due to the nascent stage of green practices in China and the various degrees to which green actions are applied, the present study explored environmental performance according to how the respondents perceived their work conditions (see Table 4).

Table 4: Environmental performance measures

Measures	Details
EPv1 Significant Reduction in environmental incidents	Reduction in the number of environmentally harmful accidents
EPv2 Continuous improvement	Continuously achieve and/or exceed environmental targets
EPv3 Recycling performance	Significant % improvement in the recycling of materials (solid, liquid and gas)
EPv4 Stakeholder perception	Use of feedback of environmental performance from the surrounding community and interest groups
EPv5 Independent audits	Use of independent assessment and report of environmental performance
EPv6 Waste reduction	Significant % reduction of waste (solids, liquids, gaseous ...)
EPv7 Resource consumption	Significant % reduction in resource consumption (water, energy, steam, solids, fuel)
EPv8 Cost savings	Significant % reduction in costs due to environmental projects and activities

(Source: Montabon et al., 2007)

. Because our respondents were Chinese, we used a Chinese version of the questionnaire. We translated the scales into Chinese by using a double translation method. We piloted the Chinese versions of our survey instrument by recruiting ten employees from Chinese firms to obtain feedback on the questionnaire design. All of the scales were validated in a pilot study. After the pilot trial, some sentences in the initial questionnaire were revised to ensure that Chinese employees could understand them. For example, using ‘if’ statements in Chinese can cause ambiguity, therefore questions of this type were changed to suit Chinese expressions. The pilot study helped to verify the instrument and ensured the appropriate usage of wording, clarity of instruction and face validity of the measurement items.

3.3 Data collection

The questionnaire was published online for approximately one month in May 2014. Hyperlinks to the online survey instrument were distributed to the employees of the manufacturing firms. We sent 500 invitations to various levels of employees including senior and mid-level managers and operational employees of 60 firms. We received 249 responses out of which 45

responses were incomplete answers, yielding a survey return rate of approximately 40.8% (204 responses). We did not receive responses to the remaining 251 invitations. Initially, we controlled the number of responses from each firm by sending a maximum of ten invitations to the employees of one company to avoid potential bias from a single firm.

To avoid respondent bias, we randomly collected secondary data from annual reports and corporate sustainability reports regarding environmental initiatives, such as reductions in carbon dioxide emissions, energy use and waste generation. Secondary data was used to corroborate the primary data and we found that the documents supported the survey data in each instance. We restricted our sample to Chinese manufacturing firms engaged in pollution prevention activities, in accordance with information provided on their corporate websites and annual reports.

3.4 Data description

Table 5 shows the respondents' demographic details. Our sample is heterogeneous, comprising respondents who varied in age, level of work experience, education, job role and organizational department (see Table 5). Even though our data contains age and gender as the demographic variables, we did not use this information because the aim of our study is to understand the relationship between enablers of organisational culture and green human resource practices on environmental performance, irrespective of the gender and age of respondents.

Table 5: Respondents' Information

Attributes	Classification	Percentage
Gender	Male	56.90%
	Female	43.10%
Age	Under 20 years	2.50%
	20 - 30 years	51.50%
	30 - 40 years	28.90%
	Over 40 years	17.20%
Work Experience	0 - 3 years	27.50%
	3 - 5 years	17.20%
	6 - 10 years	16.70%
	10 - 15 years	15.70%
	16 - 20 years	7.80%
	More than 20 years	15.20%
Department	HR	16%
	Sales	16%
	Marketing	7%
	Production	25%
	Sourcing	2%
	Customer service	4%
	Others (research and development, logistics department, IT and technology department, finance and accounting department)	30%
Position	Operational level employees	53%
	Basic level leaders	21%
	Middle level manager	17%
	Senior manager	2%
	CEO	1%
	Others (employees in research and development, logistics, IT and technology, finance and accounting)	6%
Education	High school	11%
	Junior college	40%
	Undergraduate	40%
	Graduate	6%
	MBA	2%
	PhD	1%
	Others (People progressed through experience without formal qualifications)	1%

Education background reflects the respondent's awareness of green operational improvement programmes and their ability to adopt new practices. Almost half of the respondents had graduated from University, and these individuals worked in different departments at various levels. In the department category, 'Others' refer to individuals working in research and

development, logistics, Information Technology (IT), finance and accounting departments (see Table 5). In the position category, ‘Others’ refer to the job roles of employees working in each department.

