

## Article

# The Impact of CEOs' Transformational Leadership on Sustainable Organizational Innovation in SMEs: A Three-Wave Mediating Role of Organizational Learning and Psychological Empowerment

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**Abstract:** The sustainable organizational innovation is of paramount importance for enhancing productivity in firms and provides organizations with the strategic direction needed to allow them to perform at an international level. The leadership styles play a key role in their firms' potential to consistently innovate. Using data from a time-lagged design with three waves, CEOs of Chinese small and medium-sized enterprises (SMEs) participated in the study. The findings reveal that psychological empowerment mediated the relationship between transformational leadership and sustainable organizational innovation. Organizational learning was found to indirectly effect the relationship between transformational leadership and sustainable organizational innovation. It also demonstrated that psychological empowerment had a positive impact on organizational learning. The findings indicate the strategic significance of transformational leadership and its influence on sustainable organizational innovation for SMEs. Theoretical contributions and practical implications were also discussed.

**Keywords:** transformational leadership; small and medium-sized enterprises; psychological empowerment; organizational learning; sustainable organizational innovation

## 1. Introduction

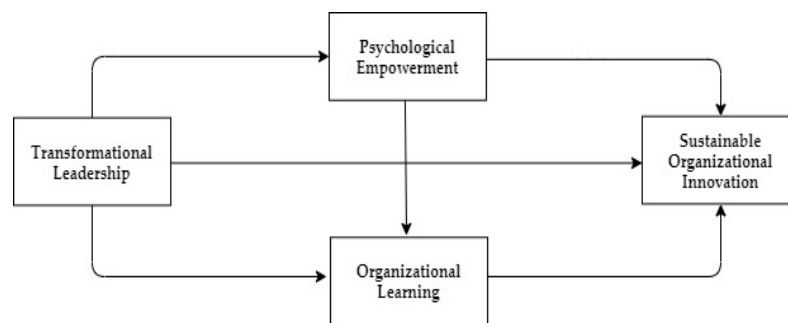
Small and medium-sized enterprises (SMEs) play a significant role in developing and developed countries' economic growth. SMEs are helping to achieve sustainable development goals by generating job prospects, stimulating sustainable innovation, fostering sustainable industrial development and reducing income inequalities in developing countries. SMEs are becoming one of the main instruments that drive a country's economic, political, financial and social growth and are the primary component of reducing poverty in developing countries [1]. Sustainable organizational innovation (SOI) implies new and useful products, mechanisms and organizational strategies that make innovation more vital than ever [2]. Therefore, SMEs have a potential to compete with large corporations in order to focus on sustainable innovation. While a large number of studies concentrate on innovation [3], however, there is still room to keep exploring how small and medium-sized enterprises can enhance sustainable development from organizational aspect. For this purpose, these organizations are engaging in a sustained effort to develop their strategies and other organizational aspects more

broadly [4–7]. Because SOI supports a firm's potential to remain competitive in today's complex business environment [8], it is now more than ever a determining factor in organizational success. The study of management has demonstrated the important role played by innovation in creating, structuring, and even re-invigorating a firm's ability to compete at larger scales [9–11]. SOI is the ability to create or improve products, processes, and services in a coherent way that enables a firm's success [9,12]. It is therefore a sine qua non condition for growth and survival [13]. Innovation nevertheless requires an individual to develop a set of ideas [14], produce competency based on acquired knowledge, and gain experience, as well as having innate or acquired abilities. Innovations must be supported by specific actors that are capable of stimulating leaders' effort to produce innovative and important results for the organization [15,16]. In this context, the study of transformational leadership (TL) has attracted interest in recent years. According to TL, leaders have the ability to enhance individuals' orientation to serve their firms' objectives instead of only their own interests [17–20]. It has been suggested that leaders with TL have an optimistic approach to the everyday challenges that occur in their organization [9,21]. Indeed, they can both hold and diffuse the attitude that challenging situations and even obstacles can be opportunities [22].

