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# Effects of Green HRM and CEO ethical leadership on organizations' environmental performance

Effects of Green HRM and CEO ethical leadership

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## Abstract

**Purpose** – This study proposes and tests a model grounded in resource-based theory to describe how the formal rules embedded in an organization's green human resource management (GHRM) combine with informal cues communicated by members of the firm's upper echelon, including the CEO and members of the top management team (TMT), to affect a firm's environmental performance.

**Design/methodology/approach** – Multi-source data were collected from 240 human resource managers, chief financial officers and CEOs in 80 firms.

**Findings** – The results show that CEO ethical leadership moderates the positive relationship between GHRM and TMT green commitment, which in turn mediates the relationship between GHRM and firms' environmental performance.

**Originality/value** – The tested importance of CEO ethical leadership as an organizational condition that amplifies the effectiveness of strategically aligned HRM systems offers new theoretical insights to advance HRM scholarship.

**Keywords** Environmental sustainability, Green human resource management, Upper echelons, Resource-based theory, Ethical leadership

**Paper type** Research paper

## Introduction

With the growing awareness of how economic development is contributing to environmental degradation and climate change, concerns about long-term sustainability are raising new strategic issues for organizations and for society as a whole (Buysse and Verbeke, 2003; Marcus and Fremeth, 2009; York *et al.*, 2018). Environmental performance of firms has since become a possible source of competitive advantage as addressing environmental issues stimulates the development of new organizational capabilities such as organizational learning, stakeholder integration and innovation (Aragón-Correa and Sharma, 2003; Dixon-Fowler *et al.*, 2013; Ren and Jackson, 2020), as well as cost reduction or differentiation through more efficient use of natural resources (Pereira-Moliner *et al.*, 2015). As a relatively new phenomenon, the pursuit of improved environmental performance and long-term sustainability requires firms to invest in acquiring and orchestrating essential resources—both natural and human resources—to optimize their strategic value (Hart and Dowell, 2011; Jackson *et al.*, 2012; Taylor *et al.*, 2013).



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Against this backdrop, green human resource management (GHRM) has been increasingly promoted in the past decade as a proactive response that organizations can take to enhance environmental performance (e.g. Dumont *et al.*, 2017; Jackson and Seo, 2010; Guerci *et al.*, 2016; Renwick *et al.*, 2016; Taylor *et al.*, 2013). GHRM refers to a set of HRM practices that explicitly consider the firm's environmental goals (Ren *et al.*, 2018; Renwick *et al.*, 2013). Exemplar GHRM practices include leveraging employee engagement to reduce the firm's environmental pollution as practiced by the 3M company (Paul and Nilan, 2012), using measurable environmental performance indicators and training programs as practiced by German automobile companies (Wagner, 2011), and linking executive pay with pollution prevention strategies, as recommended as a means to achieve a firm's strategic objectives (Berrone and Gomez-Mejia, 2009). However, firms' progress in the environmental domain varies considerably (Bové *et al.*, 2017; Global Reporting Initiative, 2015). We seek to explain this variance by examining three internal firm resources: CEO ethical leadership, adoption of GHRM policies and practices, and the commitment of top management teams (TMTs) to addressing environmental concerns.

Research on GHRM presents new opportunities for the study of strategic HRM and business ethics in organizations. The assumption that GHRM is likely to promote and improve the environmental performance of firms has not been established empirically. Also, apart from a few studies that examine green training for environmental management (e.g. Jabbour *et al.*, 2010; Li *et al.*, 2012; Vidal-Salazar *et al.*, 2012), questions about when and how GHRM influences the implementation of firms' environmental strategies and performance have received limited attention. A particular challenge is that effective GHRM requires a high level of inter-functional coordination among senior leaders with very distinct areas of expertise and accountability (Ren *et al.*, 2018). However, the role of top-level leaders in the process has been underspecified not only in the GHRM literature, but also in the strategic HRM literature in general (Jackson *et al.*, 2014; Leroy *et al.*, 2018). The lack of theoretical and empirical inquiry constrains further development of the literature and risks rendering existing programs ineffective (Renwick *et al.*, 2016; Wagner, 2011).

In the pursuit of improved environmental performance, the adoption of GHRM practices alone is not necessarily sufficient to achieve competitive advantage. According to the resource-based theory (RBT) perspective, superior performance requires organizations to possess and effectively deploy unique bundles of strategic resources (Barney, 1991; Barney *et al.*, 2011). Mobilizing organizational members for intra-organizational and cross-functional integration to enhance environmental performance is generally recognized as the responsibility of those in high-level leadership positions such as the CEO and the TMT, often with only modest participation by human resource (HR) professionals (Cohen *et al.*, 2010). The CEO, who often serves as a champion of change efforts (Berry and Rondinelli, 1998), presents contextual cues that are of particular importance to the firm's stakeholders, including those who are sensitive to the moral aspects of the firm's activities (Brown *et al.*, 2005; Den Hartog, 2015). Among many stakeholders' moral concerns is the need to protect and conserve the natural environment upon which human life depends. Meanwhile, the TMT is arguably one of the firm's most important resources to be mobilized due to its positional power within the organizational hierarchy (Michalisin *et al.*, 2004) and the consequences that are likely to follow from its commitment to stated objectives (Ulrich, 1998). Consistent with the logic of RBT, the TMT's commitment to addressing environmental concerns, which we refer to green commitment, is not only valuable, but also rare, costly to imitate, and non-substitutable (e.g. Harvey *et al.*, 2013; Wiernik *et al.*, 2013).

In this study, we consider how an organization's top-level leaders—the CEO and TMT—can influence the extent to which GHRM contributes to the environmental performance of firms that is now becoming a new source of competitive advantage in light of growing societal concerns about sustainability challenges. Consistent with the RBT paradigm (Barney, 1991;

Peteraf, 1993; Wernerfelt, 1984), our conceptual model, shown in Figure 1, asserts that both GHRM and the ethical leadership of CEOs are valuable, firm-specific resources that are essential to ensuring TMT green commitment, which in turn contributes to superior environmental performance of firms.

As a firm-level study, we tested our model with data on 80 companies located in China collected from three sources in each company. Compared to some western countries, Chinese leaders were slow to acknowledge the science relating industrial activity to climate change. However, problems of air and water pollution are now widespread and impossible to ignore, so China has begun to promulgate policies to limit carbon emissions and protect the environment in other ways against damage caused by rapid development (Marquis *et al.*, 2015; Shuli, 2018).

