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# **Empowering Sustainability: Unveiling the Crucial Role of Psychological Safety in Project Effectiveness through Sustainable Project Management Practices**

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**Abstract:** This study explores the relationship between psychological safety, project effectiveness, and sustainable project management (SPM). Drawing from the social exchange and learning theories, this study examines how psychological safety and empowerment affect the relationship between SPM-project effectiveness. Time lag data were collected from 346 project base employee in Pakistan, and statistical analysis techniques were employed to analyze the relationships between SPM, psychological safety, psychological empowerment, and project effectiveness. The study shows that psychological safety is crucial for productive project outcomes. Moreover, psychological empowerment is identified as a potential moderator, indicating its ability to enhance the relationship between SPM and project effectiveness. The study contributes to the existing literature by addressing a significant research gap and providing insights into how SPM can be aligned with project effectiveness. The study results suggest practical recommendations for



organizations striving to enhance project effectiveness through SPM. The recommendations stress the significance of creating a psychologically safe workplace and giving power to project team members to improve their performance and contribute towards the sustainability of productive project outcomes. This research provides valuable insights for project-based organizations by showing how psychological factors and sustainable project management practices can boost project effectiveness.

**Keywords:** sustainable project management, project effectiveness, psychological safety, psychological empowerment

### **Introduction**

The expansion in project management, and increasing sustainability integration of social, environmental, psychological and economic issues is viewed as one of the critical factors the importance of projects for sustainable project team performance, and competitiveness has become essential to the continued existence of matrix organizations and achieve sustainable growth (Bryson, 2018). To ensure project completion, the administration has increasingly focused on the project's goals (El Khatib, Alabdooli, AlKaabi, & Al Harmoodi, 2020). The project's effectiveness (PE) is to show the project's output and objectives are active and satisfy their stakeholder need (Toh et al., 2022). Sustainable Managerial wisdom and skills may have a vital role in the project's effectiveness. Sustainable project management meaningfully contributes to their strategic advantage. The unsustainability of the project team is frequently quoted as a contributing factor to a failed project (Princes & Said, 2022).

In today's highly competitive business world, organizations are faced with the necessity of adopting sustainable project management (SPM) practices. This imperative arises from the intersection of rapid technological breakthroughs and stringent governmental requirements pertaining to social and environmental standards (Toljaga-Nikolić, Todorović, Dobrota, Obradović, & Obradović, 2020). Additionally, there is a constant demand for businesses to adopt SPM approach, and achieve project effectiveness with better environmental, psychological and social impacts due to factors like rising public knowledge of critical sustainability issues and shifting stakeholder expectations about these issues (Martens & Carvalho, 2016). For instance, Vicente-Serrano, Quiring,

Pena-Gallardo, Yuan, and Dominguez-Castro (2020) mentioned the risks of climate change and global warming have increased the relevance of sustainability. In light of their study it's claimed that SPM has gained importance for effective project management (Shaukat, Latif, Sajjad, & Eweje, 2022), and new studies suggest that project management is significantly influenced by how sound businesses handle and incorporate critical sustainability challenges at various project lifecycle stages (Sawadogo, Sané, & Kaboré, 2022). The significance of sustainability in project management has been increasingly recognized, however, with a recent emergence of research in sustainable project management (Sankaran, Jacobsson, & Blomquist, 2021). The emergence of SPM in regards to climate change and global warming as a novel paradigm in the scholarly discourse on project management is attributable to this phenomenon (G. Silvius, 2017). In order to complete the project's goal, achieve project effectiveness, the vast majority of businesses are aligning the work assignments for their projects with sustainability principles (Paucar-Caceres, Cavalcanti-Bandos, Quispe-Prieto, Huerta-Tantalean, & Werner-Masters, 2022). Recently researcher focused on the sustainability of project management and is encourage and acknowledge globally (Zuofa & Ochieng, 2016). However, additional research is necessary and shows significant potential in advancing our comprehension of the relationship between SPM and PE and the underlying mechanisms that impact this connection (Dubois & Silvius, 2020; Khalifeh, Farrell, & Al-edenat, 2020).

Except for a very few noteworthy studies like Malik et al, (2020), Ullah, Khan, Hussain, Rana, and Khan (2020) and Shaukat et al,(2022) there still exists a dearth of information and research regarding the utilization of sustainability within the framework of sustainable project management in developing nations such as Pakistan, as well as the degree to which businesses are embracing SPM methodologies. Moreover, most previous investigations about SPM and project success (PS) were carried out inside the framework of developed nations (Dubois & Silvius, 2020). Implementing sustainable practices in project-based firms in Pakistan is currently at an early stage. The study conducted by Hongming et al. (2020) revealed that several significant factors contribute to sustainable reporting practices. These factors encompass inadequate regulatory measures, limited comprehension and engagement with sustainability

issues, and a deficiency in competency. According to Ahmad et al. (2021) study the sustainability adaptation model of the SEMs sector in Pakistan and found that the environmental issues is the sustainability principle are very rarely addressed. Furthermore , Ullah et al. (2020) investigated Pakistan's construction industry's SPM practices. The study's findings showed that while social sustainability is largely ignored by construction enterprises, the environmental element is regarded as a significant issue. The findings also showed that implementing sustainability in the construction industry is fraught with difficulties on both a policy and practical level. Accordingly, it is crucial to examine at how SPM is now being implemented in the Pakistani context because it offers new perspectives on the subject from the viewpoint of emerging nations.

