



## Green HRM and Green Innovations: A Mediated Moderation Analysis

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### Abstract

Examining the effects of Green Human Resource (GHRM) practices is the aim of this study. The hotel sector in Punjab, Pakistan is implementing environmentally friendly innovations. This research looks at the connection between environmental consciousness and its moderating effects, green creativity, and how it mediates between the two. In light of the increasing global focus on sustainability, it is essential for the hospitality companies, especially in developing nation such as Pakistan, to comprehend how GHRM may foster innovation in ecologically responsible manners. This study applied a quantitative research approach, collecting data through survey-based questionnaires administered to hotel personnel. This research examines the impact of GHRM on Green creativity and innovation in hotel business. This study investigates how GHRM procedures, including recruitment, training, and performance management, cultivate green creativity among employees, thereby propelling the advancement of green innovations in hotel industry operations. The results indicate that GHRM is essential in fostering environmentally sustainable concepts and behaviors by improving employee's environmental consciousness and problem-solving skills. The research indicates that incorporation of green HR practices fosters more sustainable and innovative solutions in hotel management. This study offers significant insights for hotel managers and policymakers aiming to integrate sustainability into their human resource strategy, so promoting enduring environmental and business success. Within Punjab, the study population consists of hotels of diverse sizes and classification assessments. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used for the purpose of examining the facts and determining the linked variables, findings from this study contribute to theory and practice by providing proof that Green HRM practices, when coupled with environmental perception, can inspire creative innovation. The results are anticipated to provide actionable insights for managers at hotels, policymakers, and stakeholders aiming to improve sustainable practices in the tourism industry, in accordance with worldwide environmental objectives and national preference in Pakistan.

### Introduction

Climate change is occurring worldwide and has become one of the biggest problems in peoples' lives (Gilal et al., 2019). In recent work environments, Companies have been under immense pressure from various stakeholders to minimize their effects on the environment (Singh et al., 2020). Over the last decade, enterprises around the world have embraced sustainability as an intrinsic component of their strategic plan. Altogether, green HRM practices can create and develop green attitudes and behaviors among employees and force employees

to voluntarily enhance organizational performance (Kim, Su, & Wright, 2018). Green Human Resource management (GHRM) has received heightened interest among sustainability-oriented organizational practices for its ability to cultivate a labor pool that is environmentally conscious, socially responsible, and aligned with the organization's long term ecological objectives (Jabbour & Santos, 2008). GHRM includes many HR tasks, including ecofriendly recruitment, sustainable training, performance evaluations, and incentives, all designed to instill pro environmental attitudes, competencies, and behaviors in employees. Literature has revealed that green HRM approaches

significantly influence corporate climate linked sustainability through activities such as workplace efficiency and waste management (Jabbour & Santos, 2008).

Parallel to the rising emphasis on GHRM, green innovation is described as the development of new or altered products, processes, or practices that reduce environmental harm has emerged as a significant driver of corporate sustainability and competitive advantage (Muisyo et al., 2022). Organizations aiming to diminish their environmental impact frequently depend on a blend of favorable human resource policies and innovation driven initiatives to effectively execute and maintain sustainable ecofriendly innovations. Current study indicates that GHRM can motivate employees to creatively address ecological issues, providing innovative avenues to minimize resource waste and create more sustainable goods or processes. Nevertheless, the strategies by which GHRM affects green innovation are inadequately comprehended, indicating a must for extra detailed inquiries. While a growing body of research has identified GHRM as an Important precursor to environmentally responsible outcomes, the particular method by which GHRM supports innovative eco-centric solutions is unknown. Researchers have suggested that employee green creativity developing innovative and beneficial solutions for addressing environmental challenges could serve as a crucial mediator in the interactions between GHRM and green innovation. By equipping employees with essential knowledge, skills, motivation, and sustainability focused rewards, GHRM can establish a foundation for enhanced green creativity, subsequently fostering green innovation (Kim et al., 2019). Insufficient research has been done on how GHRM influences green innovation both directly and indirectly through green creativity, resulting in a lack of comprehensive understanding regarding the internal mechanism that drive companies toward effective ecological inventions.

Furthermore, contextual factors may influence the effectiveness of GHRM interventions. Environmental awareness indicating the degree to which employees recognize and are intrinsically driven by environmental concerns may serve as a moderator that either enhance or changes the link between GHRM and green developments (Chen, 2008) which is reported in Figure 1. Employees with heightened environmental awareness may find GHRM activities more prominent and significant, resulting in enhanced creative and inventive outputs. Conversely, in situations where employees possess inadequate environmental awareness, the same GHRM measures may provide minimal effects on creativity and innovation (Kim et al., 2019). This phenomenon highlights the needs to investigate boundary factors that may influence the effectiveness of GHRM, particularly with the enhancement of green creativity and innovation. Exploring the relationship between GHRM, green creativity, environmental consciousness, and green innovation holds substantial academic and practical importance. This study intends to enhance current models of sustainable HRM and organizational innovation by detailing the conditions under which GHRM impacts eco-centric

