

Psychological Safety and Team Performance: Mapping Key Insights and Emerging Trends

Психолошка сигурност и тимски учинак: Мапирање кључних увида и нових трендова

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Abstract

Purpose: Psychological safety is a central concept in team research, widely recognized as a key driver of team performance. However, the rapidly growing body of research remains conceptually diverse and scattered across multiple disciplinary areas, making it difficult to consolidate dominant themes and new directions. This study maps and synthesizes recent research to identify the field's intellectual foundations, dominant themes, and emerging research fronts shaping current and future work.

Methodology: This study conducts a bibliometric mapping of literature on psychological safety and team performance from 2018 to 2025, analyzing 278 publications retrieved from the Web of Science Core Collection. VOSviewer and Bibliometrix were used to apply performance analysis and science mapping techniques, including keyword co-occurrence, reference co-citation, and bibliographic coupling.

Findings: The results reveal a highly interconnected research landscape in which psychological safety acts as a central hub linking multiple performance-related mechanisms. Dominant themes include leadership, communication and coordination, conflict and diversity, and trust, with recent research highlighting measurement refinement, contextual factors, and practical applications in understanding team performance.

Originality: This study systematically maps and synthesizes recent research on psychological safety and team performance, clarifying a fragmented field by identifying its intellectual foundations, key themes, emerging directions, and context-dependent mechanisms with implications for future research and practice.

Practical implications: The findings offer decision-makers and team leaders actionable insights to enhance psychological safety, optimize team performance, and tailor management practices to complex, dynamic work environments.

Limitations: Future research should expand database coverage and strengthen theoretical integration by exploring multilevel mechanisms, longitudinal designs, and contextual moderators influencing the psychological safety–performance relationship.

Keywords: psychological safety, team performance, team effectiveness, team dynamics, bibliometric analysis, co-citation analysis, bibliographic coupling, co-occurrence network.

JEL classification: M12, M14

Сажетак

Циљ: Психолошка сигурност је централни концепт у истраживању тимова, широко препознат као кључни покретач тимских перформанси. Међутим, брзо растући корпус истраживања остаје концептуално

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разнолик и расут по више дисциплинарних области, што отежава консолидацију доминантних тема и нових праваца. Ова студија мапира и синтетише недавна истраживања како би идентификовала интелектуалне темеље области, доминантне теме и нове истраживачке фронтове који обликују садашњи и будући рад.

Методологија: Студија спроводи библиометријско мапирање литературе о психолошкој сигурности и перформансама тимова у периоду од 2018. до 2025. године, анализирајући 278 публикација преузетих из базе Web of Science Core Collection. За анализу су коришћени алати VOSviewer и Bibliometrix, примењујући технике перформансне анализе и мапирања науке, укључујући анализу ко-појављивања кључних речи, ко-цитирање референци и библиографско повезивање.

Резултати: Резултати показују високо међусобно повезан истраживачки пејзаж где психолошка сигурност служи као централно чвориште које повезује вишеструке механизме повезане са учинком. Кључне теме укључују лидерство, комуникацију и координацију, конфликт и разноликост, и ставове засноване на поверењу, при чему недавна истраживања наглашавају усавршавање мерења, контекстуалне факторе и практичне примене, сигнализирајући помак ка контекстуално осетљивом, механизмима заснованом разумевању његовог утицаја на тимски учинак.

Оригиналност: Ова студија систематски мапира и синтетише недавна истраживања о психолошкој сигурности и тимском учинку, разјашњавајући фрагментирано поље идентификујући његове интелектуалне темеље, кључне теме, нове правце са импликацијама за будућа истраживања и праксу.

Практична примена: Резултати нуде доносиоцима одлука и вођама тимова практичне увиде за побољшање психолошке сигурности, оптимизацију тимског учинка и прилагођавање управљачких пракси сложеним, динамичним радним окружењима.

Ограничења истраживања: Будућа истраживања треба да прошире покривеност базе података и ојачају теоријску интеграцију истраживањем механизма на више нивоа, лонгитудиналних дизајна и контекстуалних модератора који утичу на однос између психолошке сигурности и перформанси.

Кључне речи: психолошка сигурност, тимске перформансе, ефикасност тима, тимска динамика, библиометријска анализа, анализа коцитирања, библиографско повезивање, мрежа ко-појављивања.

ЈЕЛ класификација: M12, M14

Introduction

Teams represent the dominant organizational form through which complex tasks are executed and knowledge is coordinated in contemporary organizations. As a result, team effectiveness and team performance have become central drivers of organizational outcomes and competitive advantage (Mathieu et al., 2019). In this context, team success does not depend solely on individual members' competencies, but also on the quality of team processes, communication patterns, and socio-emotional climates that enable collaboration, learning, and decision-making under uncertainty (Kozlowski & Ilgen, 2006; Salas et al., 2015). A critical question in organizational research is therefore why some teams manage to leverage diverse expertise, openly share information, and detect mistakes early, while other teams remain silent, suppress concerns, and underperform despite comparable resources.

One of the most influential constructs proposed to explain such differences is psychological safety, typically defined as a shared belief that the team is safe for interpersonal risk-taking allowing members to ask questions, express concerns, admit errors, and offer new ideas without fear of negative interpersonal consequences (Edmondson, 1999). Psychological safety is particularly relevant in organizational settings because it directly addresses the broader phenomenon of organizational silence and the (un)willingness of employees to speak up when doing so could prevent harm or improve

outcomes (Morrison & Milliken, 2000). When present, psychological safety enables critical team behaviors such as voice, knowledge sharing, and learning from failure, processes that are widely recognized as performance-relevant mechanisms (Detert & Burris, 2007; Edmondson, 1999).

Team science research further suggests that psychological safety functions as an enabling condition for key performance mechanisms, including team learning, coordination, adaptation, and effective decision-making (Kozlowski & Ilgen, 2006; Salas et al., 2015). In complex and high-risk environments, such as healthcare and operating teams, psychological safety is especially important because it supports error reporting, rapid information exchange, and proactive prevention of adverse outcomes (Edmondson, 2004). Accordingly, psychological safety has become a central topic across organizational behavior, leadership research, and applied psychology.

At the same time, the increasing growth of the psychological safety literature has resulted in conceptual diversification. Psychological safety has been investigated through multiple theoretical lenses (e.g., social exchange perspectives, motivational mechanisms, socio-cognitive interpretations), in a variety of team types (project, innovation, virtual, healthcare), and using heterogeneous operationalizations of both team effectiveness and team performance (Mathieu et al., 2019). This diversification has accelerated in recent years, accompanied by expanding attention to inclusive leadership, team diversity, conflict dynamics, and teams working under digital and hybrid conditions. As a consequence, the research domain connecting psychological safety and team performance has become increasingly fragmented, making it difficult to consolidate cumulative knowledge through traditional narrative reviews.

In such contexts, bibliometric analysis provides a robust and systematic method for mapping scientific knowledge structures. Bibliometric techniques enable the identification of intellectual foundations (highly influential authors and publications), major thematic clusters, and emerging research fronts shaping contemporary scholarship (Donthu et al., 2021). By combining keyword co-occurrence analysis, co-citation networks, and bibliographic coupling, it becomes possible to visualize how research streams cluster conceptually, how foundational knowledge is structured, and which newer topics are gaining momentum.

Therefore, the purpose of this study is to conduct a bibliometric analysis of scientific publications addressing psychological safety and team performance between 2018 and 2025. Using the Web of Science Core Collection (WOS CC) and applying network-based bibliometric techniques in VOSviewer and Bibliometrix (R studio), this study maps the structure of the field, identifies dominant thematic clusters, and highlights recent research trends.

