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Research Article

Does Age Matter for Innovative Behavior? A Mediated Moderation Model of Organizational Justice, Creative Self-Efficacy, and Innovative Behavior Among IT Professionals

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The significance of innovation and the expectation for employees to exhibit innovative behavior have been heightened as a result of swift technological advancements and an evolving business landscape. The present research is aimed at examining the impact of organizational justice on fostering innovation in a dynamic business environment. Extending the previous literature which generally examined the combined impact of different facets of organizational justice, we employed the social cognitive theory framework to investigate the mechanism through which the three facets of organizational justice (distributive justice, procedural justice, and interactional justice) lead to employee innovative behavior through the mediating role of employees' creative self-efficacy. Additionally, we examined the role of age as a pertinent boundary condition, an aspect often overlooked in the literature on creative self-efficacy and innovative behavior which is likely to augment our understanding of the potential mechanism driving innovative behavior. The sample comprises 320 individuals employed in the information technology industry. The data were collected in two waves, and subsequent analysis was conducted utilizing the Warp PLS 8 software. The present investigation employed partial least square (PLS)-based structural equation modeling (SEM) to conduct analysis and evaluate hypotheses. The results indicate that all three facets of organizational justice have a positive influence on employees' creative self-efficacy, which subsequently manifests in their innovative behavior. Additionally, age has an impact on the relationship between creative self-efficacy and employee innovative behavior, which becomes less pronounced as employees get older. Theoretical contributions and practical implications for practitioners are discussed.

Keywords: creative self-efficacy; demographics; distributive justice; employee innovative behavior; interactional justice; organizational justice; procedural justice

1. Introduction

The world is changing at an amazing pace, and the recent breakthrough in artificial intelligence (AI) has further boosted the change and innovation processes. Organizations across all sectors of the economy are drastically changing, yet the information technology (IT) industry is at the forefront of the change and innovation that are revolutionizing the world. There is a continuous influx of new products in the IT industry on a daily basis that are not only changing the IT industry itself but also the functionality of conventional industries. The rapidly changing nature of the industry also brings unprecedented challenges, including cut-throat competition, the risk of new product failure, high customer expectations for improved products, and new regulatory complications. To compete in such a challenging

environment, IT companies need to foster a culture of innovation where innovative behavior is nurtured, encouraged, and rewarded in a fair manner to gain and sustain a competitive advantage in the market. Thus, both academicians and practitioners are interested in unravelling the process and the factors that nurture innovative behavior in IT companies.

There is a plethora of research on technological, social, and organizational factors and capabilities leading to innovation [1–4] that includes factors related to AI, cutting-edge technologies [3, 5], organizational and industry structures [6–8], corporate social responsibility [9], and customers' expectations [10], to name a few. Related streams of the literature also examine the impact of innovation performance on organizational market and financial and environmental performance [11, 12]. Although the literature on organizational innovation is extant and further expanding, employee innovative behavior that links technological, social, and organizational factors to organizational innovation performance needs more attention [13].

The literature highlights some important psychological perspectives contributing to employees' innovative behavior that include workplace happiness [14], knowledge sharing [15], peer socialization and support [16], perceived organizational support, perceived justice, and participative climate [17, 18], yet an important construct that shapes perception of fairness within the organization and provides a congenial environment leading to innovative behavior remained understudied. Although some studies examine the link between fairness/organizational justice and employee innovative behavior, these studies used less integrated frameworks that might not offer a holistic and comprehensive perspective on innovative behavior. Thus, we argue that the process linking organizational justice and employee innovative behavior is less developed. Most of the research that studied organizational justice in relation to employee innovative behavior used organizational justice as a composite construct and did not pay attention to examining individual facets of organizational justice (see [19–21]). The literature in the related streams does indicate that three facets of organizational justice, namely, distributive justice, procedural justice, and interactional justice, have varying effects on the outcome variables [22, 23]. Thus, studying individual facets of organizational justice in relation to employee innovative behavior would extend theoretical understanding of the process leading to employee innovative behavior. In addition, the individual facets of organizational justice are not examined in detail in relation to creative self-efficacy which is an important precursor of innovative behavior. Furthermore, despite the evidence in the related streams of the literature that demographic factors particularly age may influence the translation of organizational and personal factors into innovative behavior [24], less attention is paid to organizational climate-innovative behavior research.

We used employee creative self-efficacy as a mediator between different facets of organizational justice and employee innovative behavior. We argue that a fair environment where employees do not fear injustice is likely to boost employees' confidence to think outside the box [25]. When employees feel that the organization has fair reward policies, uniform application of procedures for all employees, and fair treatment by the managers, they would not fear an unexpected reaction from the organization to their creative thoughts, enhancing their creative self-efficacy. The creative self-efficacy, in turn, would translate into employee innovative behavior. The existing literature does provide empirical evidence that fairness leads to creative self-efficacy [26, 27]; however, we did not find any notable study that examines the mediating role of creative self-efficacy between different facets of organizational justice and employee innovative behavior. The arguments are grounded in social cognitive theory (SCT), which suggests that individuals' behavior is influenced by their self-beliefs and their evaluation of the environment in which they operate [28, 29]. In line with this premise, we contend that the employee's perception of the three facets of organizational justice provides a context in which employees develop creative self-efficacy, which develops a tendency among employees to behave innovatively. Thus, the current study, by using SCT as a lens, would fill an important deficiency in the literature and would help in better understanding of the process through which employee innovative behavior is nurtured in IT companies.