Previous literature has mainly focused on determining the direct connection between SPM and PE (Llorente-Alonso, García-Ael, & Topa, 2023). Bresciani, Rehman, Alam, Ashfaq, and Usman (2023), addressing the need for learning and improvement for the sustainability , Avery and Bergsteiner (2011), focuse on susbtaible leadership and project performance. Armenia, Dangelico, Nonino, and Pompei (2019) in there review paper shown sustainable project management practices that promote novelty and the sharing of creation ideas while also fostering a comfortable environment for employees to experiment with new ideas for research. Encouraging psychological safety between project staff can be achieved by implementing certain project strategies, promoting the manifestation of sustainable behaviors in their daily work tasks. The impact of management on subordinate has been the subject of substantial research, but it is still necessary to identify the psychological factors that encourage workers to go above and beyond what is expected of them (B. M. Newman & Newman, 2017). Psychological safety supports varied ideas and inspires worker and motive toward performance. SPM and employee outcomes may be mediated by psychological mechanisms(Llorente-Alonso et al., 2023). In addition, Burawat (2019) suggested looking into any potential mediating variables that may be affecting the relationship between SMP and PE because there isn't much research on the subject. In order to better understand what motivates employees to perform sustainably and the settings that lead to this occurrence, it may be helpful to consider potential intervening variables that can moderate these effects since the context significantly impacts the

project's effectiveness (Burawat, 2019) .As a result, it is suggested that further research on the role of psychological empowerment in modulating the link between SPM and PM (Chenli & Abrokwah, 2021).

The current study contributes significantly to our comprehension of sustainable project management in various aspects. This study provides an empirical contribution to the existing body of literature on project management and sustainable development by examining the impact of psychological safety on project effectiveness and the influence of sustainable project management on both variables. This study makes a theoretical contribution to the existing body of literature on sustainable development and project management by examining the potential function of psychological safety as a mediator that connects the impact of sustainable project management (SPM) with project effectiveness. In order to demonstrate how employing sustainable project management techniques can enhance project performance by fostering an environment where employees feel psychologically safe to seize chances to accomplish project objectives, Current research is based on a variety of ideas, including Blau (1964) theory of social exchange and Bandura (1977) theory of social learning. Previous studies have demonstrated a substantial correlation between psychological safety and performance(Higgins, Dobrow, Weiner, & Liu, 2022) , and leadership role and psychological safety (Qian, Liu, & Chen, 2020).This study provides a theoretical addition by examining the moderating impact of psychological empowerment based on social exchange theory framework. Additionally, our research explores the moderating-mediating effect of psychological empowerment on the relationship between SPM (sustainable project management) and project effectiveness.

### **Related Theory and Hypothesis**

This study employed the Social Learning Theory (SLT) as a foundational framework to establish a connection between sustainable project management and psychological safety. Additionally, the Social Exchange Theory (SET) was utilized to establish a link between psychological safety and project effectiveness. According to social learning theory, people can learn from one another through observation, discussion and interaction (Bandura, 1977). Sustainable project management methods are considered a prerequisite for psychological

## *Empowering Sustainability ...*

safety (Frazier, Fainshmidt, Klinger, Pezeshkan, & Vracheva, 2017). According to extensive research, SPM focus on sustainable practices, encourages involvement, values people and places a focus on sustainable production while also providing a psychologically safe environment for workers (Barrick, Thurgood, Smith, & Courtright, 2015). According to the literature, SPM fosters psychological safety among employees by encouraging engagement, valuing people, and focusing on production (Qian et al., 2020). Sustainable project management always focused on psychological safe environment for project employees where they practice knowledge sharing, smooth communication, focus on amiable labor relations, systematic innovation, intensive training and growth (Gareis, Huemann, Martinuzzi, Weninger, & Sedlacko, 2013). SPM improves substitutable communication and relationships among many stakeholders while also promoting long-term value and project effectiveness (Robichaud & Anantatmula, 2011). SPM preserve the learning environment that is necessary to fulfill the project's goals and the social environmental, physical and mental health of project participants (Zada, Khan, Saeed, Zada, & Jun, 2023). Project staff perceptions of psychological safety are shaped by learning cultures. According to the SLT, listening to employees, guiding and clarity of goal to them, along with consistent directions, ensures that they feel safe taking risks and engaging in fear-free sustainable communication (Afzal, Arshad, Saleem, & Farooq, 2019).

