Häringer, Gomez & Schöttle (2024). An Investigation of Psychological Safety in Construction Projects and its Influence on Team Learning Behaviour: A survey-based study. In D. B. Costa, F. Drevland, & L. Florez-Perez (Eds.), *Proceedings of the 32nd Annual Conference of the International Group for Lean Construction* (IGLC32) (pp. 1123–1134). doi.org/10.24928/2024/0150

AN INVESTIGATION OF PSYCHOLOGICAL SAFETY IN CONSTRUCTION PROJECTS AND ITS INFLUENCE ON TEAM LEARNING BEHAVIOUR: A SURVEY-BASED STUDY

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ABSTRACT

Due to a construction project's dynamic, interdependent, and complex environment, it is crucial that team members are able to talk openly about risks, mistakes, ideas and best practices without fearing interpersonal risks such as punishment or dismissal. Sharing knowledge is especially critical as team structures change over a project. Therefore, psychological safety is an essential key enabler in such project environments. This paper is built upon a cross-sectional survey-based study (N=163) used to assess the current level of psychological safety within teams of the Owner, Architect, Engineering, and Construction (OAEC) industry based on the views of individuals in different teams. Furthermore, the study aimed to identify factors that can enhance psychological safety in construction project teams. These include, for example, a good failure culture, communication, and a mindset toward collaboration. The results show a strong positive relationship between psychological safety and team learning behavior, with psychological safety as a predictor explaining 50% of the variance in team learning behavior.

KEYWORDS

Construction project teams, psychological safety, team learning behaviour.

INTRODUCTION

One of the biggest challenges within construction projects is fostering open communication to create synergies, address mistakes, and thus learn together (Baiden et al., 2006). However, based on mainly traditional structures, competitive relationships and a lack of collaboration are particularly prevalent in the industry, highlighting issues such as a low level of trust, inadequate communication, and unfair risk sharing. The resulting time and cost overruns due to disputes, for example, are commonplace within the industry, so poor performance is often attributed to the lack of effective working relationships between project participants (e. g., Faris et al., 2019; Sumner & Slattery, 2010; Schöttle & Gehbauer, 2013; Fulford & Standing, 2014; Rooke, 2014; Rosenfeld, 2014; Schöttle, 2022). This can have a significant impact not only on the success of the project but also on its execution, especially on the physical safety of those involved (Gomez et al., 2020; Faris et al., 2019). By addressing issues and mistakes early on and collaborating to benefit from shared information and experience, risks and mistakes can be reduced or eliminated during the design and construction phases (Howell et al., 2017).

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Due to the dynamic and uncertain nature of a construction project's environment, errors and hazards are frequently unavoidable. Therefore, it is essential that they are addressed openly and that the team is given the opportunity to learn from them so that they do not recur and that long-term solutions can be found through shared learning and innovative approaches (Gomez et al., 2020). However, the fact that those who have pointed out errors or a lack of knowledge have been punished with negative consequences, has led to significant inadequacies (Gomez et al., 2020). In many cases, an environment where employees are ignored, ridiculed, or even disciplined for speaking out can be dangerous, especially when employees feel that their word counts for nothing and conclude that it is not worth speaking out due to self-protection (Edmondson, 2019). This is particularly difficult in a traditional sector such as construction, where the credo "we've always done it this way" often applies (Santorella, 2011).

As conceptualized by Edmondson (1999), psychological safety refers to a person's perception of the team environment as safe for taking interpersonal risks. When team members perceive a high level of psychological safety, they are more willing to engage in open discussions, share knowledge, and experiment with new approaches, leading to improved team learning (Edmondson, 1999; 2002). This includes, among other things, team members feeling encouraged to contribute their expertise, share their ideas, and provide constructive feedback to improve team performance and, thus, project performance. The interpersonal risk of raising a concern or question with a more senior person is also described by Santorella (2011) as “showing vulnerability,” which is distinct from psychological safety as a construct. In general, vulnerability requires courage to be open and authentic and often involves a degree of risk as you cannot be sure how others will react (Brown, 2018). Nonetheless, the two constructs are generally closely related and can have a positive reciprocal effect, as showing vulnerability by individuals can help to build trust and psychological safety within a group or team (Edmondson, 1999). Consequently, the construct of psychological safety within the construction industry is vital in reducing the anxiety of interpersonal risk, thereby creating essential conditions for improving productivity, safety, quality, and innovation (Gomez, 2023).

