Routledge
Taylor & Francis Group

European Journal of Work and Organizational Psychology

ISSN: 1359-432X (Print) 1464-0643 (Online) Journal homepage: www.tandfonline.com/journals/pewo20

Relations between daily stand-up meetings, work satisfaction, and team performance perceptions: the role of psychological safety

Sarah Rietze & Hannes Zacher

To cite this article: Sarah Rietze & Hannes Zacher (2025) Relations between daily stand-up meetings, work satisfaction, and team performance perceptions: the role of psychological safety, European Journal of Work and Organizational Psychology, 34:5, 565-582, DOI: 10.1080/1359432X.2025.2508178

To link to this article: https://doi.org/10.1080/1359432X.2025.2508178

EUROPEAN JOURNAL OF WORK AND ORGANIZATIONAL PSYCHOLOGY
2025, VOL. 34, NO. 5, 565–582
https://doi.org/10.1080/1359432X.2025.2508178

Routledge
Taylor & Francis Group

Relations between daily stand-up meetings, work satisfaction, and team performance perceptions: the role of psychological safety

Sarah Rietze and Hannes Zacher

Wilhelm Wundt Institute of Psychology, Leipzig University, Leipzig, Germany

ABSTRACT

Daily stand-up meetings (DSM), in which team members gather to coordinate their work in about 15 minutes every day, are the most frequently used agile teamwork practice. These meetings aim to enhance communication, learning, and decision-making within the team. However, there is little empirical evidence as to whether DSM have positive effects and what mechanisms underlie them. We hypothesized that DSM have a positive impact on individuals' perceptions of psychological safety (i.e. the belief that it is safe to take interpersonal risks within the team). Psychological safety, in turn, should be positively related to important work outcomes, including work-related satisfaction and team performance perceptions. We conducted two studies to test our hypotheses. In the first study, we asked 318 employees working in agile teams to take part in a two-wave online survey. In the second study, we used an intervention design with members of student teams (experimental group: $n = 58$, control group: $n = 50$). Results showed that DSM are directly and positively related to psychological safety, and indirectly and positively related to work satisfaction and team performance perceptions via psychological safety. These findings highlight the overall value of conducting DSM in teams.

ARTICLE HISTORY
Received 27 September 2024
Accepted 14 May 2025

KEYWORDS
Agile work practices; daily stand-up meetings; psychological safety; perceptions of team performance; work-related satisfaction

Introduction

Daily stand-up meetings (DSM) are the most widely used agile teamwork practice (VersionOne, 2022). The meeting format has its origins in agile project management for software development, particularly in the Scrum methodology (Schwaber & Sutherland, 2017). Today, DSM are increasingly used in various industries (Ćirić & Gračanin, 2017; Rigby et al., 2018). DSM, also called "dailies", "daily scrum" or "stand-ups", are "frequent check-in meetings to enable goal monitoring" (Junker et al., 2023, p. 2). They are based on the principles of agility, which emphasize transparency, collaboration, self-organization, regular reflection, continuous improvement, and iteration (Petermann & Zacher, 2021). Compared to traditional team meetings, DSM are characterized by (1) their daily cadence with a strict 15-minute time limit, (2) a focus on quick updates without extensive discussion or problem-solving, (3) self-organization of the team, and (4) a focus on goal achievement and identification of potential obstacles.

Previous studies link agile practices to positive job resources (i.e., autonomy, feedback), fewer job demands (i.e., workload, time pressure) and improved well-being (i.e., job satisfaction, engagement, reduced emotional exhaustion) (Augner & Schermuly, 2023; Rietze & Zacher, 2022; Tripp et al., 2016), as well as to better team performance (Junker et al., 2022). However, research to date has primarily examined agile practices collectively rather than the specific effects of distinct practices like DSM. Accordingly, scholagrs have emphasized the need for a better understanding of how distinct agile practices uniquely influence psychological mechanisms and outcomes (Huck-Fries et al., 2025; Rietze & Zacher, 2023).

A few qualitative and conceptual studies suggest that DSM foster trust through accountability and collective responsibility (McHugh et al., 2012), increase communication frequency, information sharing and problem identification (Hummel et al., 2015; Paasivaara et al., 2009; Pikkarainen et al., 2008; Stray et al., 2016), and enhance social support, transparency, and team alignment (Rietze & Zacher, 2023). However, DSM have also been linked to negative outcomes, such as reduced job satisfaction and trust (Stray et al., 2020), perceptions of limited value, particularly among senior developers (Stray et al., 2017), and feelings that the meetings are a waste of time and a disruption to workflow (Stray et al., 2016).