While more investigation is needed of the role played by TL in innovation in general, the specific case of its impact on sustainable innovation in the Chinese context is even less documented. First, the simple fact that China is relying on SMEs innovation to modernize its economic model makes this line of research warranted [6], and the fact that Chinese leaders are more inclined to adopt persuasive or authoritarian behaviors than to mobilize more inviting leadership attitudes underscores the need [23]. It is clear that leadership is a core factor for favorable organizational outcomes [15]. SOI, in relation to the idea of levers in TL, is a key area that remains scarcely studied [24,25]. We respond to this need with a study that empirically investigates an emerging economy. To support transformational leaders as they pursue organizational goals and to support firms in their quest for benefit, an in-depth understanding of psychological empowerment (PE) is key [26]. Spreitzer [27] defines PE as “a comprehensive motivational mechanism that exhibits the psychological state of individuals having the ability and determination to initiate and drive tasks to elicit desired goals whilst fully comprehending its meaning and impact on the environment” (see p. 1444). PE acts at two levels: first, on the individual level, where it allows a person to take initiative; then, on an interpersonal level, as taking initiative may inspire others to follow suit. Ultimately, it can lead to a positive impact on individuals' work experience [27]. PE is an asset in facing intensified competition in a context of uncertainty and growing change [28] because it shifts the focus toward proactive behaviors [29] that may help mitigate work pressure. Therefore, it is critical to investigate the relationship between PE and TL on SOI in SMEs, well known to be highly dynamic environments. Responding to calls for future research in the above-mentioned area [9], our contribution describes the mediating effects of PE in terms of TL's impact on SOI in SMEs.

The knowledge that SMEs have supports their innovation development [30]. One approach to assessing such knowledge is to conduct empirical exploration of organizational learning (OL) [24,31,32]. Argote [33] defines OL as the “creation of knowledge and its utilization in the organization” (see p. 352). OL is a major driver of sustainable innovation [34]. The strategies developed through this learning support the organizations' efforts in response to competition [33,35,36]. In this context, it is worth assessing whether TL may be responsible for innovation through the mediating influence of OL. The model explicitly shows an association between PE and OL that this study empirically investigates.

In particular, the purpose of this paper is to analyze the impact of transformational leadership on organizational learning and sustainable organizational innovation and highlights the relevance of providing empirical findings that demonstrate these linkages. As shown in Figure 1, the conceptual framework also claims to reveal the association between organizational learning and psychological empowerment and among these dynamic capabilities and sustainable organizational innovation. The limited attention paid in practice to these topics corresponds with their significance to practitioners.



**Figure 1.** The conceptual model of the study.

In sum, the study contributes to the literature on CEOs' transformational leadership, psychological empowerment, organizational learning and sustainable organizational innovation in several ways. First, it represents the first step towards understanding the association between transformational leadership and sustainable organizational innovation in small and medium-sized enterprises, thereby generalizing the research findings regarding the relationship between leadership and innovation from manufacturing industries to small and medium-sized enterprises. As suggested earlier, from the perspective of organizational practices, SMEs leaders play an important role in contributing to the successful completion of the company's missions and goals [32]. Second, we examine the three-wave mediating role of psychological empowerment and organizational learning in the relationship between transformational leadership and sustainable organizational innovation. Therefore, our study offers a new perspective that enhances our understanding of how CEOs' transformational leadership is related to sustainable organizational innovation.

To achieve the objectives, the study develops as follows. The section on theoretical background and hypothesis development proposes a series of hypotheses on the influence of CEOs' TL on PE and OL, the influence of PE and OL on SOI. The research methodology section presents the data collection procedure and the method used to analyze empirically the hypothesis developed in Chinese small and medium-sized enterprises. The results section presents the findings. Finally, the discussion and conclusion sections discuss the results and points out the limitations of the study.

## 2. Theoretical Background and Hypothesis Development

### 2.1. Influence of Transformational Leadership on Sustainable Organizational Innovation

Transformational leaders have a specific approach to recognizing work obstacles and this approach can be used by leaders to identify organizational goals while also actively striving for their completion [25]. Analyzed in relation to the spectrum of managerial practices, such leadership supports a dynamic of change and purposeful transformation [37]. As Jung and Avolio [38] reported, leaders of this style gather individuals around common values and prompt them to emulate innovative behaviors. Transformational leaders are involved in sensemaking by portraying organizationally oriented measures as necessary innovations that leading for the firm [19]. In addition, transformational leadership has a strong link to innovation [39,40], because this leadership style promotes and creates an environment where debate makes sense of new areas and novel ideas. TL behaviors create an atmosphere that enables intellectual stimulation and generates a cohesive environment to foster initiatives, creativity, and innovation [26,41]. The TL approach builds on both inspiration and motivation and encourages the flow of innovative ideas [42]. From a relational perspective, TL directs its effects to teamwork and collaborative relations among employees at all level in the organizational hierarchy [17]. At the individual level, TL strengthens self-esteem [37]. Moreover, it triggers in leader's minds the ability to acquire the support that enables them to envision opportunities for themselves, whether prospects for career evolution or personal growth [43]. It invigorates leaders' willingness and engagement in working toward new opportunities for their organization [9]. In their

empirical study, Dvir and colleagues [43] showed that transformational leaders enjoy a certain freedom and maneuverability in their everyday working lives. They witness their work advance and take responsibility for assignments [38]. TL in leaders is also positively associated with PE and sustainable innovation [44]. Khan and colleagues [45] provided evidence to show that all sub-processes of TL, namely, showing inspirational motivation, intellectual stimulation, exhilarating charisma, and showing individualized consideration, are positively correlated with sustainable organizational innovation. Thus, we postulate that