Zhang and Fai Ng (2012) describe the construction industry as a knowledge-intensive industry in which it is crucial for professionals to share their knowledge, build mutual understanding, and work together to find effective solutions to improve the efficiency of project delivery. According to Howell et al. (2017), learning organizations are essential in construction projects to minimize the difference between as-found and as-planned work. They argue that the need for organizational learning is demonstrated by workers speaking up when there is a potential obstacle to the execution of a job or by the team on a construction project working together to find the safest way to execute a job (Howell et al., 2017). Furthermore, studies have shown that psychological safety is a driver of team learning behaviors (Gomez, 2023; Gomez et al., 2019; Newman et al., 2017; Van den Bossche et al., 2006; Edmondon, 1999).

The main aim of the study is to address a significant research gap by examining the concept of psychological safety within a portion of the OAEC industry and its impact on team learning behavior. Additionally, the study seeks to raise awareness within the construction industry regarding the importance of psychological safety and offer valuable insights and practical recommendations. The research questions were:

- How psychologically safe do people feel in the OAEC industry?
- How can psychological safety be enhanced in construction project teams?
- How does psychological safety affect team learning behavior?

Also, the following research hypothesis was proposed:

H_1 Psychological safety is positively correlated with team learning behavior in construction project teams.

H_0 There is no significant correlation between psychological safety and team learning behavior in construction project teams.

THEORETICAL BACKGORUND

PSYCHOLOGICAL SAFETY AND LEAN

The concept of psychological safety, as defined by Edmondson (1999), has started to gain traction in the construction industry, particularly in terms of its connection to Lean and the impact it's having on project teams (Gomez et al., 2019; Gomez et al., 2020; Howell et al., 2017; Demirkesen et al., 2021; Gomez, 2023). For example, Demirkesen et al. (2021) discovered in a multi-method study conducted in the U.S. that projects using lean construction had more psychological safety. Gomez (2023) also investigated the relationship between psychological safety, Lean, and team behavioral dynamics, highlighting how some Lean principles, such as "respect for people," relate to psychological safety and the interdependent role that one plays in promoting the other.

Psychological safety is achieved when team members trust and respect each other and are able to open up (Edmondson, 2002). Edmondson's (1996, 1999, 2019) definition differs from Kahn's (1990) definition by expanding the construct of psychological safety for the first time as "a team-level climate" rather than an individual's perception of a feeling (Newman et al., 2017, p. 523). It was found that people working closely together tended to have similar perceptions of psychological safety, whereas scores varied between groups within the same organization (Newman et al., 2017). This difference in an employee's feeling of psychological safety within an organization, from department to department and from team to team, can be attributed primarily to differences in the behavior of local managers and supervisors, regardless of how strong the corporate culture is (Edmondson 1999, 2003).

TEAM LEARNING BEHAVIOUR

Team learning is particularly important for working together effectively in a constantly changing environment, which is the case for construction project teams (Decuyper et al., 2010; Zhang & Fai Ng, 2012). There are several definitions of team learning. Each of them describes it as a complex concept that can be viewed from different perspectives, and its meaning can vary depending on the context and discipline (Decuyper et al., 2010; Edmondson et al., 2007). Edmondson et al. (2007) referred to team learning as an umbrella term that encompasses and connects multiple theories and studies. Generally, the well-known definitions can be divided into learning as a process (Edmondson, 1999; 2002), learning as an outcome (Ellis et al., 2003), and learning as a mixture of both (Storm et al., 2010).

Edmondson's (1999) definition of team learning is adopted for this study as it describes several concrete and different learning behaviors and is dominant in research (Savelsbergh et al., 2009; Edmondson, 2002; Storm et al., 2010). Edmondson (1999) defines team learning as "an ongoing process of collective reflection and action characterized by (a) exploration, (b) reflection, (c) discussion of mistakes and unexpected outcomes of action, (d) seeking feedback, and (e) experimentation within and as a team" (Savelsbergh et al., 2009, p. 582). She distinguished the learning process from the learning outcomes using the phrase "team learning behavior," which was also adopted for the present study (Edmondson, 1999).