CONTACT Sarah Rietze sarah.rietze@uni-leipzig.de

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

Supplemental data for this article can be accessed online at https://doi.org/10.1080/1359432X.2025.2508178

Overall, existing research on DSM remains largely qualitative and descriptive, thus with limited generalizability, reflecting the perspectives of relatively few participants (Schonfeld & Mazzola, 2013). Recent empirical work further highlights the need for studies that systematically test the mechanisms linking specific agile practices to work outcomes and calls for greater methodological diversity (Huck-Fries et al., 2025). Thus, rigorous quantitative research is needed to better understand how and why DSM impact individual and team outcomes, providing a stronger empirical basis for their broader application.

To explore a possible answer to the "why", the underlying mechanisms of the effects of DSM, we focus on the concept of psychological safety. In a psychologically safe team environment, team members feel safe to take interpersonal risks and to contribute ideas without the fear of being devalued by their colleagues (Edmondson, 1999). In agile teams, psychological safety can be considered a vital resource, supporting team reflexivity and performance (Junker et al., 2024; Peeters et al., 2022). Furthermore, agile practices are assumed to positively influence psychological safety (Hennel & Rosenkranz, 2021; Marder et al., 2021). DSM may particularly help strengthen psychological safety in teams by fostering regular, open, and structured communication, and by providing a space where obstacles are discussed and in which team members support each other.

The present paper, based on a two-study approach, addresses the questions of whether DSM are positively related to psychological safety, and whether psychological safety can explain the relationships between DSM and work-related satisfaction and perceptions of team performance. Our research model is presented in Figure 1. Our studies advance the current literature at the intersection of DSM and psychological safety in several ways. First, we advance research on DSM as a distinct agile practice by empirically investigating their specific effects. By examining DSM separately, our work directly responds to recent calls for more differentiated analyses of distinct agile practices, their outcomes, and underlying mechanisms (Huck-Fries et al., 2025; Rietze & Zacher, 2023). Second, we contribute to an emerging line of research on how agile practices foster psychological safety. In particular, we investigate how DSM support psychological safety, and thus address a gap in intervention research by examining DSM as a targeted intervention (Edmondson & Bransby, 2023). Third, we contribute methodologically to research on DSM by employing multi-wave designs in both studies, thereby addressing a limitation of previous research, which has largely relied on qualitative or descriptive analyses (Stray et al., 2016, 2017, 2020). In doing so, we strengthen methodological rigour and address the need for more diverse and robust empirical designs in agile research (Huck-Fries et al., 2025). Finally, our findings provide valuable insights for practitioners by offering empirical support for the effectiveness of this meeting format through its role in fostering psychological safety, which is particularly important given its widespread use in practice.

Theoretical framework and hypotheses

Daily stand-up meetings (DSM)

Agile teams rely on regular communication and reflection to function as self-organizing units, keeping goal achievement in focus while remaining flexible and responsive to changing demands. The most common meeting structure for agile teamwork is DSM (VersionOne, 2022). Survey results indicate that 87% of teams employing agile methods regularly use DSM (Stray et al., 2017). The practice of DSM is especially prominent in agile Scrum frameworks, where the so-called "Daily Scrum" represents one of the core meeting

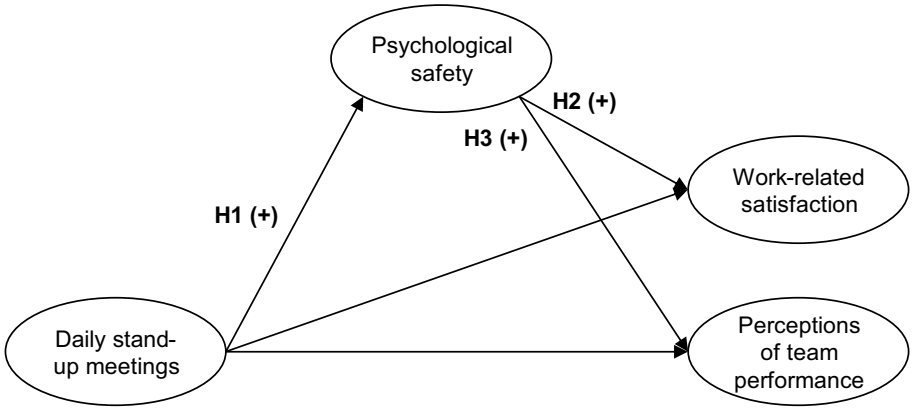

Figure 1. The hypothesized model.