The literature in related streams of the study suggests that demographical factors may be related to innovative behavior [30]. Yet in most of the innovation-related studies, the demographic variables are used as control variables, ignoring their potential role as a boundary condition. The current study also attempts to examine an important boundary condition in this mediating mechanism. The literature from the sociology and psychology domains generally indicates that age is negatively related to innovative behavior [31]. Innovative behavior is influenced by different sociological, environmental, and ecological factors, including age. A recent meta-analysis of 125 empirical studies suggests that age moderates the relationship between employee innovative behavior and some of its antecedents [30]. Despite empirical evidence in closely related streams of literature, age has not been studied as a moderator between creative self-efficacy and employee innovative behavior. To the best of our knowledge, this is the first study that examines the impact of the three facets of organizational justice on employee innovative behavior through creative self-efficacy with the boundary condition of age. The proposed framework is likely to offer theoretical extension by examining theoretically relevant and plausible constructs contributing to the development of employee innovative behavior in different age groups.

2. Theory and Hypotheses

2.1. SCT in the Study Context. SCT provides a valuable framework for understanding the dynamic interaction of the environment, human factors, and behavioral outcomes. Bandura developed his earlier work on self-efficacy [32] in his landmark book in 1986 to present the idea of social cognitive processes that lead to different behavioral outcomes (see [33]). Since then, the theory has been used in a variety of contexts to explain human behavior and the motivations

behind those behaviors [34–37]. The SCT uses an agentic perspective, where an agent influences the quality of one's functioning and the events that affect one's life. In this perspective, people's beliefs in their self-efficacy are the foundation of human agency [38]. Other factors in the environment may serve as guides and motivators, but their human actions are mainly rooted in the core belief that one can produce effects through his or her actions. This self-belief or self-efficacy encourages humans to undertake activities or to persevere in the face of difficulties.

In organizational settings, employees are engaged in an evaluative process where they assess the environment and the support they receive. The positive assessment of the environment helps employees build outcome expectancies that lead to the development of self-efficacy to perform tasks confidently [39]. Self-efficacy, in turn, influences employee behavioral outcomes in organizations. The dynamic interaction between environmental, personal, and behavioral factors was termed by Bandura as triadic reciprocal determinism [40].

The theory acknowledges that different contexts and cultures may influence the dynamic interplay among different variables. The way humans evaluate the environment and react to environmental factors varies across cultures and contexts [41]. Therefore, the theory is suitable to study relevant environmental factors, self-efficacy, and behavioral outcomes in the context of the IT industry. In the current study, we examined employees' perceptions of distributive, procedural, and interactional justice as environmental factors that influence employee self-efficacy and innovative behavior. Since the current research focuses on employee innovative behavior, we used a modified conceptualization, namely, "creative self-efficacy," instead of the conventional "self-efficacy" construct to enhance the accuracy of predicting innovative behavior. This conceptualization allows for a more precise examination of employees' confidence in their ability to generate new ideas and behave innovatively in the rapidly changing IT sector. This conceptualization is in the ambit and scope of triadic SCT in its conceptualization as triadic reciprocal determinism [40].

2.2. Distributive Justice, Creative Self-Efficacy, and Employee Innovative Behavior. Distributive justice is one of the three dimensions of organizational justice used in most of the popular conceptualizations of organizational justice in the literature. Distributive justice (reward fairness) is the perception of an employee about the fairness of rewards in proportion to their input efforts and is found to have a positive relationship with different positive behavioral and organizational outcomes [42–48].

Although a large body of literature studied organizational justice as an integrated variable instead of dissecting the effects of the three dimensions of organizational justice and examining their impact on employee innovative behavior, the limited available literature focused on distributive justice generally suggests that perception of reward fairness leads to employee innovative behavior [49–51]. The literature used different terms to examine distributive justice, including reward fairness, reward expectancies, and reward perception, but their descriptions are similar. Distributive justice has been found related to work self-efficacy as employees constantly evaluate fairness and justice in their work settings. When employees perceive that rewards and remunerations are distributed in a fair manner, it provides them with a sense of confidence and belief in their ability to accomplish tasks in an effective way and to achieve desired outcomes [52]. Such sense of confidence leads to contributing to higher levels of work self-efficacy [53]. The fairness of rewards also generates a distributive justice climate in the organizations and organizational subunits that nurtures a perception that employees' efforts will not be ignored, giving motivation and confidence to think creatively [54].

While the majority of the literature hints that distributive justice leads to innovative behavior, there are some studies that offer counterintuitive evidence by suggesting that reward fairness has either no effect or a negative effect on innovative behavior [55]. A systematic literature review by Bos-Nehles et al. [56] suggests that ambiguous results may be attributed to different theoretical perspectives and different contexts used in different studies.

Despite inconsistent findings in the literature, we contend that distributive justice leads to employee innovative behavior through various mechanisms aligned with SCT. The equitable distribution of rewards based on performance and capabilities conveys the impression to employees that the organization rewards innovative behavior. By observing a culture of fair rewards, employees shed off worries that innovative behavior has detrimental effects because of the certain degree of risk involved in organizational financial performance. This reasoning is in line with the SCT that suggests that the vicarious or observational learning of employees translates into behavioral outcomes [57]. Vicarious learning is also likely to enhance employees' creative self-efficacy by instilling confidence among employees about the transparency of the reward system, which in turn would lead to innovative behavior. Perception of a fair environment in the organization improves harmony and mitigates disharmony giving employees confidence to share knowledge with colleagues [58]. Knowledge sharing in turn leads to new ideas and confidence to think creatively [59]. Distributive justice would also instill trust in leadership and organizational systems. Employees would gain trust that their leadership and the organization value their contributions, which is likely to develop greater creative self-efficacy and innovative behavior. Some earlier research studies suggest that distributive justice does not have a direct effect on employee innovative behavior rather it influences innovative behavior through mediating mechanisms [60].