**Hypothesis 1 (H1).** *The transformational leadership of a CEO has a positive impact on sustainable organizational innovation.*

## 2.2. Influence of Transformational Leadership on Psychological Empowerment

Several studies have shown the impact of transformational leadership upon the psychological empowerment [26,46,47]. Theories of TL have long acknowledged the empowering impact of transformational leaders [48], who go beyond merely providing the accurate and appropriate information regarding the direction the organization is taking and sharing this information in a clear and transparent communication environment where real responsibilities are openly communicated. This allows feelings of empowerment to be nurtured in organizations [49]. This type of leadership allows any reluctance toward change to be mitigated, it also moves beyond inertia and actively engages in finding appropriate responses to the challenges faced by the organization [22]. That is, transformational leaders are mentors, coaching individuals to achieving high performance and to improve their abilities and proactivity [43]. As a result, psychologically empowered leaders proactively approach their work and feel responsible for constructive progress and utilize extra efforts regarding organizational goals [27]. Transformational leaders are optimistic, passionate and committed in expressing what needs to be achieved [49], maximize productivity to view the firm's vision as meaningful [50] and to perceive their own work as leading to the accomplishment of the firm's goals [29]. Hence, we propose that

**Hypothesis 2 (H2).** *The transformational leadership of a CEO has a positive impact on psychological empowerment.*

## 2.3. Influence of Psychological Empowerment on Sustainable Organizational Innovation

SOI and effectiveness can be considered the obvious outcomes of psychological empowerment [51]. Leaders are able to engage more easily in creative processes that allow them to provide innovative solutions when they feel empowered [26]. Amabile [14] argues that individuals will show a greater orientation toward efficiency if they experience satisfaction in their workplace. Empowered leaders sense freedom in the opportunity they have to control their tasks and duties [44]. Because they are not limited or constrained by other actors, they can focus more easily on developing more creative responses to challenges [52]. Empowered leaders will therefore naturally generate new original ways to meet expected organizational needs in relation to present problems [24]. This attitude, in turn, supports innovation [47]. This discussion, we postulate that organizations that have empowered leaders are more disposed to generate sustainable innovative initiatives. Therefore, we posit that

**Hypothesis 3 (H3).** *The psychological empowerment has a positive impact on sustainable organizational innovation.*

#### 2.4. Mediating Role of Psychological Empowerment

PE has long been studied in the context of organizational behavior and in management studies more broadly [46]. It remains a key theme in investigations of challenges that occur in the workplace. According to Spreitzer, PE builds on four cognitions: meaning, or “the value of a work goal judged in relation to an individual’s own ideals”; competence, or “feelings of self-efficacy: the ability to perform a job well”; self-determination, or “the autonomy to commence and regulate actions at the workplace”; and impact, “being able to influence organizational results” ([19], p. 1443). PE strengthens the effects of TL’s influence [53] and it stimulates leaders’ engagement in pro-innovation attitudes and behaviors more actively [44]; this is because it allows leaders to express and share their ideas more openly, and acquire additional opportunities to bring their innovative ideas to the implementation stage [54]. Transformational leaders appear as visionary and are able to act as catalysts for the organization’s strategic vision, which they communicate to others with optimism so those can engage consequently to a greater degree and, by investing their potential, become more part of the organization’s achievements [38]. Transformational leaders naturally inspire co-workers and promote trust [55]. For these co-workers, being in a psychologically empowered state allows them to feel part of the inspirational flow that is induced by their transformational leaders’ appeal [44].

Numerous contributions have analyzed the intermediary effects of PE in the relationship between TL and organizational commitment [49]. Leader–member exchange and work outcomes have also been studied [29,56]. Work has been done that questions the impact of TL on career satisfaction [53]. Studies have investigated the effects of TL on followers’ attitudes [48], satisfaction and commitment, and the organization [57]. TL has also been studied in its impact on task performance and organizational citizenship behavior [46]. However, there is to our knowledge no work that has investigated empowerment as a mediator for TL’s effects on sustainable innovation. To fill this gap, we posit that

**Hypothesis 4 (H4).** *Psychological empowerment mediates the association between transformational leadership of CEO and organizational innovation.*

#### 2.5. Influence of Transformational Leadership on Organizational Learning

TL positively affects OL [31]. In the specific context of change, TL behaviors more easily enhance the development of creative solutions by building upon learning [58]. The transformational leader both promotes a shared vision and actively capitalizes on OL, following a sharing philosophy, where experiences, ideas, and knowledge are discussed with everyone [59,60]. OL takes shape and blossoms under active TL [24]. As a result, willingness to learn naturally grows within co-workers, who perceive the learning process as making them part of the change and of the successful meeting of organizational challenges [34]. From that perspective, creativity and innovative abilities are the core outcomes of OL [24]. These in turn are utilized by the organization to reinforce both its competitive advantage and to generate new ways of obtaining better performance [31]. A study conducted in community clinics found that TL intensified learning culture, as it allowed one’s aspirations to be enhanced within the organization, something that transactional leadership did not enable [61]. This effect, in addition to the discussion above, allows us to suggest that TL influences OL. Hence, we hypothesize that

**Hypothesis 5 (H5).** *The transformational leadership of a CEO has a positive impact on organizational learning.*

#### 2.6. Influence of Organizational Learning on Sustainable Organizational Innovation

OL is an asset that enables greater flexibility in response to change and improved assertion of a company’s position in a competitive environment [62,63]. Firms need to demonstrate their ability to improve their services and products to ensure that they are doing more than simply meeting



current needs [64]. From that point of view, developing improved learning capabilities is crucial for bringing about a continuous process of innovation [65,66]. A well-known example of this is The Toyota Way: a strategy developed to encourage workers to take part in a specific OL approach wherein the problems to be solved are deliberately discussed [67]. OL follows a certain flow, where knowledge acquired by individuals moves to the group level before reaching the organizational level, from where it moves back again to the previous levels [30]. This dynamics of knowledge sharing supports a meaningful interpretation of information that strengthens the efficiency of approaches adopted by the organization [68]. Where knowledge originates from multiple external sources, the means to acquire it falls to the organization's own ability to process it [69,70]. This suggests that the assimilative capability is a condition for the collection of new knowledge [65]. At the same time, the extent to which an organization processes new knowledge depends on its own characteristics, including its policies and structures [71]. The linkage between OL and sustainable innovation has been found to be positive in the literature. Therefore, we suggest that

**Hypothesis 6 (H6).** *The organizational learning has a positive impact on sustainable organizational innovation.*

### 2.7. Mediating Role of Organizational Learning

TL's influence on organizational performance is enhanced by OL [31]. Studies have also suggested that with OL, organizational outcomes and effectiveness can be strengthened through TL [15]. Organizations' relationship to OL determine their potential to be open to additional opportunities in the dynamic world of work, which is characterized by rapid change, and to better compete while better positioning themselves in the market [72,73]. The greater the ability that the organization demonstrates to engage in OL, the more it can develop its innovation potential [24,74]. This combination leads to higher performance [75]. OL remains a voluntary choice and an important mediation for evaluating and shaping the measures that can contribute to bringing about innovation [76]. Prior studies have investigated the effects of TL on innovation by suggesting mediations such as followers' creativity [9], trust and individual identification [77], and the identification of individuals and R&D teams [78,79]. Recent work has indicated the limits to the knowledge acquired so far in relation to the mediating effects of OL for innovation through TL, specifically in emerging economies [80]. Further research is needed to identify and better understand OL in its relationship with TL's influence on SOI. Therefore, we postulate that

**Hypothesis 7 (H7).** *Organizational learning mediates the association between transformational leadership of a CEO and sustainable organizational innovation.*

### 2.8. Psychological Empowerment and Organizational Learning

PE is a powerful tool, as it naturally reinforces individuals' commitment to OL, as it increases engagement in organizational life and participation in its inherent challenges [81–83]. In fact, PE motivates leaders at the same time that it enhances, among others features, their self-concept [50]. Leaders thus become more productive in their work and feel more inclined to learn, supporting the development of their work efficiency [84]. When leaders are empowered and supported through learning opportunities, their attachment to the organization is likely to grow [76]. The above reasoning suggests that PE may predict OL. Hence, we propose that

**Hypothesis 8 (H8).** *The psychological empowerment has a positive impact on organizational learning.*

### 3. Research Methodology

#### 3.1. Sample and Procedure

To conduct the investigation, we collected the data from small and medium-sized enterprises (SMEs) located in northern China. The respondents for the questionnaire survey were the CEOs of the SMEs. The data were collected in three waves at three-week intervals to reduce the likelihood of common methods variance [85]. The participants were briefed about the purpose of the study and the procedures for collecting data during the regular working time. Each participant was assured that the information provided in the questionnaire would remain confidential and anonymous and would be used only for research.