The originality of this paper lies in examining the processes through which strategically tailored and aligned HRM systems combine with informal cues communicated through top-level leaders to produce the desired environmental outcomes. It has been well-established through research grounded in upper echelons theory that CEOs and TMT members can influence the financial performance of firms (Hambrick, 2007; Hambrick and Mason, 1984). Prescriptions for how to achieve organizational change very often include a mandate to ensure the “support” of these top-level managers. Yet our understanding of how leaders and HRM systems function together to influence strategically valued firm outcomes is limited (c.f. Jackson *et al.*, 2014). This limitation is further raised in a recent special issue edited by Leroy *et al.* (2018) who observed that although HRM and leadership share the goal of realizing organizations’ strategy, few studies consider how they co-determine commitment and performance in organizations. Our theoretically-enriched and research-informed findings therefore advance the literature at the intersection of strategic HRM, upper echelons theory and ethical leadership.

Although environmental regulations may constrain some aspects of business operations, they generally create a low floor and leave many opportunities for progressive firms to do more than is legally required. Indeed, some firms began addressing environmental concerns before government regulations made it mandatory, in response to pressure from other stakeholders. These firms with strong green policies reap benefits such as increased sales and brand recognition (Liu *et al.*, 2015; Wee and Quazi, 2005; Yang *et al.*, 2011). Therefore, our study offers both theoretical and practical implications for improving understandings of how ethical leadership and GHRM together can generate commitment to responsible business practices among top executives, thereby improving the environmental performance of firms.

## Theory and hypothesis development

### *Resource-based theory as an integrative theoretical perspective*

Although the field of GHRM, or strategic HRM in general, is not directly born from the resource-based theory of the firm (Peteraf, 1993; Wernerfelt, 1984), RBT is instrumental to the field’s development (Jackson *et al.*, 2014; Wright *et al.*, 2001). As a dominant theoretical paradigm in the strategic HRM literature, RBT shifts emphasis from external factors (e.g. industry position) to internal resources (e.g. leadership, knowledge, dynamic capability) in explaining competitive advantage, which brings legitimacy to HRM’s strategic value



**Figure 1.**  
Hypothesized  
theoretical model

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(Colbert, 2004; Saridakis *et al.*, 2017). A precept of GHRM is that environmental performance benefits organizations' competitiveness, for instance, through optimization of production processes, development of new products and services, cross-function integration, and organizational learning (Marcus and Fremeth, 2009; Porter and van der Linde, 1995), and thus has a natural affinity with RBT, and in particular the natural resource-based view of the firm (Hart, 1995). As Hart (1995) argues, early formulations of RBT ignore the importance of the natural environment, which can impose constraints on a firm's efforts to create unique opportunities to gain and maintain competitive advantage. Subsequently, elaboration of RBT has resulted in it now encompassing the full range of resources upon which businesses depend, including natural resources (Hart and Dowell, 2011) as well as human resources.

The central tenet of RBT draws attention to the contribution of internal organizational resources that are valuable, rare, inimitable and non-substitutable as sources of superior performance. Often applied in conjunction with other theoretical perspectives (e.g. the behavioral perspective, Schuler and Jackson, 1987), RBT serves as an integrating perspective for understanding *why* and *how* strategic HRM practices contribute to firm performance (Colbert, 2004). Current formulations argue that superior firm performance depends on both the availability of requisite resources and the effective orchestration of resources across different organizational levels and functions (Sirmon *et al.*, 2012). Managed well, a firm's resources can be used to create distinctive and advantageous capabilities (Christmann, 2000).

Despite the potential contribution of GHRM to the creation of competitive advantage and superior performance, the promotion of GHRM has almost always been predicated on the behavioral perspective of strategic HRM, which assumes that employers rely on their HRM systems as a means for communicating, eliciting, and sustaining desired role behaviors (Mossholder *et al.*, 2011; Schuler and Jackson, 1987; Snape and Redman, 2010). However, the realization of GHRM also requires investing resources in other organizational domains (Jabbour, 2015)—a challenge that goes beyond the traditional strategic HRM practices and is less understood. As recent reviews of the GHRM literature reveal, having established that GHRM practices are being adopted by some firms, additional research is needed to address the conditions and processes for realizing the potential strategic value of GHRM (Ren *et al.*, 2018; Renwick *et al.*, 2016). Next, we explain our rationale for asserting that the green commitment of a firm's TMT and the ethical leadership of its CEO are two valuable organizational resources that can contribute to realizing GHRM's strategic contributions.

#### *GHRM and TMT green commitment*

In the context of organizations, the commitment of employees is a strategic resource that encompasses a belief in the organization's activities, for commitment increases one's willingness to expend both in-role and extra-role effort (Kacmar *et al.*, 1999; Kehoe and Wright, 2013). The more specific concept of green commitment describes "a frame of mind denoting both a sense of attachment and responsibility to environmental concerns in the workplace" (Raineri and Paille, 2016, p. 133). In this study, we use the term TMT green commitment to refer to the extent to which a firm's senior executives are perceived as sincere stewards of the natural environment. Given that these executives are responsible for mobilizing firm resources (Chadwick *et al.*, 2015; Teece, 2007), their commitment is needed to achieve a firm's strategic objectives.

HRM systems have been shown to influence favorable employee attitudes such as commitment, although studies of the relationship between HRM and commitment seldom focus on TMTs (Jiang *et al.*, 2012). Nevertheless, several lines of argument support our expectation of a positive relationship between the adoption of GHRM systems and TMT green commitment. First, a GHRM system communicates the vision, values and goals that reflect the strategic importance of superior environmental performance; examples include

using environmental attitudes and skills as criteria in staffing, requiring environmental training, rewarding employees for achieving environmental goals, and engaging employees in the search for more sustainable ways of working. As a system, practices such as these are designed to ensure that members of a firm's workforce have the abilities required to make decisions and take actions that are environmentally friendly, feel motivated to exert effort to achieve environmental performance goals, and have sufficient opportunities to contribute to the firm's environmental agenda. Assuming that a firm's strategically aligned HRM system targets all employees in the organization, GHRM systems should be as influential in shaping the green commitment of TMT members as are other types of strategic HRM systems in shaping the commitment of lower-level employees (Jackson *et al.*, 2014).

Second, adopting GHRM can facilitate information sharing through which top-level managers are informed of the larger picture of work processes, which may facilitate their involvement (Lee *et al.*, 2016). Research shows that managers are motivated by a sense of responsibility and importance (Gong *et al.*, 2009), both of which are heightened by strategically-aligned HRM systems. For the aspirations inherent in GHRM systems to be realized, firms rely on managers who are committed to and passionate about environmental issues to effectively implement GHRM. In addition to the motivational consequences of information sharing within the TMT are the behavioral consequences. Information sharing facilitates behavioral integration among top-level leaders, and such integration has been shown to be associated with positive organizational performance (e.g. Lubatkin *et al.*, 2006).