creativity and promotes green innovation (Chen, 2008). Specifically, recognizing the mediating function of green innovation and the moderating impacts of environmental consciousness enhances theoretical frameworks, demonstrating avenues for attaining significant sustainability results within enterprises. Managers looking to improve their organization's environmental performance may benefit from learning how GHRM practices may be systematically planned and executed to promote an innovation driven culture centered on ecological stewardship. By acknowledging the significance of environmental awareness as a catalyst, leaders can customize communication methods and training programs to improve employee's ecological sensitivity, thus optimizing the returns on environmentally focused investments (Muisyo et al., 2022). Ultimately, the findings of this study could help business decision makers and regulators design more effective and context-specific strategies that go beyond mere compliance and lead to sustained competitive advantage. This research intends to investigate a) the consequences of GHRM on green innovation through the mediation of green creative behaviors, and b) moderation of environmental awareness.

## Literature Review

### Green HRM Practices and Green Innovation

Green Human Resource Management (GHRM) is described as the "the systematic, planned alignment of typical human resource management practices with the organization's environmental goals" (Jabbour & Santos, 2008). Green HRM is essential for firms as it substantially impacts different other departments, including green transportation, green advertising, green actions and green management. Third, the developed classification of green HRM has a broader perspective for organizational personnel to be aligned in the context of the organizational environment. Significant change is needed for green HRM activities, which are complex to implement. For these transformations to succeed, they must be carried out, executed, and embraced by the organization's personnel, a key objective of green HRM. Integrating green recruitment, training, performance appraisal, and incentive system, GHRM practices promote pro environmental behaviors across diverse organizational activities, including green supply chain, green marketing, and green operation (Renwick, Redman, & Maguire, 2013). Our entire practiced HRM is a comprehensive analysis of green practicing by job analysis and design, staffing, and training, growth, performance oversight and assessment, compensation, and awards (Renwick et al., 2013). While GHRM is linked to enhanced environmental performance, its direct impact on green innovation (such as eco-friendly goods, processes, and practices) continues to be a central topic of contemporary research. Using the Ability-Motivation-Opportunity (AMO) perspective, GHRM can improve employees' competencies, motivations, and opportunities to develop innovative ecological solutions, thereby contributing to organizational sustainability (Haddock-Millar, Sanyal, & Müller-Camen, 2016). Organization may face obstacles

such managerial opposition or insufficient resources, that undermine the potential advantages of GHRM on green innovation. Empirical research from diverse contexts, such as the Pakistani textile and hotel sectors, substantiate the advantageous effects of GHRM on green innovation, underscoring its crucial role in attaining environmental sustainability (Shahzad et al., 2020). This research explores that green HRM practices have notable impacts on green innovation, with green knowledge sharing as a mediator and green product/process innovation as a moderator by using the data collected from the textile industry of Pakistan (Mustafa et al., 2023). The study also focuses on culture. Green HRM and Green Innovation are critical determinants of environmental sustainability and influence the relationship among OE culture and these outcomes (Al Doghan et al., 2022). This study was that the extent of green process and product innovation returns to environmental performance, as human resource practices and management commitment magnify it. The research establishes that the literature asserts that green HRM practices enhance green innovation, as well as an organization's environmental achievement and suitability (Marditama, Yusliza, & Purnomo, 2024).

**Hypothesis 1:** *“Green HRM practices positively linked with green innovation”.*

#### **Green HRM Practices and Green Creativity**

Green Innovation entails developing new ideas for sustainability and environmental improvements (Paillé et al., 2014). Many papers have examined how promoting pro-climate HRM practices can help green creativity in organizations (Malik et al., 2021). GHRM practices such as ecofriendly training, sustainable enrollment, and recognition systems can cultivate an environment that empowers employees to suggest and execute environmentally focused innovations (Martin-Ordas & Atance, 2018). Through the enhancement of employee competencies and establishment of nurturing environment, GHRM has augmented employee's environmentally creative behaviors, resulting in ecological problem solving and innovative resource utilization strategies. The correlation between GHRM and green creativity frequently enhanced by elements such as environmental specific psychological empowerment and altruistic ideals (Farrukh et al., 2024). It was determined that green development and training, performance, and compensation positively correlate with employee's green creativity via green psychological climate and green observable aim. Furthermore, pro-environmental leadership styles such as ethical or transformational leadership can strengthen this connection by facilitating employee's expression and development of green ideas (Aloqaily, 2023). Through recruitment, many HR professionals directly promote the environmental responsibility of the organizations in order to attract competent and congruent employees who organize imperative needs for sustainability (Renwick et al., 2013). In more detail, university students seek firms with a background and image supporting action on climate (Rosa, Capolupo, &

Marolla, 2024).