METHODOLOGY

RESEARCH DESIGN AND SAMPLING APPROACH

The research design of the present study is based on a quantitative cross-sectional survey in which data was collected in the form of an online-based questionnaire for self-completion. In

addition, to give participants a chance to contribute their perspectives and possibly uncover novel insights in the field, as in a qualitative research approach, the questionnaire included an open-ended question providing qualitative data about psychological safety and how it can be improved within construction project teams.

The selection of the sample was guided by predetermined criteria to fulfill the research questions and hypotheses precise demands and guarantee the data's comparability. The desired sample consists of people who work within the construction industry (filter question 1) and are members of an interdisciplinary construction project team when answering the questionnaire (filter question 2). In order to keep the complexity of the questionnaire low with regard to the different disciplines of a construction project team, only the superordinate areas of design, execution, project management and control, consultancy, and the owner or owner's representatives are considered (filter question 3). Chan et al. (2004) also identified these as key areas.

INSTRUMENT OF DATA COLLECTION

The questionnaire comprises a total of 36 items and offers the option to be completed in German or English. Furthermore, the questionnaire is structured into five main sections: sample filtering, control variables, psychological safety, team learning behavior, and personal information (such as gender and age). The following control variables were asked to ensure generalizability: project volume, team size, team meetings (regularity, online vs. face-to-face vs. hybrid), existence of informal team events (e.g., joint lunches, after-work events), country of work, and whether the respondent is in a management position. Furthermore, the respondents of the desired sample were asked to answer from the perspective of the project on which they are presently spending the majority of their working hours.

To measure psychological safety, the seven items (questions) developed by Edmondson (1999) were used to maintain high content validity (Newman et al., 2017). She used a 7-point Likert scale to assess participants' responses, ranging from "very inaccurate" to "very accurate," including a neutral middle category. This study employed a 6-point scale without a neutral middle category, ranging from "strongly disagree," coded as 1, to "strongly agree," coded as 6. In the context of interpreting the values, it is considered that values equal to or beyond 4, which align with the category of "slightly agree" or higher, are indicative of psychological safety. By removing the neutral middle category, participants are required to adopt a distinct stance on either low or high psychological safety. This is also important due to a statement by Edmondson and Bransby (2022), in which they say that it does make more sense that psychological safety is reported at the individual level for individuals working with different people at different times rather than aggregated in a group context, as in most studies, due to a lack of stability.

Given that each study participant may be responding from the perspective of a different team, the scores for psychological safety are thus left at the individual level. Therefore, the calculated mean score of individuals can be better interpreted without a neutral middle category. The seven questions used to assess psychological safety, including the response options, can be seen in Figure 1.

Psychological safety

Please select the answer option that applies.
The answer depends on how much you think the statement applies to the team on the project on which you currently spend most of your working time.

If you make a mistake on this team, it is often held against you.	☐ Strongly disagree	☐ Disagree	☐ Slightly disagree	☐ Slightly agree	☐ Agree	☐ Strongly Agree
Members of this team are able to bring up problems and tough issues.	☐ Strongly disagree	☐ Disagree	☐ Slightly disagree	☐ Slightly agree	☐ Agree	☐ Strongly Agree
It is safe to take a risk on this team.	☐ Strongly disagree	☐ Disagree	☐ Slightly disagree	☐ Slightly agree	☐ Agree	☐ Strongly Agree
It is difficult to ask other members of this team for help.	☐ Strongly disagree	☐ Disagree	☐ Slightly disagree	☐ Slightly agree	☐ Agree	☐ Strongly Agree
No one on this team would deliberately act in a way that undermines my efforts.	☐ Strongly disagree	☐ Disagree	☐ Slightly disagree	☐ Slightly agree	☐ Agree	☐ Strongly Agree
Working with members of this team, my unique skills and talents are valued and utilized.	☐ Strongly disagree	☐ Disagree	☐ Slightly disagree	☐ Slightly agree	☐ Agree	☐ Strongly Agree
People on this team sometimes reject others for being different.	☐ Strongly disagree	☐ Disagree	☐ Slightly disagree	☐ Slightly agree	☐ Agree	☐ Strongly Agree

Figure 1: 7-item scale to measure psychological safety and answer options.