Finally, prior studies have shown that managers develop commitment to the firm and its objectives to the extent the firm allows them to express personal values and address personal concerns (Allen *et al.*, 2003; Meyer and Allen, 1997). GHRM can promote a sense of personal meaning and value-consistent work identity through practices such as creating a learning climate for green awareness and incorporating benefits to reward green behaviors (Wagner, 2013). Such practices provide top-level executives with an opportunity to realize their own environmental goals through self-expression and/or by influencing the behavior of other employees. Following social exchange theory, executives who experience benefits in the form of an enhanced sense of involvement and importance should be more likely to maintain balance in their employment relationship by reciprocating positive attitudes (Hannah and Iverson, 2004). Commitment is a primary example of positive attitudes because it denotes greater investment in line with organizational goals (Kehoe and Collins, 2017), such as achieving environmental sustainability. Taken together, the above arguments lead to the following hypothesis:

*H1a.* GHRM is positively associated with TMT green commitment.

#### *TMT green commitment and environmental performance*

Research at the intersection of HRM and environmental management has sought to reveal "black box" processes that can help explain how GHRM improves environmental performance (e.g. Paillé *et al.*, 2014), and we propose TMT green commitment as central to such processes. Commitment in general has been well established as a contributor to both individual job performance and organizational performance (e.g. Jaramillo *et al.*, 2005; Macedo *et al.*, 2016; Riketta, 2002; Wright and Bonett, 2002). The more specific concept of TMT green commitment should influence a firm's environmental performance for two main reasons.

First, TMT green commitment can improve how well the firm coordinates environmental management activities across functional and firm boundaries (cf., Teixeira *et al.*, 2016). When the TMT demonstrates commitment to the firm's environmental goals, it is less likely that GHRM policies are perceived as insincere "greenwashing" that can be safely ignored. Consistent with our argument, Chun *et al.* (2011) found that collective organizational

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commitment is a meaningful intervening mechanism that connects corporate ethics to a firm's financial performance. Conversely, when the behaviors of executives seem to betray their stated intentions and policies, their employees are more likely to feel cynical (Andersson and Bateman, 1997; DeCelles *et al.*, 2012).

Second, TMT green commitment may increase the ability of TMT members to gain commitment from other stakeholders in their organization. For example, a survey of 241 environmental professionals describing their attempts to gain the buy-in of purchasing managers, operations managers, industrial engineers and others for environmental projects found that intra-organizational commitment is positively associated with influence tactics and project payback (Gattiker and Carter, 2010). For those employees whose commitment is engendered, research shows that their pro-environmental attitudes, similar to the concept of green commitment, are positively associated with pro-environmental behaviors (e.g. Bamberg and Möser, 2007; Bissing-Olson *et al.*, 2013), which can aggregate to firm performance. Thus, we propose the following hypotheses:

- H1b. TMT green commitment is positively associated with the environmental performance of firms.
- H1c. TMT green commitment mediates the relationship between GHRM and firm environmental performance.

#### *The moderating role of CEO ethical leadership*

A basic tenet of the strategic HRM perspective is that HRM systems are most effective when they are aligned with other aspects of the organization's internal environment (Delery and Doty, 1996; Schuler and Jackson, 1987). Misalignment can occur for various reasons, such as the pursuit of new business strategies, simply imitating what other organizations do, and changes in leadership. When HRM systems are aligned with other elements of the organization, they tend to be more effective. In particular, several studies have found that HRM systems are more effective when they are aligned with an organization's culture (Jackson *et al.*, 2014). Although senior leaders are generally recognized as influential shapers of organizational cultures (Schneider *et al.*, 2017), few studies have specifically examined how leaders contribute to or constrain the effectiveness of strategically aligned HRM systems. Despite increasing concerns about the ethical position of modern businesses due to various scandals and systemic social problems, we found no studies that looked at the joint influences of HRM and ethical leadership or ethical organizational climate or culture. It is likely this state of affairs will begin to change soon; if so, this study will be at the forefront of a new field of inquiry.

Consistent with the contingency logic described above, we assume that the influence of a GHRM system on the commitment of a firm's high-level managers is likely to be conditioned by contextual influences that either reinforce or negate the performance expectations and demands that GHRM purportedly targets. Following recent calls for further investigation of relevant boundary conditions (e.g. Jiang *et al.*, 2013) and consistent with emerging evidence that leadership is one important element to take into account (Chuang *et al.*, 2016), we investigate CEO ethical leadership as a potential moderator of the GHRM-TMT green commitment relationship.

The resource orchestration tenet of the RBT perspective suggests that the CEO is a conductor who facilitates the integration of managerial efforts (Teece, 2007). Indeed, top executives—including CEOs—have long been portrayed as influential in organizational outcomes (e.g. upper echelons theory, Hambrick and Mason, 1984), but their role in promoting and achieving environmental performance objectives has not yet been closely examined and is poorly understood. We argue that CEOs who demonstrate ethical leadership help to

strengthen the expected positive relationship between GRHM and TMT green commitment. Because the personal values of ethical CEOs would be consistent with their firm's GHRM policies, ethical leaders are more likely to explore and to strive to exploit proactive environmental strategies that contribute to financial performance while also recognizing that GHRM policies can be helpful for implementing such strategies (cf., King and Lenox, 2002; Sharma and Vredenburg, 1998).

Ethical leadership has been defined as "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two-way communication, reinforcement, and decision-making" (Brown *et al.*, 2005, p. 120). Implicit in this definition is the idea that perceptions of a leader's own behavior and interactions with followers are the basis for judging a CEO's ethical leadership. That is, CEO ethical leadership is a higher-level construct that encompasses perceptions such as integrity, fairness and responsibility (Eisenbeiss *et al.*, 2015). The integrity component of ethical leadership encompasses the expectation of consistency between a firm's espoused values and its formal policies. The responsibility component of CEO ethical leadership values a firm's sustainable relationship with its stakeholders, including the wider community (Eisenbeiss *et al.*, 2015), which depends on a healthy natural environment for its development and growth and for its citizens' personal health and quality of life.