As pollution in China’s manufacturing sector is a significant issue that affects all levels and types of employees, heterogeneous representation allowed us to capture a variety of views across the firm. Moreover, this approach allowed us to examine the cross disciplinary culture of teamwork in many Chinese manufacturing companies where people share their views about environmental issues and solutions in teams and using social media platforms such as Wechat.

4. Data Analysis

A covariance-based structural equation modelling (CB- SEM) approach was used to examine the multi-construct conceptual model. Compared to variance based structural equation modelling, CB-SEM is a robust method in terms of parameter accuracy if the data has a normal distribution and reasonable sample size (Reinartz, Haenlein, & Henseler, 2009). As our data satisfied both these requirements, we have adopted CB-SEM for our analysis. The present study employed an online survey tool (sojump.com) to avoid respondent bias and ensure confidentiality, diversity, convenience and effectiveness (Preston & Colman, 2000). We used SPSS Version 22 to test the reliability of the model and conducted an exploratory factor analysis to identify the factors corresponding to green organisational culture, GHRM and environmental performance. Table 6 shows a summary of the reliability analysis results. The Cronbach’s alpha values were higher than 0.7 for all constructs, indicating adequate reliability and consistency in the data (see Table 6).

Table 6: Reliability analysis results

Items	Cronbach's Alpha
Enablers of Green Culture	0.975
Green Human Resource Management Practices	0.966
Operational Environmental Performance	0.944

We performed Bartlett's test of sphericity to determine whether the correlation matrix showed significant relationships among variables. We also used the Kaiser–Meyer–Olkin (KMO) test to measure the sampling adequacy. The results passed our test with a p -value of less than 0.05 and a KMO value higher than 0.6 ($KMO > 0.7, p < 0.05$). The exploratory factor analysis revealed three factors that explained 72.5% of the total variance; these were labelled enablers of green organisational culture (EGC), GHRM practices and Environmental Performance (EP). CFA was then conducted to test the relationships among the observed and unobserved variables (Schreiber, Nora, Stage, Barlow, & King, 2006).

We used a Harman one-factor test to check the dominance of the single factor and whether it accounts for all or most of the common variance that exists in the data (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Un-rotated factor analysis with an eigenvalue greater than one suggested the existence of three different factors and they are 27.3%, 23.5% and 21.7% respectively. This is a standard procedure to ensure the non- dominance of single factors and it should not account for the majority of the variance. In addition, we used scales to capture the perception of the company's environmental performance based on the employees' experience and perceptions. Table 7 shows the CFA estimates and model fit values.

Table 7: CFA Estimates and Fit Indices

			Standardized Estimate	S.E.	C.R.	P	Label	SCM
EEv3	<---	EGC	0.824					0.679
PIv2	<---	EGC	0.84	0.066	17.138	***	par_1	0.705
PIv1	<---	EGC	0.847	0.06	17.46	***	par_2	0.718
MCv5	<---	EGC	0.842	0.06	17.218	***	par_3	0.708
MCv4	<---	EGC	0.82	0.067	16.3	***	par_4	0.672
MCv3	<---	EGC	0.742	0.074	13.555	***	par_5	0.55
MCv1	<---	EGC	0.816					0.667
LEv4	<---	EGC	0.823	0.065	16.418	***	par_6	0.677
LEv3	<---	EGC	0.764	0.072	13.214	***	par_7	0.583
LEv1	<---	EGC	0.738	0.061	15.758	***	par_8	0.545
Rv2	<---	GHRM	0.816	0.061	15.65	***	par_9	0.666
Sv2	<---	GHRM	0.717	0.073	12.487	***	par_10	0.513
Tv1	<---	GHRM	0.805	0.059	15.239	***	par_11	0.647
Tv2	<---	GHRM	0.818	0.051	18.495	***	par_12	0.67
Tv3	<---	GHRM	0.884					0.782
PAv1	<---	GHRM	0.887	0.051	18.578	***	par_13	0.787
PAv2	<---	GHRM	0.853	0.055	17.052	***	par_14	0.727
PAv3	<---	GHRM	0.843	0.054	16.655	***	par_15	0.71
EPv1	<---	EP	0.838					0.702
EPv2	<---	EP	0.775	0.07	13.222	***	par_17	0.601
EPv3	<---	EP	0.827	0.073	14.622	***	par_18	0.683
EPv4	<---	EP	0.842	0.069	15.068	***	par_19	0.709
EPv5	<---	EP	0.845	0.065	15.165	***	par_23	0.714
EPv6	<---	EP	0.876	0.067	16.124	***	par_24	0.768
EEv5	<---	EGC	0.844	0.057	17.315	***	par_25	0.712
EPv7	<---	EP	0.852	0.062	15.368	***	par_35	0.726
Chi-square / df = 2.460			CFI = 0.919		IFI = 0.919		RMSEA = 0.085	