routines (Schwaber & Sutherland, 2017). Unlike retrospective meetings, which focus on learning from past experiences over a longer period, or planning meetings that set project goals and priorities for upcoming sprints, DSM aim to facilitate immediate synchronization and day-to-day problem-solving within the team. They are action-oriented, closely linked to daily tasks, and contribute to maintaining a steady flow of collaboration. DSM are widely implemented, not only within the software industry, but also across sectors such as manufacturing, construction, public administration, consulting, and healthcare, particularly in cross-functional agile teams and project teams managing complex and dynamic work environments (Ćirić & Gračanin, 2017; Rigby et al., 2018). Their standardized format and daily recurrence provide an ideal setting for observing how communication behaviours, transparency, and mutual support mechanisms evolve within teams. Accordingly, we selected DSM as the focal practice for this study.

How teams conduct DSM reflects how they communicate with each other and how they address different needs of their team members (Junker et al., 2023). DSM are designed to enhance efficiency for goal achievement through transparency, collaboration, and fast decision-making (Schwaber & Sutherland, 2017). DSM are characterized by the following elements: First, DSM are held daily and are limited to a maximum of 15 minutes. Thus, they increase the overall frequency of communication among team members (Hummel et al., 2015). Second, DSM are based on a clear structure and a focus on status updates. The meeting is structured around the following three questions, answered by each team member: *What did I work on yesterday? What will I work on today?* and *Are there any obstacles that are blocking me from reaching our goals?* (Schwaber & Sutherland, 2017). The idea is to continuously optimize the flow of work and enhance transparency – deeper discussions and problem solving are supposed to take place outside the meeting. Third, DSM are organized by the team for the team. Typically, only the core team members participate, and other stakeholders are only invited if needed. This ensures that the focus remains on internal team communication and self-organization, rather than waiting for external instructions. Moreover, equality is a key component of DSM, referring to the degree to which all members have equal opportunities to participate and influence decisions (Koch & Schermuly, 2021). DSM support a balanced participation among team members, ensuring that everyone can actively contribute (Lindsjørn et al., 2016). Fourth, two key components of agile DSM are comparing the status towards goal achievement and identifying and removing obstacles that may hinder progress (Stray et al., 2020).

So far, DSM have primarily been examined as part of the broader construct of agile practices. Research has shown that agile practices are positively related to various work-related outcomes, including organizational commitment (Prommegger et al., 2019), job satisfaction (Tripp et al., 2016), work engagement (Rietze & Zacher, 2022), psychological empowerment and innovative work behaviour (Prediger & Schermuly, 2025), and team performance (Junker et al., 2022; Malik et al., 2021; Peeters et al., 2022). This research has often conceptualized agile practices as a form of work design (e.g., Rietze & Zacher, 2022; Tripp et al., 2016), examining their relationships with various outcomes through changes in job characteristics, such as increased job resources (e.g., autonomy, feedback) and reduced job demands (e.g., workload, time pressure). In a meta-analysis on the effects of agile work principles (i.e., team autonomy, iterative delivery, and team equality), Koch et al. (2023) found small positive relations with job satisfaction, affective strain, and organizational commitment, medium to large relations with performance and innovative behaviour, and moderate relations with psychological empowerment.

Research has identified DSM as a key component of agile teamwork (alongside retrospective meetings), distinguishing it from agile taskwork (Junker et al., 2024, 2025). The researchers emphasize the resource-activating role of agile practices, suggesting that their benefits arise from fostering cognitive and socio-emotional resources within teams. While agile taskwork is central to the iterative nature of agile work, fostering cognitive resources, agile teamwork supports goal alignment, progress monitoring, and team reflexivity. Junker et al. (2025) examined whether agile teamwork activates socio-emotional resources – such as emotional support, positive interactions, and trust – that enhance team engagement. They found a positive link between agile teamwork and team engagement, but only in teams with low role conflict.

Psychological safety

Since the 1990s, psychological safety has become a key focus in team research due to the growing importance of learning and innovation in organizations (Edmondson & Lei, 2014). In today's complex business landscape, it is vital for teams to identify mistakes, learn collaboratively, and explore new solutions, requiring a willingness to take interpersonal risks, challenge norms, and experiment despite potential conflicts or failures. Edmondson (1999) presents a model of team learning by introducing the construct of team psychological safety, defining it as "a shared belief held by members of a team that the

team is safe for interpersonal risk taking" (p. 350). A psychologically safe team climate allows members to share ideas, request and give honest feedback, and experiment without fearing rejection, knowing their views are respected.