Due to a CEO's formal position in the organizational hierarchy, the influence of CEOs who are perceived as ethical leaders goes beyond that explained by legitimate power; ethical leadership can also imbue CEOs with referent power for they are desirable role models who followers look to for guidance (Brown and Treviño, 2006). By observing a CEO's behavior, which is a particularly salient social cue, members of the TMT learn socially acceptable workplace behaviors and are more likely to engage in similar behaviors in order to fit in and/or strengthen their relationship with the CEO (c.f., Brett and Stroh, 2003; Lavelle, 2010). Based on the above theoretical reasoning, we propose the following:

- H2. CEO ethical leadership positively moderates the relationship between GHRM and TMT green commitment, such that the relationship is stronger when CEO ethical leadership is higher (vs lower).
- H3. CEO ethical leadership positively moderates the positive indirect relationship of GHRM with environmental performance via TMT green commitment, such that the indirect relationship is stronger when CEO ethical leadership is higher (vs lower).

## Methods

### *Sample and procedure*

Our sample comprised medical and pesticide-chemical firms, mostly small to medium-sized firms, located in northern areas of China where environmental activities to manage production pollution are a key concern. We surveyed participating companies by using three different surveys addressed to the firm's CEO, HR manager and CFO respectively. The data collection was undertaken in three rounds mainly using postage-paid envelopes. We followed commonly recognized research ethics for the responsible conduct of research in this process (Comstock, 2013). In all the invitation letters we sent to the CEOs, HR managers and CFOs, we included a plain language statement that explained the purpose of the study, the methods used to collect data and potential risks involved in participating in the study. This scope of information disclosure is important so participants were able to make an accurate assessment of the risks and benefits of the study before deciding to participate (DuBois, 2006). All participants were informed that participation was voluntary and their responses were confidential.



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First, in early January 2019 we mailed the HR survey to the HR managers of the targeted firms ( $n = 172$ ) in the region, asking for their consent for data collection. The HR managers provided ratings to assess GHRM and CEO ethical leadership. Second, within one month of receiving the response from the HR managers, we mailed the CEO survey to the participating firms, asking CEOs to evaluate the green commitment of their TMT. Of 172 sets of questionnaires sent to HR managers and CEOs, we obtained useful responses from 96 firms. The response rate of 56% was comparable to or higher than that reported in prior firm-level studies in the strategic HRM literature (e.g. [Gong et al., 2009](#)). Third, in December 2019, we mailed out the CFO surveys to the 96 firms for whom we had data from the HR manager and CEO; of those 96 firms, we received 80 completed surveys from CFOs, who provided evaluations of the firm's environmental performance, yielding a response rate of 83.3% for the third round of data collection, and an overall response rate of 46.5%, which is comparable to prior studies of this kind (e.g. [Gong et al., 2009](#)).

### *Measures*

The original measures were written in English and translated into Chinese following the commonly-used back translation procedure ([Brislin, 1970](#)). We pre-tested the questionnaire with a small group of Chinese-speaking academics and HR managers ( $n = 12$ ) and modified items as needed to ensure clarity. All responses were made using a 5-point Likert-scale (1 = "strongly disagree" to 5 = "strongly agree") unless indicated otherwise.

*Environmental performance.* CFOs rated their firms' environmental performance using a 4-item scale adapted from [Chen et al. \(2015\)](#). CFOs are an appropriate source of data because environmental reporting with third-party audits is rare in China and publicly available performance data are often inaccurate in China ([Gong et al., 2009](#)). Sample items included "our firm limits environmental impact beyond regulatory compliance" and "our firm prevents and mitigates environmental crises". The Cronbach's reliability was 0.89.

*Green human resource management.* HR managers provided ratings of GHRM using 13 items developed by [Tang et al. \(2018\)](#). At the time of this study, [Tang et al.'s](#) GHRM measure was the only psychometrically sound one of its kind for assessing GHRM in the Chinese context using an integrated approach to assess a comprehensive array of practices, including green recruitment and selection, green training, green performance management, green compensation and green involvement. For this study, we did not assess green involvement, as our pilot-test interviews with HR managers indicated that employee involvement was very uncommon in these companies. Sample items included "we use green performance indicators in our performance management system and appraisals" and "we develop training programs in environmental management to increase environmental awareness, skills and expertise". The Cronbach's reliability was 0.96.

*TMT green commitment.* CEO-rated TMT green commitment was assessed using a 7-item scale developed by [Raineri and Paillé \(2016\)](#). Sample items included "the top management team really cares about the environmental concern of our firm" and "the top management team strongly values the environmental efforts of our firm". The Cronbach's reliability was 0.92.

*CEO ethical leadership.* HR managers rated CEO ethical leadership using the 10 items developed by [Brown et al. \(2005\)](#). They provide a valuable, yet often overlooked, perspective to evaluate CEO ethical leadership, which is critical to strategic decision making and boundary spanning within organizations ([DeChurch et al., 2010](#)). Sample items included "the CEO defines success not just by results but also by the way that they are obtained" and "when making decisions, the CEO asks 'what is the right thing to do'". The Cronbach's reliability was 0.96.

*Control variables.* Several firm-level variables were included in our analyses to control for their influence on green-related outcomes. First, we controlled for the industry (0 = medical

firms; 1 = pesticide-chemical firms) because it might influence the specific institutional environment where GHRM is undertaken (Ahuja *et al.*, 2018; Ren *et al.*, 2018). Second, we controlled for firm size (measured as the number of employees at the time of the study) and firm age (measured as the number of years the firm had existed prior to the study), which have been found to be correlated with environmental outcomes (e.g. Chen *et al.*, 2015; Paillé *et al.*, 2014; Stanwick and Stanwick, 1998). Third, we controlled for the CEO's age (0: 25–35 years old, 1: 36–45 years old, 2: 46–55 years old; and 3: 56 and above) and gender (0: male; 1: female), as some evidence suggests that these demographic characteristics may be associated with environmental attitudes and behaviors (e.g. Klein, D'Mello and Wiernik, 2012; Raineri and Paillé, 2016). For this same reason, we controlled for the average age of TMT members and the TMT's gender ratio (the percentage of males) using data provided by the HR managers and based on the firm's personnel records. Finally, we controlled for firm-level corporate social responsibility (CSR) to investigate whether GHRM explained additional variance in environmental performance beyond that explained by CSR. CSR was measured using a 5-item scale developed by Lichtenstein *et al.* (2004) (Cronbach's reliability = 0.83), which was completed by the HR managers. A sample item included "our firm gives back to the communities in which it does business".

### *Analytical strategy*

We tested the proposed model using the SPSS PROCESS macro version 3.0 developed by Hayes (2013), which is capable of simultaneously estimating direct and indirect effects in a single mediator model. Bootstrapping based on 5,000 bootstrap samples was used to determine statistical significance and confidence intervals for moderated mediation effects.