Similarly, as for psychological safety, for the measurement of team learning behavior, the 7-item scale by Edmondson (1999) was used due to its strong content validity. The items for team learning behavior are also assessed using a 6-point scale without a neutral middle category. This was modified due to the measurement of psychological safety to facilitate a more accurate comparison of the mean scores of the two variables in subsequent analyses. Consequently, in the context of interpreting the values, it is considered that values equal to or beyond 4, which align with the category of "slightly agree" or higher, indicate team learning behavior. The seven questions used to assess team learning behavior, including the response options (see Figure 2).

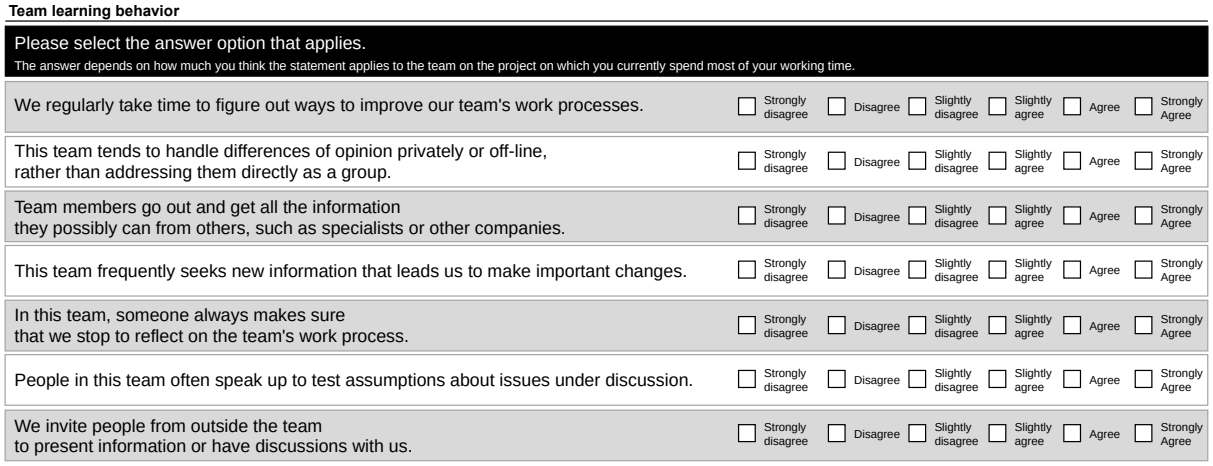

Figure 2: 7-item scale to measure team learning behavior and answer options.

DATA COLLECTION AND SAMPLE

To ensure the questionnaire's validity and reliability and minimize any misconceptions in the wording of the questions and instructions, a pilot test (N = 10) was undertaken prior to the distribution of the survey. The data collection itself took place between June 23 and August 12, 2023, using Unipark's EFS 22.2 Survey software. The survey was distributed via hyperlink and QR code through online social media platforms, as well as directly via email to the researcher's network of construction industry professionals.

As shown in Table 1 on the next page, the participants in the sample are distributed across various sectors within the construction industry, with the majority originating from Germany. Additionally, the gender distribution is nearly equal, with a slight female predominance. Furthermore, a significant proportion of participants aged between 20 and 40, with 1 to 10 years of professional experience, contributed to the study. This demographic profile should be taken into account when interpreting the findings.

RESEARCH FINDINGS

Considering the population of individuals working in the construction industry in the surveyed countries, the sample size of N = 163 is sufficient to provide general conclusions, with the research findings demonstrating a 90% confidence interval with a margin of error of 10%.

MEASURING PSYCHOLOGICAL SAFETY

First of all, a reliability analysis was conducted to assess the internal consistency of the construct of psychological safety prior to the final calculation. Cronbach's alpha is (α) =.78, which is, according to Field (2018), "acceptable." Therefore, the seven items could be summarized as psychological safety. Utilizing a descriptive frequency analysis afterwards, it was possible to determine the current state of psychological safety within construction project.