To achieve this objective, the study addresses the following research questions:

- *RQ1: What are the intellectual foundations (most influential publications, authors, and conceptual traditions) of research connecting psychological safety and team performance?*
- *RQ2: What dominant thematic clusters structure the contemporary literature on psychological safety in teams?*
- *RQ3: What emerging trends and research fronts characterize psychological safety–team performance scholarship during 2018–2025?*

This study contributes to the literature in three ways. First, it provides a systematic mapping of a rapidly growing research domain on psychological safety and team performance. Second, it identifies dominant thematic clusters and key performance-relevant mechanisms (e.g., voice, learning, coordination, and conflict) through which psychological safety influences team outcomes. Third, it highlights research gaps and proposes directions for future research, including multilevel explanations, longitudinal research designs, and improved measurement consistency across contexts.

1. Theoretical background

Psychological safety has become a central construct in organizational behavior and team research, largely due to its explanatory power for understanding how interpersonal environments shape collective learning and effectiveness. It is typically defined as a shared belief among team members that the team is safe for interpersonal risk-taking, such that individuals can express concerns, ask questions, admit mistakes, and offer new ideas without fear of embarrassment, rejection, or punishment (Edmondson, 1999). This conceptualization emphasizes psychological safety as a collective team climate, rather than an individual trait, and positions it as a foundation for open and adaptive team functioning.

Importantly, psychological safety directly addresses the broader organizational challenge of silence and self-censorship at work. Morrison and Milliken (2000) describe organizational silence as a systemic phenomenon that prevents employees from speaking up, thereby limiting organizational learning and change. In teams, psychological safety counteracts silence by legitimizing interpersonal risk-taking and reducing the fear-based withholding of voice, information, and feedback elements that are essential for performance, especially in uncertain or complex environments.

The theoretical relevance of psychological safety is strongly tied to team effectiveness models, which propose that performance outcomes are shaped by mediating team processes such as coordination, learning, conflict management, and knowledge integration (Kozlowski & Ilgen, 2006; Mathieu et al., 2019). Psychological safety plays a pivotal role in enabling these processes, making it a mechanism through which teams transform inputs (e.g., diversity, expertise, leadership) into performance outcomes.

A major line of research emphasizes the relationship between psychological safety and voice. Voice behavior refers to employees' discretionary communication of ideas,

suggestions, or concerns with the intent to improve team or organizational functioning (Detert & Burris, 2007). When team members perceive psychological safety, they are more likely to speak up about errors, risks, or improvement opportunities rather than remain silent. This is particularly relevant given that implicit norms can otherwise encourage self-censorship, and Detert and Edmondson (2011) show that “implicit voice theories” can inhibit expression even when opportunities for improvement are obvious. In turn, higher levels of voice contribute to performance by facilitating early problem detection, learning, and more informed decision-making.

Psychological safety is also foundational for team learning behaviors, including reflection, experimentation, feedback seeking, and learning from failure. Edmondson’s work highlights that teams learn more effectively when members can discuss mistakes openly and treat errors as opportunities for improvement rather than sources of blame (Edmondson, 1999; Edmondson, 2004). This is consistent with broader scholarship on learning in organizations, where learning requires conditions that support risk-taking, exploration, and error management (Argote et al., 2020; Frese & Keith, 2015). In dynamic contexts, learning capacity becomes performance-critical, as teams must continually adjust their strategies and coordination patterns.

A further stream of research links psychological safety to knowledge sharing and information exchange. In interdependent teams, performance depends on whether members share expertise, coordinate actions, and integrate diverse perspectives. When psychological safety is present, members are more likely to contribute unique knowledge and engage in constructive discussion. This mechanism is particularly important in knowledge teams where boundaries across roles or expertise domains can create coordination barriers (Faraj & Yan, 2009). In this sense, psychological safety supports performance not only by reducing silence but also by enhancing knowledge integration and collaborative problem-solving.

A consistent finding across the psychological safety literature is that leadership constitutes one of the most important antecedents shaping whether teams develop psychologically safe climates. Leaders influence psychological safety through behavioral signals that define norms of interaction and interpersonal consequences. Nembhard and Edmondson (2006) demonstrate that leader inclusiveness, particularly in professional status-differentiated teams, increases psychological safety and supports improvement efforts in healthcare teams. Similarly, leadership styles characterized by ethical conduct and supportive interpersonal engagement have been linked to psychological safety and voice behaviors (Walumbwa & Schaubroeck, 2009).

While psychological safety is generally viewed as beneficial, its effects on team performance may depend on contextual and compositional factors. Research on diversity and faultlines highlights that subgroup dynamics may reduce open communication and weaken knowledge integration, especially when demographic or professional boundaries become salient (Lau & Murnighan, 1998; Gibson & Gibbs, 2006). Under such conditions,

psychological safety may be particularly critical in enabling teams to leverage diversity rather than suffer from fragmentation.

Similarly, conflict research suggests that psychological safety shapes whether task conflict becomes productive or destructive. Bradley et al. (2012) argue that task conflict can enhance team outcomes only when teams possess a psychologically safe climate that supports open discussion and constructive disagreement. Therefore, psychological safety functions as a moderator that determines whether teams can transform challenging interactions into improved performance.

Psychological safety scholarship has matured into an established research stream, as demonstrated by major reviews and meta-analytic syntheses that consolidate evidence on antecedents, outcomes, and boundary conditions (Frazier et al., 2017; Newman et al., 2017; Edmondson & Lei, 2014; Edmondson & Bransby, 2021).

Recent changes in work design have intensified interest in psychological safety within virtual and hybrid team environments. In remote settings, employees have fewer informal opportunities for sensemaking and relational repair, which may amplify silence and reduce willingness to speak up. Consequently, psychological safety becomes particularly important for sustaining voice, coordination, and performance during virtual collaboration and online meetings (Hao et al., 2022). Emerging research also points to measurement and construct validity challenges when applying psychological safety scales in virtual teamwork contexts, suggesting that hybrid work may represent a boundary condition that requires greater conceptual precision and context-sensitive operationalization (Rødsjø et al., 2024). The expansion of flexible work arrangements highlights the need for supportive organizational climates in which employees can effectively adapt, collaborate, and maintain well-being across diverse work settings (Gašić et al., 2025).

Research on virtual teams indicates that team effectiveness increasingly depends on relational mechanisms such as trust and knowledge sharing in digitally mediated environments (Hodzic et al., 2025). In this regard, psychological safety represents a critical socio-emotional foundation that supports open communication and collective learning in technology-mediated work. A qualitative study by Lechner and Tobias Mortlock (2022) highlights that virtual teams are less likely to develop psychological safety organically over time, suggesting that teams may need to invest proactively in explicit communication routines, relational practices, and leadership behaviors to cultivate a safe climate in virtual collaboration. These findings align with broader perspectives indicating that interpersonal risk-taking is structurally more difficult when interaction is dominated by scheduled meetings and digital channels rather than co-located day-to-day exchanges.

Emerging empirical work further suggests that psychological safety in remote and hybrid environments may depend strongly on contextual factors such as communication quality, leadership support, and organizational practices. For instance, recent qualitative evidence from remote IT and project work indicates that psychological safety is shaped by leaders' responsiveness, interpersonal openness, and the degree to which organizations

provide supportive practices that normalize speaking up and addressing challenges transparently (Pereira, 2024). Taken together, these developments suggest that remote and hybrid work environments do not diminish the relevance of psychological safety, rather, they create conditions in which psychological safety may be both more difficult to establish and more critical for sustaining effective team performance. Future research is therefore needed to clarify the mechanisms through which psychological safety develops in virtual and hybrid teams and to identify leadership behaviors and structural interventions that can reduce interpersonal risk and enable high-performing collaboration in distributed work settings.