We randomly distributed 500 questionnaires to our respondents in the SMEs in the first wave (Time 1). We obtained 470 usable responses from the SMEs' CEOs, for a response rate of 94%. The participants provided their demographic information and reported their perceptions of TL in the first wave (Time 1). In the second-wave survey (Time 2), 470 CEOs who had filled in first-wave (Time 1) questionnaires were asked three weeks later to report their PE and OL during the past three weeks. During this round, we obtained 440 usable responses from CEOs of the SMEs, with a response rate of 93.6%. In the third-wave survey (Time 3), which was conducted three weeks after the second-wave survey (Time 2), the CEOs were asked to rate SOI. A total of 440 questionnaires were sent to CEOs; we obtained 410 responses, for a response rate of 93.1%. Taken together, the final sample of this study comprised 410 CEOs. The average age of the respondents was 31.22 years ( $SD = 0.907$ ). The 77.3% of respondents were male and 22.7% were female.

#### 3.2. Measures

All survey materials were presented in Chinese and the back-translation approach of Brislin's [86] was followed. The survey included a scale for each construct of interest (transformational leadership, organizational learning, psychological empowerment, sustainable organizational innovation), along with the demographic variables. All survey items were mainly derived and adapted from prior literature with good reliability and validity.

##### 3.2.1. Transformational Leadership

To assess the impact of TL, four items were used, drawn from [87]. The scale that ranged from "1 = strongly disagree to 5 = Strongly agree" was used to gauge TL. The sample item was "Emphasizes the use of my intelligence." Cronbach's alpha value was 0.86.

##### 3.2.2. Psychological Empowerment

The PE construct for our study, which contains 12 items, was adopted from [27], who referred to leading by example, showing concern, informing, coaching, and participative decision-making. Items were measured on a five-point Likert scale that ranged from "1 = strongly disagree to 5 = strongly agree". Cronbach's alpha value was 0.88.

##### 3.2.3. Organizational Learning

The four items used for OL were drawn from the seminal work of [31,88,89] and were assessed by using a five-point Likert scale that ranged from "1 = strongly disagree to 5 = strongly agree." Sample items were "In the last three years, the firm has acquired and shared much new and relevant knowledge that provided a competitive advantage in technologies" and "The firm is a learning organization." Cronbach's alpha value was 0.87.

### 3.2.4. Sustainable Organizational Innovation

The innovation construct was taken from [89]. It contained 10 items, assessed on a five-point Likert scale that ranged from “1 = strongly disagree to 5 = strongly agree.” Sample items were “Firms developing new products or services” and “Firms emphasis on sustainable innovation.” Cronbach’s alpha value was 0.96.

## 3.3. Results

### 3.3.1. Descriptive Statistics

The means, standard deviations, correlation matrixes, and alpha values are given for all items in Table 1. It can be seen that TL is positively correlated with SOI ( $r = 0.322^{**}$ ,  $p < 0.01$ ), and PE is positively correlated with SOI ( $r = 0.531^{**}$ ,  $p < 0.01$ ). Further, OL is positively correlated with SOI ( $r = 0.234^{**}$ ,  $p < 0.01$ ). All the values were significant at the 0.01 level. As suggested by [90] approach, the sample adequacy indicator (Kaiser–Meyer–Olkin) was checked and the value is 0.903, which was well above the KMO’s acceptable range. This result shows that the sample size was adequate. These findings are compatible with our hypotheses and provide initial support for further analysis.

**Table 1.** Descriptive statistics and correlation.

| Variables                                   | Mean | SD   | AVE  | CR   | SOI     | TL      | PE      | OL     |
|---|------|------|------|------|---------|---------|---------|--------|
| Sustainable organizational innovation (SOI) | 3.98 | 0.96 | 0.81 | 0.96 | (0.96)  |         |         |        |
| Transformational leadership (TL)            | 4.26 | 0.54 | 0.61 | 0.86 | 0.32 ** | (0.86)  |         |        |
| Psychological empowerment (PE)              | 4.02 | 0.62 | 0.58 | 0.89 | 0.53 ** | 0.23 ** | (0.88)  |        |
| Organizational learning (OL)                | 3.5  | 1.09 | 0.64 | 0.87 | 0.23 ** | 0.13 ** | 0.18 ** | (0.87) |

Note: N = 410; \*  $p < 0.05$ ; \*\*  $p < 0.01$ . Cronbach  $\alpha$  values appear in parentheses on the diagonal; AVE: average variance extracted, CR: composite reliabilities.

### 3.3.2. Confirmatory Factor Analyses (CFA)

We adopted the Hu and Bentler [91] cut-off approach with the following parameters:  $\chi^2/\text{df}$ , chi-square/degree of freedom less than 2; TLI, Tucker–Lewis index greater than 0.90; CFI, comparative fit index is greater than 0.90; and RMSEA, root-mean-square error of approximation less than 0.05. Using AMOS 24.0, we performed confirmatory factor analyses with the maximum likelihood technique, to validate the discriminate validity of TL, OL, PE, and SOI. The fit index of the four-factor model was compared to the fit index of single-factor models. As shown in Table 2, the hypothesized four-factor model had a good fit, with all fit indices at the acceptable level ( $\chi^2 = 291.477$ ,  $\text{df} = 167$ ,  $\chi^2/\text{df} = 1.745$ , TLI = 0.980, CFI = 0.984, RMSEA = 0.043).

After comparison with other models, we concluded that the four-factor model had the best fit to our data. In this study, as shown in Table 1, all the values for average variance extracted (AVE) were greater than 0.5, and composite reliabilities (CRs) were greater than 0.80, meeting criteria recommended by [91]. This proved the accuracy of convergent validity. Taken together, these results showed that the measures in our study were valid and are appropriate for use in further hypothesis testing.



**Table 2.** Results of confirmatory factor analyses (CFA).

| Models                           | $\chi^2$ | df  | $\chi^2/df$ | TLI   | CFI   | RMSEA |
|----------------------------------|----------|-----|-------------|-------|-------|-------|
| Four Factors Model               | 291.477  | 167 | 1.745       | 0.980 | 0.984 | 0.043 |
| Three Factors Model-1 PE and SOI | 659.561  | 188 | 3.508       | 0.933 | 0.940 | 0.078 |
| Three Factors Model-2 TL and SOI | 739.951  | 188 | 3.935       | 0.922 | 0.930 | 0.084 |
| Three Factors Model-3 OL and SOI | 761.396  | 188 | 4.049       | 0.919 | 0.927 | 0.086 |
| Single-Factor Model              | 2939.07  | 189 | 15.550      | 0.612 | 0.650 | 0.189 |

Note: N = 410; PE: psychological empowerment; SOI: sustainable organizational innovation; TL: transformational leadership; OL: organizational learning; TLI: Tucker–Lewis index; CFI: comparative fit index; RMSEA: root-mean-square error of approximation.

### 3.3.3. Multiple Meditation Analysis

All the analyses were performed using the bootstrapping sampling technique [92]. This study analyzes the direct relationship among variables and, also examines the meditation role of psychological empowerment and organizational learning in the relationship between transformational leadership and sustainable organizational innovation. In this protocol, all demographics factors that were significantly correlated with explanatory variables (gender, age, education, and tenure) were controlled. Likewise, all variables were standardized to reduce any potential bias owing to wide variance. We generated 95% asymmetric confidence intervals (CIs) through the bias-corrected bootstrap method and set 10,000 reiterations.

### 3.3.4. Hypotheses Testing

As shown in Table 3, hierarchical regression analyses revealed significant and positive direct effects of TL on SOI ( $\beta = 0.34$ ,  $SE = 0.07$ ,  $p < 0.0001$ , 95% CI (0.2071, 0.4938)), supporting H1.

**Table 3.** Results of hierarchical regression analysis.

| Relationships Among TL, PE, OL, and SOI in the Regression Model |                     |      |           |      |            |      |
|---|---------------------|------|-----------|------|------------|------|
|   | Explained Variables |      |           |      |            |      |
|   | PE                  |      | OL        |      | SOI        |      |
|   | $\beta$             | SE   | $\beta$   | SE   | $\beta$    | SE   |
| Constant  | 2.84 ***            | 0.29 | 1.41 **   | 0.57 | 0.56 **    | 0.26 |
| PE  |                     |      | 0.26 ***  | 0.08 | 0.46 ***   | 0.06 |
| TL  | 0.26 ***            | 0.05 | 0.18 *    | 0.09 | 0.34 ***   | 0.07 |
| OL  |                     |      |           |      | 0.10 **    | 0.04 |
| age   | −0.03               | 0.03 | 0.06      | 0.05 | 0.04       | 0.04 |
| gender  | 0.07                | 0.07 | −0.02     | 0.12 | 0.03       | 0.09 |
| education   | −0.01               | 0.04 | 0.04      | 0.07 | −0.09      | 0.05 |
| tenure  | 0.01                | 0.01 | −0.01     | 0.02 | −0.05      | 0.01 |
| R <sup>2</sup>  | 0.06                |      | 0.046     |      | 0.36       |      |
| F   | 5.536 ***           |      | 3.798 *** |      | 32.290 *** |      |

Note: N = 410; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .  $\beta$  = unstandardized coefficients; TL: transformational leadership; PE: psychological empowerment; OL: organizational learning; SOI: sustainable organizational innovation.

Likewise, significant and positive direct effects were found for TL on PE ( $\beta = 0.26$ ,  $SE = 0.05$ ,  $p < 0.0001$ , 95% CI (0.1539, 0.3694)), supporting H2. Significant and positive direct effects were also found for PE on SOI ( $\beta = 0.46$ ,  $SE = 0.06$ ,  $p < 0.0001$ , 95% CI (0.6003, 0.8555)), supporting H3. Analyses showed significant and positive direct effects for TL on OL ( $\beta = 0.18$ ,  $SE = 0.09$ ,  $p < 0.05$ , 95% CI (0.0011, 0.3956)), supporting H5 and OL on SOI ( $\beta = 0.10$ ,  $SE = 0.03$ ,  $p < 0.01$ , 95% CI (0.0350, 0.1767)), supporting H6. Finally, significant and positive direct effects were shown for PE on OL ( $\beta = 0.26$ ,  $SE = 0.08$ ,  $p < 0.01$ , 95% CI (0.1109, 0.4595)), supporting H8.

Similarly, Table 4 shows the results of mediating variables psychological empowerment and organizational learning and their effects between transformational leadership and sustainable organizational innovation. The analyses showed significant and indirect effects of TL on SOI via PE ( $\beta = 0.12$ ,  $SE = 0.05$ ,  $p < 0.05$ , 95% CI (0.1017, 0.3004)), supporting H4. We also analyzed another significant and indirect pathway from TL to SOI via OL ( $\beta = 0.05$ ,  $SE = 0.02$ ,  $p < 0.05$ , 95% CI (0.0094, 0.1001)), supporting H7.

**Table 4.** Results of mediation through bootstrapping method.

| IV | MV | DV  | Effect of IV on M (a) | Effect of M on DV (b) | Indirect Effect (a*b) | Total Effects (c') | Total Effects (c) | 95 % CI          | Supported |
|----|----|-----|-----------------------|-----------------------|-----------------------|--------------------|-------------------|------------------|-----------|
| TL | PE | SOI | 0.26                  | 0.48                  | 0.12                  | 0.37               | 0.56              | (0.1017, 0.3004) | Yes       |
| TL | OL | SOI | 0.27                  | 0.17                  | 0.05                  | 0.52               | 0.56              | (0.0094, 0.1001) | Yes       |

Note: IV = TL, DV = SOI, MV = PE, OL; TL = transformational leadership; PE = psychological empowerment; OL = organizational learning; SOI= sustainable organizational innovation; IV= independent variable; MV = mediating variable; DV = dependent variable.

The total effect of TL on SOI was also significant ( $\beta = 0.56$ ,  $SE = 0.08$ ,  $p < 0.0001$ , 95% CI (0.4061, 0.7317)). The overall model represented 36% of the total variance in SOI ( $F = 32.29$ ,  $p < 0.0001$ ). These results supported H4 and H7, indicating that TL enhances both PE and OL, which are positively related to SOI in small and medium-sized enterprises.

#### 4. Discussion

In this study, we investigated the mechanisms PE and OL that could supplement the influence of small and medium-sized enterprises CEOs' TL on sustainable organizational innovation. Transformational leadership and organizational learning capability are important indicators of the internal conditions that firms require in order to innovate. Our findings confirm the theoretical arguments offered in prior literature about the existence of a positive association between organizational learning and empowerment [84,93]. Additionally, our findings support the significance in generating innovation. The finding is particularly appealing because it promotes the characterization of TL as more related to collective decision-making, collective priorities and the generation of capability than conventional leadership, which relies more on standardized practices and the production of products and services. The readiness of a CEO to recognize risks and failures is certainly also one of the first steps of the innovation. Transformational leaders are key drivers in the knowledge acquisition to achieve the sustainable organizational innovation in SMEs. Our model empirically demonstrates that TL directly predicts sustainable organizational innovation. Our findings are in line with the previous studies [9,47], which suggest that TL support is relevant for encouraging innovation in SMEs. These leaders motivate to adopt experimentation-oriented behaviors to construct ideas, bringing about the innovative approaches needed by the organization to meet its strategic objectives, such as penetrating new markets [18].