Table 1: The sample's sociodemographic characteristics

Attributes		Frequency	%	Min.	Max.	Mean	SD
Gender	Female	88	54%				
	Male	75	46%				
Work country	Germany	140	85,90%				
	Austria	16	9,80%				
	Switzerland	7	4,30%				
Working area	Design	30	18,40%				
	Construction	59	36,20%				
	Project Management/Control	34	20,90%				
	Owner	20	12,30%				
	Consultancy	20	12,30%				
Age in years	20-30	67	41,10%				
	31-40	65	39,88%				
	41-50	19	11,66%	20	62	35	8,72
	51-60	9	5,53%				
	61-70	3	1,83%				
Work experience in years	1-5	53	32,52%				
	6-10	48	29,45%				
	11-15	25	15,34%				
	16-20	14	8,59%				
	21-25	9	5,52%	1	40	11	8,86
	26-30	5	3,07%				
	31-35	6	3,68%				
	36-40	3	1,84%				
	41-45	1	0,06%				

The results indicate that the participants in the study (N = 163) perceive a high level of psychological safety within their interdisciplinary project teams, where they currently spend the most working time. The mean score for psychological safety was calculated to be 4.5, with a standard deviation (SD) of 0.76. The result corresponds to a high value for psychological safety, as the value of 4.5 is to be classified within the higher end of the scale, ranging from 1 (indicating little to no psychological safety) to 6 (indicating a high degree of psychological safety). In addition, the participant who reported the lowest level of psychological safety has an individual mean score of 2.29, while the participant who reported the highest level of psychological safety has an individual mean score of 6.00. The graph in Figure 3 illustrates the distribution of the mean values within the sample.

Using an independent-sample t-test, a one-sided statistically significant difference was found between individuals who reported having *regular team meetings* to exchange information and their psychological safety score and those who did not, $t(161) = 1.7$, $p<.044$. The mean score of psychological safety for those with regular meetings was around 0.45 points higher on average (90%-CI [0.016, 0.87]) (see Table 2). Another statistically significant difference in

psychological safety was found between individuals who have *informal team events* in their team, such as joint lunches and after-work gatherings (53.4%), and those who do not (42.9%), using a t-test for independent samples, t (120.53) = 3.26, p<.001. The mean score of psychological safety was around 0.40 points higher on average for those who reported informal team meetings (90%-CI [0. 20, 0.60]).

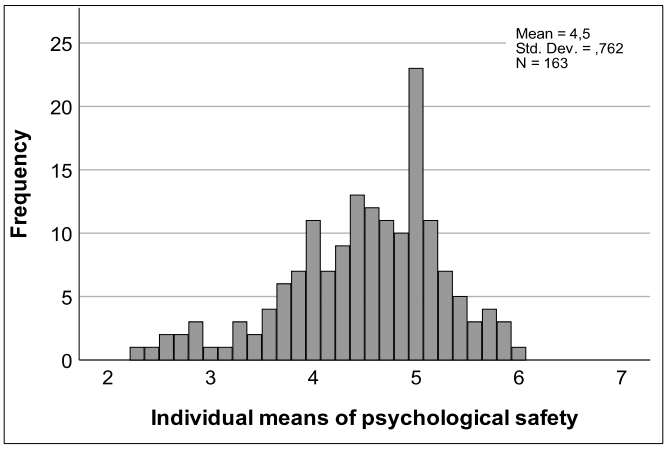

Figure 3: The level of psychological safety

Table 2: Group statistics for the independent-samples t-tests

Team meetings	N	Psychological safety Mean	SD	Std. Error Mean
Yes	154	4,53	0,75	0,06
No	9	4,08	0,83	0,28
Team events	**N**	**Psychological safety Mean**	**SD**	**Std. Error Mean**
Yes	87	4,69	0,61	0,07
No	70	4,29	0,86	0,10

However, *no significant mean differences or correlations* could be found between the psychological safety scores and variables such as gender, age, work experience, managerial position, country of work (Germany, Austria, Switzerland), area of work (design, execution, project management/control, consulting, owner), team size, or project volume.

WHAT WOULD HELP TO INCREASE PSYCHOLOGICAL SAFETY?