Recent evidence from software workplaces suggests that psychological safety is essential for collaboration, knowledge exchange, and effective performance in innovation-driven team environments (Santana et al., 2025). Comparative findings suggest that psychologically safe and cooperative teams are better positioned to develop dynamic capabilities and sustain superior performance across national contexts (Dickel et al., 2026). Psychological safety appears to enhance performance perceptions by strengthening confidence, resilience, and supportive interpersonal dynamics within high-pressure team environments (Sakallı et al., 2026).

The rapid growth and cross-disciplinary diffusion of this literature has produced a fragmented knowledge base with parallel research streams and heterogeneous measurement approaches. To address this challenge, the present study applies bibliometric science mapping to identify the intellectual foundations, dominant thematic clusters, and emerging research fronts in psychological safety–team performance research.

2. Bibliometric methods

2.1. Search strategy and data source

This study adopts a bibliometric research design to systematically map the intellectual structure and thematic development of research addressing psychological safety in relation to team performance. Bibliometric methods are particularly suitable for consolidating fragmented bodies of knowledge by quantitatively analyzing publication patterns, citation relations, and keyword networks. To capture both the foundational knowledge base and the contemporary research front, the study combines performance analysis (descriptive bibliometric indicators) and science mapping techniques (network-based bibliometric analysis). The bibliographic data were retrieved from the Web of Science Core Collection (WoS CC), a widely used and high-quality bibliographic database in management and organizational research. WoSCC was selected due to its strong coverage of peer-reviewed scholarly journals and its compatibility with bibliometric software tools such as VOSviewer and Bibliometrix. The database provides standardized bibliographic records and cited references, enabling robust analyses including co-citation mapping and bibliographic coupling.

A structured topic search was conducted in the Web of Science Core Collection using a predefined query capturing three conceptual components: (1) psychological safety, (2) team performance outcomes, and (3) team- and organization-related context terms. The search query was formulated as follows: ("psychological safety" OR "team psychological safety") AND ("team performance" OR "team effectiveness" OR "group performance" OR "team productivity" OR "team outcome" OR "team success") AND ("team" OR "group" OR "workplace" OR "organization" OR "organizational" OR "employee*"). To ensure the analysis reflects contemporary and emerging research patterns, the time span was restricted to 2018–2025. This period was chosen because it reflects the most recent growth phase of psychological safety scholarship and captures the increasing relevance of modern team contexts.

To ensure data quality and relevance, the dataset was refined using the following inclusion criteria: (1) publications explicitly addressing psychological safety and team performance-related outcomes within team or organizational contexts, (2) peer-reviewed scholarly documents indexed in WoSCC, (3) publications within the defined time period (2018–2025), (4) records providing complete bibliographic metadata necessary for science mapping (authors, titles, sources, keywords, cited references).

Records outside the scope of team or organizational contexts were excluded indirectly through the search query design emphasizing team and workplace terms. The final dataset comprised 278 documents, representing the full sample for subsequent bibliometric analysis. The dataset was limited to 2018–2025 to capture the most recent and rapidly expanding phase of research on psychological safety and team performance. Prior bibliometric guidelines suggest that time span selection should reflect the purpose of the study, especially when mapping current research fronts and thematic developments (Zupic & Čater, 2015; Donthu et al., 2021). Annual publication trends indicate strong growth after 2020, suggesting that this period represents the domain's most dynamic development stage. The selected window also provides an adequate sample size (278 documents) for reliable science mapping while maintaining a focus on contemporary research.

2.2. Bibliometric analysis techniques

To address the research questions, three complementary bibliometric techniques were employed, each capturing a different dimension of the knowledge structure (Donthu et al., 2021):

- Keyword co-occurrence analysis was performed to identify dominant themes and conceptual clusters within the dataset. Keywords were used as indicators of research topics and were mapped based on their frequency of occurrence and co-occurrence patterns. The resulting network allows the identification of thematic clusters, central constructs, and bridging concepts that connect research streams. This method primarily addresses RQ2 by revealing the thematic structure of psychological safety–team performance scholarship.

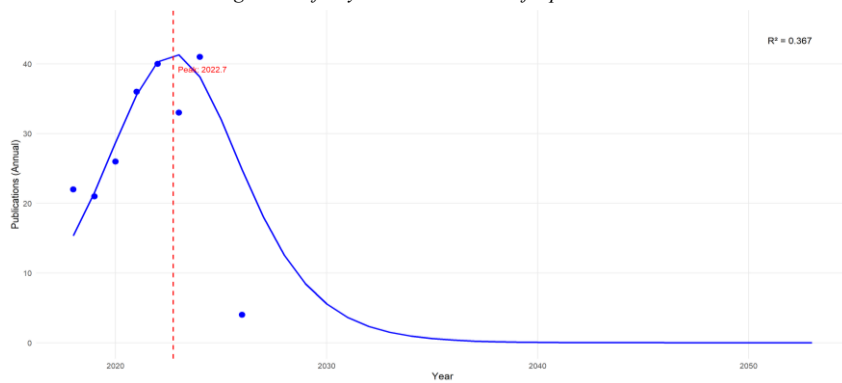
- Co-citation analysis was used to identify the intellectual foundations of the field. Co-citation mapping is based on the principle that references frequently cited together reflect shared theoretical or conceptual origins. This analysis highlights seminal works, foundational theories, and dominant research traditions shaping the field. Co-citation analysis primarily addresses RQ1.
- Bibliographic coupling was applied at the document level to identify the contemporary research front. Unlike co-citation analysis (which highlights historical intellectual roots), bibliographic coupling groups documents based on shared reference lists, capturing current thematic specialization and active research communities. This technique primarily addresses RQ3 by identifying recent clusters and emerging directions.

3. Results

3.1. Performance analysis

This section presents the descriptive bibliometric results of the dataset, offering an overview of publication patterns and the basic performance indicators of the psychological safety–team performance research domain. Performance analysis is essential in bibliometric studies because it provides a quantitative summary of the productivity and impact of the field, including publication growth, influential sources, and key contributors (Donthu et al., 2021). A key initial step in bibliometric research is describing the dataset's scope, composition, and structure before conducting advanced analyses, for which the Main Information dashboard in the Bibliometrix environment was used (Aria & Cuccurullo, 2017). The analyzed dataset covers 2018–2025 and includes 278 documents across 179 sources, indicating a dispersed and multidisciplinary domain typical of management research and supporting the need to map thematic clusters and intellectual foundations (Zupic & Čater, 2015).

Figure1: Life Cycle - Annual scientific production



Source: Author

Collaboration indicators show strong co-authorship, with 942 authors, an average of 3,74 authors per document, only 29 single-authored works, and 28,42% international collaboration, reflecting the interdisciplinary and globally relevant nature of psychological safety research. Content indicators reveal high conceptual diversity, including 890 author's keywords, 764 keywords plus terms, 15.845 cited references, an average of 16,03 citations per document, and a mean document age of 3,79 years, confirming an active and contemporary research area. Annual publication trends demonstrate sustained growth from 2018 to 2025, despite a brief decline in 2023, indicating rising scholarly interest and the emergence of psychological safety as a performance-critical mechanism in complex and technology-mediated team environments.