## **Results**

### *Descriptive statistics*

Table 1 summarizes the descriptive statistics for the study variables. As can be seen, GHRM is positively and significantly correlated with TMT green commitment (0.39,  $p < 0.01$ ). Also as expected, TMT green commitment is positively and significantly correlated with environmental performance (0.43,  $p < 0.01$ ).

### *Confirmatory factor analysis*

Prior to conducting tests of our hypotheses, we examined the psychometric quality of the measures, with results presented in Table 2. Correlations among the primary variables of interest were all below 0.60 and the variance inflation factors ranged between 1.19 and 1.50, suggesting that multicollinearity did not contaminate findings. The loadings of all items are above 0.58, higher than the acceptable minimum threshold of 0.50 and significant at  $p < 0.01$ , providing evidence of convergent validity for the constructs under consideration. Confirmatory factor analysis with GHRM, TMT green commitment, CEO ethical leadership and environmental performance yielded four factors, with each item loaded to its respective construct and the first factor accounting for 37.64% of the total variance. The average variance extracted (AVE) ranged from 0.68 (TMT green commitment), to 0.73 (GHRM) and 0.77 (environmental performance, CEO ethical leadership), the square roots of which were larger than the correlations amongst these constructs. The findings further support the discriminant validity of all constructs.

### *Test of hypotheses and research model*

Hypothesis 1 (a, b and c) addresses the relationship between GHRM and environmental performance via the mediating role of TMT green commitment. As shown in Table 3, results

**Table 1.**  
Descriptive statistics,  
reliability estimates,  
and study variable  
intercorrelations

| Variable                     | Mean                | S.D    | 1        | 2       | 3       | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 11   | 12   |
|------------------------------|---------------------|--------|----------|---------|---------|--------|--------|--------|--------|--------|--------|--------|------|------|
| 1. Firm industry             | 0.55 <sup>a</sup>   | 0.50   | n.a.     |         |         |        |        |        |        |        |        |        |      |      |
| 2. Firm size                 | 139.66 <sup>b</sup> | 102.58 | 0.37**   | n.a.    |         |        |        |        |        |        |        |        |      |      |
| 3. Firm age                  | 11.99               | 7.57   | 0.24*    | -0.22*  | n.a.    |        |        |        |        |        |        |        |      |      |
| 4. CEO age                   | 2.50 <sup>c</sup>   | 0.94   | -0.35*** | -0.32** | 0.35**  | n.a.   |        |        |        |        |        |        |      |      |
| 5. CEO gender                | 0.75 <sup>d</sup>   | 0.44   | 0.06     | -0.44** | 0.05    | 0.62** | n.a.   |        |        |        |        |        |      |      |
| 6. TMT average age           | 1.78 <sup>e</sup>   | 0.60   | -0.52**  | -0.44** | 0.05    | 0.62** | 0.10   | n.a.   |        |        |        |        |      |      |
| 7. TMT gender ratio          | 0.58 <sup>f</sup>   | 0.23   | 0.16     | 0.12    | -0.23*  | -0.10  | 0.14   | 0.22*  | n.a.   |        |        |        |      |      |
| 8. CSR                       | 3.39                | 0.67   | 0.07     | 0.18    | -0.02   | -0.13  | 0.32** | -0.03  | 0.27*  | 0.83   |        |        |      |      |
| 9. Environmental performance | 3.90                | 0.72   | -0.06    | 0.17    | -0.24*  | -0.21  | 0.06   | -0.25* | 0.32** | 0.18   | 0.89   |        |      |      |
| 10. TMT green commitment     | 3.71                | 0.77   | -0.08    | -0.04   | -0.07   | -0.12  | -0.11  | 0.05   | 0.24*  | 0.24*  | 0.43** | 0.92   |      |      |
| 11. CEO ethical leadership   | 4.00                | 0.60   | -0.02    | 0.10    | -0.37** | -0.25* | 0.14   | -0.07  | 0.22   | 0.39** | 0.35** | 0.47** | 0.96 |      |
| 12. GHRM                     | 3.32                | 0.66   | 0.02     | 0.32**  | 0.28*   | 0.23*  | 0.13   | 0.29** | 0.31** | 0.22*  | 0.17   | 0.39** | 0.14 | 0.96 |

**Note(s):**  $N = 80$ . \*\* $p < 0.01$  (two-tailed); \* $p < 0.05$  (two-tailed); n.a. = not applicable; Cronbach's alphas are shown on the diagonal in italic;  
CEO: Chief Executive Officer; CSR: Corporate social responsibility; GHRM: green human resource management;  
<sup>a</sup> Firm industry was coded as 0 = medical firms; 1 = pesticide-chemical firms;  
<sup>b</sup> Firm size was coded as the number of employees;  
<sup>c</sup> CEO age was coded using three categories. The mean of 2.50 indicates an average age for CEOs of approximately 50 years;  
<sup>d</sup> CEO gender was coded as 0 = male and 1 = female;  
<sup>e</sup> The age of top management team members was coded using three categories. The mean of 1.78 indicates an average TMT member age of approximately 47 years;  
<sup>f</sup> TMT gender ratio was measured as the percentage of males