Based on the review of literature that offers inconclusive or indeterminate guidance on the relationship between distributive justice, creative self-efficacy, and employee innovative behavior, it is important to examine the relationship in the context of the IT industry to add empirical evidence to the literature. We argue that based on the reasoning embedded in SCT, distributive justice is likely to influence employee innovative behavior both directly and through mediating mechanisms. Thus, we hypothesize the following:

- H1. Distributive justice is positively related to employee innovative behavior.
- H2. Creative self-efficacy mediates the relationship between distributive justice and employee innovative behavior.

2.3. Procedural Justice, Creative Self-Efficacy, and Employee Innovative Behavior. While distributive justice pertains to how fairly rewards are distributed among employees and how employees perceive the reward distribution, procedural justice focuses on employees' perceptions of uniformity in the application of procedures within organizations. The term procedural justice was first coined by Thibaut and Walker [61], who defined it as the fairness of formal procedures underlying organizational decisions made about employees. It emphasizes how resources are distributed among employees, in contrast with distributive justice, which deals with the fairness of the distribution of outcomes in the organization [46, 62, 63]. The process for making organizational decisions is as important to employees as outcome fairness [64]. If the process involves unfairness, whereby procedures are not uniformly applied to all employees, it creates an unfavorable perception of the organization. Employees constantly evaluate the application of organizational policies and procedures, including those related to promotion, job appraisal, reward distribution, and task assignments. The perception of discriminatory applications of the procedures leads to negative perceptions about the organization and unfavorable employee outcomes [65]. On the contrary, positive perceptions about procedural justice lead to positive employee outcomes, including self-efficacy and innovative behavior [66, 67].

Procedural fairness reduces uncertainty about the outcome of employees' efforts. Employees believe that uniform principles would be applied in performance evaluations and other organizational assessments that would reflect their true efforts. In the absence of discriminatory treatment, employees are encouraged to focus on their efforts as they believe that their efforts would be valued fairly [68]. With this trust in the fairness of procedural applications, employees develop greater creative self-efficacy as no unfair or unfavorable treatment is likely to transpire against them for their creative tendencies. Their confidence in the fair procedures also strengthens their belief in the positive outcomes. Such creative self-efficacy, in turn, is likely to enhance innovative behavior in addition to having a direct impact of procedural justice on employee innovative behavior [69]. Yang and Bentein [70] examined the impact of entrepreneurial leadership on employee creativity in a multilevel study at both the individual and team levels. Entrepreneurial leadership was used as a contextual variable that enhances employee positive outcomes. The study found that encouraging leadership as context enhances employee creative self-efficacy. By the same token, we argue that procedural justice as a context instills confidence among employees to think creatively and behave innovatively. In another study, Yang and Bentein [70] found that procedural justice had a positive impact on creative self-efficacy.

The literature presents different perspectives on the potential role of procedural justice in generating creative self-efficacy and innovative behavior. Ståhl et al. [68] noted differences in the perception of procedural justice for in-group and out-group organizational members. Employees may ignore an unusual favor given to an in-group member but may react negatively to an undue favor extended to an out-group member. In the latter case, the procedure is perceived as biased and prejudiced. In a similar study conducted in the Chinese context, it was observed that there is variation in the perception of procedural justice. When the unfair treatment was given to a relative of a senior official, employees reacted negatively to the procedural violation. However, when the discriminatory favor was given to a school fellow, employees did not have a negative reaction [71]. The findings of these studies indicate that the impact of procedural justice on creative self-efficacy and innovative behavior is more complicated than previously comprehended, warranting further investigation.

From another perspective, some studies examined creative self-efficacy as a predictor of procedural justice [72], claiming that self-efficacy improves an employee's lens to view procedural fairness. Similarly, some studies used procedural fairness as a moderator of self-efficacy and its outcome relationship [73]. While we appreciate the different perspectives adopted by these studies, we argue that the SCT perspective is more plausible as employees learn and evaluate the environment related to the procedural environment and develop creative self-efficacy and innovative behavioral tendencies based on their social learning. Thus, we hypothesize the following:

- H3. Procedural justice has a positive relationship with employee innovative behavior.
- H4. Creative self-efficacy mediates a positive relationship between procedural justice and employee innovative behavior.

2.4. Interactional Justice, Creative Self-Efficacy, and Employee Innovative Behavior. As the literature on organizational justice expanded around distributive and procedural justice, Bies and Moag [74] added a new dimension to the literature on organizational justice by introducing a new facet: interactional justice. They argued that reward outcomes and reward procedures are not sufficient to gauge the overall perception of organizational justice as employees closely observe the quality of the interpersonal treatment they receive when procedures are implemented. They defined interactional justice as the "quality of interpersonal treatment employees receive during the enactment of organizational procedures" (p. 44). Compared with other forms of injustice, injustice in interactions is described as a "hot and burning" experience that has a profound impact on an employee's psyche and identity [75]. After the publication of the seminal work by Bies and Moag [74], the construct has been validated as a distinct dimension [22, 76, 77] and used in a number of studies in relation to favorable organizational and individual outcomes [78, 79].

Greenberg [62] posits that interactional justice may consist of two types of treatments, namely, interpersonal justice and informational justice. Interpersonal justice reflects the degree to which people are treated with politeness, dignity, and respect by their supervisors and seniors, while informational justice deals with the explanations provided to people that convey information about why procedures were used in a certain way or why rewards were distributed a certain way.

Interactional justice involves providing employees with clear explanations for decisions [80], offering opportunities for voice and input [81], and recognizing employee contributions. Interactional justice also takes away or mitigates the fear of failure among employees that boost their motivation to engage in creative problem-solving and take calculated risks as they experience greater psychological safety in an environment with greater interactional justice [82]. Reduced fear is found to have favorable impact on employee creative self-efficacy as well as innovative behavior. Interactional justice also helps employees to think about creative solutions in external interactions as they experience reduced relational risk in their interactions [83].

From the perspective of SCT, interactional justice creates trust in the leadership and in the organization. Employees' belief that they would be treated politely and respectfully by their respective supervisors despite some minor mistakes gives them confidence in their creative ability and reinforces innovative behavior. Interactional justice reduces anxiety among employees, creating a healthy environment that enhances creative self-efficacy and behavioral tendencies to act innovatively. Similar streams of literature in perceived supervisor support and leader-member exchange (LMX) postulate that fair and supportive treatment of the supervisors leads to positive behavioral outcomes, including innovative behavior [84, 85]. Despite the logical plausibility of the relationship between interactional justice, creative self-efficacy, and innovative behavior, the relationship is not emphasized in the literature. Moreover, employees who experience high levels of interactional justice feel psychologically safe to express their ideas and opinions without fear of negative consequences, which is likely to boost their confidence. This sense of psychological safety augments their risk-taking tendencies and fosters a culture of open communication, which may lead to promoting employee innovative behavior. Thus, we hypothesize the following:

- H5. Interactional justice has a positive relationship with employee innovative behavior.
- H6. Creative self-efficacy mediates a positive relationship between interactional justice and employee innovative behavior.

2.5. Moderating Role of Age Between Self-Efficacy and Innovative Behavior. The relationship between self-efficacy and employee innovative behavior is documented in the literature [86–88]; however, there is some inconsistent empirical evidence in the literature that suggests that the relationship between creative self-efficacy and employee innovative behavior may have different intensity in certain boundary conditions [88–90]. The literature examined optimism [90], servant leadership [91], entrepreneurial leadership [92, 93], interprofessional learning [94], and emotional intelligence [95]. Most of these moderating variables studied in the self-efficacy–innovative behavior relationship pertain to the environment, while some studies paid attention to individual psychological factors. The SCT suggests that human actions are mainly rooted in the core belief that one can produce effects through his or her actions. In line with the SCT, we argue that individual's cognitive perspectives vary with an important demographical factor (i.e., age). As employees age, the diversity of their life and job experiences influences their ability to learn and interpret various events and constructs.

Despite an extensive search, we did not find any research that examines age as a moderating variable for creative self-efficacy. The related streams of literature reveal mixed findings [96, 97]. Frosch [98] observed that the impact of age on innovative behavior is not linear but rather hump-shaped. Further, Ng and Feldman [97] observed in an extensive review of the literature that most of the studies related to innovation have either used age as a control variable or simply excluded age from the respective studies. Some recent studies also emphasize paying attention to the role of age in relation to innovation [99]. They underscore the importance of age in studies related to innovative behavior. Based on the deficiency pointed out in the literature and the SCT-inspired reasoning presented earlier, it seems plausible to examine age as a potential boundary condition between creative self-efficacy and employee innovative behavior. It is also reasonable to examine age as a moderator in the study context (i.e., the IT industry), where rapid innovation is essential for the survival of organizations and younger workers are somewhat preferred [100, 101]. Based on theoretical reasoning, industry context, and shortcomings in the literature, we contend it is important to examine age as a moderating variable in the creative self-efficacy–employee innovative behavior relationship. Therefore, we hypothesize the following:

- H7. The relationship between creative self-efficacy and employee innovative behavior is moderated by age.

Figure 1 shows all the proposed relationships.

3. Method

3.1. Sample and Design. The data was collected from companies operating in the IT sector in Pakistan. The list of IT companies was obtained from the Pakistan Software Houses Association (P@SHA), which maintains records of the companies, their sales turnover across the sector, and other marketing details. We collected data from mobile communication companies, software development companies, and mobile app development companies. Some of the subsectors in the IT industry were excluded, including medical transcription and telemarketing. The reason for excluding these companies was that employees are required to do repetitive jobs in these companies, and thus, these

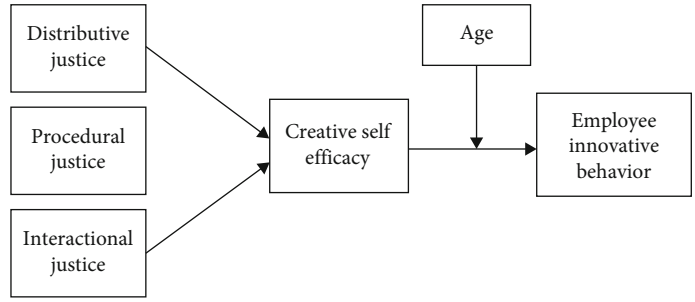

Figure 1: The proposed research model.

companies were not suitable for studying employee innovative behavior.

Data was collected from sixty companies from the earlier mentioned IT companies, and the questionnaires were distributed to these companies by one of the members of the research team. The data were collected in two waves. In Wave 1 (T1), data were collected for the three facets of organizational justice and creative self-efficacy, while the data on innovative behavior and gender were collected after 1 week (T2) to minimize the possibility of common method variance. A total of 450 questionnaires were distributed at T1, out of which 405 were returned. After 1 week, those who completed Wave 1 were given the questionnaire in Wave 2. A total of 352 questionnaires were returned by the respondents who filled out both waves, making the final response rate 78%. Out of the responses collected, 32 were found substantially incomplete and thus excluded from the analysis, leaving 320 responses for final analysis. We used different techniques for sample size determination and revalidation. We determined the minimum sample to be 310 by applying the well-known "10-times rule" suggested by Hair et al. [102]. The 10-times rule is built on the assumption that the sample size should be greater than 10 times the maximum number of inner or outer model links pointing at any latent variable in the model. Considering the critique offered in the literature about the use of the 10-times rule [103, 104], we decided to validate the minimum sample size through other suggested tools for PLS-SEM models. Thus, we used the inverse square root method and gamma-exponential method in line with the recommendations of Kock and Hadaya [104]. Our results of the inverse square root method with a significance value of 0.05 and a statistical power level of 0.80 indicate that the minimum sample required is 160, while the results of the gamma-exponential method indicate that the minimum sample required is 146. Our analysis is performed on a final sample of 320, which meets the sufficiency requirements suggested by Hair et al. [102] as well as alternative sampling requirements proposed by Kock and Hadaya [104] to ensure statistical power.

The responses were collected from office employees working in operations, marketing, and product design departments, as their job tasks require innovative behavior in the organizations. The janitorial staff and other offices involved in purely administrative tasks of a repetitive nature are excluded from the sample.

3.2. Measures. All responses were measured on a five-point Likert-type scale anchored at 1 (*strongly disagree*) and 5 (*strongly agree*) unless specified otherwise.

Distributive justice was measured using a five-item scale developed by Niehoff and Moorman [105]. The scale was based on the earlier work of one of the authors on distributive justice (see [48]). The scale is focused on measuring the fairness of rewards in the organization. A sample item is "I think that my level of pay is fair." The scale has shown high reliability in previous studies [105–107].

Procedural justice is measured using the scale developed by Niehoff and Moorman [105] to examine the fairness of procedures and their uniform applicability among employees. The scale has been used in a number of studies before and has shown high reliability [108–110]. A sample item is "All job decisions are applied consistently across all relevant employees."

The scale for *interactional justice* is also adapted from Niehoff and Moorman [105] with minor modifications. A sample item is "When decisions are made about my job, the general manager treats me with respect and dignity." The scale has shown high reliability in previous studies [111, 112].

Creative self-efficacy is measured using the scale developed by Sue-Chan and Hempel [113] with minor adaptations. The sample item is "I believe I have a unique perspective." The scale has been used in different studies and produced reliable results [114, 115].

For *employee innovative behavior*, we adapted the widely used four-item scale of Scott and Bruce [116]. The scale has been used in a large number of studies and has shown reliability in these studies [117, 118].

For *age*, we categorized age into two categories: younger employees and mature employees. The workers below the age of 30 were classified as younger employees, while the employees over the age of 30 were classified as mature employees. Although there are varied practices in the literature to categorize age, we follow the guidelines of Brunetto et al. [119]. In addition, the majority of employees working in the IT industry are either young or middle-aged [120]. Further, McCarthy et al. [121] argued in the findings of an empirical study that workers are considered older at a relatively young age depending upon the context of the organization. Since the majority of workers in the industry are younger workers, employees over 30 are considered mature or old, not in the biological sense but in task-related matters.

Keeping in view the context of the industry being studied, its demographic composition, and the practices adopted in the literature, we categorized workers below and above 30.

4. Results

The current study used partial least square (PLS)-based structural equation modeling (SEM) to perform analysis and test hypotheses. We used Warp PLS 8 to analyze the results. Before testing hypotheses, we performed confirmatory factor analysis (CFA), reliability analysis, and validity analysis. CFA was done as all the constructs used in the current study were used in previous studies, and CFA could confirm the validity of the instrument in such cases [122]. All items are loaded to their respective constructs except one item of procedural justice, one item of interactional justice, and one item of creative self-efficacy. The items with low loading were removed before proceeding to further analysis. Reliabilities were tested through Cronbach's alpha and composite reliability. Composite reliability is considered to be a more unbiased measure of reliability [123]. Thus, sticking to the practices advised in the literature, we tested both Cronbach's alpha and composite reliability. All constructs have a Cronbach's alpha higher than 0.70, the acceptable level recommended in the literature [124]. Similarly, all latent variables have composite reliability above 0.80, indicating high reliability of the scales. The average variance extracted (AVE) for all constructs met the 0.50 threshold level suggested in the literature [125]. Factor loading, reliabilities, and AVEs are provided in Table 1.

Following the Becker [126] guidelines, we first performed correlation analysis. None of the control variables, including gender and marital status, were found to have a significant relationship with any of the other variables. Therefore, we omitted all control variables in testing our hypotheses because such "impotent" control variables can bias parameter estimation by inflating degrees of freedom and have no additional use for hypothesis testing [126–128]. This view is supported by Atinc et al. [129], based on a review of 812 articles.

Table 2 presents the mean, SD, correlations, and square root of AVEs. The discriminant validity was examined by comparing the square root of AVEs with the correlations among the factors, and it was found that the values of the square root of AVEs were greater than the correlation values of other factors. The square root values of AVE are given in parentheses for evaluating the discriminant validity of the constructs in line with the criteria given by Fornell and Larcker [130].

In order to assess the goodness of the final structural model, we used various model fit indices provided in Warp PLS 8.0. These fit indices include average path coefficient (APC), average adjusted R^2 (AARS), Simpson's paradox ratio (SPR), average full collinearity VIF (AFVIF), R^2 contribution ratio (RSCR), and nonlinear bivariate causality direction ratio (NLBCDR). The results of these indices are provided in Table 3. All results are within acceptable ranges in line with the recommendations provided in the literature [104, 131, 132]. The results indicate goodness of model fit on all indices generated in the Warp PLS results output.

For examining the possible common method bias and multicollinearity, we check variance inflation factors (VIFs) in line with the guidelines provided by Kock and Lynn [132]. Our results indicate and found that the values of all constructs were within the ideal range (≤ 3.3.0), which indicates that the data does not have common method bias or multicollinearity issues.

Once the measurement model was tested and the results were found appropriate for further analysis, we tested the structural model containing the results of PLS-SEM. We tested the hypotheses proposed in the theory and hypotheses section, including mediating and moderating paths, and displayed the results of PLS-SEM. We tested the overall proposed model, including mediating and moderating paths, to examine it holistically and draw comprehensive inferences regarding the acceptance or rejection of the study hypotheses instead of testing the model in parts that may increase the possibility of inaccurate or spurious estimates. The approach used in the current study is in line with widely accepted practice in the literature [133, 134]. The results in Figure 2 indicate that the three independent variables procedural justice, distributive justice, and interactional justice explain about 46% variance in the mediating variable creative self-efficacy, $R^2 = 0.458$. In addition, the model indicates that the mediating variable creative self-efficacy explains about 31% variance in the dependent variable employee innovative behavior, $R^2 = 0.306$. Considering the context of management studies, both values indicate that substantial variation in the mediating variable can be attributed to the independent variables used in this study and a sizeable variation in the dependent variable can be attributed to the mediating variable, thus indicating the effectiveness of the model used in the current study (see [135, 136]). For hypothesis testing, path coefficients and p values are examined. The results show that distributive justice has a significant positive effect on employee innovative behavior ($b = 0.304$, $p < 0.001$). The indirect relationship between distributive justice and employee innovative behavior is mediated by creative self-efficacy ($b = 0.181$, $p < 0.001$); therefore, H1 and H2 are supported. Collectively analyzing the results of H1 and H2 indicates that distributive justice not only has a direct relationship with employee innovative behavior, but the relationship is also mediated by creative self-efficacy suggesting that distributive justice fosters a conducive environment for innovation among employees directly as well as through the mediated path of creative self-efficacy in a positive manner.

The relationship between procedural justice and employee innovative behavior is also found significant ($b = 0.298$, $p < 0.001$). The indirect relationship between procedural justice and employee innovative behavior is mediated by creative self-efficacy ($b = 0.177$, $p < 0.001$); therefore, H3 and H4 are supported. The results indicate that procedural justice not only directly leads to employee innovative behaviour as the perception of uniform applications of procedures gives confidence to employees thereby leading to innovative behavior, but the impact of procedural justice on employee

Table 1: Factor loading, Cronbach's alpha, composite reliability, and AVE.

Variables	Items	Loadings	Cronbach's alpha	Composite reliability	AVE
Distributive justice	DJC1	0.76	0.80	0.86	0.55
	DJC2	0.77			
	DJC3	0.77			
	DJC4	0.68			
	DJC5	0.73			
Procedural justice	PJC2	0.75	0.79	0.86	0.61
	PJC3	0.80			
	PJC4	0.78			
	PJC5	0.79			
Interactional justice	IJC2	0.67	0.72	0.82	0.54
	IJC3	0.77			
	IJC4	0.77			
	IJC5	0.72			
Employee innovative behavior	EIB1	0.70	0.76	0.85	0.59
	EIB2	0.79			
	EIB3	0.78			
	EIB4	0.78			
Creative self-efficacy	CSE1	0.69	0.74	0.83	0.50
	CSE2	0.78			
	CSE3	0.74			
	CSE4	0.69			
	CSE6	0.59			

Table 2: Mean, standard deviation, correlation coefficients, and square roots of AVEs.

	Mean	SD	1	2	3	4	5
1. Distributive justice	3.524	0.852	(0.743)				
2. Procedural justice	3.686	0.85	0.448**	(0.782)			
3. Interactional justice	3.596	0.797	0.509**	0.431**	(0.735)		
4. Employee innovative behavior	3.685	0.858	0.474**	0.430**	0.492**	(0.765)	
5. Creative self-efficacy	3.648	0.786	0.547**	0.550**	0.519**	0.534**	(0.703)

Note: Square roots of AVEs are given on the diagonals.
**$p < 0.01$.

Table 3: Model fit index results of the structural model.

Index	Model results	Model fit criteria
Average path coefficient (APC)	0.30, $p < 0.001$	$p < 0.001$
Average adjusted R^2 (AARS)	0.39, $p < 0.001$	$p < 0.001$
Simpson's paradox ratio (SPR)	0.80	≥ 0.7, ideally = 1
Average full collinearity VIF (AFVIF)	1.50	≤ 5, ideally ≤ 3.3
R^2 contribution ratio (RSCR)	0.98	≥ 0.9, ideally = 1
Statistical suppression ratio (SSR)	1.00	≥ 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	1.00	≥ 0.7

innovative behavior is also mediated through creative self-efficacy. It signifies that procedural justice perception boosts employee confidence to think creatively that in turn generates innovative behavior. Similarly, the relationship between interactional justice and employee innovative behavior is also found to be significant ($b = 0.228$, $p < 0.001$). The

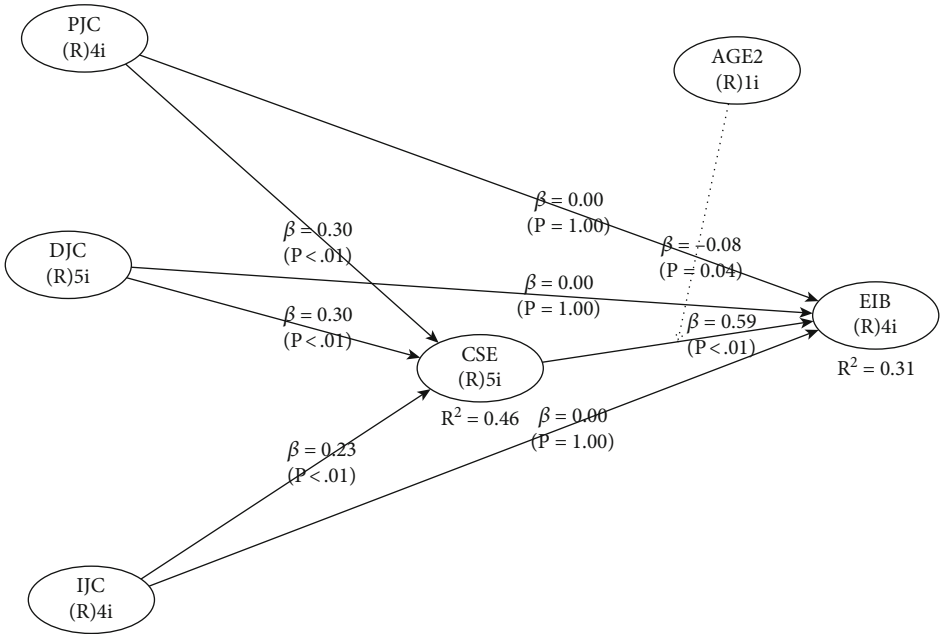

Figure 2: Structural model relationships between latent variables. CSE = creative self-efficacy, DJC = distributive justice, EIB = employee innovative behavior, IJC = interactional justice, PJC = procedural justice.

indirect relationship between procedural justice and employee innovative behavior is mediated by creative self-efficacy ($b = 0.136$, $p < 0.001$); therefore, H5 and H6 are supported. As in these relationships, both direct and indirect effects of different facets of organizational justice on employee innovative behavior are significant, suggesting that the mediation between facets of organizational justice and employee innovative behavior through creative self-efficacy is partial. The partial mediation suggests that justice facets not only enhance creative self-efficacy, which in turn increases innovative behavior, but these facets also directly influence employee innovative behavior. Although the literature is inconsistent on the relationship between different facets of organizational justice and innovative behavior, our results corroborate the prevailing notion within the literature that suggests that the two constructs have a positive relationship [19, 49, 67].

The results also indicate that gender moderates the relationship between creative self-efficacy and employee innovative behavior ($b = -0.083$, $p = 0.042$). The negative sign of the beta indicates that age is associated with a weakening of the relationship between the independent and dependent variables. As employees grow older, the relationship between their creative self-efficacy and innovative behavior will weaken. Figure 3 shows the curvilinear moderation graph. We presented a nonlinear graph as the literature suggests that using linear graphs for examining moderation effects in social sciences may not give appropriate estimates [137]. Based on the nature of the data assessed by Warp PLS 8, a curvilinear graph is presented. The graph shows that the curve is relatively flatter for the higher age group compared with the lower age group. Based on the value of the beta coefficient for moderation effects, H7 is also supported. The nonlinear relationship involving age and innovation is also supported in the literature [138]. The summary of hypotheses is given in Table 4.

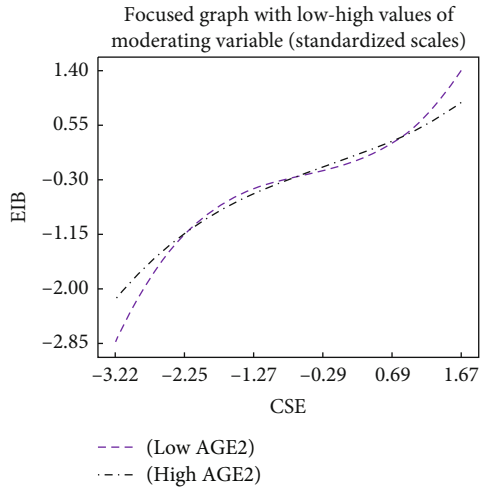

Figure 3: Moderation graph.

5. Discussion

The current study empirically examines the relationship between distributive, procedural, and interactional justice and employee innovative behavior in direct paths as well as through mediating variable creative self-efficacy in the IT industry, where the importance of creative self-efficacy and innovative behavior is increasing enormously due to the rapid changes in the wake of AI. The results of the study indicate that all three facets of organizational justice play vital roles in encouraging innovative behavior among

Table 4: Summary of hypothesis testing.

Hypotheses	Result
H1. Distributive justice is positively related to employee innovative behavior.	Supported
H2. Creative self-efficacy mediates the relationship between distributive justice and employee innovative behavior.	Supported
H3. Procedural justice has a positive relationship with employee innovative behavior.	Supported
H4. Creative self-efficacy mediates a positive relationship between procedural justice and employee innovative behavior.	Supported
H5. Interactional justice has positive relationship with employee innovative behavior.	Supported
H6. Creative self-efficacy mediates a positive relationship between interactional justice and employee innovative behavior.	Supported
H7. The relationship between creative self-efficacy and employee innovative behavior is moderated by age.	Supported

employees. All three facets examined in this study were found to have a positive impact on employee innovative behavior. Different facets of organizational justice create a perception of a fair work environment in which employees experience low levels of anxiety and stress. The innovation process is often stressful, and thus, employees are sometimes reluctant to behave innovatively. The uncertainty and equivocality in the innovation process affects the psychological safety of employees [139] which needs to be addressed by organizations by providing a fair environment. Janssen [140] reported in the findings of a widely cited empirical study that the perception of a fair environment reduces the level of anxiety among employees. The reduced anxiety and absence of apprehension about negative consequences not only increase innovative behavior but also increase the creative self-efficacy of the employees [65].

