

## Responsible Innovation and Employee Performance: The Mediating Role of Ethical Climate in Manufacturing Firms of Pakistan

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### Abstract

Factors that threaten competition, sustainability, and ethical conduct are increasing in Pakistan's manufacturing industry, making employee performance a critical issue for organisations. To respond, companies are using responsible innovation to help develop accountable, ethical behaviour, engage with stakeholders, and build sustainability into the companies they develop. Based on Social Information Processing Theory, this research will investigate how responsible innovation relates to employee performance, mediated by ethical climate, in Pakistan's manufacturing sector. A cross-sectional quantitative research design was employed, and data were collected through surveys of employees from various manufacturing entities in Pakistan's major industrial cities. Through a convenience sampling approach, 200 usable survey responses were obtained for statistical analysis using structural equation modelling. The findings of the study show that responsible innovation has a statistically significant positive impact on employee performance and ethical climate, and that ethical climate, in turn, has a statistically significant positive impact on employee performance. Responsible innovation and ethical climate were also found to have a partial mediating effect on the relationship between responsible innovation and employee performance. Therefore, responsible innovation helps create and promote an ethical organisation where employees will be motivated, committed, and effective in their job performance. This study contributes to the responsible innovation and organisational behaviour literature by identifying ethical climate as the behavioural mechanism that connects responsible innovation outcomes to employee performance in developing-market manufacturers.

**Keywords:** Responsible innovation, ethical climate, employee performance, Social Information Processing Theory.

### Introduction

The manufacturing industry is widely regarded as one of the most vital drivers of economic prosperity, industrial growth, and job creation; this importance is especially pronounced in developing countries such as Pakistan. Manufacturers extensively utilise a range of resources, driven by their strong human capital, operational efficiency, and innovative administrative approaches, to remain competitive in an increasingly rapid, technology-driven global market. Consequently, executive attention on employee performance has become an increasingly prevalent concern in the workplace because

employees are now considered one of the most significant strategic resources for achieving sustainable productivity and enduring competitive advantage (Afsar & Umrani, 2020; Abbas & Sağsan, 2019).

The concept of responsible innovation (RI) has gained considerable popularity over the last number of years and is emerging as a fundamental management capability for organisations as it aligns RI innovation processes with ethical standards, stakeholder expectations or interests, sustainability, and social responsibility. Responsible innovation differs from other forms of research, development, and innovation in that it integrates many conventional principles and practices, including transparency, accountability, inclusiveness, and the overall happiness of society, into all organisational decision-making processes (Stilgoe et al., 2013). Consequently, you will tend to find that organisations that follow responsible innovation rules create positive workplaces that promote ethical and collaborative behaviours and employee engagement, as these characteristics are directly correlated with how individuals view themselves, their co-workers, and their performance (Lythreath et al., 2024).

The ethical climate (EC) of an organisation profoundly influences how all employees perceive the organisation's ethical norms, acceptable behaviour, and values. According to Victor and Cullen (1988), the EC of an organisation is created by the collective perceptions of its employees about how ethical issues should be handled. Additionally, Schminke et al. (2005) found that organisations' decision-making regarding leadership practices, organisational policies, and innovation-related activities shapes the organisation's EC. When organisations support and promote responsible innovation, employees perceive a stronger EC (i.e., higher standards of ethical behaviour on the part of the organisation) and feel a greater sense of organisational responsibility, both of which promote a positive EC. A positive EC promotes fairness, integrity, accountability, and mutual trust between employees, thereby enhancing both employee motivation and performance outcomes (Al Halbusi et al., 2020).

Within manufacturing companies, the EC of organisations is particularly important due to the high-pressure working environments in which their employees work. Common conditions faced by manufacturing employees are production targets, operational hazards, technological advancements, and competitive pressures. As a consequence, ethical organisational practices provide a framework for employees, enabling them to reduce uncertainty and develop trust in the organisation, while encouraging responsible behaviour in the workplace. Manufacturing employees demonstrate enhanced commitment to the organisation, greater cooperation with coworkers, and higher task performance when they perceive organisational practices to be approached ethically and fairly (Khurshid et al., 2021). Finally, manufacturers that promote ethical values and responsible innovation are more likely to achieve sustainable organisational outcomes by increasing employee productivity and aligning employee behaviours to improve organisational performance.