Employees who are in psychological safety get higher levels of respect and support from their project team (Frazier et al., 2017). In light of social exchange theory that the project team's collective emphasis on project effectiveness is heightened by their passionate involvement and identification with their respective firms (Akers, 2017). Similar to ensuring physiological safety enhances employees' creativity, it also boosts the project's effectiveness.

### **Sustainable project management and project effectiveness**

Sustainable project management is becoming more prominent in the environmental, corporate and climate strategic planning (Stanitsas, Kirytopoulos, & Leopoulos, 2021) Literature shown that many practitioners view sustainability as a critical factor to consider during the different phases of the projects (Martens & Carvalho, 2016). Many researchers recommended SPM is important for project success and has a

favorable effect on project effectiveness (Martens & Carvalho, 2016; Shaukat et al., 2022) . Martens and Carvalho (2016) conducted a study wherein they utilized a sample of organizations from Brazil and the United States to assess the correlation between project sustainability and project success. Their research shows a significant relationship between project management and durability. Consequently, numerous organizations are incorporating sustainability principles into their project endeavors and they also noticed that public sector organizations placed higher weight on social sustainability issues than on projects' economic and environmental components.

The study conducted by Shaukat et al. (2022) examines the influence of SPM on project success, finding that PSM contributes positively to achieving project objectives. Furthermore, it is imperative to establish a stronger correlation between stakeholder engagement and the process of team establishment. In order to assess the correlation between SPM (Sustainable Project Management) and the achievement of project objectives, Carvalho and Rabechini Jr (2017) surveyed a sample of 200 individuals actively involved in various projects. The findings indicated that using SPM had a significant and beneficial effect on project success. A study by Martens and Carvalho (2016) investigated the sustainability into project management function . The study that the researchers presented demonstrates the crucial elements that affect a project's sustainability, including economic, environmental, and social factors. It looks into the significant impact of these factors on project success using data from six different countries. The impact of SPM on project effectiveness in underdeveloped nations like Pakistan has received less attention in the literature. Most recent studies on SPM evolution have addressed the phenomena in the setting of sophisticated societies (Shaukat et al., 2022). Furthermore, based on the existing literature, there is need to be more studies that have examined the research void about the relationship between sustainable project management (SPM) and project effectiveness, specifically considering the potential moderating and mediating effects of psychological empowerment. Therefore, this research addresses a gap in the existing body of literature by focusing on the correlation between sustainable project management (SPM) and project effectiveness within the setting of developing nations like Pakistan. The current study employs the social exchange theory to investigate the relationship between SPM

## *Empowering Sustainability ...*

and PE (Bandura, 1977). As we argue that SPM is a focus on project sustainable practices, valuable sources of knowledge exchange and learning that can connect the project's effectiveness. The confidence of subordinate is enhanced through Knowledge sharing, observation, and a providing learning environment (Zada et al., 2023). The result-oriented team learning from each other and spent a significant portion of their work time performing tasks that could assist the team in achieving sustainable project's effectiveness. As a result, an efficient team that concentrates on achieving a set of targets facilitates the effective execution of project management. Hence, according to extensive research, SPM encourages sustainable approach such as involvement of team, values project staff and stakeholder and places a focus on project effectiveness. We suggest the following hypothesis based on the preceding discussion:

**H1.** Sustainable project management is positively associated with the project effectiveness.

### **psychological safety as a mediator**

Hu, Erdogan, Jiang, Bauer, and Liu (2018) propose that psychological safety refers to a work environment in which employees experience a sense of comfort and security, enabling them to express their emotions and perspectives openly. According to Iqbal, Ahmad, Nasim, and Khan (2020), the perception of sustainable project management positively impacts the psychological safety that project participants experience. Sustainable project management refers to the theoretical framework and practical application of principles to achieve long-term development goals "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987). The presence of psychological safety is indicated by sustainable project management performing ethically (Qian et al., 2020). Though this project team also have numerous opportunities to learn from each other and enhance project sustainability. Where SPM encourage employees to participate eco innovation and sustainable development process.

It has also been found that the socially responsible aspect of Sustainable Project Management (SPM) significantly influences the psychological safety of project employees (Gong, Cheung, Wang, & Huang, 2012). Project team will also feel comfortable and confident if SPM



procedures are perceived to be essential Iqbal et al. (2020), it results in a significant level of psychological safety among the individuals engaged in the project, and the way project management conducts itself in social interactions, as well as meeting the requirements of various stakeholders, influences workers' perceptions of safety (Farooq, 2018). Sustainable management practices have an impact on the sense-making process of employees, which ultimately leads to favorable project results. Psychological safety has a favorable impact on project performance at the individual and team level and effect of project effectiveness (Shen, Tuuli, Xia, Koh, & Rowlinson, 2015). At the organizational level, the collective sense of psychological safety significantly contributes to completing project goals (Frazier et al., 2017). Management needs to emphasize that project effectiveness is measured by asset return and accomplishment of project goals. According to empirical research Liu, Zhang, Liao, Hao, and Mao (2016), there may be a connection between employee creativity and perceived psychological safety. Furthermore, the extent to which individuals sense psychological safety substantially influences the level of creativity and propensity for risk-taking within teams (Javed, Naqvi, Khan, Arjoon, & Tayyeb, 2019). In recent studies, the effectiveness of projects and sustainable knowledge management has been found to have a highly positive association with psychological safety.