Meta-analytic research on psychological safety (Frazier et al., 2017) shows positive relationships with individual and team-level outcomes, such as team learning and performance. This highlights the importance of understanding the antecedents of psychological safety. Previous research has focused on leadership behaviours (e.g., transformational leadership, trust in leader), work design characteristics (e.g., autonomy, role clarity), team characteristics (e.g., mutual understanding, high quality relationships), and supportive work contexts (e.g., peer support, organizational support) (Edmondson & Lei, 2014; Frazier et al., 2017; Newman et al., 2017). In contrast, meeting formats and other interventions have received little attention in psychological safety research (Edmondson & Bransby, 2023).

Daily stand-up meetings and psychological safety

Psychological safety theory (Edmondson, 1999) views safety as an emergent outcome of team interactions. As structured and recurring meetings with a defined purpose, DSM likely contribute to psychological safety through several mechanisms. First, they offer a platform for open communication and transparency (Hennel & Rosenkranz, 2021). A positive conversational environment, shaped by disclosing, questioning, and steering verbal behaviour, can enhance psychological safety (Akan et al., 2020). DSM inherently facilitate these interactions. Disclosing occurs when team members share updates or challenges, while questioning helps clarify progress and signals openness to seeking help. Steering behaviour keeps discussions focused. Additionally, the structured nature of DSM and their 15-minute time limit ensure goal-oriented conversations, helping teams stay focused while enabling constructive discussions.

Second, by fostering shared responsibility (Buvik & Tkalich, 2022), DSM strengthen relationships and social support, both of which are key antecedents of psychological safety (Carmeli et al., 2009; Frazier et al., 2017). By promoting shared goals, DSM enhance team cohesion. A no-blame attitude and shared decision-making further reinforce this dynamic (Alami et al., 2023), creating a team environment where interpersonal risk-taking is encouraged.

Finally, DSM promote team reflexivity by establishing feedback loops that normalize open discussions about challenges and uncertainties. Team feedback, defined as information regarding task progress, team processes, and psychological states, plays a central role in this context (Handke et al., 2022). By promoting shared awareness and enhancing processes like communication, coordination, and cohesion, DSM not only facilitate team learning, but also cultivate positive emergent states such as trust and cohesion. Furthermore, DSM serve as a key platform for team reflexivity, the process through which teams reflect on and adapt their goals, strategies, and working methods (Leblanc et al., 2024). Encouraging active participation and open dialogue during DSM lays the groundwork for greater reflexivity, which, in turn, fosters psychological safety within the team. Thus, team feedback and reflexivity in DSM go hand in hand with encouraging open, risk-free dialogue among team members, thereby building psychological safety.

Taken together, DSM and psychological safety seem closely linked. By fostering communication and transparency, shared responsibility and mutual support, as well as team feedback and reflexivity, DSM create conditions that strengthen psychological safety within teams. Based on this reasoning, we propose a direct relationship between DSM and psychological safety, independent of contextual factors, leading to our first hypothesis:

Hypothesis 1 (H1): DSM are positively related to psychological safety.

Daily stand-up meetings, psychological safety, and work-related satisfaction

Psychological safety plays a crucial role in shaping workplace behaviour, fostering collaboration, and enhancing work-related satisfaction (Frazier et al., 2017; Newman et al., 2017). To explain its relationship with work satisfaction, we draw on two complementary theoretical perspectives: conservation of resources (COR) theory (Hobfoll, 1989) and social exchange theory (Blau, 1964). From an individual-resource perspective, COR theory posits that individuals strive to acquire, maintain, and protect valuable resources, such as social support and trust, to navigate workplace challenges effectively. Psychological safety serves as a key resource by reducing uncertainty and stress, allowing employees to focus on their tasks rather than self-preservation. Within this framework, psychological safety mitigates resource loss (health impairment pathway), while simultaneously activating resources that enhance motivation and satisfaction (motivation pathway) (Newman et al., 2017). From a social-dynamic perspective, social exchange theory helps explain how psychological safety fosters trust,

collaboration, and reciprocal support in teams. In psychologically safe environments, employees feel valued and supported, encouraging open communication and cooperation, which strengthens team cohesion and job satisfaction. Conversely, when psychological safety is lacking, employees may withhold their thoughts, disengage from team processes, and experience lower satisfaction.