The theoretical foundation of this study is grounded in Social Information Processing Theory (Salancik & Pfeffer, 1978), which posits that employees form attitudes and behaviours by interpreting social and organisational cues in their work environment. According to this perspective, organisational practices such as responsible innovation

provide signals regarding acceptable behaviour, ethical standards, and organisational priorities. Thus, responsible innovation may enhance employee performance, both directly and indirectly, through the ethical climate.

Although there is growing academic research and interest in both responsible innovation and ethically responsible organisations, there is limited research on how responsible innovation affects employee performance through its impact on ethical climate, particularly in manufacturing companies in Pakistan. Previous studies focused on leadership, CSR or ethical leadership in service industries and developed countries (Yasin et al., 2021; Saygili et al., 2020). Therefore, the purpose of this research is to assess the relationship between responsible innovation and employee performance and to examine the mediating role of ethical climate in manufacturing organisations in Pakistan. By doing so, the study enhances the literature on responsible innovation and organisational behaviour by explaining the processes through which responsible innovation affects employee performance in emerging-economy manufacturing organisations.

### **Theoretical Foundation and Hypothesis Development**

#### **Responsible Innovation and Employee Performance**

Responsible innovation encompasses ethical considerations, social responsibility, sustainability, and stakeholder engagement in organisational decision-making, achieving greater transparency in processes associated with creating new products or processes (Stilgoe et al., 2013). While traditional innovation approaches tend to be driven by financial gain or technological advancement, responsible innovation focuses on the impact of innovation activities on society while promoting the socially and ethically responsible pursuit of innovation by organisations. Responsible innovation provides organisations with mechanisms to create an accountable, inclusive, fair and stakeholder-oriented environment, which leads to improved employee attitudes and behaviours at work (Lythreathis et al., 2024).

Prior studies have shown that organisational practices that support responsible innovation increase employee motivation, engagement, and behavioural commitment; as a result, employees rate their employers as ethical and socially responsible (Afsar & Umrani, 2020). When employees see an organisation using responsible and ethical innovation processes, they will build trust within its processes and coordinate their efforts with the organisation's objectives. Such working environments motivate employees to be more responsible, work cooperatively, and demonstrate greater commitment to their jobs, thereby enhancing employee performance. Additionally, responsible innovation encourages learning and provides employees with opportunities to collaborate on problem-solving and to make ethical business decisions, thereby increasing employee confidence and productivity within manufacturing organisations. According to Social Information Processing Theory (Salancik & Pfeffer, 1978), all employees use organisational innovation practices as significant social indicators of both acceptable workplace conduct and the organisational value system. Signals of equity, ethical responsibility, and sustainability through responsible innovation will influence how employees behave and perform through the interaction among these

signals. Therefore, responsible innovation is expected to positively affect employee performance in manufacturing organisations.

**H1:** Responsible innovation positively influences employee performance.

### **Responsible Innovation and Ethical Climate**

An ethical climate is established by employees' shared perceptions of ethical standards, moral obligations, and acceptable workplace conduct within their organisational context (Victor & Cullen, 1988), and it measures how well organisational policies, practices, and managerial actions substantiate ethical values and responsible behaviour. The ethical climate of a firm influences employees' attitudes and guides their decision-making, particularly for organisations operating in ambiguous and highly competitive environments.

Under Social Information Processing Theory, employees utilise signals from the organisation and their experiences at work to determine which behaviours are expected and rewarded (Salancik & Pfeffer, 1978). Responsible innovation serves as a strong signal that the organisation is committed to ethical behaviour, accountability, and sustainability and therefore helps shape employee perceptions of ethical behaviour and create a socially responsible, ethical climate.

In addition, prior research suggests that ethical organisational and responsible management practices improve employees' perceptions of an organisation's ethical climate (Al Halbusi et al., 2020; Schminke et al., 2005). In the manufacturing industry, employees are often exposed to operational pressures and performance targets, making the ethical climate critically important for supporting responsible workplace behaviours and reducing ethical ambiguity. Thus, responsible innovation is expected to enhance the ethical climate in manufacturing organisations.

**H2:** Responsible innovation positively influences ethical climate.

### **Ethical Climate and Employee Performance**

The ethical climate has a significant impact on employee behaviour, attitudes, and performance. An ethical climate enables employees to develop a sense of trust and cooperation with other individuals and to feel committed to helping the organisation achieve its goals.