Additionally, the social exchange theory postulates that psychological safety may influence project outcomes (Khan, Jaafar, Javed, Mubarak, & Saudagar, 2020). According to literature, psychological empowerment and availability are critical in promoting project effectiveness. A lack of psychological safety, on the other hand, has a negative impact on projects, employees, and eventually organizations in terms of economic and social losses (Liang, Farh, & Farh, 2012). Based on the preceding discussion and existing research, it is hypothesized that:

**H2.** Sustainable project management positively influences the project employee's perception of psychological safety

**H3.** Psychological safety mediates the link between sustainable project management and project effectiveness.

### **Psychological empowerment moderating effect**

Sustainable development is essential for programs that strike an unconventional balance between ecological, social, and economic growth (Kozicka, Jones, Gotor, & Enahoro, 2022). The sustainability of a project has a significant impact on environmental and ecological performance through compliance, while commitment influences social and environmental performance (Ren, He, Zhang, & Chen, 2019). It has been determined that integrating compliance, moral principles and commitment between project employees allows organizations to achieve project effectiveness. Similarly, psychological empowerment has been shown to positive impact on project staff dedication. The project employee's commitment level can be judge by their competency, motivation, goal achievement and self-determination.

In contexts where psychological empowerment influences the level of employee commitment level (Fan, Zhao, Zhang, & Meng, 2023), a severe loss in psychological empowerment may be irreparable, even though fresh induction. According to the social learning theory the employee commitment and self-determination have a significant impact on project effectiveness performance (Deng & Fei, 2023). Employees regularly increase their efforts to finish their work when there is psychological safety work setting. A psychologically safe work environment would encourage employees to foresee problems and take the initiative while acting independently (Gong et al., 2012), maximizing project effectiveness. The following hypothesis is put forth after a review of the literature and discussion:

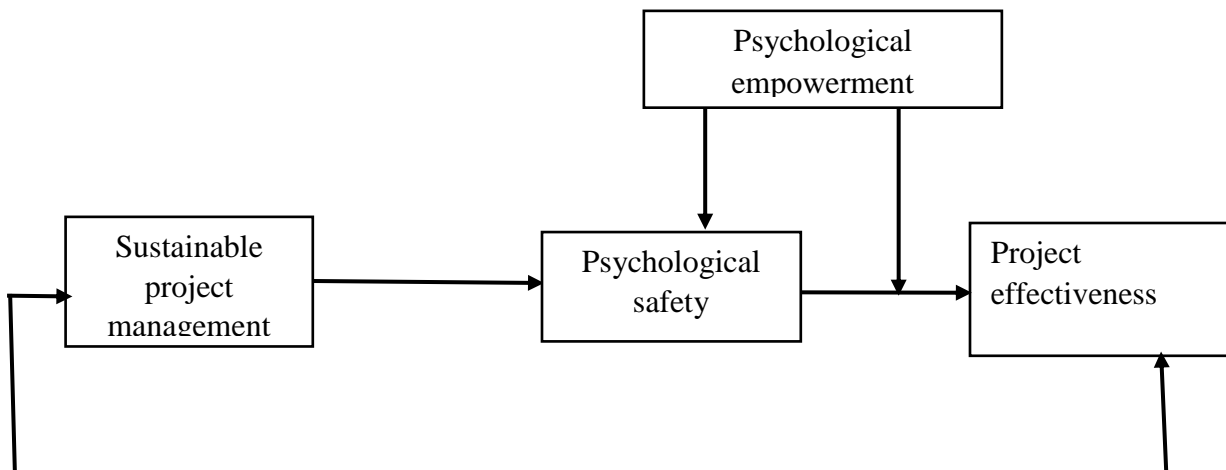
**H4a.** Psychological empowerment moderates the association between psychological safety and project effectiveness such that high psychological empowerment will have high psychological safety- project effectiveness relationship.

#### **Psychological empowerment's moderating-mediating function**

Empirical research shows that psychological empowerment improves project performance. Employees who are psychologically empowered have a great sense of self-efficacy as well as enough empower in their jobs and achieve project goal effectively (Hu et al., 2018). In such psychological safe environment project employees are occupied with sufficient resources, facilities and responsibility to achieve project work output (Iqbal et al., 2020). Sustainable project management will consider the

organization's macro level (Schaltegger, Christ, Wenzig, & Burritt, 2022). This is consideration attend through encouraging employee mental and physical health, fostering a favorable work atmosphere that fosters multiple skills, and focusing socially acceptable project activities. Similarly, employees who are mentally at ease are more willing to share their knowledge and haul risks in order to provide quality and long-term project sustainability decisions. According to the social learning theory proposed by Bandura (1977), employees in a psychologically safe work setting are more likely to engage in learning and actively participate in crucial debates. Consequently, an effective decision-making process is deemed to exert a significant impact on project effectiveness, as illustrated in Figure 1 of the study framework.

**H4b.** Psychological empowerment moderates the indirect relationship between sustainable project management and project effectiveness through psychological safety such that this relationship is strong in the presence of high psychological empowerment.



**Fig 1 study framework**

**Research methodology**

**Sample and data collection**

The data were collected through survey in three phases from 346 employees based in Pakistan and working in various project-based organizations which helped to reduce common method variance (Podsakoff et al., 2003). In Survey 1, respondents assessed sustainable

project management, psychological empowerment, and provided demographic information. Survey 2 gathered information on psychological safety, while Survey 3 focused on collecting data about project effectiveness. From the initial pool of 450 randomly selected employees, sourced from a comprehensive list provided by senior leadership in participating organizations, 402 individuals completed the first survey. For the second survey, 375 participants responded, and in the third phase, 346 participants completed the survey. Consequently, empirical analyses were conducted using a dataset comprising 346 fully completed response sets, resulting in a response rate of 76.88%. In the final sample, 46.8% of the employees identified as male, while 53.2% identified as female. On average, these individuals possessed six years of organizational experience.

### **Measures**

The 14-item SPM construct was adapted from A. G. Silvius, Kampinga, Paniagua, and Mooi (2017) based on choices aligned with pertinent literature connecting project management to sustainability issues. Carmeli, Reiter-Palmon, and Ziv (2010) modified five existing measures to assess psychological safety, drawing from A. Edmondson (1999). The measurement of psychological safety items in this study employed five identical questions. The scale used to assess psychological empowerment consisted of 12 items derived from Spreitzer (1995). This assessment scale was also utilized by A. Newman, Donohue, and Eva (2017), who reported a reliability score of 0.8. The effectiveness of the project was evaluated using a scale comprising 10 items developed by Ong and Bahar (2019). The instrument's reliability, as measured by Cronbach's alpha, was found to be 0.92. To explore the impact of sustainable project management and its consequences, we incorporated control variables such as gender, experience and education as potential factors in our study. This was done to assess the validity of our hypothesis (Aga, Noorderhaven, & Vallejo, 2016).

### **Results**

#### **Construct validity**

We evaluated the convergent and discriminant validity of the central constructs using a confirmatory factor analysis based on a four-factor measurement model. The fitness of this model was deemed satisfactory

with the following indices:  $\chi^2(252) = 436.20$ , CFI = 0.91, IFI = 0.92, TLI = 0.91, RMSEA = 0.07, and SRSMR = 0.06. Convergent validity was substantiated through notably significant loadings ( $p < 0.001$ ) of each measurement item on its corresponding construct. Furthermore, this validity was confirmed by the average variance extracted (AVE) values exceeding 0.50. Discriminant validity was also established through AVE values that surpassed the squared correlations between the associated constructs.