Building on these two theoretical perspectives, we examine how psychological safety emerges in teams and fosters work-related satisfaction, with DSM as a key antecedent. Although previous research has examined psychological safety functions as a moderator in agile work contexts (Hennel & Rosenkranz, 2021), our theoretical reasoning suggests that psychological safety functions as an explanatory mechanism between DSM and outcomes. This view is supported by Peeters et al. (2022), who demonstrated that psychological safety mediates the relationship between agile work principles and team engagement. Their conceptualization of agile work principles – including reflexivity, face-to-face communication, self-management, and simplicity – aligns with the core elements of DSM. Similarly, Junker et al. (2024) propose that agile practices activate psychological resources such as psychological safety, ultimately fostering positive workplace outcomes. Based on this reasoning, we propose the following hypothesis:

Hypothesis 2 (H2): DSM have a positive indirect effect on work-related satisfaction via higher psychological safety.

Daily stand-up meetings, psychological safety, and team performance

Beyond its impact on satisfaction, psychological safety is a key antecedent of team performance. The input-mediator-output (IMO) model (Mathieu et al., 2008, 2019; Ilgen et al., 2005) provides a structured framework for understanding how psychological safety facilitates team effectiveness. According to the IMO model, team functioning unfolds as a dynamic sequence in which inputs (e.g., DSM as a structured meeting format) influence mediators, comprising both team processes (e.g., communication, coordination) and emergent states (e.g., psychological safety), which ultimately drive team performance outcomes.

Within this framework, psychological safety functions as a critical emergent team state that translates structured inputs into effective collaboration. When teams experience psychological safety, they engage in open communication, constructive risk-taking, and learning from mistakes without fear of negative consequences (Edmondson, 1999). These behaviours are fundamental for knowledge sharing, coordination, and problem-solving, which, in turn, enhance team effectiveness. Meta-analytic research confirms its positive impact on team learning, decision-making, and performance (Frazier et al., 2017). DSM serve as a structured input that actively fosters psychological safety by shaping team interactions. Through team processes such as daily coordination, goal alignment, and transparent communication, DSM create a structured setting where employees feel psychologically safe, thus enhancing team performance. Furthermore, in the context of DSM, team functioning can be understood through the lens of a complex, adaptive system, where inputs, mediators, and outputs dynamically interact and evolve over time. Outputs from one day's stand-up discussion, such as resolved blockers, new action points, or updated goals, can immediately become inputs for subsequent team processes and the next cycle of coordination and adaptation, aligning with Ilgen et al.'s (2005) extension of the IMO framework into the input-mediator-output-input model.

Empirical research supports the reasoning that DSM can strengthen psychological safety and team effectiveness. Buvik and Tkalich (2022) demonstrated that psychological safety enhances team reflexivity and performance in agile development teams. Alami et al. (2024) further found that psychological safety fosters proactive quality-improving behaviours, such as defect resolution, knowledge sharing, and collaborative problem-solving, ultimately increasing software quality and team effectiveness in agile teams. Similarly, Peeters et al. (2022) found that psychological safety mediates the relationship between agile work principles (i.e., reflexivity, face-to-face communication, self-management) and team performance. Marder et al. (2021) showed that agile team interventions, including DSM, enhance psychological safety, team performance, group learning, communication, and creativity while reducing free riding. However, Hennel and Rosenkranz (2021) also proposed a model linking social agile practices to performance through psychological safety. Their findings are based on a broad conceptualization of agile practices and case study evidence, requiring further quantitative-empirical validation. Despite growing evidence on psychological safety in agile contexts, empirical studies specifically examining DSM's role in fostering psychological safety and team performance remain limited. To address this gap, we propose the following hypothesis:

Hypothesis 3 (H3): DSM have a positive indirect effect on perceptions of team performance via higher psychological safety.

Study 1

Method

Procedure and participants

We used a survey design with two measurement waves, which were approximately six weeks apart. Data collection took place between April and September 2020 as part of a larger research project. Another publication based on data from the same project, investigating the effects of four agile practices other than DSM, on different, non-overlapping outcome variables (i.e., emotional fatigue, emotional engagement), has been published (Rietze & Zacher, 2022). Participants were recruited worldwide via the social network platform LinkedIn, searching for the roles "Agile Coach", "Scrum Master", "Product Owner", "Developer", and "Tester". Contact requests were sent, and those who accepted the requests were invited to the survey, which was available in English or German. Participants were required to work in software or hardware development within the context of agile project management. To minimize common-method bias, the independent variable was measured at Time 1 (T1), whereas the mediator and dependent variables at Time 2 (T2) (Podsakoff et al., 2003). Common-method bias is especially likely when predictor and outcome variables are collected from the same source at the same time, leading to an inflated correlation due to shared measurement methods. As both predictor and outcome variables in the present study were assessed using self-reported data, temporally separating data collection of the independent variable and the mediator and dependent variables was an important step to reduce this risk.