Even though only a handful of those working in the HR field are placing environmental awareness criteria in job descriptions (Renwick et al., 2013). Organizational HR professionals play a relatively active role in personnel training and development concerning the organization's environmental issues (Irani, Kiliç, & Adeshola, 2022). Here, we highlight the previous study on green innovation. Green innovations are significantly influenced by GHRM practices, including product and process innovations, which are crucial to attaining environmentally sustainable advancements (Farooq et al., 2022). Moreover, green HRM practices, including green recruitment and selection, are positively linked to green product innovation emerges from the inventiveness of green teams. To conclude, the evaluation of the search results proved that GHRM practices affect the green creativity of the employees and related green behaviors through mechanisms like green psychological climate, green behavioral intention, green self-efficacy, green work engagement, and green knowledge sharing. Here is the hypothesis we developed based on the above discussion:

**Hypothesis 2:** *“Green HRM practices positively linked with green creativity”.*

#### **Green Creativity and Green Innovation**

Green creativity emphasizes an organization's ability to generate new ideas and solution to climate concerns (Chen & Chang, 2013). Such a leadership style, trying to conceptualize personnel needs, capacity, and motivation at the same time, positions the personnel to contribute significantly to the potential and futuristic green concepts and ideas. Green creativity in the workplace helps their followers to think creatively, analyze issues in different ways, and identify new strategies for environmental conservation (Chen & Chang, 2013). When employees participate in advance cognitive processes and examine environmental concerns from several viewpoints, they promote green innovation the introduction of sustainable products, processes, or services. Using green HRM practices in the workplace empowers the personnel to think creatively, analyze problems from multiple viewpoints, and explore innovative solutions to environmental challenges (Chen & Chang, 2013). Studies in the Taiwanese electronics and Pakistani hospitality sectors indicate that green innovation is essential antecedent for the development of commercial green products and sustainable processes. Organization can significantly enhance their environmental and social outcomes by fostering a creative atmosphere and promoting environmentally conscious improvisation (Bashir et al., 2024). Green HRM practices influence individual and collective green creativity in hotels, with environmental-specific servant leadership playing a moderating role (Alyahya et al., 2023). Several studies have examined this relationship and also established that green transformational leadership, green innovation, and green HRM practices can enhance the environmental performance of the

hospitality industry of Pakistan. It stresses the process of green creativity in the improvement (Shafiq et al., 2023). Moreover, it proves that green transformational leadership can facilitate green practices, including green creativity, in the hotel industry of Pakistan. The researchers note that green HRM affects green creativity, which impacts organizational environmental performance (Rehman & Yaqub, 2021). As earlier, research confirms that green creativity (GC) is the most significant mediating factor among the various green drivers that affect the relation between green SW innovation (GSI) and green process innovational performance (GPIP) in the Pakistani hospitality industry (Zahid et al., 2023). Analyzing the moderating role of green creativity in the relationship between green HRM and green innovation. In doing so, the study posits that green HRM can allow creativity among Pakistani hospitality employees (Sharif et al., 2023). Green creativity in the workplace helps their followers to think creatively, analyze issues in different ways, and identify new strategies for environmental conservation (Chen & Chang, 2013).

**Hypothesis 3:** “Green Creativity and Green Innovations are positively linked”.

#### Mediation of Green Creativity

Green creativity can act as a mediator, transforming GHRM driven environmental knowledge and motivation into practical eco-innovation (Chen & Chang, 2013). Consequently, ideas that are new and distinct are implemented by the organizational personnel to their green responsibilities and notions of climate are referred to as green creativity. An organizational green creativity-based leadership approach is where leaders drive desired changes and inspire and motivate personnel to work towards a shared organizational vision and objectives (Avolio, Bass, & Jung, 1999). Practical green organizational-based creativity encourages employees to prioritize corporate goals over personal ones, supports them in various situations, and fosters resilience to inspire green innovative ideas for environmental sustainability (Mittal & Dhar, 2016). Many prior research studies have postulated that green creativity helps organizations promote a green culture among employees, eventually contributing to better green innovation performance (Chen & Chang, 2013). Besides, ‘green creativity at the workplace’ encourages and develops the incumbent’s green innovation, passion, and creativity through green HRM practices. When further investigation is conducted, green HRM practices collectively affect green creativity. The study also found that GHRM plays the moderating character of green innovation in investigating the mediating effects and the ongoing mediation role of GHRM on the relationship between employees’ green dedication and TL with green creativity. The findings underline the importance of GHRM and green creativity in leading to green innovation (Muisyo et al., 2022). In analyzing how green creativity works as a moderator between green HRM and green innovation, it is critical to understand the place of green HRM in the process. Green HRM promotes regulations and practices that are environmentally sustainable inside organizations while