| Measurement   | Standardized factor loading | CR   | AVE  | Effects of Green HRM and CEO ethical leadership |
|---|-----------------------------|------|------|---|
| Environmental performance: skewness: $-0.241$ , se = 0.269; kurtosis: $-1.134$ , se = 0.532   |                             |      |      |   |
| Item 1: Complying with environmental regulations  | 0.863                       | 0.93 | 0.77 |   |
| Item 2: Preventing and mitigating environmental crises  | 0.885                       |      |      |   |
| Item 3: Limiting environmental impact beyond regulatory compliance  | 0.897                       |      |      |   |
| Item 4: Educating employees and the public about the environment  | 0.842                       |      |      |   |
| CEO ethical leadership: skewness: $-0.165$ , se = 0.269; kurtosis: $-0.866$ , se = 0.532  |                             | 0.96 | 0.77 |   |
| Item 1: Conducts personal life in an ethical manner   | 0.899                       |      |      |   |
| Item 2: Defines success not just by results but also the way that they are obtained   | 0.879                       |      |      |   |
| Item 3: Listens to what employees have to say   | 0.842                       |      |      |   |
| Item 4: Disciplines employees who violate ethical standards   | 0.925                       |      |      |   |
| Item 5: Makes fair and balanced decisions   | 0.863                       |      |      |   |
| Item 6: Can be trusted  | 0.903                       |      |      |   |
| Item 7: Discusses business ethics or values with employees  | 0.883                       |      |      |   |
| Item 8: Sets an example of how to do things the right way in terms of ethics  | 0.924                       |      |      |   |
| Item 9: Has the best interests of employees in mind   | 0.893                       |      |      |   |
| Item 10: When making decisions, asks "what is the right thing to do?"   | 0.738                       |      |      |   |
| TMT green commitment: skewness: $-0.806$ , se = 0.269; kurtosis: $-0.083$ , se = 0.532  |                             | 0.92 | 0.68 |   |
| Item 1: I would feel guilty about not supporting the environmental efforts of my company  | 0.793                       |      |      |   |
| Item 2: The environmental concern of my company means a lot to me   | 0.798                       |      |      |   |
| Item 3: I feel a sense of duty to support the environmental efforts of my company   | 0.784                       |      |      |   |
| Item 4: I really feel as if my company's environmental problems are my own  | 0.911                       |      |      |   |
| Item 5: I feel personally attached to the environmental concern of my company   | 0.847                       |      |      |   |
| Item 6: I feel an obligation to support the environmental efforts of my company   | 0.854                       |      |      |   |
| Item 7: I strongly value the environmental efforts of my company  | 0.804                       |      |      |   |
| GHRM: skewness: $-0.153$ , se = 0.269; kurtosis: $-0.308$ , se = 0.532  |                             | 0.96 | 0.73 |   |
| Item 1: Attracting green job candidates who use green criteria to select organizations  | 0.884                       |      |      |   |
| Item 2: Using green employer branding to attract green employees  | 0.949                       |      |      |   |
| Item 3: Recruiting employees who have green awareness   | 0.925                       |      |      |   |
| Item 4: Developing training programs in environment management to increase environmental awareness, skills and expertise of employees | 0.840                       |      |      |   |
| Item 5: Integrating training to create the emotional involvement of employees in environment management                               | 0.854                       |      |      |   |
| Item 6: Having green knowledge management (linking environmental education and knowledge to behaviors)                                | 0.838                       |      |      |   |
| Item 7: Using green performance indicators in performance management system and appraisals  | 0.714                       |      |      |   |
| Item 8: Setting green targets, goals and responsibilities for managers and employees  | 0.794                       |      |      |   |
| Item 9: Setting objectives on achieving green outcomes included in appraisals   | 0.928                       |      |      |   |

**Table 2.** Discriminant validity  
(continued)

| Measurement   | Standardized factor loading | CR | AVE |
|---|-----------------------------|----|-----|
| Item 10: Disincentives in the performance management system for non-compliance or not meeting environment management goals                              | 0.824                       |    |     |
| Item 11: Making green benefits (transport/travel) available   | 0.863                       |    |     |
| Item 12: Financial or tax incentives for green behavior (bicycle loans, use of less polluting cars)   | 0.853                       |    |     |
| Item 13: Having recognition-based rewards in environment management for staff (public recognition, awards, paid vacations, time off, gift certificates) | 0.748                       |    |     |

Table 2.

|                               | TMT green commitment |      |                | Environmental performance |       |                |
|-------------------------------|----------------------|------|----------------|---------------------------|-------|----------------|
|                               | <i>B</i>             | S.E. | 95% CI         | <i>B</i>                  | S.E.  | <i>p</i>       |
| <i>Controls</i>               |                      |      |                |                           |       |                |
| Firm industry                 | -0.18                | 0.16 | [-0.50, 0.14]  | -0.37*                    | 0.17  | [-0.70, -0.03] |
| Firm size                     | -0.01**              | 0.01 | [-0.02, -0.01] | -0.01                     | 0.001 | [-0.01, 0.01]  |
| Firm age                      | -0.02                | 0.01 | [-0.04, 0.01]  | -0.02*                    | 0.01  | [-0.05, -0.01] |
| CEO age                       | -0.18                | 0.10 | [-0.39, 0.02]  | 0.20                      | 0.11  | [-0.01, 0.42]  |
| CEO gender                    | -0.41*               | 0.18 | [-0.78, -0.04] | 0.35                      | 0.20  | [-0.04, 0.74]  |
| TMT average age               | -0.03                | 0.20 | [-0.44, 0.38]  | 0.20                      | 0.11  | [-0.01, 0.42]  |
| TMT gender ratio              | 0.01                 | 0.33 | [-0.64, 0.67]  | 1.10*                     | 0.33  | [0.44, 1.77]   |
| CSR                           | 0.14                 | 0.11 | [-0.08, 0.06]  | -0.04*                    | 0.11  | [-0.26, 0.17]  |
| <i>Main Effects</i>           |                      |      |                |                           |       |                |
| GHRM                          | 0.42**               | 0.14 | [0.14, 0.69]   | 0.26                      | 0.15  | [-0.04, 0.56]  |
| CEO ethical leadership        | 0.31*                | 0.33 | [0.41, 0.86]   |                           |       |                |
| TMT green commitment          |                      |      |                | 0.29**                    | 0.11  | [0.08, 0.50]   |
| <i>Interactions</i>           |                      |      |                |                           |       |                |
| CEO ethical leadership * GHRM | 1.32**               | 0.33 | [0.65, 1.99]   |                           |       |                |
| $R^2$                         | 0.56                 |      |                | 0.46                      |       |                |
| $F$                           | 7.83**               |      |                | 5.77**                    |       |                |

Table 3.

Parameter estimates for proposed model

Note(s):  $N = 80$ ;

\*\* $p < 0.01$  \*  $p < 0.05$ ;

CEO: Chief Executive Officer; CSR: Corporate social responsibility; GHRM: green human resource management

of the analysis indicated that GHRM was positively related to TMT green commitment:  $B = 0.42$ , s.e. = 0.14,  $p < 0.01$ , thereby supporting [H1a](#). TMT green commitment was, in turn, positively related to environmental performance:  $B = 0.29$ , s.e. = 0.11,  $p < 0.01$ , supporting [H1b](#). The indirect effect of GHRM on environmental performance was tested using a bias-corrected bootstrapping strategy based on 5,000 bootstrap samples:  $B = 0.20$ , s.e. = 0.11, 95% CI [0.04, 0.48]. The results well supported the hypothesized mediation relationship ([H1c](#)).