A total of 3,534 people clicked on the link they received with the survey invitation. Of these, 700 people took part at T1 and 413 people (59%) at T2. 318 people (45%) provided complete data at both time points. 70% of the participants were male, and 65% were under 40 years old. 67% of the participants were from the German-speaking region and completed the German questionnaire, while the remaining participants came from 24 different countries worldwide and completed the English questionnaire. The distribution of the sample across countries is available via the Online Appendix 4 (https://osf.io/u6c4k). The participants worked almost exclusively in software development (97%). 18% of participants had less than two years, 38% had two to five years, and 45% had more than five years of experience in agile project management. In terms of roles in the agile project team, 47% of participants were employed as Scrum Masters or Agile Coaches, 28% as Developers, 19% as Product Owners and 6% in other roles (e.g., Testers). 72% of participants worked with Scrum, 12% with Scrumban, and 16% with other agile methods. Finally, 54% of participants worked in small and medium enterprises and 46% in large companies.

Formal ethical approvals for our studies by an ethics committee were not required by our university. All procedures performed in our studies were in accordance with the ethical standards of the German Psychological Society and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent about participation was obtained from all individual participants included in the study. Participation in the study was voluntary, and data were saved and processed anonymously.

Measures

Self-reported measures were collected via an online survey. German items based on English scales were translated using the forward-backward translation method. All items were scored on 5-point Likert scales ranging from "strongly disagree" to "strongly agree." The reliability estimates of all scales were acceptable and are shown in Table 1. The complete questionnaire is available via the Online Appendix 1 (https://osf.io/u6c4k).

Daily stand-up meetings (T1). DSM were measured using a 3-item scale adapted from Tripp et al. (2016). The items are "The team has a short meeting (max. 15 min) every day to discuss what is going on with the project", "Each day, all team members share with the team what they are working on", and "The team discusses issues together daily." A lower average score on the scale indicates less frequent meetings. This scale was selected because it captures the core elements of DSM in agile contexts. It was further validated as part of the Agile Work Practices Instrument (Junker et al., 2023).

Table 1. Item means, item standard deviations, correlations, and reliabilities among the variables of Study 1.

	M	SD	1	2	3	4
1. Daily stand-up meetings (T1)	4.49	0.82	(.83)			
2. Psychological safety (T2)	3.96	0.63	.19**	(.76)		
3. Work-related satisfaction (T2)	3.70	0.82	.03	.44**	(.77)	
4. Perceptions of team performance (T2)	3.79	0.61	.14*	.47*	.39**	(.68)

$N = 318$. Cronbach's α are shown on the diagonal. *$p < .05$, **$p < .01$.

The factor loadings for the three items ranged from .74 to .81, indicating high measurement quality.

Psychological safety (T2). We measured psychological safety using the original 7-item scale developed by Edmondson (1999), which remains the most widely used and validated instrument for assessing team psychological safety (Edmondson & Lei, 2014). An example item is "It is safe to take a risk in our team." The factor loadings for the items ranged from .43 to .69, which does not indicate fully satisfactory measurement quality (Hair et al., 2013). Nevertheless, we retained the full scale in the primary model. As a robustness check, we re-estimated the model after removing items with factor loadings below .50. The results of this analysis are presented in the supplemental analyses.

Work-related satisfaction (T2). We used a 3-item scale developed by Tripp et al. (2016) to measure job satisfaction. This scale is based on the General Job Satisfaction scale developed by Hackman and Oldham as part of the Job Diagnostic Survey (1975), which remains one of the most widely used instruments for assessing job satisfaction in the context of work design research. An example item is "I am satisfied with the important aspects of my job." Item factor loadings ranged from .63 to .87, indicating good measurement quality.