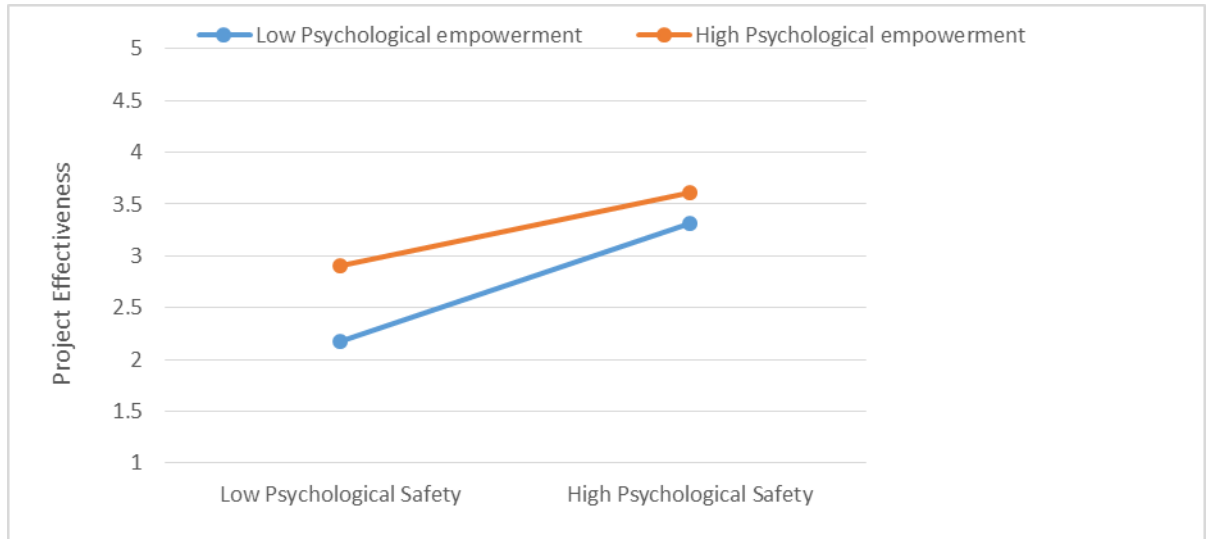
### Main analysis

Table 1 presents the zero-order correlation coefficients and descriptive statistics for the variables examined in the study. To test the hypotheses statistically, we utilized the Process macro, which enables the simultaneous estimation of both the suggested mediation and moderation effects (Hayes et al., 2017). Table 2 results shows that there are positive relations between sustainable project management and project effectiveness ( $b = .292$ ,  $p < 0.01$ , Hypothesis 1) and psychological safety ( $b = .384$ ,  $p < 0.01$ , Hypothesis 2). Moreover, to assess mediation, we used PROCESS macro model 4 to test the propose mediation. The results show that psychological safety mediates the link between sustainable project management and project effectiveness ( $b = .234$ ,  $p < 0.01$ , (LL: .1615; UL: .3091). The confidence interval (CI) of this link did not include 0, indicating the presence of mediation (Hypothesis 3).

To examine moderation and moderation mediation, we applied PROCESS macro 1 and 14 to test the proposed hypotheses. The results in table 3 and fig 2, indicate, significant effect of the psychological safety x psychological empowerment interaction term ( $b = -.087$ ,  $p < 0.01$ , LL: -.1392; UL: -.0364 Hypothesis 4) in predicting project effectiveness. To examine moderation mediation, we examined the strength of indirect relationship between sustainable project management and project effectiveness, through psychological safety, at different levels of psychological empowerment. The results in table 3 shows the strength of this indirect effect is dependent on psychological empowerment, when psychological empowerment is high, the impact of sustainable project

## ***Empowering Sustainability ...***

management on project effectiveness via psychological safety is highly pronounced ( $\beta = .2237$ ,  $SE = .0357$ ) than when psychological safety is low ( $\beta = .1811$ ,  $SE = .035$ ). These findings provide evidence that psychological empowerment stimulates the positive indirect relationship between sustainable project management and project effectiveness, through psychological safety, in support of hypothesis 5.



**Figure 2. Moderating effect of psychological empowerment**

### **Discussion**

This research examines the correlation between psychological safety, project effectiveness, and sustainable project management while also considering the potential mediating effect of psychological safety on relationship between sustainable project management and project effectiveness. And moderating influence of psychological empowerment on these associations. The study successfully validated all of the research hypotheses and research questions. Our research findings contribute to the existing literature in the domains of organizational psychology, project management, sustainable deviltment and business management. Additionally, they support policymakers and managers by offering guidance on potential areas for future research. Here we discuss the comprehensive findings of this study.

The results suggest a robust and favorable association between project efficacy and the implementation of sustainable project management practices. The favorable impact of sustainable project management practices on project effectiveness has been demonstrated in studies conducted by Dubois and Silvius (2020) and Malik et al. (2020). In a similar study, Martens and Carvalho (2016) examined how sustainable project effectiveness practices contribute to the project manager's ability to execute a project effectively. Carvalho and Rabechini Jr (2017) have conducted research that establishes a significant association between sustainable project management and the project's success. This study provided evidence of the developmental progress in Pakistan. Developing nations exhibit diverse contexts and cultural backgrounds, although the objective of sustainable project management has remained consistent in addressing advancements in social, environmental, psychological and economic challenges. According to Pinto (2020, p. 207), that contemporary project management acknowledges the advantages of sustainability for the firm, its key stakeholders, and the global environment. Similarly, different research suggested that Pakistan must prioritize climate-resilient economic development and infrastructure design to achieve a consistent level of economic growth that safeguards human dignity and preserves ecological, psychological and environmental processes. It is particularly relevant within the context of sustainable project management.

**Table 1.** Correlations

	Mean	SD	1	2	3	4	5	6	7
1. Age	2.81	0.95							
2. Experience	3.15	0.91	0.016						
3. Education	1.33	0.47	-0.019	-					
				0.034					
4. SPM	3.78	0.86	0.005	-	0.012	0.88			
				0.073					
5. PEM	3.61	0.75	-0.080	0.011	0.042	0.336**	0.82		
6. PSM	4.00	0.90	-0.061	-	-	0.369**	0.441**	0.87	
				0.067	0.094				
7. PEM	3.85	0.70	-0.059	-	-	0.439**	0.544**	0.237**	0.91
				0.041	0.041				

\*\* Correlation is significant at the 0.01 level (2-tailed).

Our study provides evidence of the positive impact of sustainable project management on psychological safety. The finding above was corroborated by prior studies conducted by Burawat (2019); (Farooq, 2018), their findings also show similar results. Sustainable project management is characterized by its emphasis on effective communication and establishing a conducive working environment. In such an environment, project teams are encouraged to engage in mutual learning, acknowledge and rectify mistakes, and collaborate towards attaining shared objectives, fostering organizational growth (Farooq, 2018). According to Burawat (2019) that sustainable project management leadership provides psychologically safe healthy working atmosphere to project team where they can work effectively and encourage knowledge sharing culture and contribute to innovation. Using social learning theory our research linked sustainable project management with psychological safety. As social learning theory promotes learning culture among project employees and encourages project team to follow their manager instruction to meet project sustainability objectives.