According to prior studies, ethical climates help improve employee performance by reducing uncertainty, decreasing conflict and stress, and encouraging appropriate behaviour at work (Khurshid et al., 2021). Ethical climates also form the basis for establishing a psychologically safe working environment in which employees feel respected, valued, and supported, thereby increasing their motivation to perform tasks and their effectiveness in completing them. In a manufacturing environment, the ethical climate plays a particularly important role because employees face time pressures to produce goods, adapt to new technology, and meet strict deadlines. The ethical climate provides employees with the tools necessary to manage these pressures and to be productive and responsible at work.

In addition, employees who perceive their organisations as having a strong ethical climate tend to be more accountable, have greater organisational commitment, and exhibit higher levels of job involvement, all of which contribute positively to employee performance (Al Halbusi et al., 2020). Ethical climates also strengthen employees' trust

in the organisation's leadership and systems, thereby enabling them to focus their efforts on achieving the organisation's goals. Thus, ethical climate is expected to positively affect employee performance.

**H3:** Ethical climate positively influences employee performance.

#### Mediating Role of Ethical Climate

Responsible innovation can influence employee performance by fostering an ethical climate that promotes ethical values, transparency, accountability, and other stakeholder behaviours within organisations. These practices, therefore, provide ethical signals to employees, allowing them to develop their perceptions of the organisation's ethics and workplace norms. As a result, employees will develop a stronger ethical climate, leading to positive motivation, commitment, and performance behaviours.

According to Social Information Processing Theory, employees develop their behavioural responses from the cues and information in their organisational environment (Salancik & Pfeffer, 1978). Responsible innovation can be viewed as an organisational signal that encourages positive ethical perceptions and responsible behaviour at work. Ethical climate takes these organisational signals and converts them to produce better employee attitudes and performance outcomes.

There is also supporting empirical evidence for the mediating role of the ethical climate in explaining how ethical organisational practices influence employee outcomes (e.g., Mayer et al., 2010; Al Halbusi et al., 2022). Thus, this study proposes that the ethical climate mediates the relationship between responsible innovation and employee performance.

**H4:** Ethical climate mediates the relationship between responsible innovation and employee performance.

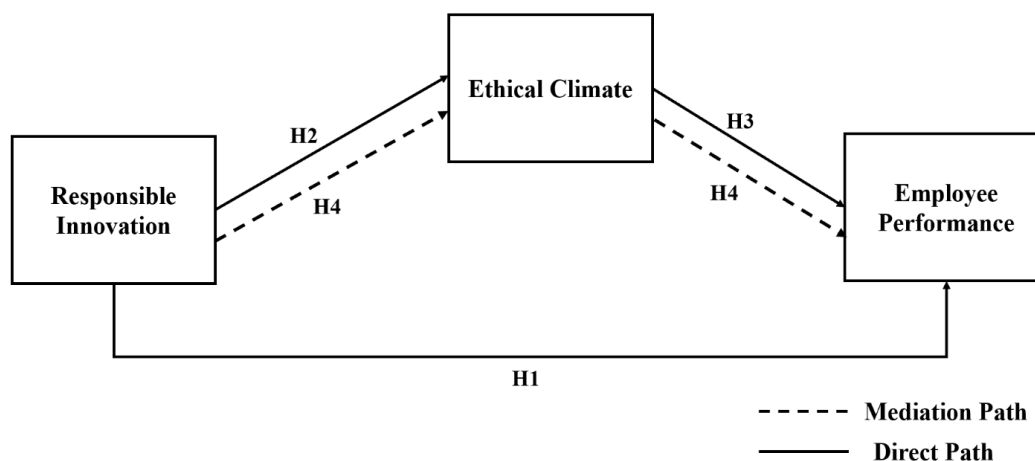


Figure 1. Conceptual Framework

## Methodology

### Data Collection and Sample

The researchers conducted this study by collecting data from employees in manufacturing companies in Pakistan. Data were collected using a structured questionnaire administered via both online (i.e., a survey and Google Forms) and paper (i.e., personal distribution of printed surveys) formats to maximise participant access and response rates. Survey links to access the online survey were sent via multiple communication channels (WhatsApp, email, LinkedIn, and Facebook). Printed surveys were hand-delivered to employees at the selected manufacturing company for completion. At the time of data collection, respondents were informed about the study's academic nature and the confidentiality and anonymity of their responses.

Both middle and lower-level employees were included in the study. Middle-level employees included supervisors, production managers, team leaders, quality control personnel, and administrative employees, while employees in operational positions included machine operators, technicians, assembly line employees, assistants, warehouse employees, and other support employees. Employees from manufacturing companies across all sectors in Pakistan, including textiles, automobile, pharmaceuticals, food processing, electronics, and chemicals, participated in this study. The objective of the current research was to investigate manufacturing organisations with large employee bases and formalised organisational structures in relation to their innovation-related activities. Convenience sampling was chosen to collect primary data, as it has been shown to be a cost-effective and efficient way to access large populations of research participants (Jager et al., 2017). A cross-sectional research design was employed, meaning data were collected from research participants at a single point in time (Setia, 2016). A total of 250 surveys were distributed to employees of manufacturing firms in the major industrial cities of Pakistan (Lahore, Karachi, Faisalabad, Sialkot, and Islamabad). A total of 222 completed surveys were returned to the researcher, and following data verification procedures (including the removal of incomplete surveys), 200 usable surveys were retained for further analysis of study results. The demographic characteristics of the research participants are provided in Table 1 below.

### Measures

Respondents were asked to rate each statement on a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." The items employed in the present study were adapted from relevant literature. The measure of responsible innovation was adapted from Stilgoe et al. (2013). This scale consisted of six items to operationalise responsible innovation within the context of employees' perceptions of organisational innovation practices. The next step was to adapt Victor and Cullen's (1988) ethical climate measuring scale. The five items used in this study were altered to fit the context of manufacturing firms in Pakistan. Lastly, employee performance was assessed using a scale adapted from Williams and Anderson (1991). The scale consisted of four items related to employees' task performance, productivity, and overall work effectiveness within manufacturing organisations.

**Table 1.** *Demographic profile*

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	142	71.0
	Female	58	29.0
Age (years)	20–29	69	34.5
	30–39	83	41.5
	40–49	34	17.0
	50 and above	14	7.0
Education level	Bachelor's degree	138	69.0
	Master's degree	50	25.0
	Other (Diploma/PhD)	12	6.0
Job level	Non-managerial	115	57.5
	Managerial	85	42.5

#### Data Analysis and Results

SmartPLS version 4.1.0.3 was utilised to conduct a PLS-SEM analysis to test hypotheses and assess directional relationships. The KMO statistic was 0.691 (exceeding the minimum recommended value of 0.60; Kaiser & Rice, 1974), while the mean VIF of 3.01 was well below the conservative cutoff of 4 (Hair et al., 2017) and did not provide evidence of multicollinearity. Harman's single-factor test yielded an explained variance of 35% for the first factor, which was below the 50% minimum threshold (Podsakoff et al., 2024).

#### Measurement Model

The measurement model was assessed for indicator reliability, internal consistency, convergent validity, and discriminant validity. As shown in Table 2, the factor loadings for all constructs exceeded the minimum recommended threshold of .70; therefore, the constructs met the criteria for satisfactory indicator reliability as defined by Hair et al. (2017).

The Cronbach's alpha coefficients for all constructs ranged from .836 to .883, indicating excellent internal consistency. The construct's CR's also ranged between .854 and .902 and were above the minimum recommended threshold CR of .70, thus supporting the reliability of the constructs.

The AVE values for each construct were also above the recommended threshold of .50 as specified by Hair et al. (2017), with the AVE values of the constructs ranging as follows: AVEs of .632 to .668, thus demonstrating adequate convergent validity for each construct. Discriminant validity was evaluated using the Fornell and Larcker criterion (Fornell and Larcker, 1981) and is represented in Table 3. As indicated in Table 3, all of the squared root AVEs for each construct were higher than their correlations with the other constructs, demonstrating satisfactory discriminant validity among the organisational cynicism, innovative work behaviour, and employee engagement constructs. The factor loading and AVE values for all of the constructs are depicted in Figure 2.

**Table 2.** Measurement Model

Variables	Items	Factor Loading	Cronbach's alpha	CR	AVE
Responsible Innovation	06	0.704-0.878	0.883	0.902	0.632
Ethical Climate	05	0.705-0.895	0.868	0.900	0.652
Employee Performance	04	0.799-0.854	0.836	0.854	0.668

**Table 3.** *Discriminant Validity*

Variables	EC	EP	RI
<b>EC</b>	<b>0.808</b>		
<b>EP</b>	0.410	<b>0.818</b>	
<b>RI</b>	0.432	0.270	<b>0.795</b>

Responsible Innovation (RI), Ethical Climate (EC), Employee Performance (Ep)

Note. Bold values are the square Root of AVE

### The Structural Model

Once reliability and validity were established for the measurement model, a structural model was used to assess the proposed hypotheses. Multicollinearity diagnostics using variance inflation factor (VIF) values were performed prior to conducting hypothesis testing. All VIF values were well below the recommended threshold of 5, indicating multicollinearity was not an issue (Hair et al., 2017).

The structural model accounted for moderate amounts of the variance in Ethical Climate ( $R^2 = 0.156$ ) and Employee Performance ( $R^2 = 0.154$ ). This indicates that both models had sufficient explanatory power for behavioural research, given the amount of variance explained by each.

### Discussion and Conclusion

This study examined the relationship between responsible innovation and employee performance in manufacturing firms in Pakistan, with the mediating role of ethical climate. The manufacturing sector in Pakistan is currently facing intense competitive pressure, technological transformation, sustainability demands, and operational challenges, making employee performance and ethical organisational practices increasingly important for long-term organisational success. The findings of this study provide important insights into how responsible innovation practices improve employee performance by fostering a positive ethical climate within manufacturing organisations.

The findings reveal that responsible innovation has a significant positive effect on employee performance ( $\beta = 0.147$ ,  $p < 0.001$ ), thereby supporting H1. This suggests that employees working in organisations that emphasise ethical innovation practices, transparency, accountability, stakeholder engagement, and sustainability are more likely to achieve higher performance levels. These findings are consistent with previous studies suggesting that responsible organisational practices and innovation-oriented

environments positively influence employee attitudes and behavioural outcomes (Afsar & Umrani, 2020; Lythreath et al., 2024).

The findings further indicate that responsible innovation significantly influences ethical climate ( $\beta = 0.394$ ,  $p < 0.001$ ), supporting H2. Manufacturing firms that adopt responsible innovation practices tend to promote ethical values, fairness, accountability, and stakeholder-oriented decision-making, which strengthen employees' perceptions of organisational ethics. These findings are supported by prior literature emphasising that organisational responsibility initiatives and ethical managerial practices contribute positively to the development of an ethical climate (Schminke et al., 2005; Al Halbusi et al., 2020).

Moreover, the results demonstrate that ethical climate positively affects employee performance ( $\beta = 0.373$ ,  $p < 0.001$ ), supporting H3. Employees working in organisations with strong ethical climates are more likely to experience trust, fairness, organisational support, and behavioural clarity, which improve their productivity and effectiveness at work. These findings align with previous organisational behaviour studies that identified ethical climate as an important predictor of positive employee outcomes and workplace performance (Khurshid et al., 2021; Fein et al., 2021).

Finally, the findings reveal that ethical climate partially mediates the relationship between responsible innovation and employee performance ( $\beta = 0.148$ ,  $p < 0.001$ ), thereby supporting H4. This indicates that responsible innovation enhances employee performance not only directly but also indirectly by fostering a positive ethical climate. The mediating role of ethical climate highlights the importance of organisational ethics as an explanatory mechanism that links responsible innovation to employee outcomes. Therefore, this study concludes that responsible innovation and ethical climate are critical organizational mechanisms for enhancing employee performance in manufacturing firms of Pakistan. By integrating ethical responsibility with innovation practices, organisations can create sustainable workplaces that not only improve operational effectiveness but also strengthen employees' behavioural commitment and organisational performance.

**Table 4** *Path Analysis*

Paths	$\beta$	S.E	t-value	p-value	Decision	R <sup>2</sup>
<b>H1: RI → EP</b>	0.147	0.030	4.879	0.000	Supported	<b>0.154</b>
<b>H2: RI → EC</b>	0.394	0.057	6.847	0.000	Supported	<b>0.156</b>
<b>H3: EC → EP</b>	0.373	0.055	6.852	0.000	Supported	
<b>H4: RI → EC → EP</b>	0.148	0.030	4.880	0.000	Supported	

Responsible Innovation (RI), Ethical Climate (EC), Employee Performance (EP)