***Significant at 0.001

We used a maximum likelihood algorithm to determine whether the measurement model and the GoF criteria, such as the chi-square to degrees-of-freedom ratio, comparative fit index, incremental fit index and root mean square error of approximation, met the criteria indicating acceptability (Fornell & Larcker, 1981). Before testing the structural model, we confirmed convergent validity using composite reliability (CR) and the average variance extracted (AVE) (Jenatabadi & Ismail, 2014). The AVE and CR results are shown in Table 8.

Table 8: Convergent validity results

Construct	Variables	Factor Loading	AVE	CR
EGC	LEv1	0.708	0.460	0.903
	LEv3	0.615		
	LEv4	0.740		
	MCv1	0.747		
	MCv3	0.657		
	MCv4	0.636		
	MCv5	0.665		
	PIv1	0.710		
	PIv2	0.614		
	EEv3	0.718		
	EEv5	0.631		
GHRMP	Rv2	0.689	0.464	0.885
	Sv2	0.813		
	Tv1	0.728		
	Tv2	0.742		
	Tv3	0.656		
	PAv1	0.600		
	PAv2	0.631		
	PAv3	0.651		
EP	EPv1	0.725	0.500	0.860
	EPv2	0.699		
	EPv3	0.748		
	EPv4	0.679		
	EPv5	0.722		
	EPv6	0.672		
	EPv7	0.701		

The AVE values are higher than 0.4 and the CR values are higher than 0.7 meaning that, according to Jenatabadi and Ismail (2014), both results are over the prescribed values. In

addition, we checked the discriminant validity using average variance extracted for each construct that was greater than the squared correlation between that construct and the other constructs and found that the squared correlation value was not higher than 0.4. We also assessed the degree of multicollinearity in the data set using variance inflation factor (VIF) for the 27 measured variables and results indicate that VIF values range from 1.26 to 2.78. Applying the Hair et al. (2010) rule of thumb stating that a VIF above 3 indicates a potential problem of multicollinearity, we can conclude there is no major issue of multicollinearity in the sample of data collected. The GoF indices of the structural model are shown in Table 9. All values are higher than the acceptable values, and our model passed the test.

Table 9: Structural model goodness of fit indices

Fit Index	Value	Critical (acceptable) Value (Schreiber et al., 2006)	Acceptability
Chi-square/df	2.46	0.002-4.80	Yes
CFI (Comparative fit index)	0.92	≥0.9	Yes
IFI (Incremental fit index)	0.92	≥0.9	Yes
RMSEA (Root means square error of approximation)	0.08	≤0.08	Yes

To check the robustness of the model, we compared the hypothetical model that relates GHRM with EP mediated by EGC, with two direct models (GHRM on EP and EGC on EP) and one reverse model (EGC-GHRM-EP) as shown in table 10. Both the direct models influence on EP is substantial. However the influence of EGC on GHRM and EP is lower than the proposed model (see Table 10).