This beneficial correlation between psychological safety and project effectiveness was also discovered through our research. Similar empirical data has been presented in earlier research (A. Newman et al., 2017; Schaubroeck, Lam, & Peng, 2011), demonstrating a favorable impact of psychological safety on project effectiveness. A. Newman et al. (2017) state that when workers feel psychologically safe, they are more committed to their work and are more willing to share their knowledge, strengthening social interchange across project staff organizations and ultimately leading to project effectiveness. The project staff's view of psychological safety has a significant impact on objective accomplishment and project effectiveness (Frazier et al., 2017). Our study links psychological safety to project effectiveness using the social exchange theory. The current study supported the hypothesized link and supported the requirement for psychological security to complete the project's objectives and successfully ensure project effectiveness.

**Table 2.** Hypotheses testing

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<b>Hypotheses</b>	<b>B</b>	<b>SE</b>	<b>95% CI</b>	<b>p</b>	<b>Decision</b>
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[LL; UL]

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<b>Direct relationships</b>					
SPM → PE	0.292	-	-	<0.001	Accepted
		0.044			
SPM → PSY	0.384	0.052	-	<0.001	Accepted
<b>Mediating effect</b>					
SPM → PSY → PE	0.234	0.038	[0.1615; 0.3091]	<0.001	Accepted
<b>Moderating effect</b>					
PSY * PSYEMP → PE	-0.087	0.026	[-0.1392;- 0.0364]	<0.001	Accepted

Moderator	Level	Conditional Indirect Effect	SE	LLCI	ULCI
Psychological	Low	0.1811	0.0353	0.1150	0.2523
Empowerment	High	0.2237	0.0357	0.1556	0.2949
<b>Moderation</b>		0-.0282	0.0100	-0.0487	-0.0097
<b>Mediation index</b>					

**Table 3.** Moderation mediation

*Note:* Moderator values in table are the mean and +/- SD from the mean.

The present study has unveiled that psychological safety serves as a mediating factor in the relationship between sustainable project management and project effectiveness. Employees possessing a

### *Empowering Sustainability ...*

heightened understanding of psychological safety are noted to feel unrestrained in sharing their expertise, posing questions, and contributing to a positive work atmosphere. The collective influence of these factors enhances productivity and, consequently, contributes to project effectiveness. The project manager encourages team members to establish a psychologically safe work environment by applying the principles of the social learning theory. These factors collectively enhance productivity and, consequently, contribute to project effectiveness. The project manager encourages the team members to provide a psychologically safe work setting psychologically secure by utilizing the social learning theory. According to research, employees who work in psychologically safe environments are more engaged, seek out constructive criticism, are recognized for their efforts, and are interested in personal development, all of which improve project effectiveness (A. C. Edmondson & Lei, 2014). Similarly, Jha and Varkkey (2018) research demonstrates that sharing information among psychologically safe project staff members increases project effectiveness. Furthermore, the empirical results show that support in the form of long-term a psychologically safe environment is psychologically safe will guarantee perfect project outcomes and on-stimulation. According to Hajro, Gibson, and Pudelko (2017), this outcome is comparable to the better support learning viewpoint. The present study has also examined the moderating influence of psychological empowerment on the relationship between project safety and project effectiveness. Several studies have provided evidence of a positive association between psychological safety and project successes. This study aims to enhance our comprehension of the relationship between psychological safety and project success by examining it through social exchange theory, building upon previous research that has already established a correlation on similar relationship in different domain (A. C. Edmondson & Lei, 2014).

Moreover, the finding of current studies suggests that psychological empowerment mitigates the indirect effects of sustainable project management on project effectiveness. The findings of earlier investigations Jha and Varkkey (2018) were supported by this empirical evidence. Psychological empowerment motivates the project team and fosters the belief that they are in charge and have authority over other team members. However, more than structural empowerment is required to complete a project in effective way (Jha & Varkkey, 2018). In sustainable

project management practices, psychologically safe project personnel play a crucial role in effectively completing a project. This effectiveness is contingent upon individuals believing that obtaining assistance from project management is essential for the successful execution of the project. The findings of our study illuminate the pivotal roles that psychological safety, as posited by A. Edmondson (1999), and psychological empowerment, as proposed by Spreitzer (1995), play in determining project effectiveness. Additionally, we explore the influence of sustainable project management, as discussed by Chawla, Chanda, Angra, and Chawla (2018), on these dynamics. The association between psychological safety and project effectiveness and sustainable project management was made more accessible by psychological empowerment. Existing literature provides evidence for the correlation between sustainable project management and the effectiveness of projects. Nevertheless, it is imperative to acknowledge that the implications at hand possess an intricacy that surpasses their initial appearance, primarily due to many underlying phenomena (Chakrabarty, Whitten, & Green, 2008; Chawla et al., 2018; Wang, 2023).