inspiring fellow employees to be innovative in their sustainability. Studies have found that initiatives like green training, performance management, eco-centric incentive plans can foster an environment conducive to workplace innovation. Research indicates that GHRM does not immediately result in green innovation unless it concurrently enhances employees’ creative capacities. Consequently, green creative serves as the essential connection elucidating how GHRM methods improve environmental performance results and company sustainability. As a result, to examine the options of green creativity in moderating the association between green HRM and green innovation, it is possible to distinguish three specific categories regarding green HRM while promoting environmental initiatives and sustainable corporate culture. We suggest that Green HRM practices, including training targeted at environmental concerns, performance appraisals that reward green behavior, and green compensation policies, foster an organizational culture that encourages green creativity. Yusoff et al. (2020) established that green HRM practices increase employee awareness concerning environmental problems and enable employees to generate more innovative solutions, thus improving green innovation performance in the organization. Furthermore, green creativity means that organizational sustainability objectives can be achieved with the help of ideas created by workers aware of environmental problems. They indicate that green creativity mediates HRM practices and the organization’s green innovation outcomes. Dumont, Shen and Deng (2017) organizations promoting green creativity in a better place to realize green HRM since employees encouraged to create green solutions when implementing HRM green activities. That is why green creativity is critical in the four-way green HRM creation of meaningful green innovations, underlining the importance of creativity within sustainability-oriented HR practices:

**Hypothesis 4:** “Green Creativity mediates the relationship between GHRM and Green Innovations”.

#### Environmental Awareness

Environmental awareness inside an organization refers to the beliefs, values, and attitudes that influence pro-environmental action (Wallace, Hunt, & Richards, 1999). A “green” company culture emerges when employees and leaders prioritize the reduction of ecological damage, hence incorporating sustainability into routine operation (Khalid, Mahmood, & Rukh, 2016; Sroufe, Coffino, & Carlson, 2010). A green organizational society, therefore, be understood as the activity, as well as the consciousness of the members of the organization concerning the natural environment. The HR unit contributes actually to fostering a green corporate culture because human resources influence organizational personnel’s behavior and awareness of the natural climate. The organizational human resource management unit’s primary role is to foster a green culture in various working environments since it adapts the behavior and consciousness of the organizational members based on various

processes Human resource (HR) departments are pivotal in fostering this understanding via eco-sensitive recruiting, training, performance evaluation, and incentives. This culture motivates employees to actively pursue and use sustainable solutions (Martin-Ordas & Atance, 2018). The green vision of organizational leadership and the credibility of environmental communications further strengthen and eco-centric mindset (Lin & Ho, 2011).

Thus, increased environmental consciousness can substantially improve the connection between GHRM and green innovation. Clausen et al. (2012) explained that the prior study showed that when organizational employees of staff unapproved and produced engagement activities for a green culture across work settings, they were provided to maximize a green culture. In addition, the HR unit can share pro-environmental messages with the personnel during the performance evaluation, training, and development meetings (Renwick et al., 2013). Also, for more specific purposes, the HR units cooperate with certain departmental professionals or groups involved in completing the pro-environmental tasks. The KPIs can be integrated with

WM processes, recycling improvements, and reductions in resource usage, water, electricity, and raw materials. The organizational HR units ensure that environmentally aware incumbents are hired and that the units train the staff through training, reward, and leadership development techniques. Such awareness examples include practicing environmental conservation in identifying tasks in an incumbent's daily tasks. As incumbents plan and communicate to address environmental threats, such actions become practices over time while an environmental culture develops in the workplace. Therefore, from the aforementioned arguments and discussions, it is suggested that the mantra: green HR management practices have an impact on the promotion of peer involvement, personnel enablers, and message authority and leadership emphasizes the meaning of development:

**Hypothesis 5:** "Environmental awareness moderates the effect of green creativity on green innovation, and the relationship strengthened when environmental awareness is high than when it is low".

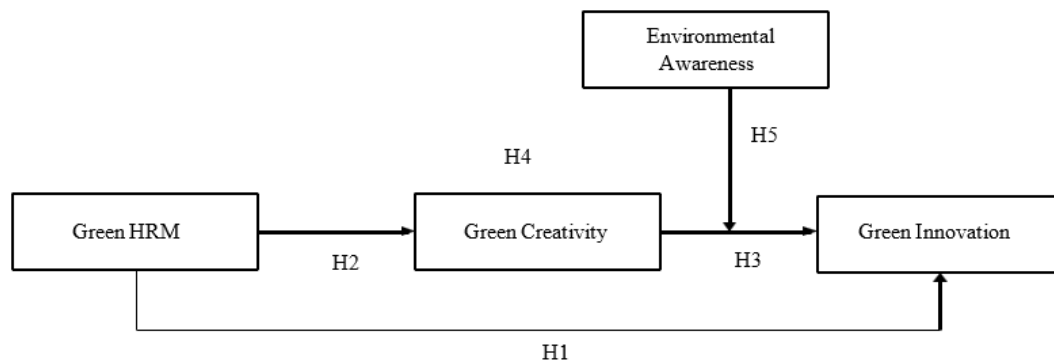


Figure 1: Conceptual Framework of the Study.