Table 10: Comparison of models

Alternate models	Path			Standardized Coefficient	P
Direct model (GHRM on EP)	GHRM	————→	EP	0.75	***
Direct model (EGC on EP)	EGC	————→	EP	0.85	***
Reverse model (EGC – GHRM – EP)	EGC	————→	EP	0.54	***
	EGC	————→ GHRM ———→	EP	0.98-0.31	***

***Significant at 0.001

Additionally, based on the structural model, which includes indirect effects, it is necessary to consider the mediation effect (Jenatabadi and Ismail, 2014). For mediation we used the Sobel test/three step standard procedure prescribed by Deng and Poole (2010). In examining the mediation effect, we found that all factors are significant, indicating a full mediating effect of the enablers of green organisational culture on the relationship between GHRM and environmental performance. Because the effect of all factors is significant, the direct, indirect and total effect can be estimated using AMOS software (see results in Table 11),

Table 11 Direct, Indirect and Total Effect of Model

Outcome	Input	Standardised Estimates		
		Direct	Indirect	Total
EGC	GHRM	0.82	0	0.82
EP	GHRM	0.525	0.350	0.875
	EGC	0.389	0	0.389

5. Results and Discussion

Our study tested an original model that examines the relationship between GHRM practices, the enablers of green organisational culture and environmental performance using empirical data gathered from employees of Chinese manufacturing firms. The tested model has not been explored by any previously published work on the relation of GHRM and green organisational culture (for instance, Daily & Huang, 2002; Jabbour & Santos, 2008; Daily et al., 2012). The parameter estimates in Table 12 show that all path coefficients are significant ($p < 0.05$). The results reveal a significantly positive relationship between GHRM practices and environmental performance (EP) (H1), as well as a similarly positive relationship between GHRM practices and the enablers of green organizational culture (EGC) (H2). Specifically, the results suggest

that the GHRM practices of recruitment, selection, training, performance assessment and reward play a positive role in the development of the enablers of a green organisational culture.

Moreover, we found a positive relationship between the enablers of green organisational culture and environmental performance (H3). Therefore, our findings reinforce Harris and Crane’s (2002) assertion that the enablers of green organisational culture can positively influence the performance of firms pursuing environmental objectives (Harris & Crane, 2002) (See Table 12).

Table 12: Hypotheses results

Hypotheses	Path			Standardized Coefficient	P	Result
H1	GHRM	————→	EP	0.31	***	Supported
H2	GHRM	————→	EGC	0.82	***	Supported
H3	EGC	————→	EP	0.54	***	Supported
H4	GHRM	————→ EGC ———→	EP	0.82-0.54	***	Supported

***Significant at 0.001

Importantly, our data indicates that there is a full mediation effect for the enablers of green organisational culture on the relationship between GHRM and environmental performance. In a recent study by Arda et al. (2018), the authors determined that quality performance and environmental proactivity mediate the relationship between environmental management and firm performance. Our findings build on this work by indicating that companies implementing environmental management programs need to consider the critical role of pro-environmental leadership emphasis, credible environmental messaging, peer involvement and employee empowerment. Without a consideration of these factors, firms may find they have robust environmental management systems, without an environmentally conscious workforce to support its implementation. We therefore suggest that scholars examining the relationship between GHRM and environmental performance, consider the enablers of green organizational culture in their analysis.

6. Contribution, Limitations and Future Directions

6.1 Theoretical Contribution

According to Corley and Gioia (2011), theory contribution requires a particular type of research result that is able to provide original insights into a phenomenon that is considered useful for improving organisations. In this context, our research provides original insights based on empirical data on the relation of GHRM and the enablers of green organisational culture. GHRM scholars have yet to identify the enablers of green organisational culture from an empirical perspective, and our study therefore makes an important contribution in this area.

To be specific, our research contributes to both classic HRM theory and the body of knowledge surrounding GHRM. In terms of HRM theory, our findings are aligned with classic HRM assumptions that human resources can improve firm performance (Becker & Gerhart, 1996; Bowen & Ostroff, 2004; Ferris et al., 1999; Guest, 2011), particularly when the focus of analysis is industrial and manufacturing sectors (Santos, 2000).