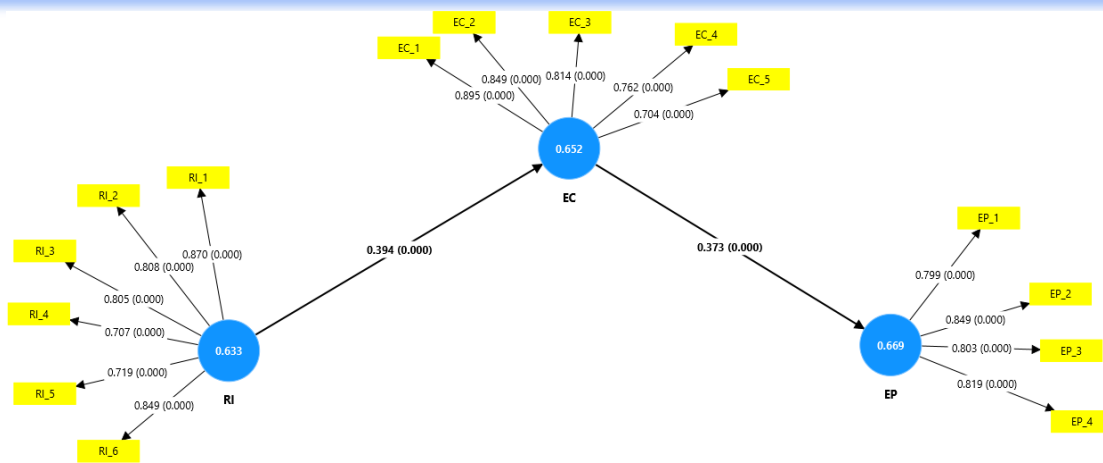


Figure 2. Integrated Model

### Theoretical and Practical Implications

This research has several implications for both theory and practice for manufacturing companies in Pakistan. The research also extends the academic body of knowledge on responsible innovation, ethical work climate, and employee performance by creating conceptual connections among these constructs through the lens of Social Information Processing Theory and demonstrating that these constructs interact within organisations. Social Information Processing Theory asserts that employees interpret the actions of their organisation and the signals they receive in the workplace to determine which behaviours are appropriate and which priorities they should have within that organisation (Salancik and Pfeffer, 1978). As such, responsible innovation plays a crucial role within an organisation as an organisational signal that impacts how employees interpret the ethical implications of their roles and respond behaviourally. The study extends the existing knowledge base of organisational behaviour and innovation by demonstrating that responsible innovation directly impacts employee performance and indirectly impacts it via an ethical work climate.

Additionally, the combination of responsible innovation, ethical culture and performance of employees as unexamined areas in current literature, more specifically, in manufacturing firms located in emerging economies, is a dearth of investigation. Most studies to date have focused on ethical leadership, corporate social responsibility or sustainable organisational practice within developed countries. The implications of this study offer managers, policymakers, and manufacturing companies in Pakistan critical guidance. It is recommended that firms implement responsible innovation methods based on ethical accountability, transparency, sustainability, and stakeholder engagement. Further, there is evidence that employee performance can be enhanced when employees perceive their organisation's innovation methods as ethical, fair, and socially responsible.

In addition, the results show that organisations need to develop and strengthen ethical climates by implementing ethical policies and practices, using transparent communication methods, employing fair decision-making processes, and establishing

an employee-centred organisational value system. An ethical organisational environment will allow employees to be treated with respect, receive the necessary support, and, in turn, be motivated to achieve a high level of performance in their workplaces and develop a commitment to their organisations. Managers should thus focus on applying ethical standards to their innovation-related decisions and operational processes to build a sustainable and productive workplace environment.

#### **Limitations and Directions for Future Research**

The findings of this research were limited; however, despite these limitations, the study has many contributions that make it worthwhile to discuss.

First, there was a single time point data collection (cross-sectional research design), therefore, limitations exist for establishing cause-and-effect relationships between responsible innovation, ethical climate and employee performance. Researchers in the future could use a longitudinal or experimental study design to help establish cause-and-effect relationships among responsible innovation, ethical climate, and employee performance, and to examine how employees view their organisation over a longer period of time.

Second, this study was limited to manufacturing companies in Pakistan, thus limiting the ability to generalise the results to other industries or countries. Researchers in the future should examine the research framework in other industries (e.g., information technology, banking, healthcare, hospitality, and telecommunications) as well as across developed and developing countries.

Third, this research study utilised a convenience sample; hence, the sample may not represent the population of all possible respondents. Future researchers are encouraged to use probability sampling to increase the generalizability of the results and decrease the possibility of sampling bias. Future research studies should have larger sample sizes across multiple manufacturing industries in Pakistan, particularly if the organisations being studied are from different categories.

Finally, this research study utilised self-report data collection methods, which may increase the likelihood of common method variance. Researchers in the future are encouraged to utilise multi-source or time-lagged data collection methods to reduce common method variance and improve the validity and reliability of their results. Despite these limitations, this research study provides insight into the importance of responsible innovation and ethical climate in improving employee performance in manufacturing organisations within Pakistan.

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