Some previous studies reported an insignificant relationship between organizational justice and employee innovative behavior [55, 69]; however, our findings are aligned with the findings of the dominant literature that suggest that organizational justice is positively associated with innovative behavior [49–51]. All three facets of organizational justice are found to have a significant impact on employee innovative behavior in the findings of the current study. Thus, the current study adds evidence from the rapidly changing IT industry to validate previous research. We argue that the insignificant findings in the literature in a few studies could be attributed to the specific context of those studies or some methodological issues [56].

The findings of the current study also provide new evidence about the mediating role of creative self-efficacy between different facets of organizational justice and employee innovative behavior. Although we could not find a comprehensive study in the literature that simultaneously tests the mediating role of creative self-efficacy between the three facets of organizational justice and employee innovative behavior, our findings are aligned with the studies that suggest that positively perceived organizational initiatives lead to creative self-efficacy and employee innovative behavior [55, 141]. While a research study in the Chinese context found employees react negatively to fairness violations made by certain groups only [71], our findings provide the basis for the unacceptability of an unfair environment in the IT industry as the industry is globalized and the workers in the industry have frequent interactions with international clients; thus, they are more sensitive to fairness practices across the globe.

The current research provides empirical evidence that age moderates the relationship between creative self-efficacy and employee innovative behavior. While we could not find any notable study that tested age as a moderator between creative self-efficacy and employee innovative behavior, the literature does provide empirical evidence that the relationship between these two variables is subject to boundary conditions [92–95]. Further, our findings are also aligned with the innovation literature, which suggests that age in innovation studies generally has a curvilinear relationship instead of a linear relationship [96]. Thus, the current study not only extends the literature by introducing age as an important boundary condition between creative self-efficacy and employee innovative behavior but also confirms the results of the studies in the related stream of the literature. The negative sign of the moderating variable age signifies that as employees grow older, the relationship between creative self-efficacy and employee innovative behavior gets weakened. This is in line with some previous studies that suggest "innovation is age-biased" [138].

5.1. Theoretical Contributions. The current study offers a number of important contributions to the body of literature. First and foremost, the study presents a holistic model in which three facets of organizational justice, creative self-efficacy, and employee innovative behavior are examined in the presence of an important boundary condition. To the best of our knowledge, this is the first study to examine this combination of relationships. By testing this holistic model, the current study advances the theory by suggesting that each facet of organizational justice not only influences employee innovative behavior directly but also has indirect effects on innovative behavior through creative self-efficacy. This theoretical extension would help future researchers better comprehend the underlying mechanism regarding the impact of perceived environmental fairness on employee innovative behavior.

Second, the current study tested an important boundary condition, age, in the relationship between creative self-efficacy and employee innovative behavior. While there is ample theoretical foundation for using age as a moderator between creative self-efficacy and employee innovative behavior, the previous literature did not pay attention to it. In most of the innovation-related studies, age is only used as a control variable, and the researchers did not examine its potential moderating effects. Thus, the study offers significant theoretical advancement in organizational justice-

innovative behavior literature by studying an important and plausible demographic boundary condition that would help our understanding of the phenomena in different age groups.

Lastly, the study offers a SCT perspective to explain how environmental and individual factors influence employee innovative behavior. The SCT suggests that individual behaviors are influenced by their self-belief and their evaluation of the environment [28, 29]. The current study examines both environmental factors related to fairness as well as self-belief about an individual's creative potential (creative self-efficacy). By studying facets of organizational justice, creative self-efficacy, and innovative behavior, the current study adds new evidence and dimension to the literature of SCT.

5.2. Practical Implications. Besides theoretical contributions, the current study offers valuable practical implications for practitioners and decision-makers in the organization by identifying important environmental, demographic, and personal factors that could potentially influence employee innovative behavior. As the study is conducted in a rapidly transforming IT industry where the importance of innovative behavior is pivotal, the underlying mechanisms leading to the innovative behavior identified in this research would help managers boost innovation in their organizations. The current study underscores the importance of distributive, procedural, and interactional justice for creative self-efficacy and innovative behavior. Thus, managers can incorporate policy measures to ensure fairness in rewards, procedures, and interactions so that employees do not feel at monetary or organizational risk. The managers can boost employee creative self-efficacy by taking measures to communicate a perception of a fair working environment, which in turn would lead to innovative behavior. Further, the study reports that age moderates the relationship between creative self-efficacy and innovative behavior. That would help managers understand that they need to inculcate extra support for aging employees so that their beliefs about their creativity capacity are translated into innovative behavior. This may be done by removing any potential negative consequences attached to innovative behavior.

5.3. Limitations and Future Research. Like any other study, the current study also has some limitations. Although the authors have attempted to minimize the limitations attached to the study through rigorous design and statistical measures, the limitations must be kept in mind while interpreting the results of the study and generalizing them. The first limitation is the cross-sectional nature of the study. Although we incorporated measures at the design stage as well as statistical analysis to ensure that the study was not biased by the common method, potential limitations may still exist in the study. Another limitation is related to the sample size. Although we ran multiple tests to ensure the sufficiency of the sample size, the inferences from the sample to the population may have some inherent errors that should be kept in mind while interpreting the results. Lastly, since the study is conducted on a sample taken from a specific developing country, the model may be verified in other industrial or country contexts to validate the findings of the current study.

Future researchers need to test the model using a longitudinal or experimental design to add rigor to the findings. Further, different sectors of the economy may be studied together, and their results may be compared to examine the generalizability of the findings. To add the theoretical extension to the current study, we propose that other demographic variables may also be examined as boundary conditions. In addition, supervisory or coworker support may be examined as moderators in justice facets, creative self-efficacy, and innovative behavior relationships.

Data Availability Statement

The data is available on request.

Conflicts of Interest

The authors declare no conflicts of interest.

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