Perceptions of team performance (T2). We measured team performance adopting Edmondson's (1999) 5-item scale, which assesses individuals' perceived team performance. We chose this scale due to its established link to psychological safety (e.g., Chan et al., 2003; Van Woerkom & Van Engen, 2009). Given the stakeholder-driven and customer-oriented nature of software development, it was particularly suitable for our context. The scale captures team output and quality as perceived by others, aligning well with the agile framework of our study. An example item is "Those who receive or use the work our team does often have complaints about our work." The factor loadings for the items ranged from .38 to .71, indicating partially problematic measurement quality. Therefore, in a supplemental analysis, the scale was re-examined by removing items with factor loadings below .50 to assess the robustness of the results. The results of this analysis are presented in the supplemental analyses.

Data analysis

Data analysis was conducted using the *lavaan* package of the R statistical computing environment (Rosseel, 2012; RStudio Version 1.4.1106). The models were tested using structural equation modelling (SEM) following the two-step analytical approach suggested by Anderson and Gerbing (1988). First, we tested the measurement model by performing a confirmatory factor analysis (CFA). In the second step, SEM was used to estimate the model fit and to test our hypotheses. We applied the maximum-likelihood estimation with robust standard errors and evaluated model fit with the χ^2 goodness-of-fit statistic, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Following Schermelleh-Engel et al. (2003), we interpret the model fit using the limits .95 for CFI and TLI, .08 or lower for RMSEA, and .10 or lower for SRMR. We performed a bootstrapping analysis with 10,000 replications to test the indirect effects of the model. The R code for the data analysis is available via the Online Appendix 3 (https://osf.io/u6c4k).

Results

The descriptive statistics are shown in Table 1.

Measurement model

The measurement model was tested including the four latent variables and their items as reflective indicators, which are (1) DSM, (2) psychological safety, (3) work-related satisfaction, and (4) perceptions of team performance. The results of the CFA indicated an acceptable fit of the measurement model, $\chi^2(129) = 242.556$, CFI = .94, TLI = .93, RMSEA = .05, SRMR = .05.

Total effects

The model fit for estimating the total effects of DSM on the two outcomes was good, $\chi^2(41) = 76.774$, CFI = .97, TLI = .96, RMSEA = .05, SRMR = .05. The total effect of DSM on satisfaction was not significant ($\gamma = .04$, $p = .541$), whereas the total effect on performance was positive and significant ($\gamma = .18$, $p = .034$).

Direct and indirect effects

The fit of the hypothesized model was acceptable, $\chi^2(129) = 242.556$, CFI = .94, TLI = .93, RMSEA = .05, SRMR = .05. Figure 2 presents the standardized parameter estimates. The effect of DSM on psychological safety was positive and significant ($\gamma = .25$, $p = .006$), supporting Hypothesis 1. The effects of psychological

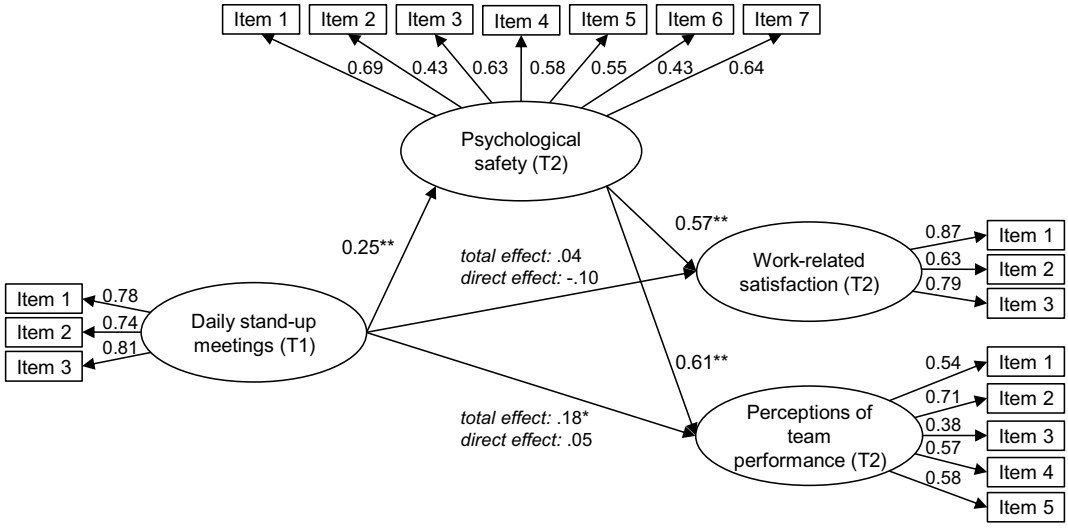

Figure 2. Results of the structural equation model for Study 1.
$N = 318$. Path coefficients are standardized. *$p < .05$, **$p < .01$.