### **Conclusion**

This study used a mediating-moderating approach to explore the connection between project effectiveness and sustainable project management (SPM). Data was collected through questionnaires using a time lag method from project base organization in various sectors. The results revealed significant factors contributing to our understanding of project outcomes. Firstly, the study showed that creating a psychologically safe work environment is crucial for productive projects outcome. Building trust, encouraging collaboration, and promoting open communication among project teams are essential. Secondly, Sustainable project management significantly increases psychological safety by integrating sustainability into processes. The study found evidence supporting psychological safety's mediating role in the relationship between sustainable project management and project effectiveness. This study shows that implementing sustainable project management practices results in better project outcomes by promoting psychological safety. Additionally, the research found that psychological empowerment moderates the relationships between psychological safety, sustainable project management, and project effectiveness. Effective project

## ***Empowering Sustainability ...***

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management requires psychological safety and empowerment. Adopting sustainable project management practices, fostering psychological safety, and empowering team members can create an environment for successful organizational projects and outcomes. This study highlights the importance of psychological safety, sustainable project management, and psychological empowerment in achieving project effectiveness. It emphasizes the interplay between these factors and provides valuable insights for project-based organizations seeking to enhance performance and promote sustainability.

### **Policy Recommendations**

The findings provide important implications that business organizations should consider in order to achieve project goals effectively. The research findings underscore the significance of advocating for sustainable project management within organizational contexts. To strengthen sustainable management practices, it is essential for project managers to plan and participate in training and development programs. These initiatives aim to further enhance their skills, enabling them and their team to demonstrate sustainable management more proficiently. Second, since sustainable project management leadership parties in organization create a sustainable environment in which employees are encouraged to idea sharing, information exchange, and risk-taking, it is imperative to prioritize top management as a critical element in achieving project effectiveness. It is the responsibility of top management in organizations to establish compatibility and harmony among project employees, fostering a psychologically safe working environment. It is recommended that emphasis be placed on assisting employees who are performing below expectations, aiming to enable them to achieve their maximum potential according to their individual talents, competencies, and skills. Furthermore, organizational management can offer training programs targeting project objectives, sustainable development, job descriptions, roles, and duties. The primary aim of such training initiatives is to foster an environment of psychological safety among project employees. Additionally, it is essential to assess employees' perceptions of a psychologically safe environment when considering their suitability for challenging tasks in future projects.

Fourth, it is essential to comprehend the extent of psychological empowerment to which employees are exposed in order to foster a psychologically secure environment among project staff. Finally, it is critical to address the implicit and explicit needs of project personnel who lack psychological safety to reinforce the connections between psychological safety and the effectiveness of the project. Moreover, within a psychologically safe work setting, sustainable project management should inspire project staff to strive towards achieving project goals effectively. It is critical for management to be cognizant of the challenges associated with attaining project goals and fulfilling employee needs. So, emphasizing the integration of these aspects becomes essential in fostering a psychologically safe work setting. Therefore, by implementing sustainable project management practices which aim to bring such transformation among project staff, individual level progress can be improved, time can be saved, and it is possible to increase each employee's degree of confidence. In a supportive and safe environment, employees are more inclined to accept their responsibilities for accomplishing the project goal when they feel psychologically empowered and safe.

#### **Limitations and future research**

It is imperative to address the limitations of this study in future investigations. The key study variables were derived from a singular data source, which may be susceptible to the influence of the CMB problem (Podsakoff, MacKenzie, Podsakoff, & Lee, 2003). To minimize bias, we divided the respondents' data into three phases for the current study. Additionally, we have run several experiments to look at the CMB, and every test indicates that the CMB is acceptable in the current study. Different stakeholders, including the project team, can contribute to a project's effectiveness and results, and projects with psychologically safe personnel can improve the bonds between workers and managers and enhanced sustainable project effectiveness. Hence, the focus of future research will be on stakeholder roles. Additionally, data from the telecommunications, information technology, and construction industries were acquired to validate the proposed model. Future research may fill this gap and examine the effects across various industries. However, this study did not do a cross-sector analysis. Third, we looked at how SPM affects people on a personal level. Future research should examine the

impact of SPM at various levels to understand better how the model functions and provide insightful data. Fourth, while future research can obtain data from multiple meditators, this study only used one.

Last but not least, the current study was done explicitly in the setting of Pakistani culture. As a result, the conclusions are more valid and applicable in comparable situations. To further explore the causal linkages, we hypothesized in our research, it is advised to collect data from various geographical and cultural contexts, focus on longitudinal studies, and conduct more research. Future research may also explore the key success elements and drivers for businesses embracing sustainable project Management (SPM) practices. For instance, organizational culture, staff engagement, and communication climate play key roles in successfully implementing SPM (Iqbal & Ahmad, 2021). Future studies should therefore examine these issues concerning the use of SPM.

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**Data availability:** The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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