## Methodology

This study employs a positivist paradigm, positing that reality is objective and can be scientifically measured. Consistent with this perspective, the study employs a quantitative design with a self-administered questionnaire as the principal data collection tool. The population comprises the hotel industry of Pakistan, selected because it significantly contributes approximately six percent to Pakistan's GDP and employs a substantial proportion of the workforce. For practical reasons, this study focuses on hotel managers and owners in Lahore Islamabad, who serve as key respondents representing the perspective on green HRM practices, creativity, innovation, and environmental awareness in their respective organization. A list of hotels containing names, addresses, and contact details gathered from publicly available sources (such as online directories) to form the sampling frame. Two main guidelines guide the sample size determination. First, the "rule of ten" suggests that for each variable in the study, ten participants are sufficient. Given the presence of four variables, 40 participants were a minimal requirement for basic analysis. Second, this study relies on the

more robust guideline proposed by Krejcie and Morgan (1970), indicating that when a population is large or unspecified, a sample size of 384 is generally appropriate.

Consequently, 384 respondents have been targeted to ensure stronger statistical power and broader generalizability of the findings. While probability sampling techniques are common in large-scale studies, the current research employs a non-probability (purposive) sampling procedure. In doing so, the study purposefully includes managers and owners who possess knowledge and insights into green HRM, creativity, innovation, and environmentally oriented practices, thereby ensuring that only informed participants respond (Sekaran & Bougie, 2016). Data collection carried out through a self-administered questionnaire, which distributed either in person or via electronic means, depending on access and feasibility. The questionnaire seeks to capture demographic details, the degree of green HRM implementation (covering green hiring, training, performance oversight, and reward systems), the extent of green creativity and innovation and respondents' perception of environmental awareness. The confidentiality of response is



maintained at all stages of the study, and respondents are informed that participation is entirely voluntary. Following data collection, all responses are undergoing cleaning and screening to ensure completeness and accuracy. The final dataset then was exposed to Partial Least Squares Structural Equation Modeling (PLS-SEM) to analysis the hypothesis. This analytical technique is especially suitable for exploring relationships within complex models and is robust with moderate sample sizes, allowing for both direct and indirect (mediation) effects to be examined. The analysis proceeded in two stages, starting with the evaluation of the measurement model (focusing on reliability and validity) and moving to the structural model analysis (path coefficients, determination of explanatory power, and hypothesis testing). Throughout the research process, participants right and well-being remained paramount, with explicit information on the study's objectives, assurances of anonymity, and the option to the withdraw at any time. Cronbach alpha, composite reliability (CR) and average variance extracted (AVE) is reported in Table 1 and Figure 2.