Table 2. Direct and indirect effects of Study 1 using bootstrapping (10,000 replications).

Direct effects	*Est.*	*SE*	*p*	*CI 95%*
H1: Daily stand-up meetings (T1) ➔ Psychological safety (T2)	.25	.08	.006	(.04, .36)
Daily stand-up meetings (T1) ➔ Work-related satisfaction (T2)	−.10	.08	.204	(−.26, .06)
Daily stand-up meetings (T1) ➔ Perceptions of team performance (T2)	.05	.07	.529	(−.10, .16)
Psychological safety (T2) ➔ Work-related satisfaction (T2)	.57	.12	<.001	(.41, .90)
Psychological safety (T2) ➔ Perceptions of team performance (T2)	.61	.10	<.001	(.35, .73)
Indirect effects	***Est.***	***SE***	***p***	***CI 95%***
H2: Daily stand-up meetings (T1) ➔ Psychological safety (T2) ➔ Work-related satisfaction (T2)	.14	.06	.009	(.02, .25)
H3: Daily stand-up meetings (T1) ➔ Psychological safety (T2) ➔ Perceptions of team performance (T2)	.15	.05	.013	(.01, .20)

$N = 318$. All parameter estimates are presented as standardized coefficients. *Est.* = fully standardized estimates, *SE* = standard error, *p* = significance level, *CI* = confidence interval, H = hypothesis, *T* = measuring time.

safety on satisfaction ($\gamma = .57$, $p < .001$) and performance ($\gamma = .61$, $p < .001$) were positive and significant, whereas the direct effects of DSM on satisfaction ($\gamma = -.10$, $p = .204$) and performance ($\gamma = .05$, $p = .529$) were not significant. Results of mediation analyses (see Table 2) show that the indirect effects of DSM via psychological safety on satisfaction ($\gamma_{indirect} = .14$, $p = .009$) and performance ($\gamma_{indirect} = .15$, $p = .013$) were positive and significant. The total effect on performance was significant, but the direct effect was not, supporting mediation. For satisfaction, the total effect was not significant, but opposing indirect and direct effects still suggest that psychological safety mediates the relationship between DSM and satisfaction (O'Rourke & MacKinnon, 2018). Thus, Hypotheses 2 and 3 were also supported.

Supplementary analyses

We conducted additional robustness checks to ensure the stability of our findings. First, we examined whether the relationship between DSM and psychological safety remained significant when controlling for other agile work practices investigated in previous research (i.e., self-organized teamwork, incrementation, iterative planning, and retrospectives; Rietze & Zacher, 2022). The results show that the direct relationship between DSM and psychological safety remained significant after controlling for these additional practices ($\gamma = .18$, $p = .038$).

Second, we controlled for the perceived impact of the COVID-19 pandemic on daily work, as data collection occurred during this period using a single item: "My daily work has been greatly changed by the

Corona crisis." The relationship between DSM and psychological safety remained significant after controlling for this variable ($\gamma = .25$, $p = .005$). Moreover, the variable was not significantly related to psychological safety ($\gamma = -.08$, $p = .275$), satisfaction ($\gamma = -.02$, $p = .787$), or performance ($\gamma = .05$, $p = .564$).

Third, we tested an alternative model in which psychological safety was positioned as a moderator of the relationship between DSM and the two outcomes, performance, and satisfaction. To test for interaction effects, we created a mean-centred interaction term between the manifest composite scores of DSM and psychological safety, which was entered as an observed variable in the structural model. The main effects were modelled as latent variables. The interaction terms had no significant effects on satisfaction ($\gamma = .06$, $p = .412$) or performance ($\gamma = .07$, $p = .258$).

Fourth, since some of the items used to assess psychological safety and team performance had relatively low factor loadings (i.e., below .50), we conducted an additional robustness check by re-estimating the model after eliminating these items (Item 2 and Item 6 from the psychological safety scale, and Item 3 from the team performance scale). The revised model demonstrated an acceptable fit across all standard indices ($\chi^2(84) = 149.185$, CFI = .96, TLI = .95, RMSEA = .05, SRMR = .05), suggesting that the model structure remains stable even when potentially problematic items are excluded. The significance of both direct and indirect paths remained consistent with the original model, thus the key relationships observed were not dependent on the excluded items. Moreover, the Chi-Square difference test (conducted with the "anova" function from the R package "lavaan"; