



**RESEARCH PAPER**

**Impact of Authentic Leadership on Worker' Green Creativity:  
Mediating Role of Self-Efficacy in Manufacturing Industries**

<sup>1</sup>Sultan Saleem<sup>1\*</sup>, <sup>2</sup>Adil Sufyan and <sup>3</sup>Jamshid Ur Rehman

1. PhD Scholar HR, IBMS, The University of Agriculture Peshawar, KP, Pakistan
2. PhD Scholar HR, IBMS, The University of Agriculture Peshawar, KP, Pakistan
3. Lecturer, Department of Management sciences, Khushal Khan Khattak University, Karak, KP, Pakistan

**\*Corresponding Author:** sultan.ms19450@gmail.com,

**ABSTRACT**

Over the past ten years, authentic leadership has gained importance in the literature and attracted the interest of numerous researchers. This study examined the relationship between authentic leadership and worker' green creativity and investigation of the mediation effect of self-efficacy. Data collected from 250 individuals working across different manufacturing industries was analyzed. The findings show that authentic leadership and workers' green creativity have a statistically significant positive association and self-efficacy significantly mediates the stated relationship. Thus, the findings demonstrate that authentic leadership fosters employee creativity in the workplace. To foster sustainable innovation in the manufacturing sector, the study emphasises the value of developing authentic leadership qualities and raising self-efficacy. These findings provide vital data for organisational strategies that support environmentally friendly initiatives.

**KEYWORDS** Authentic Leadership, Manufacturing Industries, Self-Efficacy, Worker' Green Creativity

**Introduction**

Over the past ten years, authentic leadership has developed into a vital topic of study in the field of organisational behaviour (Farid et al., 2020). Innovative green behaviour encourages the sustainability trend and encourages workers to create and apply environmentally friendly procedures in workplaces. According to Rehman et al. (2023), green innovation contributes to the UN Sustainability Agenda 2030 while lowering manufacturing costs and gaining an advantage over competitors. According to Zameer et al. (2021), workers who develop creative thinking and approaches can recognise opportunities for better use of resources, reduce energy usage, enhance economic performance, and put into effect more efficient methods. These workers are viewed as the most valuable asset of organisations and essential capability (Imam et al., 2020; Zhou et al., 2018). For these reasons, companies frequently decide for putting investment in worker growth to foster sustainability-oriented skills (Zameer et al., 2021; Zeb et al., 2019). As a result, authentic leadership is important for motivating workers to pursue the goals set by the Sustainable Development Goals (Cheng and Yang 2019; Zeb, 2020). The ability to motivate and encourage colleagues, make wise judgments, and accomplish people and resources effectively is a fundamental requirement for authentic leadership, which fosters values of green creativity (Ma et al., 2023; Zeb et al., 2019; Wang et al., 2014; Xu et al., 2017). In the workplace, employees' green creativity is defined as "their potential and roles to generate and initiate green innovative ideas" (Yoshida et al., 2014). In the context of workers' green creativity, authentic leadership fosters the exchange of information, sharing of knowledge, influence, and a positive work atmosphere (Ahmad et al., 2015; Nguyen et al., 2022). However, more study is needed in

this area. To increase creativity, previous research has typically concentrated on servant leadership, idealistic (Umalihayati et al., 2022; Nasab and Afshari 2019). Still, less attention has been paid to the function of authentic leadership (Zeb et al., 2019; Arici and Uysal 2022), particularly when it comes to employees' green creativity from the point of view of the emotional atmosphere (Farrukh et al., 2023) in developing countries. Further study has been conducted to identify the character of authentic leadership and explore the basic steps involved in fostering a green creativity atmosphere (Sarkar, 2019; Chaudhary & Panda 2018; Zameer and Yasmeen, 2022).

Additionally, authentic leadership supports worker self-efficacy, improves performance and creativity, promotes a work environment, and strengthens organisational commitment, as shown in studies by Meng et al., (2016) and Laschner et al., (2015). Particularly self-efficacy encourages workers to take part in inventive efforts to promote green creativity (Zhou et al., 2018; Maria et al., 2022). Furthermore, previous studies (e.g., Yang et al., 2017; Zeb et al., 2020) have focused on examining the role of authentic leadership in a broad range of theoretical contexts, including the intermediating effect of self-efficacy and the environment of trust and safety, to investigate the association among authentic leadership and workers' green creativity. Hence, very limited studies were found on this scenario to examine the worker's green innovative behaviour (Semedo et al., 2018; Ma et al., 2017), especially in developing states (Wang et al., 2021; Lee et al., 2019; Nguyen et al., 2022).

Previous research studies have generally explored the relationship between self-efficacy and the psychological environment, but it has never specifically examined the relationship between authentic leadership and employees' green creativity in the manufacturing industries. Furthermore, they have not evaluated the mediating role of self-efficacy. Thus, in the context of a manufacturing industry environment, it is important to explain the behaviours of authentic leadership to influence the worker's green creativity via the intervening role of self-efficacy.

## **Literature Review**

### **Authentic leadership and worker' green creativity**

Self-awareness, relational transparency, coordinated the process, internal moral viewpoints, and other characteristics are all considered to be components of authentic leadership. It indicates how aware the leader is of showing a pattern of transparency and lucidity, and how consistently they express and act upon their own thoughts, emotions, and intentions (Walumbwa et al., 2008; Walumbwa et al., 2011). Organisations should concentrate on selecting managers and executives who priorities self-awareness and openness in their dealings with workers, suggest by Semedo et al., (2016; Ghani et al., 2022). The research revealed that in order to achieve the goals that were set at the organisational and individual scales, leadership and management can process emotions within and strike a balance when interpreting data. Semedo et al. (2018) revealed by emotional commitment and inventiveness are influenced by authentic leadership. According to the study, authenticity fosters creativity and increases an employee's ability to overcome changeable challenges at work. George (2003) pointed out that authentic leadership fosters positive mindsets and behaviours that can lead to vastly green creativity (Karman et al., 2023; Manzoor et al., 2023). It also improves the relationship between leaders and their employees and enhances environmental efficacy. This study adopts a similar approach to the leader-member collaboration, assuming that an effective association between managers and employees may enhance their opinions of the work environment as a whole. Thus, we propose the following hypothesis:

**H1:** Authentic leadership has significantly foster worker' green creativity.

### **Self-efficacy mediates the relationship Authentic and worker' green creativity**

The research study on this matter concluded that the responsibilities of the leader have an immense impact on the creativity of workers and that the link between leader position and creativity is mediated by self-efficacy. According to Santoso et al. (2019), there is a significant connection among creativity, self-efficacy, and transformational leadership. Yang et al. (2017) showed that the relationship between servant leadership and employees' creativity is mediated by self-efficacy. The research also found that self-efficacy encourages employee creativity, which was predicted by servant leadership. Based on the intrinsic motivation principle of creativity, Zeb et al. (2019) confirmed that authentic leadership fosters creative perceives that in turn encourage employees' creativity. The intervening effect of self-efficacy has been examined in a variety of contexts by earlier research, but it has not been as thoroughly examined in the link between authentic leadership and worker' green creativity in manufacturing industries. As a result, we build the following hypothesis:

**H2:** Self-efficacy significantly mediates the relation between authentic leadership and worker' green creativity.



Figure 1: Conceptual framework

## **Material and Methods**

### **Sample Procedure**

The participants of the study were managerial level employees working in several manufacturing industries at Peshawar region. A cross-sectional survey approach was used to collect quantitative data from workers. The informed consent part of the survey began with an explanation of the research objectives and an assurance of the privacy and secrecy of the data that was collected. For the purpose of gaining a deeper thoughtful of the association between authentic leadership and worker' green creativity, there were no right or wrong response for any issue, and the instructions made that clear. The participants were urged to response as fairly as they possibly. To reduce the likelihood of errors, instructions on how to complete the survey were also given. Minimizing anxiety regarding evaluations and protecting participant anonymity, together with avoiding permissive, obedient, and socially acceptable responses, are two strategies that help lower response bias (Podsakoff et al., 2003). After their decision to engage in the study and reading the informed consent section, the respondents shared their opinions about authentic leadership, self-efficacy, and worker' green creativity. Items related to socio-professional characteristics (such as respondents' age, gender, education, length of

employment in their organisations) were included in the last part. After implementing a non-probability, convenience sample technique, Zeb et al. (2021) suggestions were followed. Because participants may be chosen who are conveniently accessible, this kind of sampling technique enables data collection simple and fast. This method performs well in industrial settings and is helpful when resources and time are limited (Rasool et al., 2023). Due to the time and resource constraints, as well as the unstructured nature of industrial environments, this study decided to gather data through convenience sampling methods.

350 questionnaires were distributed, but only 230 (65.71% of the total) were received fully completed. Showing the current dynamics of authentic leadership, self-efficacy, and the worker' green creativity at manufacturing industries in the regions of Peshawar, the data was utilized for the first time.

### Questionnaire measures

#### Independent variable: Authentic Leadership

A six-item scale was used to measure authentic leadership; a particular item on the scale was "my immediate leader is able to improve his/her interactions with others by requesting feedback." The scale, which has a valid alpha value of 0.827, was obtained from a study performed by Walumbwa et al., (2008).

#### Dependent variable: worker' green creativity

Workers' green creativity was assessed using a six-item scale. For example, one sample item questioned regarding "suggests new ways to achieve goals or objectives." With a valid Cronbach's alpha of 0.877, study scale was derived from a past research conducted by Zhou and George (2003).

#### Mediating variable: Self-efficacy

Six items contained the self-efficacy scale; one sample item "I will be capable accomplish most of the goals that I have established for myself." Cronbach alpha for the scale, which was found by Rehman et al., (2021), was 0.86.

### Data Analysis

This research analyzed the data using regression analysis, and SPSS version 25 was used for all of the studies. Additionally, this study used SPSS Process Macro (Model 4) to examine the mediation effect (Hayes, 2013).

### Results and Discussion

**Table 1**  
**Participant's profile**

Distributions	Details	Frequencies	Percentage%
<b>Gender</b>			
	<i>Male</i>	180	78.3
	<i>Female</i>	50	21.7
<b>Ages</b>			
	<i>18 to 24 years</i>	135	58.7
	<i>25 to 30</i>	39	17.0
	<i>31 to 34</i>	16	7.0

<i>35 to 40</i>	25	10.9
<i>Above 40</i>	15	6.5
<b>Education</b>		
<i>SSC or less</i>	69	30.0
<i>Undergraduate</i>	101	43.9
<i>Graduate</i>	35	15.2
<i>Master</i>	25	10.9
<b>Work experience</b>		
<i>5 years</i>	118	51.3
<i>10</i>	72	31.3
<i>15</i>	35	15.2
<i>Above 15</i>	5	2.2
<b>Total</b>	<b>n= 230</b>	

There were 230 responses in all, as shown in table 1. Male respondents made up the majority (78.3%). The remaining employees (21.7%) were female, 58.7% were between the ages of 18 and 24, 17.0% were in the 25-30 age groups, 7.0% were in the 31-34 age groups, 10.9% were in the 35-40 age groups, and 6.5% of the workforce was 40 years of age and above. The findings of the participants' education specified that 69 (30.0%) have SSC level of education or less, 101 (43.9%) have undergraduate degree holders, 35 (15.2%) have graduated, and 25 (10.9%) have MS degree holders. According to the experience results of the respondents, 118 (51.3%) have less than 5 years of experience, 72 (31.3%) have 10 years of experience, 35 (15.2%) have 15 years of experience, and only 5 (2.2%) have above 15 years of experience.

**Table 2**  
**Scale Reliability**

<b>Names of variables</b>	<b>Scale items</b>	<b>Cronbach values</b>
<b>Independent variable</b>		
<i>Authentic Leadership</i>	16	<b>.909</b>
<b>Dependent variable</b>		
<i>Worker' green creativity</i>	06	<b>.874</b>
<b>Mediating variable</b>		
<i>Self-efficacy</i>	06	<b>.835</b>

The instrument reliability test findings provided adequate proof of scale reliability. As shown in the above table 2, when Alpha value is greater than the suggested value, verifying the accuracy of the research's instruments. Hence, alpha value of all the variables is higher than 0.7 that clearly shows that items used in the study are reliable.

**Table 3**  
**KMO and BTS test**

<b>Variables</b>	<b>(AL)</b>	<b>(WGC)</b>	<b>(S)</b>
	<b>Independent variable</b>	<b>Dependent variable</b>	<b>Mediating variable</b>
<b>KMO</b>	<b>.884</b>	<b>.787</b>	<b>.744</b>
<i>Chi-square</i>	<b>828.969</b>	<b>263.529</b>	<b>171.216</b>
<b>BTS Df</b>	<b>28</b>	<b>6</b>	<b>6</b>
<i>Significance</i>	<b>.000</b>	<b>.000</b>	<b>.000</b>

We conducted the KMO and Bartlett's tests to ensure that sure the data was appropriate before conducting factor analysis. Both of these tests were effective. The KMO statistic is a value that ranges between 0 and 1. Kaiser (1974) suggests that values greater than 0.5 are acceptable. KMO levels less than 0.5 should to encourage greater

collection of data. The sample adequacy range measured by Kaiser-Meyer-Olkin (KMO) is (MSA) >= 0.5 (Table 3).

**Table 4**  
**Regression Analysis**

Summary	values	Durbin Watson test
R	.690	1.706
R2	.476	
S.e	.802	

**Predictor Authentic leadership (AL)**

Regression analysis was confirmed in the model tables 4. The independent variable authentic leadership explains 47% variation in the dependent variable worker' green creativity, as per R<sup>2</sup> value. In the range, the DW value is almost falling. Thus, the DW result shows that there are no autocorrelation problems in the data.

**Table 5**

Coefficient Summary	values
<i>Unstandardized Coefficient B</i>	.654
<i>t</i>	14.92
<i>p</i>	(.000) p< .05

**Predictor: Authentic Leadership (AL)      Dependent variable: Worker' Green Creativity (WGC)**

The regression analysis of the study variables is displayed in model table 5 above. The value of *p* is .000, which is significant, and clearly indicates that authentic leadership significantly foster worker' green creativity.

The predictor AL has unstandardized beta value is (.65) that suggest a one unit increase in AL due to 65% unit increase in worker' green creativity. The authentic leadership showed significant and positive impact on worker' green creativity, as shown by the finding of *t* and *p* values. Hence, hypothesis **H1** was confirmed.

**Mediation Analysis**

We tested the mediation effect between the authentic leadership and worker' green creativity using Hayes' (2013) SPSS macro in order to determine the effect of mediation. Additionally, this approach adheres to the guidelines provided by (Baron and Kenney, 1986). Hayes Model 4 (2013) was utilized for the analysis of mediation. Self-efficacy mediates the second hypothesis of the study in the following table 6, which states that authentic leadership and worker' green creativity are indirectly connected (Effect= 0.2984, BootSE= 0.0586, BootLLCI= 0.1836, and BootULCI= 0.4132). Hence, second hypothesis of the study was supported.

**Table 6**

Indirect path	Boot s.e	B.LLCI	B.ULCI	<i>b</i>	<i>T</i>	Decision
AL → S → WGC	.0586	.1836	.4132	.2984	5.43	H2 Supported Partial Mediation

**P<.001; (Predictor-AL), (Dependent variable-SGC), (Mediating variable-S)**

## **Conclusion**

The primary objective of this study was to fill a knowledge gap regarding the relationship between authentic leadership (AL), self-efficacy (S), and worker' green creativity (WGC) in manufacturing industries in the city of Peshawar, Pakistan. The research's findings revealed that authentic leadership positively promotes worker' green creativity. The findings also showed that self-efficacy mediates the relationship between AL and WGC. However, the first pathway's results are in line with earlier study conducted by Imam et al., (2020), Zeb et al., (2019), Semedo et al., (2018). In the second pathway, the associations between green creativity among employees and authentic leadership were partially mediated by self-efficacy. The findings proved that leaders with a higher level of authenticity are capable of motivating their workers to participate in creative initiatives pertaining to the environment. Workers will consistently respond with green creativity at work when they observe their leader to be authentic and capable of fostering a creative atmosphere. The results of our investigation are somewhat corroborated by other studies conducted by the writer Zeb et al., (2019), and Phuong and Takahashi (2021). According to the studies, authentic leadership fostered sincere interactions with colleagues, improved motivation, encouraged creative work environments, and encouraged worker initiative. By exploiting self-efficacy as a mediating mechanism between authentic leadership and employees' green creativity in those industries that they are making products in the city of Peshawar, our study further strengthened the body of knowledge. The findings indicate that green creativity among workers in manufacturing industries in the regions of Peshawar has a positive relationship with authentic leadership.

The study's conclusions supported earlier research findings by showing that authentic leadership has a positive effect on workers' green creativity. Additionally, the analysis showed that self-efficacy partially mediated the association between authentic leadership and worker' green creativity. These results suggest that employees are more inclined to participate in green creative activities when leaders exhibit authenticity and foster a positive, creative environment. The findings are consistent with earlier studies and highlight the value of authentic leadership relations in encouraging employees' creativity (Rehmat & Zeb, 2023; Malodia and Goyal, 2023). Furthermore, the research extends to the theoretical framework of social identity and social exchange theories in evaluating the association between green creativity among employees and authentic leadership. With everything considered, this study offers valuable information about how authentic leadership fosters workers' green creativity and emphasises the need for more research on the mediation effects of leaders on creativity.

## **Theoretical and Practical implications**

The findings add support to the body of knowledge already available on authentic leadership, self-efficacy, and worker' green creativity. The results highlight the importance of authentic leadership in fostering positive stimulating workers' green creativity. This study extended the body of research on authentic leadership in a significant new way by examining the mediation by which worker green creativity transmitted the impact of authentic leadership on employees' performance. Authentic leaders increase their team workers' confidence and self-efficacy and enable them to actively offer creative, environmentally friendly ideas. Progressively, adopting authentic leadership in environmental management not only maintains but also improves an organization's competitiveness. Companies gain from investing in policies and training that support authentic leadership and encourage green innovation among their workers. Industries should fund authentic leadership activities designed

specifically for the manufacturing sector, as these initiatives can encourage employees' creativity and eco-awareness and promote a sustainable environment. Management of manufacturing industries should focus an emphasis on motivating surroundings that boost self-confidence encourages workers to actively offer innovative, eco-friendly ideas, which makes it possible to integrate green initiatives into production processes.

### **Limitations and future Study**

This study reflects the first of this type that investigates empirically the relationships between authentic leadership, employee self-efficacy, and green creativity in the context of manufacturing industries in Peshawar regions. Due to a few significant shortcomings, this work offers possible directions for further investigation. Firstly, the sample data, which only encompasses manufacturing industries in the regions of Peshawar, is one of the limitations. Therefore, the study's findings are restricted to that companies that producing products. As a result, there are issues with generalizability with the study's findings. Second, data was gathered from workers in the manufacturing industries, and employees' green creativity and authentic leadership were examined. Following studies efforts may investigate the green creativity of employees through the acquisition of data from various managerial contexts and broad organisational levels. Thirdly, the relationship between authentic leadership and employees' green creativity was examined in this study through mediating effect of self-efficacy. Future research may use few mediating variables that enhanced the stated relationship, and could investigate the role of age, gender, and education as control variables to further expand on this area of knowledge. According to Hughes et al. (2018), future studies may evaluate the recognition of various mechanisms and concepts that could provide additional notions for comprehending the relationships between leaders and workers. Fourthly, a cross-sectional research design was employed in this study. Future study might evaluate the relationship between employees' green creativity and authentic leadership using a longitudinal research method.



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