Additionally, our research suggests that a ‘green’ organisational culture – here assessed through four enablers – plays an important role in the relationship between human resources and a firm’s environmental performance. Specifically, we have found that enhancing a firm’s environmental performance requires pro-environmental HRM practices (Jackson et al., 2014), and that the enablers of green organisational culture positively mediate the GHRM – environmental performance relationship. The pro-environmental HRM practices of recruitment, training, assessment and incentivization were found to support the development of the enablers of green organizational culture (leadership emphasis, message credibility, peer involvement and employee empowerment). Our data suggests that these enablers encourage employees to proactively reduce waste, consume fewer resources, develop recycling programs and, in doing so, improve the firm’s environmental performance.

To our knowledge, our paper is the first to consider green organisational culture as mediating the relationship between green HRM practices and environmental performance. Consequently our research, even though focused on green issues, is aligned to broader assumptions in HRM theory, which affirms that enablers of organisational culture can impact the relationship between HRM practices and firm performance (see Chow, 2012; Ngo & Loi, 2008; Wei, Liu, & Herndon, 2011).

6.2 Managerial Implications and Implications for Teaching Green Organisational Culture

Our study has significant implications for both managers as well as scholars responsible for teaching green organisational culture to the next generation of responsible managers. In terms of managerial implications, this research can aid managers in their efforts to motivate employees to implement pro-environmental initiatives in their daily roles. Our findings indicate that human resource managers can use pro-environmental recruitment, training, assessment and incentivization to develop the enablers of green organisational culture. Hiring environmentally conscious employees and then establishing a consistent, effective training and measurement system promotes environmental awareness across the various functions of the firm. These activities ensure that environmental awareness is embedded in the behaviours and habits of employees. And, over time these behaviours become habits that can shape a pro-environmental organizational culture (Schein, 1992). In turn, this culture reinforces employee efforts to implement environmentally responsible initiatives to improve their company's environmental performance. We therefore suggest that managers should not only consider green HRM initiatives in driving environmental performance improvements, but also the significant role that organizational culture plays in the sustainable development of their company.

Within the subject of green management, teaching green organisational culture to the next generation of responsible managers can be a challenge, as there is a lack of empirical

evidence, best practices, and must-know guidelines that students can use. This is because most of the literature on GHRM portrays green organisational culture as an important topic, without offering a wide range of empirical evidence (such as survey research results, case studies). In this context, our paper can be useful for advancing the scholarship on green organisational management within business schools, as we offer and test a unique model based on empirical data collected from one of the most relevant economies of the contemporary world: China. We add details on the relation of GHRM and green culture, by unveiling enablers of green organizational culture. Scholars will be able to teach that key enablers of green organizational culture include leadership emphasis, message credibility, peer involvement, and employee empowerment. It will be possible to debate that these key enablers mediate the relation of GHRM and green organisational culture. This in-depth discussion can enrich teaching and learning on the topic. Consequently, academicians in charge of teaching green organisational culture can find in this work a rich source to be included in module outlines on green management, which is aligned with the education of next generations of more responsible managers (Marcus & Fremeth, 2009; Peoples, 2009).

6.3 Limitations and Future Directions

Admittedly, our study is not without its limitations. Although the research sample comprises more than 200 respondents, this sample remains limited when compared with the entire population of the Chinese manufacturing industry; the generalisability of the results may be limited to some extent because of the sample size.

Moreover, we recognize that our research measured green organisational culture through its enablers, rather than focusing on the constituents of organisational culture as per Schein (1992) and Jabbour and Santos (2008). Specifically, our study includes four behavioural attributes (leadership emphasis, message credibility, peer involvement, employee

empowerment) as the enablers of green organisational culture. As argued by Harris and Crane (2002), future studies would need to consider pro-environmental values and beliefs, as well as behaviours, to have a comprehensive picture of green organizational culture. Some values and beliefs worth considering in future studies are managerial perceptions of environmental initiatives (Harris & Crane, 2002); the institutionalization of green values (Post & Altma, 1994); and the congruence of managerial and employee beliefs concerning environmentalism (Hoffman, 1999; Welford, 1995). Also, the role played by green organisational culture in promoting voluntary green workplace behaviour (Kim et al., 2017; Pham et al., 2019) can be further explored. The challenge of studying organisational culture in sustainable development research has already been outlined in the literature (Dubey et al., 2017) and we call for further study in needed in this important area.

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