The open-ended question in the questionnaire was: "What would help you to feel safe in this team to raise concerns, make suggestions, ask questions, and talk about risks and mistakes?" In total, 64 of the 163 participants responded to this question. A content analysis was conducted to identify ways to improve psychological safety on a construction project team. The content analysis resulted in nine themes, along with their respective subcategories. The nine categories are: Feeling safe (12,5% (8 mentions) of the participants mentioned that they already feel very secure in their team and have no suggestions for improvement); failure culture (39,1% (25 mentions)); communication (34,4% (22 mentions)); relationship with other team members (20,3% (13 mentions)); mindset (12,5% (8 mentions)); support (7,8% (5 mentions)); environment (6,3% (4 mentions)); clarity/Structure: (3,1% (2 mentions)); extra time slots for psychological safety (3,1% (2 mentions)).

THE INFLUENCE OF PSYCHOLOGICAL SAFETY ON TEAM LEARNING BEHAVIOR

Before running the analysis, the internal consistency of team learning behavior was checked using a reliability analysis. Cronbach's alpha is (α) =.79, which is "good" according to Field (2018). Consequently, the construct of team learning behavior could be formed as a dependent variable via the mean of the seven items. Subsequently, a correlation analysis and a simple regression analysis were conducted between the two variables to examine the presence of a positive correlation and gain a deeper understanding of the extent to which the variance can be accounted for in the model team learning behavior.

Using Pearson's correlation, a strong positive correlation between psychological safety and team learning behavior could be demonstrated according to Cohen (1988), r= .709, p<.001. This means that the more psychologically safe team members in construction project teams felt within this study, the more likely team learning behavior could be perceived within the team. Due to the significance level of p<.001, the H0 can be rejected, and the H1 can be accepted. This means that psychological safety positively correlates with team learning behavior in construction project teams.

The result of the simple regression analysis with team learning behavior as the dependent variable and psychological safety as the explanatory variable is significant, F (1,161) = 162.47, p < .001. In addition, the regression analysis yielded an R-squared of .50, which means that psychological safety can explain 50% of the model team learning behavior. Since there are no similar studies within the industry yet and the pilot study data is no longer accessible, according to Cohen (1988), the smallest effect size can be used that is still perceived as practically relevant. For the present study, R-Square= .50, according to Cohen (1988), is considered a very large effect. Due to the significance level of p<.001, the H0 can be rejected, and the H1 can be accepted, which means that psychological safety has a statistically significant influence on team learning behavior.

DISCUSSION OF THE RESEARCH FINDINGS

HOW PSYCHOLOGICALLY SAFE DO PEOPLE FEEL IN THEIR CONSTRUCTION PROJECT TEAMS?

Although a first impression guided by the mean score of 4.5 on a scale from 1 (low) to 6 (high) regarding psychological safety can be that the level of psychological safety in the population studied is quite high, Figure 1 shows a good number of respondents' scores being closer to a value of 1-3. This high deviation in the results shows that while some people in this industry feel safe, we still have plenty of work to do to improve the work environment. Other studies in construction industry teams reported means of 5.68 and 6.66 (on a 7-point scale), differentiating the perception of psychological safety from the perspective of craftworkers and staff members, respectively (Gomez et al., 2023). While we cannot directly compare these results because this study collected responses from the view of individuals in different teams, other studies in construction have focused on analyzing psychological safety within one team (Gomez et al., 2019; Gomez, 2023), the results of this study expand upon prior work that focused on ways to enhance psychological safety within this population done by Gomez et al. (2020).

HOW CAN PSYCHOLOGICAL SAFETY BE ENHANCED IN CONSTRUCTION PROJECT TEAMS?

According to Demirkesen et al. (2021), lean construction projects typically have a greater level of psychological safety because meetings are more collaborative and transparent, resulting in improved communication. The study's findings suggest that regular team meetings and informal gatherings can improve psychological safety. This phenomenon can be attributed to two key factors that improve psychological safety: familiarity and the level of prior interaction among

team members (Roberto, 2002; Newman et al., 2017). Furthermore, promoting equal interactions between leaders and team members through informal events fosters an environment that encourages open expression regardless of hierarchical structures, as the supervisory relationship is critical for psychological safety in construction projects (Gomez et al., 2020). This, in turn, can decrease the phenomenon of "status anxiety," as discussed by Santorella (2011).

Furthermore, a good failure culture enhances psychological safety, as previously discussed. The participants in this study interpreted a good failure culture as an inclusive setting where team members feel comfortable discussing and acknowledging mistakes as well as engaging in subsequent reflection (Edmondson, 2019). It is important to note that it is primarily up to the manager to establish such a robust failure culture (Edmondson, 2019). However, other coworkers' behaviors can also influence individuals' perceptions of how safe the work environment is (Subhakaran & Dyaram, 2018; Ng et al., 2021). Based on the participants' responses in this study, mindset is primarily about openness to new ideas and innovations that do not correspond to the traditional way of thinking: "We have always done it this way." Additionally, this also includes a collaborative attitude towards working together and driving continuous improvement. Therefore, it is primarily the manager's responsibility to adopt a curious, productive mindset instead of an avoidant one, as well as to reframe problems and mistakes as opportunities to learn and develop.

HOW DOES PSYCHOLOGICAL SAFETY AFFECT TEAM LEARNING BEHAVIOR?

The present study found a significantly strong positive correlation between psychological safety and team learning behavior. Therefore, evidence suggests that the more psychological safety is present in a construction project team, the more team learning behavior is indicated. Thus, in terms of practical implications, enhancing psychological safety in a construction project team is worthwhile, as it is one of the essential prerequisites for team learning behavior. The study aligns with previous research conducted by Edmondson (1999) in terms of examining the strength of the link. Nevertheless, it is important to be aware that a direct comparison of these values is not feasible due to different response scales. However, as previously emphasized by Edmondson and Lei (2014), psychological safety is not the sole determinant of team learning and performance. Instead, it is dependent on the existence of certain conditions that necessitate learning and communication. This is confirmed by the regression analysis conducted as part of this research, as psychological safety is only able to explain 50% of team learning behavior.

LIMITATIONS OF THE RESEARCH

First of all, it is important to acknowledge that there are certain limitations related to the definitions of the variables. Although scientifically accepted definitions were used, there are many definitions of a construction project team, as well as the concepts of psychological safety and team learning behavior, which can make comparisons with studies difficult. Furthermore, by choosing a quantitative research design, the study is limited in terms of the depth and complexity of the examined constructs, as psychological safety and team learning behaviors are multi-layered constructs that are difficult to represent in one single study. Therefore, it is important to note that the study's cross-sectional methodology limits the ability to demonstrate causal links as the data were obtained at a singular time. In addition, self-completion questionnaires are vulnerable to the influence of social desirability and response bias. Also, removing the neutral middle category in the response scales of the constructs of psychological safety and team learning behavior may introduce certain constraints in the results because participants who lack a neutral option may feel obligated to select an opinion that does not accurately reflect their true sentiments just to provide a response. Moreover, the survey participants came from different organizations and teams, which has the disadvantage that other

unknown variables may have had an impact on the constructs that were not captured. Finally, it is important to note that the findings of this study have limited generalizability because the sample comprises solely of construction project teams, and the number of participants is limited and biased according to their sociodemographic. As a result, the findings are only applicable to the construction industry and cannot be easily adapted to other industries or contexts.

CONCLUSION

In conclusion, the study was able to enhance the recognition and importance of psychological safety within construction project teams. The study revealed that the sample's current level of psychological safety was high. However, there was also a considerable percentage of participants with low levels of psychological safety. Consequently, it is important to enhance the industry's comprehension and awareness of psychological safety. In particular, fostering regular team interaction through collective meetings or informal team events improves psychological safety. Additionally, cultivating a good failure culture and an open mindset towards collaboration can also contribute to establishing a psychologically safe environment. However, it is important to acknowledge that psychological safety should not be regarded as a cure-all for addressing every challenge related to organizational collaboration and learning (Edmondson & Lei, 2014). It is more about psychological safety being seen as an 'engine' — an interpersonal climate of safety— which, combined with other essential components (e.g., strategy, goals, supportive leadership, etc.), can facilitate better learning and performance (Edmondson, 2019). To conclude, any unacknowledged voice or unspoken mistake, risk, or idea from a team member can contribute to a culture of silence, thereby decreasing psychological safety. Not only can this affect the project's success, but in a dangerous industry like construction, it could even be a matter of life and death (Sumner & Slattery, 2010) and inhibit improvement and change within the industry.

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