Our finding that PE is a mediating mechanism through which TL generates organizational innovation is a contribution to the literature on sustainable innovation and leadership. The relationship between TL and PE has high importance because it is significantly related to sustainable organizational innovation [44]. We note, however, that previous findings [47] indicated a negative association between PE and organizational innovation. Our findings do not support those results, as we observed a significant and positive impact between the two variables. Instead, our study outcomes reinforce work that has found that psychologically empowered individuals build on their self-confidence and provide their organizations with creative and sustainable innovative solutions and take efficient

initiatives [46,94]. Our work can be conceived to be preliminary to the prediction of the positive (and significant) influence of TL upon sustainable organizational innovation through PE.

Third, remaining with the literature on leadership and sustainable innovation, we stressed OL as a potential mediator through which TL stimulates sustainable organizational innovation. The association between TL and OL is key, as OL is significantly connected to SOI. Our results indicate OL mediates the influence of TL on SOI. Previous work has suggested that TL reshapes internal logic through knowledge sharing that can encourage OL in firms [95]. As a result, it is seen that OL supports innovation [96]. Knowledge gained through OL is the basis of innovation [62,97].

Finally, as theoretically predicted, the results of the study confirm the effects of PE on OL in SMEs. Our results are evidence that the PE of CEOs has a positive and significant impact on OL. PE provides support for leaders as they acquire relevant knowledge and information and enables them to experience and participate in their organization's goals in a more meaningful way [50]. Most importantly, organizational members internalize knowledge when they enjoy a certain autonomy [76].

## 5. Conclusions

This research has important implications for the competitive context of contemporary small and medium-sized enterprises (SMEs). More specifically, this work invites us to rethink the role played by leadership in supporting ambition in emerging economies to better drive sustainable innovation development. Our work has implications for management that suggest that in SMEs, leaders should adopt a leadership style that allows them to nurture the workplace with features that will make it a place where sustainable innovation initiatives are generated. This study aims to elucidate such sustainable innovation by showing the strategic role of OL and PE. First, the study demonstrates a significant positive relation between transformational leadership, organizational learning, psychological empowerment and innovation. This leadership modifies, analyses, and is designed to transfer knowledge via the process of organizational learning [98]. Thus, TL is dedicated to and promotes OL [99], making it possible to address the barriers that might impede this learning [15]. OL aims to create a path for professional development to acquire skills or aptitudes that give sustainable benefits through innovation [63]. Empirically, the research shows a positive association between OL and SOI. The innovative firm learns and understands how to become competent. Through learning, the enterprise can change its actions, thus reinventing its technologies and production to prevent falling into stagnation and allow SOI. Different firms will find themselves in distinct states of advancement in learning. Thus, OL avoids stagnation and promoted continuous innovation [100]. First, we suggest that SMEs build on this key element and design training to help them develop their TL style. In this way, small and medium-sized enterprises can reinforce their propensity to rely on leaders to stimulate individuals across key dimensions that will eventually bear fruit for firms as they seek opportunities to innovate and prepare to face change. We propose that SMEs invest in supporting their personnel with specifically targeted training. For instance, leaders could be trained to become more involved in their transformational leadership to efficiently transfer the vision and objectives of the firm. Second, because the mediating role of PE is vital for TL and innovation, leaders in SMEs should also seek to make the work environment a place where encouraging and supportive interactions are experienced. These factors can promote confidence-building. In this sense, TL can bring about a more cohesive environment for leaders who will develop greater commitment to organizational goals.

Finally, the findings on OL direct us toward more practical implications for small and medium-sized enterprises. When leaders are more concerned with knowledge acquisition, they acquire deeper insight into skills that can eventually support their participation in meaningful decision making that contributes to refining the firm's business strategy. As a result of this, leaders in small and medium-sized enterprises can become involved in targeting the best learning opportunities. More precisely, we encourage leaders of SMEs to keep themselves informed about conferences and various training options. For academics and researchers, our results can assist in enabling a clearer picture of the role played by TL for sustainable organizational innovation in emerging economies.

Our study was cross-sectional in nature; as this limits the extent to which our results can be interpreted, we recommend for research to adopt a longitudinal approach to our study objects. Second, we used PE and OL as mediators. We encourage researchers to investigate other potential mediators or moderators to analyze the effects of TL and sustainable organizational innovation. For instance, employee innovative work behavior and organizational commitment in SMEs could be used as potential mediators. Third, our work was conducted in a specific cultural context, and this limits the generalizability of our findings. Further studies should be undertaken in other contexts.

Despite its limitations, this study provided insightful information on how TL behaviors in SMEs leaders' behaviors influence sustainable organizational innovation through PE and OL in modern small and medium-sized enterprises.

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