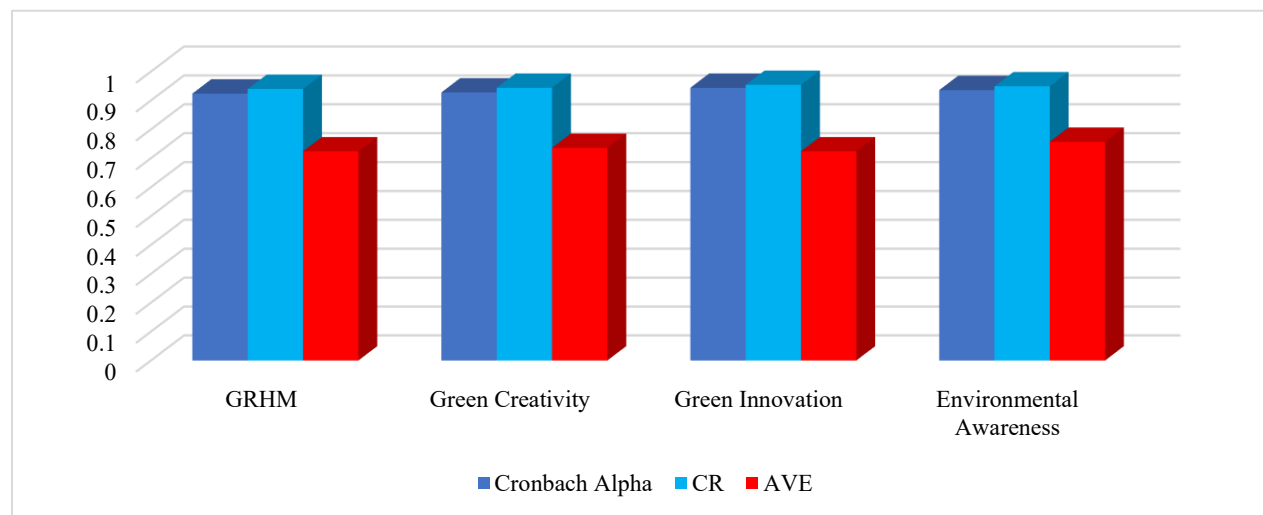
## Data Analysis and Results

The evaluation framework begins with a discriminant validity test. The discriminant validity has three processes and procedures for test and validations. As per the prior literature suggestions, the current study employs the HTMT technique to analyze discriminant validity. Two perspectives are suggested for determining the threshold value while evaluating discriminant validity using the HTMT technique of minor or less important. The threshold value is 0.85 and below to claim that the results match the threshold value. Second, a threshold value of 0.90 and below is used to determine that the results were raised to meet the threshold value. The current study deemed the second school of thought a threshold value to evaluate the discrimination value. According to the findings all the values of compared constructs are higher than 0.90 and below the threshold; therefore, there is no discriminant validity problem.

**Table 1:** Assessment of Reliability and Validity.

|                         | Cronbach Alpha | CR    | AVE   |
|-------------------------|----------------|-------|-------|
| GRHM                    | 0.924          | 0.940 | 0.724 |
| Green Creativity        | 0.928          | 0.944 | 0.736 |
| Green Innovation        | 0.944          | 0.954 | 0.724 |
| Environmental Awareness | 0.936          | 0.949 | 0.757 |

CR = Composite Reliability; AVE = Average Variance Extracted

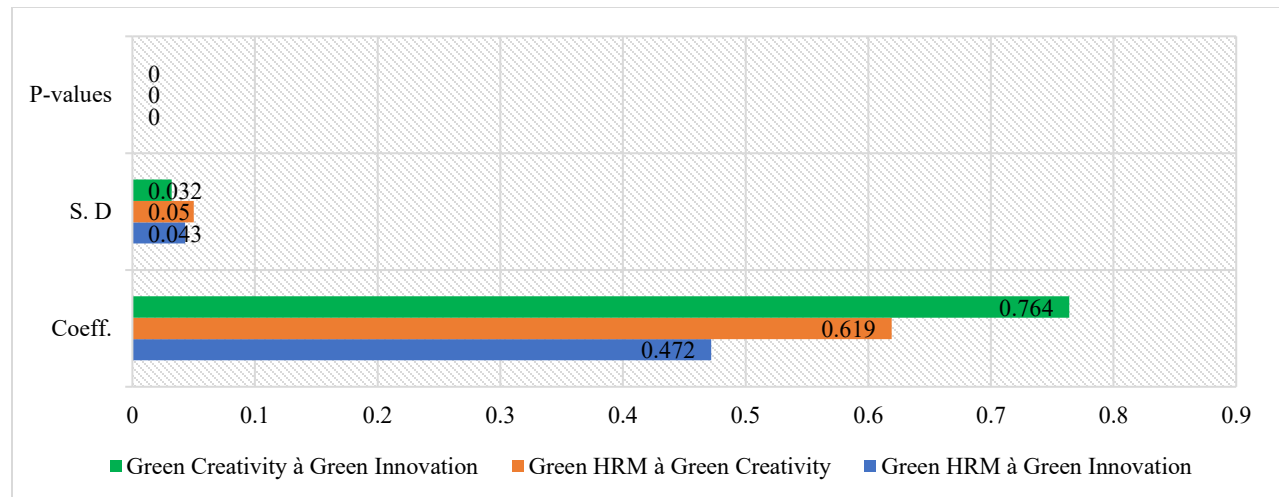


**Figure 2:** Assessment of Reliability and Validity.

The empirical findings of the direct relationship between the variables tested evaluated based on the coefficients, standard deviation, t-values, p-values using the sample re sample 5000 bootstrapping. Prior literature affirms that p-value alone is not appropriate for validating association among the latent construct; hence, the t-value is considered vital. The results of direct relationship between latent construct are reported in Table 2 and Figure 3.

**Table 2:** Summary of Direct Effects.

|                                     | Coeff. | S. D  | P-values |
|-------------------------------------|--------|-------|----------|
| Green HRM → Green Innovation        | 0.472  | 0.043 | 0.000    |
| Green HRM → Green Creativity        | 0.619  | 0.050 | 0.000    |
| Green Creativity → Green Innovation | 0.764  | 0.032 | 0.000    |



**Figure 3:** Summary of Direct Effects.

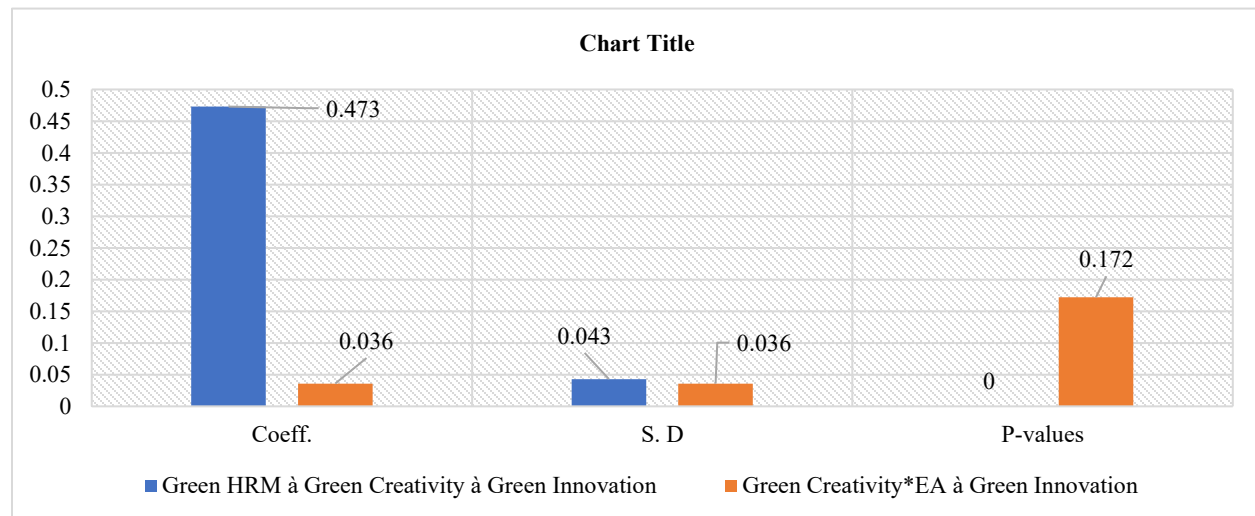
The empirical Findings of the current study, reported in Table 3 and Figure 4 indicate that green HRM is notably and positively linked with green innovation at the 5% significance level ( $\beta = 0.472$ ,  $t = 10.960$ ,  $p = 0.000$ ). Moreover, the empirical discovering of the current study indicate that green HRM is significantly and positively associated with green creativity ( $\beta = 0.619$ ,  $t = 12.269$ ,  $p = 0.000$ ) at the 5% significance level. In

addition, green creativity is significantly and favorably linked with green innovation ( $\beta = 0.764$ ,  $t = 24.008$ ,  $p = 0.000$ ) at 5% level of significance. Furthermore, empirical findings affirm that environmental awareness is notably and positively linked with green innovation at the 5% level of significance ( $\beta = 0.618$ ,  $t = 5.180$ ,  $p = 0.00$ ).

**Table 3:** Summary of Indirect Effects.

|   | Coeff. | S. D  | P-values |
|---|--------|-------|----------|
| Green HRM → Green Creativity → Green Innovation | 0.473* | 0.043 | 0.000    |
| Green Creativity*EA → Green Innovation          | 0.036  | 0.036 | 0.172    |

Notes: EA = Environmental Awareness, S.D = Standard deviations



**Figure 4:** Summary of Indirect Effects.

The present study proposed that green creativity mediates the association between Green HRM and Green innovation. The empirical findings affirm the mediation relationship of green creativity between green HRM and Green innovation at a 5% significance level ( $\beta = 0.473$ ,  $t = 10.960$ ,  $p = 0.000$ ) at a 5% significance level. Furthermore, the present study proposed that

environmental awareness considerably modifies the connection between green innovation and green creativity. The results affirm that environmental awareness positively yet insignificantly moderates the relationship between green creativity and green innovation ( $\beta = 0.036$ ,  $t = 1.367$ ,  $p = 0.172$ ) at the 5% level of significance.

## Discussion and Conclusion

The investigation looked into several objectives related to the links between green HRM practices, green creativity, green innovation, and the moderating role of environmental consciousness in the hotel business. Initially, empirical evidence substantiated that Green HRM practices exert a significant and beneficial effect on green innovation, consistent with previous studies demonstrating that green recruitment, selection, and associated imitative promote employees environmentally friendly behaviors. The research revealed a significant positive correlation between Green HRM practices and green creativity, supporting prior research that indicates pro-environmental HRM functions (such as recruitment, training, appraisals, and rewards) foster employee's green creative behaviors (Marditama et al., 2024). Third, the findings revealed a strong, positive relationship between green creativity and green innovation, consistent with prior investigation that emphasizes the importance of creative thinking in developing sustainable practices, processes services, and products (Chen & Chang, 2013). Fourth, green creativity serves as a significant mediator in the relationship between Green HRM and green innovation, aligning with evidence that positions green creativity as an essential connection that converts HR-driven environmental initiatives into concrete eco-innovations (Sharif et al., 2023). While environmental awareness considerably and positively predicts green innovation, its moderating effects on the association between green creativity and green innovation was determined to be statistically negligible. This discovery, which is supported in part by earlier research on the role of organizational culture and leadership emphasis on sustainability, suggested that awareness alone may not be sufficient to strengthen the creativity innovation link.