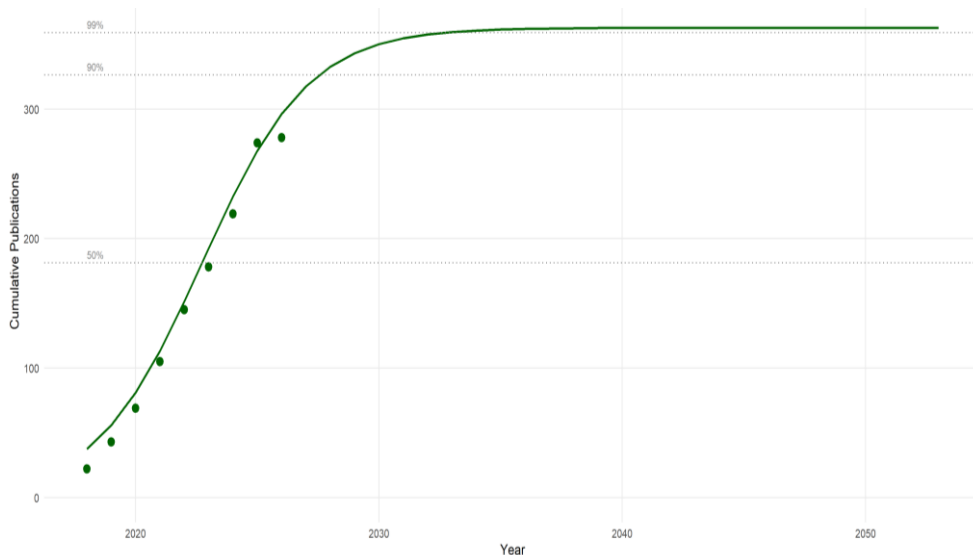
Recent scholarship increasingly examines psychological safety in remote and hybrid teams where digital collaboration can inhibit spontaneous communication and speaking up, as well as in high-reliability settings (e.g., healthcare teams) where silence may lead to serious negative outcomes. Consequently, psychological safety is increasingly framed as a strategic resource that enables voice, learning, coordination, and team effectiveness in modern work environments. Edmondson (2004) emphasizes that healthcare organizations encounter numerous opportunities to learn from errors, yet strong barriers often persist due to blame-oriented cultures, hierarchical structures, and fear of sanctions. Under such conditions, psychological safety enables teams to treat errors as sources of learning rather than as grounds for punishment, thereby increasing the likelihood of early problem detection and process improvement. This stream of research is closely aligned with literature highlighting the shift from a "blame culture" to a "just culture" in healthcare, where organizations seek to foster climates that encourage reporting problems and support systematic improvement (Khatri et al., 2009). Overall, the annual trend signals that the research domain has moved from early development into a phase of maturity and thematic diversification.

The Cumulative Growth Curve (Figure 2) provides complementary evidence on the evolution of this research stream by showing how publications accumulate over time. The curve displays a classic S-shaped diffusion pattern: a gradual increase in early years, followed by a steep growth phase, and then a gradual flattening. The steep middle segment indicates a rapid increase in scientific production—reflecting the point at which psychological safety became widely adopted as a core explanatory construct in team research and began diffusing into multiple contexts (e.g., healthcare teams, leadership research, innovation and creativity studies).

The later flattening of the cumulative curve does not imply a loss of relevance. Instead, it typically indicates that the field is entering a more stable phase, in which growth becomes less explosive and research increasingly shifts toward deeper specialization. In this stage, scholarship tends to focus more on boundary conditions, measurement refinement, context-specific applications, and mechanism-based theorizing rather than basic conceptual introduction. Consequently, the cumulative growth curve suggests that psychological safety–team performance research has reached a stage of consolidation,

while still offering substantial opportunities for advancing theory and empirical knowledge through emerging topics and new organizational contexts.

Figure2: Cumulative Growth Curve



Source: Author

The analysis of the most globally cited documents reveals that the psychological safety–team performance literature is anchored in a set of highly influential works that consolidate team effectiveness research, advance theoretical integration, and extend psychological safety scholarship into diverse organizational contexts.

The most cited paper is Mathieu et al. (2019), which provides a comprehensive synthesis of team effectiveness research and serves as a central reference point for understanding performance mechanisms in team settings. This finding suggests that psychological safety research in relation to team performance is strongly embedded in the broader team science tradition, where performance outcomes are theorized as a function of emergent team processes, coordination dynamics, and learning mechanisms (Mathieu et al., 2019).

A second prominent cluster of highly cited work is directly associated with psychological safety scholarship. Among the most influential publications is Edmondson (2018), reflecting the enduring relevance of psychological safety as an explanatory mechanism for interpersonal risk-taking, voice behavior, and learning in teams and organizations. Psychological safety is increasingly treated not merely as a supportive team climate but as a strategic enabling condition for performance-relevant behaviors, such as speaking up, problem detection, and collective learning, particularly in uncertain or high-pressure work environments (Edmondson & Harvey, 2018). The central position of this

work confirms that psychological safety has become one of the most widely recognized constructs for explaining why some teams consistently outperform others despite comparable resources.

In addition, the results highlight the importance of integrative team science perspectives. Salas et al. (2018), published in *American Psychologist*, emerges as one of the most globally cited contributions, emphasizing the scientific foundations of teamwork and identifying key coordination and learning processes that determine team effectiveness. The strong citation impact of this work reinforces the idea that psychological safety research is tightly linked to broader teamwork frameworks that prioritize communication quality, mutual monitoring, and adaptive coordination as central performance drivers (Salas et al., 2018). Together with Mathieu et al. (2019), this evidence indicates that psychological safety–performance research is increasingly interpreted through a mechanism-based lens that integrates micro-level interpersonal dynamics with macro-level team effectiveness models.

The presence of Wang et al. (2018), Kim et al. (2020), and others among highly cited works suggests that psychological safety scholarship increasingly connects with broader psychological frameworks of team functioning, employee wellbeing, and organizational behavior in diverse contexts. Overall, the global citation structure demonstrates that the field is simultaneously shaped by (1) foundational team effectiveness syntheses, (2) core psychological safety theorizing, and (3) contextually grounded empirical research streams, reinforcing the multidisciplinary and rapidly expanding nature of psychological safety–team performance research.

3.2. Science mapping and network analysis

While performance indicators provide an overview of productivity and impact, they do not reveal how a research field is conceptually structured or how its knowledge base evolves. To address this limitation, the present study applies science mapping and network-based bibliometric techniques to examine the intellectual and thematic architecture of psychological safety–team performance research. Science mapping enables the visualization of relationships among publications, references, and concepts, thereby identifying dominant research streams, conceptual clusters, and emerging research fronts within a rapidly expanding literature (Zupic & Čater, 2015; Aria & Cuccurullo, 2017; Donthu et al., 2021).

Specifically, three complementary network analyses are employed. First, reference co-citation analysis is used to uncover the intellectual foundations of the field by identifying highly co-cited works that represent shared theoretical traditions. Second, keyword co-occurrence analysis maps the thematic structure of the domain by clustering frequently co-occurring keywords, which reflect major research topics and conceptual linkages. Third, bibliographic coupling at the document level captures the contemporary research front by grouping recent publications that share similar reference profiles, thereby indicating active and emerging areas of inquiry. Together, these techniques provide a

multidimensional understanding of how psychological safety scholarship relates to team performance outcomes, how the field is organized into subdomains, and where future research opportunities are most likely to emerge (Kessler, 1963; Callon et al., 1991; van Eck & Waltman, 2010).