[Hypothesis 2](#) predicted CEO ethical leadership would positively moderate the relationship between GHRM and TMT green commitment. As shown in [Table 2](#), the GHRM  $\times$  CEO ethical leadership coefficient was positively and statistically significantly related to TMT green commitment ( $B = 1.32$ , s.e. = 0.33,  $p < 0.01$ ). The  $R^2$  change associated with this interaction term was 0.10, with  $F$  change of 15.49,  $p < 0.01$ . [Figure 2](#) provides a visual illustration of this interaction. For firms whose CEO demonstrated a higher level of ethical leadership, the positive relationship of GHRM with TMT green commitment was stronger (simple slope = 1.74,  $p < 0.01$ ) compared to firms whose CEOs demonstrated a lower level of ethical leadership (simple slope = -0.90,  $p < 0.05$ ). These findings supported [Hypothesis 2](#).

**Hypothesis 3**, which proposes a moderated mediation model, was also supported, with the index of moderated mediation positive and statistically significant: 0.38, s.e. = 0.16, 95% CI [0.08, 0.72]. At a low level of CEO ethical leadership (−0.59), the indirect effect was −0.11, s.e. = 0.13, 95% CI [−0.30, 0.22]. When the level of CEO ethical leadership was zero, the indirect effect was 0.12, s.e. = 0.10, 95% CI [0.01, 0.40]. At a high level of CEO ethical leadership (0.59), the indirect effect was 0.59, s.e. = 0.35, 95% CI [0.09, 0.69].

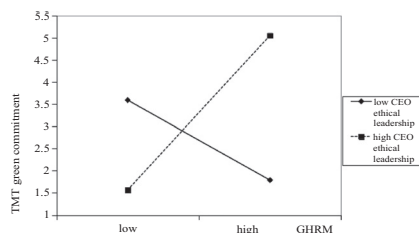
*Supplementary analyses*

Research cautions that the results of moderated regression may be spurious and mask a non-linear relationship between predictors and criterion variables (Shepperd, 1991). We therefore examined this possibility by including the squared terms of the two predictors (i.e. GHRM, CEO ethical leadership) as additional control variables in the overall model. After controlling for their non-linear effects, the interaction term of GHRM and CEO ethical leadership remained statistically significant ( $B = 1.53$ , s.e. = 0.32,  $p < 0.01$ ), suggesting that the observed interaction effect was not spurious. Of the non-linear effects of GHRM and CEO ethical leadership, the quadratic term of GHRM was significantly and negatively associated with TMT green commitment ( $B = -0.64$ , s.e. = 0.15,  $p < 0.01$ ), suggesting that GHRM may be associated with TMT green commitment up to a point after which its positive influence slows.

**Discussion and conclusion**

In an era when governments and consumers recognize that business activities can and do cause lasting environmental damage, business leaders are being pressured to accept more responsibility for protecting and even renewing the Earth’s finite and depleted natural resources. Increasingly, environmentally responsible business practices are recognized as consistent with achieving competitive advantage as well as society’s moral values (Bansal and Song, 2017; Marcus and Fremeth, 2009). The aim of this study was to examine the combined influences of GHRM, CEO ethical leadership and TMT green commitment on the environmental performance of firms. Responding to calls for research that advances the theoretical development of GHRM (e.g. Jackson and Seo, 2010; Marquis et al., 2015; Ren et al., 2018; Renwick et al., 2013; Renwick et al., 2016). It provides an empirical test of RBT and expands the domain of outcomes associated with the field of strategic HRM to include environmentally responsible business operations and practices. An enhanced understanding of the role of ethical leadership as a condition that potentially influences both TMT green commitment and the GHRM–environmental performance relationship has practical implications for organizations seeking to maximize the benefits of GHRM in the realization of environmental goals.

Our analysis of survey responses from 240 CEOs, HR managers and CFOs in 80 Chinese companies found support for the model shown in Figure 1. The results indicate that both ethical leadership and GHRM are positively associated with TMT green commitment, which in turn is positively related to the environmental performance of firms. Importantly, CEO



**Figure 2.** The moderating role of CEO ethical leadership on the GHRM–TMT green commitment relationship

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ethical leadership appears to set the stage for the effectiveness of GHRM systems. In firms with CEOs who display ethical leadership, the relationship between GHRM and the green commitment of TMT members is distinctly positive. However, in firms with CEOs who display weak ethical leadership, the relationship between GHRM and TMT green commitment is negative, suggesting that the combination of formal policies to promote environmental stewardship and informal cues from unethical leaders may generate cynicism and perhaps encourage behavior that is harmful to the environment.

Before discussing the implication of these findings, we acknowledge that the insights from this study must be considered preliminary and interpreted with caution. Although the multi-source and lagged data collection procedures help mitigate against some methodological concerns, they also make collecting data somewhat difficult. Thus, one limitation of our study is the somewhat small sample size, which provides marginally adequate power for our analysis (Bauer and Curran, 2005). A larger sample would increase confidence that the results are valid and generalizable to other firms. Also, although we collected data in two distinct industries, additional research conducted in firms drawn from a more heterogeneous mix of institutional settings is needed before drawing definitive conclusions from our results (Bruton and Lau, 2008). Another limitation relates to the essentially cross-sectional nature of the research design, which means we cannot demonstrate causality; other possible causal models are plausible so additional research is needed to understand the complex and dynamic relationships between CEO ethical leadership, GHRM and TMT green commitment as precursors to improved environmental performance. Also, because objective environmental performance data are generally unavailable for Chinese firms, we relied on the reports of CFOs, which may be upwardly biased; if the amount of true variability in firms' environmental performance was under-estimated, it would likely reduce our ability to find the predicted relationships. Despite such limitations, our results offer evidence that is sufficient to suggest some intriguing ideas for further development, as we discuss next.

#### *Contributions and implications*

Our study contributes to the literature in several ways. First, it enriches the theorization of GHRM research, which so far remains undertheorized (Ren *et al.*, 2018), by introducing RBT to develop our research model. By so doing, this study responds to repeated calls for research that integrates strategic HRM and environmental sustainability (e.g. Dubois and Dubois, 2012; Jackson and Seo, 2010; Jackson *et al.*, 2011; Renwick, 2018; Renwick *et al.*, 2013), while also responds to calls for extending beyond the behavioral perspective of strategic HRM to explain the influences of GHRM (Ren and Jackson, 2020; Ren *et al.*, 2018). While the dominant behavioral perspective in the current GHRM literature is helpful to understand employees' abilities, motivations and opportunities, it is insufficient to fully uncover the internal workings of an organization towards strategic pursuit of superior environmental performance. RBT provides an explanatory logic, alternative to the behavioral perspective, to unravel the relationships among various internal resources. Drawing from RBT also acknowledges the contribution of environmental performance to a firm's competitiveness that has long been advocated (e.g. Marcus and Fremeth, 2009; Porter and van der Linde, 1995). Our results show the importance of two valuable organizational resources in the realization of GHRM's contribution to a firm's environmental performance: the ethical leadership of CEOs and the green commitment of TMTs. This contribution is important considering that prior GHRM studies have focused primarily on the existence of green elements in HRM practices or descriptive correlations between specific HR practices and environmental management systems (e.g. Harvey *et al.*, 2013; Jabbour *et al.*, 2010; Wagner, 2011).