The study concludes that green HRM practices are essential for enhancing both green creativity and green innovation, with green creativity serving as an effective mediator in this relationship. Although environmental awareness is positively correlated with green innovation, it does not significantly moderate creativity-driven innovation outcomes. Theoretically, the results expand social learning theory by demonstrating how an organization's internal capabilities (via green HRM) and creative personnel can stimulate green innovation. The research underscores the necessity of developing and executing resilient pro-environmental human resource system to augment employees' creative abilities in environmentally focused business solutions. Future research may incorporate more dimensions, explore varied context, and investigate supplementary leadership or cultural factors that enhance the green creativity-green innovation relationship.

The empirical evidence of this study outlines the various implications for the stakeholders, including managers owners of hotel industry, regulatory authorities, and policymakers. In addition, the present study outlines the implications based on the theory, methodological, and contextual context. This research emphasizes the importance of awareness held by

organizational personnel in this context. HRM is essential in building an organization's internal capability and capacity as it relates to people management from a hospitality perspective. Nevertheless, there should be a more vexatious analysis of the relationships between the two mentioned significant concepts. The hospitality industry, which commonly creates large proportions of the environmental repercussions from business operation activities, remains a key taxonomy or point of research in the context of Pakistan. Considering the concept's significance, the hotel industry organized a panel discussion titled "Green Practices" by the Hashoo Foundation in late 2019. The event's focus was to figure out ways of achieving a massive change in climate security by adopting and practicing 'Green' in organizations operating in the hospitality sector of Pakistan. In addition, by integrating studies on green HRM practices and environmental passion, this study seeks to significantly contribute to this important research topic by examining the role of employees' environmental passion as a mediator between green HRM practices and organizational green innovation. This study also aims to establish the extent of green innovation as a result of green HRM practices. Further, it explores how the level of environmental awareness influences the linkage between firm creativity in green products and green innovation.

Building on the findings of this study, various routes for the future research can be explored. The present study concentrated on green HRM practices as the primary precursor of green innovation; future research may incorporate supplementary organizational elements (e.g., leadership styles, green organizational culture, or employee involvement) to furnish a more thorough understanding of the determinants influencing eco-innovation. Secondly, although this study focused on hotels in particular parts of Pakistan (namely, Lahore and Islamabad), subsequent researchers are urged to broaden data collecting to other provinces such as Khyber Pakhtunkhwa (KPK), Sindh, or Baluchistan to encompass a wider array of market conditions. Third, extending outside national borders may provide comparative insights on cross-cultural distinctions and commonalities regarding the influence of green HRM on environmental outcomes. Fourth, although managers and owners were the primary informants in this study, future research should broaden respondent categories by incorporating middle managers for frontline staff, thereby obtaining diverse viewpoints on green creativity and innovation processes. Researchers should contemplate employing longitudinal designs to investigate the evolution of green HRM and green creativity over time, in addition to the interplay of these processes with continuous environmental awareness activities.

Despite the significant contributions, this study has certain drawbacks, initially, solely green HRM practices were include as per predictors of green innovation, excluding potentially significant aspects such as leadership style, organizational culture, or technology uptake. The geographical scope was confined to Lahore and Islamabad in Pakistan; hence the results



may have reduced generalizability to other regions or industrial environments. Third, the respondents were exclusively managers and owners, potentially omitting the perspective of other organizational members, such as frontline staff or mid-level supervisors who are directly engaged in operations and sustainable practices. The research approach was cross-sectional, so preventing an analysis of how correlations among the construct may change over time. Finally, although environmental awareness was examined as a moderator, additional contextual or demographic factors (such as organizational size, ownership type, or external regulatory demands) may potentially influence the conversion of green creativity into concrete eco-innovations. Subsequent research must confront these constraints to cultivate a more comprehensive and resilient comprehension of the origins and results of green innovation.

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### CRediT Authorship Contribution Statement

Umer Khatab: Conceptualization, Data curation, Formal analysis, Funding acquisition. Syed Ahsan Raza: Investigation, Methodology, Project administration, Resources, Software. Maria Saleem: Supervision, Validation, Visualization. Writing – original draft. Saba Sabir and Faisal Mahmood: Writing – review & editing.

### Declaration of Competing Interest

The authors declare no relevant financial or non-financial interests.

### Fundings

The authors confirm no external funding was received for this research.

### Ethical Statement

This study followed ethical standards, with no ethical approval required as no human tissue or biological samples were used.

### Data Availability Statement

Datasets from this study are available from the corresponding author upon reasonable request.

### Artificial Intelligence/ Language Module Statement

The authors confirm no AI or LLMs were used in the writing, analysis, or editing of this research and take full responsibility for its content.

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