3.2.1. Keyword co-occurrence network

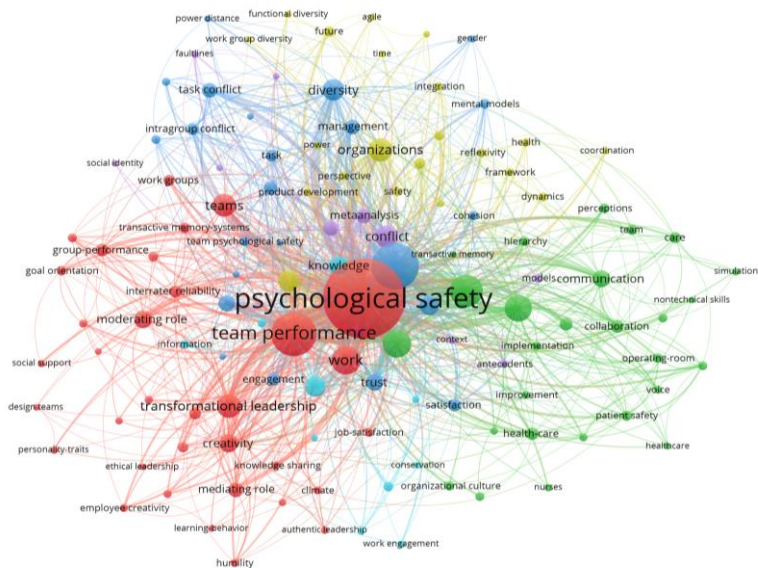
To examine the thematic organization of the psychological safety–team performance literature, a keyword co-occurrence analysis was conducted using VOSviewer (Figure 3). The resulting network is strongly centralized, with “psychological safety” occupying the most dominant and central position, reflecting its role as the conceptual anchor of the field. The structure also shows dense interconnections between psychological safety and performance-relevant team constructs, indicating that the domain is not fragmented into isolated subfields, but rather organized around a shared core. Within this core, “team performance” emerges as the second major hub, tightly linked to constructs that describe both explanatory mechanisms (e.g., communication, trust, knowledge) and boundary conditions (e.g., conflict, diversity, hierarchy). The clustering solution reveals several major thematic clusters that represent dominant research streams:

- **Cluster 1 (Red) – Leadership-driven performance pathway:** The red cluster is centered on team performance, transformational leadership, and innovation-related concepts such as creativity, employee creativity, and knowledge sharing. This cluster reflects a dominant stream examining psychological safety as a mediating mechanism through which leadership styles foster performance by enabling proactive and creative behavior, learning behavior, and open information exchange. The prominence of “mediating role” and “moderating role” suggests a highly mechanism-oriented literature focusing on how psychological safety explains why leadership and climate factors translate into team effectiveness outcomes.
- **Cluster 2 (Green) – Communication, voice, and high-reliability teamwork:** The green cluster is strongly focused on communication, collaboration, and voice, and it includes several context-specific terms such as health-care. This cluster indicates that healthcare teams represent a major applied research domain in which psychological safety is treated as essential for speaking up, coordination, and safe performance. The emphasis on “communication” as a large node confirms that psychological safety research increasingly focuses on interaction processes rather than solely on attitudinal outcomes.
- **Cluster 3 (Blue) – Conflict–diversity dynamics and boundary conditions:** The blue cluster captures the conflict–diversity dynamics stream, with prominent nodes including conflict, task conflict, intragroup conflict, diversity, and work group diversity (including “faultlines” and “power distance”). This stream reflects research examining when interpersonal differences and disagreements improve team outcomes versus when they undermine performance. Psychological safety plays a crucial boundary role in this literature by enabling constructive conflict, fostering open

disagreement without interpersonal threat, and supporting integration of diverse perspectives. This interpretation aligns with evidence that psychological safety determines whether conflict translates into learning and performance gains rather than relationship deterioration and silence (Bradley et al., 2012; Frazier et al., 2017).

- Cluster 4 (Yellow) – Organizational systems, coordination, and adaptive capability:** The yellow cluster reflects a more macro-oriented research stream that emphasizes organizations, management, coordination, integration, framework, and mental models. It highlights scholarship that situates psychological safety within broader organizational systems and coordination architectures. The presence of terms such as agile, future, and dynamics suggests emerging interest in psychological safety as a capability supporting adaptation under uncertainty—particularly relevant in modern organizational forms characterized by fluid teams and cross-boundary collaboration (Edmondson & Lei, 2014; Mathieu et al., 2019). This cluster reinforces that psychological safety is increasingly being discussed not only as a within-team phenomenon but as an organizationally embedded condition tied to system-level coordination and resilience.

Figure3: Co-occurrence network



VOSviewer

Source: Author

3.2.2. Co-citation references

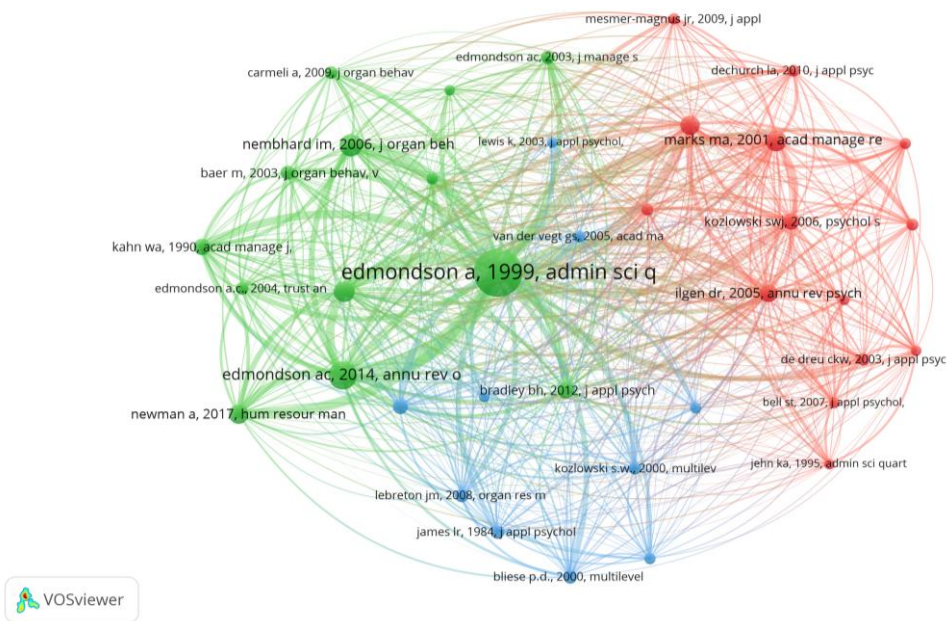
To identify the intellectual foundations of psychological safety–team performance research, we conducted a reference co-citation analysis and visualized the network using VOSviewer (Figure 4). Co-citation analysis reflects the extent to which two references are cited together, thereby revealing shared theoretical roots and dominant intellectual traditions (Donthu et al., 2021). The resulting network exhibits a strongly centralized structure, indicating that the field builds upon a relatively cohesive theoretical core. In particular, Edmondson's (1999) article emerges as the central and most influential node, confirming its foundational role in defining psychological safety as a team-level climate that enables interpersonal risk-taking and team learning. The prominence of this reference demonstrates that contemporary research continues to rely heavily on Edmondson's conceptualization when linking psychological safety to performance-related mechanisms such as learning, coordination, and speaking up. The co-citation network reveals three major clusters:

- **Cluster 1 (Green) – Psychological safety as a learning and improvement infrastructure:** The green cluster represents the dominant foundational stream in which psychological safety is conceptualized as an enabling condition for learning, improvement, and voice in teams, particularly in organizational and healthcare contexts. This cluster includes key contributions focusing on leader inclusiveness and team learning, such as Nembrand and Edmondson (2006) and earlier organizational learning-oriented work connected to psychological safety mechanisms. The strong connectivity among these references indicates that psychological safety research is deeply rooted in theories of collective learning and continuous improvement. Additionally, the presence of integrative works such as Edmondson and Lei (2014) further suggests that the field has increasingly consolidated its theoretical base through review-driven synthesis and conceptual refinement, reinforcing psychological safety as a central interpersonal construct in organizational behavior research. This cluster positions psychological safety not as a general “positive climate” variable, but as a learning infrastructure enabling experimentation, error reporting, and improvement behaviors-processes that are directly performance-relevant in knowledge-intensive and high-stakes teams.
- **Cluster 2 (Red) – Team process theory, conflict, and socio-cognitive dynamics:** The red cluster reflects the intellectual tradition emphasizing team processes, conflict, and socio-cognitive mechanisms underlying team effectiveness. Core references in this cluster include work on team conflict and performance, notably De Dreu and Weingart (2003), along with foundational contributions on teamwork and group processes (Marks et al., 2001). The co-citation structure indicates that psychological safety scholarship has been strongly influenced by classic team effectiveness theories that conceptualize performance as the outcome of emergent states (e.g., cohesion, affect), coordination patterns, and the regulation of conflict. Psychological safety is frequently integrated into this tradition as a contextual condition that shapes whether task disagreements and interpersonal differences translate into constructive outcomes

(learning, creativity, decision quality) or destructive patterns (relationship conflict, silence, reduced performance). This cluster emphasizes psychological safety as a boundary condition for conflict and team dynamics, linking the interpersonal climate to the quality of interaction processes that ultimately determine team outcomes.

- Cluster 3 (Blue) – Multilevel theory and methodological foundations of team research:** The blue cluster represents the methodological and multilevel foundation of the field and includes references that underpin contemporary team research designs and measurement approaches. The presence of Bliese (2000), Klein and Kozlowski (2000), and related multilevel contributions highlights that psychological safety–performance research is increasingly embedded in multilevel theory, recognizing that psychological safety operates at the team level while being influenced by individual perceptions and organizational contexts. In addition, methodological references such as LeBreton and Senter (2008) suggest the relevance of reliability and measurement discussions in constructing valid team-level climate indicators. The integration of these references indicates that the field is not only theoretically but also methodologically grounded in multilevel modeling, aggregation logic, and rigorous team measurement standards. This cluster shows that research on psychological safety and team performance has matured methodologically, emphasizing cross-level mechanisms and robust measurement of team-level psychological safety climate.

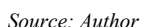
Figure4: Co-citation network



Source: Author

3.2.3. Bibliographic coupling

Figure5: Bibliographic coupling



A large portion of the coupled literature is grounded in contemporary team effectiveness theory and performance mechanisms, which provides the dominant explanatory lens for psychological safety research in the examined period. The visibility of highly coupled works centered on team effectiveness and teamwork science indicates that psychological safety is increasingly positioned as a mechanism embedded in broader process-based models of team performance. Rather than being treated solely as a stand-alone climate variable, psychological safety is integrated with constructs such as coordination, team processes, and emergent states, reflecting a growing interest in explaining how interpersonal climates translate into collective performance outcomes, particularly in complex and dynamic teamwork settings (Mathieu et al., 2019; Salas et al., 2018).

This network reveals several bridging documents positioned between densely connected areas of the map, suggesting emerging efforts to integrate previously separate research directions. These bridging works appear to connect performance-oriented teamwork science with leadership and applied-context research, indicating a trend toward more integrative theorizing. Overall, the bibliographic coupling results demonstrate that recent psychological safety–team performance research is organized around interconnected contemporary streams and is increasingly shifting toward explanatory and context-sensitive approaches, thereby offering a strong foundation for identifying emerging themes and future research opportunities.

To further explore the temporal dynamics of research themes, we examined trend topics across the 2018–2025 period (Figure 6). The trend topic analysis highlights how frequently used terms emerged, persisted, and gained prominence over time, thereby providing insight into the thematic evolution of psychological safety–team performance scholarship. Overall, the figure suggests a shift from early-stage conceptual consolidation toward a more diversified agenda characterized by mechanism-based explanations and context-sensitive applications.

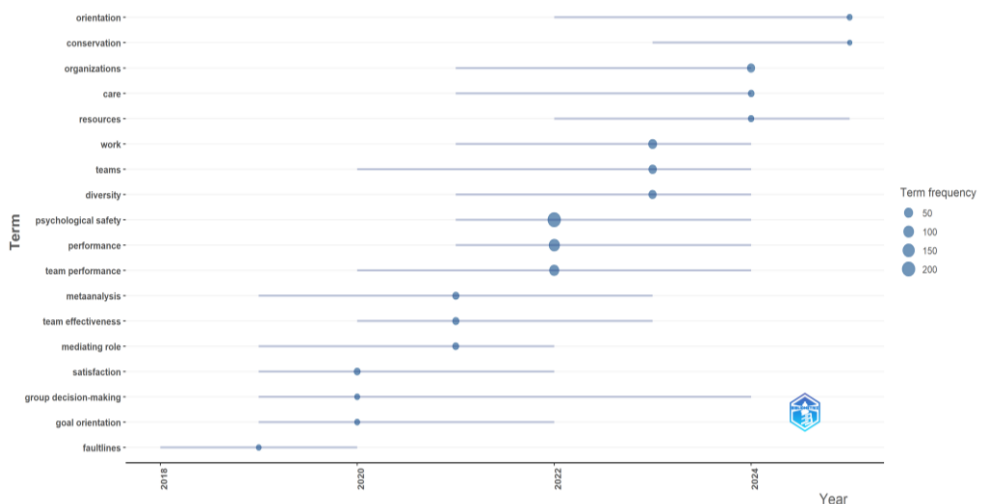
During the earlier phase of the observed period (2018–2020), research attention was primarily associated with classic team effectiveness constructs and group composition themes. Terms such as faultlines, goal orientation, and group decision-making appear as early focal points, indicating that initial studies often situated psychological safety within broader debates on diversity-related dynamics, coordination, and team decision processes. In this phase, psychological safety was frequently discussed together with performance-related outcomes such as satisfaction and team effectiveness, reflecting a dominant focus on establishing core relationships and clarifying conceptual mechanisms.

Between 2021 and 2022, the field exhibits stronger consolidation around its central constructs. The terms psychological safety, team performance, and performance become highly prominent, peaking in frequency around 2022. This period aligns with the most intensive growth phase of the literature and suggests a stronger emphasis on explicitly integrating psychological safety into performance-centered team research. Notably, the appearance of meta-analysis and mediating role as trend topics indicates that the field

increasingly shifted toward evidence synthesis and mechanism-testing approaches, reflecting a maturing research domain that moves beyond simple associations to examine mediation pathways and boundary conditions.

In more recent years (2023–2025), the trend topics indicate further thematic expansion and contextual diversification. Terms such as diversity, teams, and work remain salient, while broader context-level terms including resources, care, and organizations become increasingly visible. These patterns suggest that psychological safety research is extending beyond narrowly defined team processes toward broader organizational and applied contexts, consistent with the growing interest in high-stakes teamwork environments and organizational conditions that support team performance. The persistence of these topics into 2024–2025 implies that the field is entering a phase of specialization and refinement, in which psychological safety is examined as part of larger organizational systems and resource frameworks.

Figure6: Trend topics



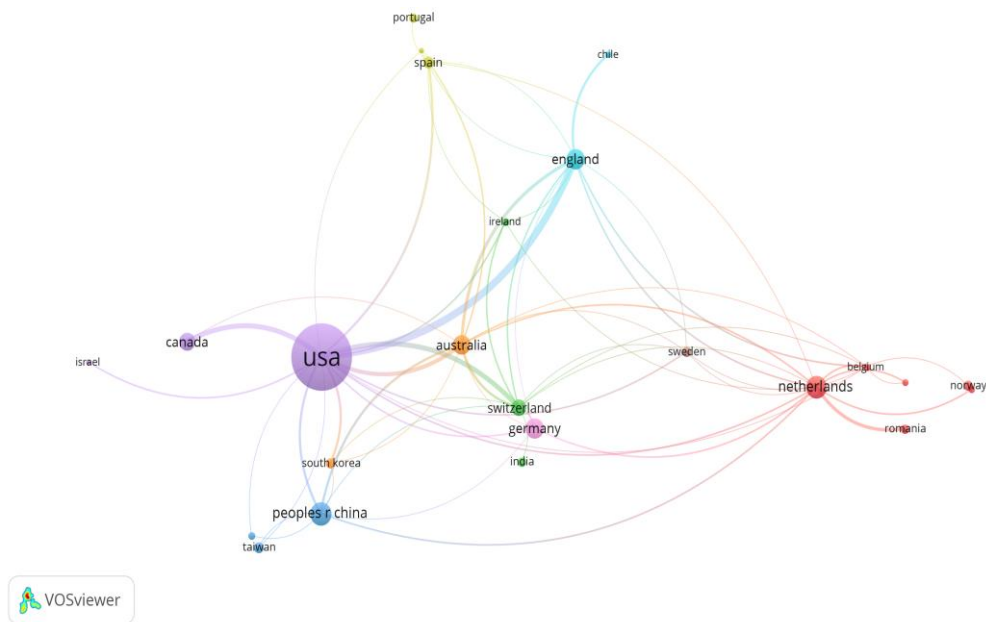
Source: Author

Taken together, the trend topic analysis supports the conclusion that psychological safety–team performance scholarship has undergone a rapid developmental trajectory: moving from early conceptual grounding in team dynamics and composition, to consolidation around performance mechanisms, and most recently toward broader organizational and applied research contexts. This evolution indicates both the maturity of the core construct and the continued emergence of new opportunities for research at the intersection of psychological safety, work design, and complex organizational environments.

3.2.4. Co-authorship by countries

The country-level co-authorship network (Figure 7) reveals a highly internationalized research landscape in psychological safety–team performance scholarship. The United States occupies a dominant and central position, functioning as the primary hub of international collaboration, with strong co-authorship ties to countries such as England, Australia, Canada, China, and Germany. This pattern indicates that the intellectual leadership of the field remains concentrated in Anglo-American research systems, while simultaneously relying on extensive cross-national collaboration. Several European countries, particularly the Netherlands, Germany, Sweden, and Switzerland, form interconnected collaboration clusters, suggesting a strong regional research ecosystem that is closely integrated with the broader global network rather than operating in isolation.

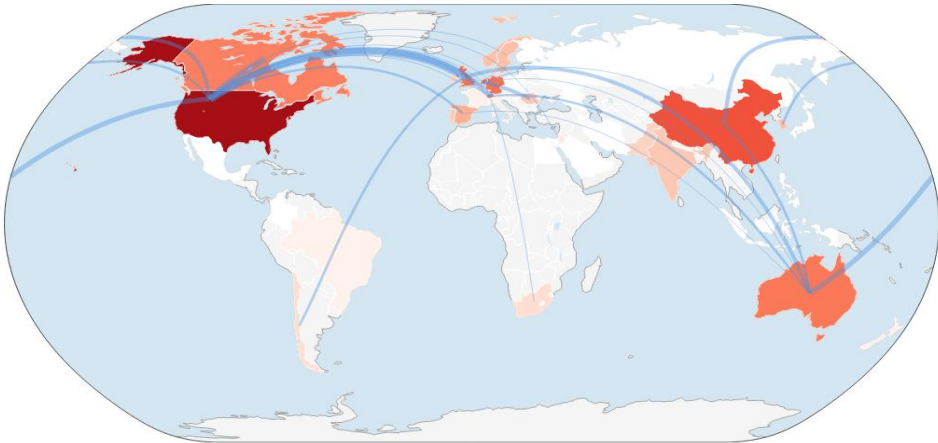
Figure7: Co-authorship network



Source: Author

The global collaboration map (Figure 8) further illustrates that psychological safety research has achieved broad geographic diffusion, with visible contributions from North America, Europe, East Asia, and Oceania.

Figure8: Global collaboration map



Source: Author

Notably, the presence of active collaboration links involving China, South Korea, and Australia points to the increasing globalization of the field and the growing relevance of psychological safety across diverse institutional and cultural contexts. However, the uneven density of contributions across regions also suggests that research output remains concentrated in a limited number of high-income countries, indicating opportunities for future expansion into underrepresented regions. Overall, the international co-authorship patterns underscore that psychological safety–team performance research is both globally connected and structurally asymmetric, with knowledge production shaped by a small number of central countries that act as brokers in the global research network.

4. Discussion

This bibliometric analysis provides a systematic overview of the current state of research in the field of psychological safety and team-level performance, based on a sample of 278 papers indexed in the Web of Science database for the period 2018–2025. By combining performance analysis and science mapping techniques, the paper identifies key trends in publication volume, the most influential papers and authors, dominant topic areas, and the intellectual foundations that shape the current state of this research domain. The results indicate that the field has experienced rapid growth and thematic diversification, with a marked increase in publication activity during the early 2020s. Table 1 synthesizes the principal bibliometric findings by combining descriptive, structural, and evolutionary perspectives, thereby providing an integrated overview of the current state and future direction of psychological safety–team performance research.

Table 1: Integrated Summary of Bibliometric Findings on Psychological Safety and Team Performance Research (2018–2025)

<i>Analytical Dimension</i>	<i>Methodological Approach</i>	<i>Core Findings</i>	<i>Scholarly Contribution</i>	<i>Implications for Future Research</i>
Field Growth and Productivity	Descriptive performance analysis	The dataset includes 278 publications across 179 sources, with strong growth during 2018–2025, indicating increasing academic attention.	Confirms that psychological safety has evolved into an established and expanding research domain within team and organizational studies.	Future studies may compare growth trajectories across databases and disciplines.
Collaboration Structure	Authorship and co-authorship indicators	A total of 942 authors contributed, with an average of 3.74 authors per article and 28.42% international collaboration.	Demonstrates that the field is highly collaborative, interdisciplinary, and internationally connected.	More cross-regional collaboration involving emerging economies would broaden contextual validity.
Intellectual Foundations	Reference co-citation analysis	Edmondson (1999) emerged as the dominant foundational reference, followed by works on team processes, conflict, and multilevel theory.	Establishes that the field rests on three major pillars: psychological safety theory, team effectiveness theory, and multilevel methodological approaches.	Future work should integrate newer perspectives such as digital teamwork, AI collaboration, and dynamic climate models.
Conceptual Structure	Keyword co-occurrence analysis	“Psychological safety” and “team performance” represent the central nodes of the thematic network.	Confirms psychological safety as the conceptual bridge linking interpersonal climate with collective outcomes.	Future studies should examine underexplored constructs such as resilience, inclusion, and algorithmic trust.
Dominant Research Streams	Cluster analysis of keywords	Four clusters were identified: (1) leadership and innovation, (2) communication and voice, (3) conflict and diversity, and (4) organizational adaptation.	Shows that the literature has diversified beyond direct performance effects toward mechanism-based and contextual explanations.	Future studies should investigate cross-cluster integration and longitudinal causal mechanisms.

Contemporary Research Front	Bibliographic coupling	Recent studies are organized around interconnected communities focused on leadership, teamwork science, and applied settings.	Indicates that the field is currently in a phase of theoretical integration rather than fragmentation.	Promising avenues include hybrid work, virtual teams, and AI-enabled team coordination.
Thematic Evolution	Trend topic analysis	Earlier studies focused on faultlines and decision-making, while recent topics include resources, care, and organizations.	Reveals a shift from micro team processes toward broader organizational systems perspectives.	Future research should explore sustainability, employee wellbeing, and adaptive capability.
Global Knowledge Network	Country co-authorship analysis	The United States is the central hub, with strong links to the UK, Australia, Canada, China, and Germany.	Demonstrates global diffusion of the field, although research production remains geographically concentrated.	Greater inclusion of underrepresented regions would enhance external validity and cultural generalizability.

Source: Author

The scientific mapping analyses reveal that psychological safety occupies the conceptual center of the literature and serves as a bridge between several important research streams. The keyword co-occurrence network showed strong linkages between psychological safety and themes such as leadership, communication, trust, conflict, diversity, knowledge sharing, and innovation. This finding suggests that psychological safety is not an isolated topic, but rather a mechanism through which multiple antecedents influence team outcomes. In particular, leadership-related themes were highly visible, reinforcing prior arguments that inclusive, supportive, and empowering leadership behaviors are instrumental in creating climates where team members feel safe to contribute ideas, raise concerns, and engage in learning behaviors.

The presence of communication and voice-related clusters also highlights that the relationship between psychological safety and performance is strongly process-based. Teams do not benefit from psychological safety merely because members feel comfortable; rather, performance benefits emerge because psychologically safe environments facilitate open communication, constructive dissent, rapid error detection, and knowledge exchange. This interpretation aligns with contemporary team effectiveness theory, which emphasizes that performance is generated through interaction processes, coordination quality, and adaptive learning rather than through static team composition alone.

Another notable finding concerns the strong visibility of conflict and diversity themes within the conceptual structure of the field. This suggests that psychological safety increasingly functions as a boundary condition determining whether differences among

team members become a source of creativity and better decision-making or instead lead to relational tension and reduced effectiveness. In diverse teams, disagreements and contrasting perspectives may generate valuable information, but only when members perceive that expressing divergent views is interpersonally safe. Therefore, psychological safety may be particularly important in organizations seeking to leverage diversity as a strategic advantage.

The co-citation analysis demonstrates that the intellectual foundation of the field remains strongly anchored in Edmondson's seminal conceptualization of psychological safety, while simultaneously integrating broader team process theory and multilevel methodological perspectives. This indicates that the field has achieved a relatively coherent theoretical base. Rather than fragmenting into disconnected subdomains, contemporary scholarship appears to build cumulatively on established foundations while refining mechanisms and extending applications. The prominence of multilevel references is especially important, as it reflects the growing recognition that psychological safety is simultaneously shaped by individual perceptions, team interactions, leadership behaviors, and organizational systems.

The bibliographic coupling results provide complementary evidence that the current research front is focused less on whether psychological safety matters and more on how, when, and under what conditions it matters. Recent studies appear increasingly concerned with mediation pathways, contextual contingencies, and applied settings such as healthcare, virtual teams, and knowledge-intensive work. This shift suggests theoretical maturation. Once direct associations between psychological safety and performance became well established, scholars moved toward more sophisticated models examining dynamic processes, boundary conditions, and cross-level effects.

The trend topic analysis further supports this developmental trajectory. Earlier research concentrated on team composition, faultlines, satisfaction, and general effectiveness outcomes, whereas more recent themes include resources, care, organizations, and broader contextual variables. This evolution implies that the field is moving beyond micro-level team processes toward a systems-oriented perspective in which psychological safety is embedded within organizational design, leadership architecture, and resource environments. Such a transition is particularly relevant given the growth of hybrid work, digital collaboration platforms, and AI-supported teamwork, where communication barriers and uncertainty may intensify the need for psychologically safe climates.

Overall, the discussion of findings indicates that psychological safety has become one of the most influential explanatory constructs in contemporary team research. Its importance lies not only in promoting employee wellbeing, but also in enabling the interaction processes through which teams learn, innovate, adapt, and sustain high performance. The field now appears well positioned for a next stage of development focused on longitudinal dynamics, multilevel mechanisms, and the management of psychological safety in technologically mediated and globally distributed work systems.

Conclusion

The study contributes to the academic literature in several important ways. First, it provides a comprehensive review of recent and highly relevant scientific literature on the increasingly important topic of psychological safety and team performance. In doing so, the study extends previous narrative and systematic reviews by offering an objective, data-driven synthesis of publication trends, influential papers, collaboration patterns, and thematic development. Second, the study advances theoretical understanding by showing that psychological safety has evolved into a central integrative construct connecting multiple streams of team research, including leadership, communication, learning, conflict management, and organizational adaptation. The results indicate that psychological safety is no longer viewed merely as a supportive team climate, but increasingly as a strategic mechanism through which teams achieve higher levels of coordination, innovation, and performance. Third, through co-citation and bibliographic coupling analyses, the study maps both the historical intellectual foundations and the contemporary research front in this field. The findings show that the domain is grounded in three main knowledge bases: psychological safety as a learning infrastructure, team process and conflict theory, and multilevel methodological perspectives. Finally, the study contributes to future research development by identifying emerging themes such as hybrid work, digital collaboration, healthcare teams, and AI-mediated teamwork. These findings provide a structured roadmap for researchers seeking to extend psychological safety research into new organizational contexts and dynamic forms of teamwork.

The findings also generate several practical implications for managers, team leaders, and organizations. The results highlight that psychological safety should be viewed as a strategic organizational resource rather than a purely interpersonal phenomenon. Teams perform more effectively when employees feel safe to speak up, report mistakes, share ideas, and challenge existing assumptions without fear of negative consequences. Leaders play a key role in creating a psychologically safe climate. Since leadership-related themes are strongly emphasized in the literature, organizations should invest in leadership development programs that promote inclusiveness, openness, constructive feedback, and supportive communication behaviors.

The growing importance of healthcare, remote work, and digital collaboration suggests that psychological safety is particularly critical in complex, high-risk, and technology-mediated environments. Organizations operating in such contexts should intentionally design communication routines, learning systems, and error-reporting mechanisms that encourage proactive participation. In addition, multinational collaboration patterns indicate that psychological safety has global relevance, although cultural and institutional differences may shape how it is implemented. Therefore, organizations managing international teams should adapt psychological safety practices to different cultural contexts while maintaining universal principles of respect, trust, and open communication.

However, the study has certain limitations. The sample is limited to papers from the Web of Science database and the period 2018–2025. Also, bibliometric indicators describe publication and citation patterns, but do not represent evidence of causality between variants. Nevertheless, by combining performance analysis and network science mapping techniques, this study offers a robust and up-to-date overview of a rapidly growing research field, providing a solid foundation for further development of theory and empirical work in the field of psychological safety and team performance.

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