Second, this study advances the GHRM literature by considering the role of top-level leaders in the process of eliciting the influences of HRM. While both HRM and leadership aim to influence employees towards organizations' strategic goals, the two fields have developed largely separately until recently. In the special issue targeted at integrating the study of HRM and leadership (Leroy *et al.*, 2018), work is under way to conceptualize the leadership role of line managers in the implementation of HRM practices. Our work shows another important source of leadership influence, i.e. from the CEOs at the top, which is even less understood. Indeed, just as leadership scholars have begun to consider how HRM practices such as selection, training and development might influence ethical leadership (Brown *et al.*, 2005), strategic HRM scholars have argued that the support of CEOs and other leaders is essential for unlocking value from HRM systems (e.g. Jiang *et al.*, 2012; Wang *et al.*, 2011). Our finding that GHRM and CEO ethical leadership interact to enhance TMT green commitment and firm environmental performance shows a supplementary fit – when HRM and top leaders are aligned in their underlying values, the effects will be optimal (c.f. Leroy *et al.*, 2018). More fine-grained analyses of leadership and other organizational contingencies are needed to improve our understanding of the conditions that can attenuate or augment the effects of formal HRM systems (Chuang *et al.*, 2016). Conversely, future research at the intersection of strategic HRM and leadership may also improve our understanding of how transformational leadership can be enacted through HRM systems (Zhu *et al.*, 2005).

Third, the study clarifies the underlying mechanism and boundary condition of the GHRM–environmental performance linkage, which is another under-developed area of GHRM (Ren *et al.*, 2018). The mediation role of TMT green commitment contributes to a growing body of evidence concerning the importance of affect and attitudes as mediators that determine whether the aims of HRM policies are realized. The essential role played by middle managers as co-creators and implementers of HRM policies is widely recognized (e.g. Jamali *et al.*, 2015; Ostroff and Bowen, 2000), however, there has been little systematic research of the inter-relationships between HRM policies and a firm's CEO and top-level executives, which our study addresses.

In addition, the “black-box” on top-level leaders' attitudes and behaviors revealed in our study extends previous research by Kim *et al.* (2017) on voluntary green workplace behavior, which found that employees' pro-environmental behavior is influenced by the moral attentiveness of team leaders and the green behavior of teammates. Although Kim *et al.* (2017) collected team-level data in Korean companies, the results of these two studies both point to the conclusion that (un)ethical leadership can be a major force that shapes the organizational context and provides cues that influence whether employees strive to contribute to environmental sustainability as they do their work. Furthermore, in contrast to the findings of Pitesa and Thau (2013), our results suggest that members of the TMT are as susceptible to the normative influence of (un)ethical leaders as employees at lower levels, like those studied by Kim *et al.* (2017).

Employees pay attention to the signals sent by the elements of a firm's formal management systems, including HRM systems, but they also attend closely to informal cues communicated through the attitudes and behavior of the CEO and other top-level executives. CEOs who are perceived as unethical and TMTs who seem to lack sincere commitment to addressing environmental concerns may negate the potential benefits that could otherwise be gained from formal policies intended to convey a pro-environment message (cf., Treviño *et al.*, 2014). If environmental metrics are used as performance goals and incentives are offered for attaining those goals, lower-level employees may engage in unethical behaviors to obtain the rewards offered if they believe their CEO and other executives are insincere when they make statements about the importance of protecting the environment; when leaders seem insincere, employees throughout the organization might think that gaming the system is a reasonable route to take, when possible (Gino *et al.*, 2009; Latham and Locke, 2006; Schweitzer *et al.*, 2004). It has been said that a fish rots from the head down. The same may be true of organizations. If so, investing in interventions aimed at improving the ethical behavior of lower-level



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employees may be useless or worse in organizations headed by unethical CEOs. On the other hand, our results suggest that HRM systems designed to improve environmentally responsible business practices can be very effective when complemented by ethical and committed leadership.

As we have acknowledged, the findings of our research should be interpreted cautiously. Likewise, it would be premature to recommend that specific practical actions be taken based simply on the results of this one study. However, there is now a growing body of evidence to suggest that the behavior and performance of employees are influenced jointly by informal social milieu created by organizational leaders and formal policies such as those comprising an HRM system. Thus, as citizens and governments continue to put pressure on businesses to operate responsibly, we encourage those recommending how to respond to also recognize the importance of aligning formal and informal messaging.

More specifically, for organizations that aspire to build competitive advantages through environmental stewardship, our results point to the value of CEOs who promote environmental objectives through ethical leadership and GHRM systems that garner the commitment of those responsible for driving the organization toward its strategic objectives. In the absence of supportive leadership, formal policies such as investing in environmental training, incorporating indicators of environmental management into TMT performance reviews, and recruiting and selecting executives with the relevant environmental knowledge and social values are unlikely to produce the desired results.

Last but not least, undertaking this study in China adds to the knowledge base of GHRM in the Asian context. Despite the urgency of transforming business models to address resource scarcity in Asia as the largest and most populous continent, research on how GHRM can contribute to environmental management in Asia is deficient (Memon *et al.*, 2019). The concept of environmental management is gradually gaining popularity (e.g. in China, Tang *et al.*, 2018; in Malaysia, Lee *et al.*, 2015; in India, Sandhu and Kulik, 2019) with the development of formal laws and regulations. However, our findings derived from an organization-level analysis show that the effective use of GHRM needs to be understood in the context of internal organizational resources, particularly the commitment of top-level managers. In this sense, selecting and monitoring CEOs and TMTs for ethical and environmental conduct should become an integral part of Asian firms' sustainability efforts.

#### *Concluding remarks*

Addressing the problems of environmental damage and rapid climate change has gained much and increasing attention in recent years, and businesses are increasingly called on to take responsibility for addressing society's mounting concerns. Effectively orchestrating a firm's resources to achieve environmental sustainability is not easy; however, evidence from this study suggests that firms are more likely to succeed in mobilizing the required resources by implementing GHRM practices and combining with CEO's ethical leadership, which jointly engender TMT green commitment and promote environmental performance.

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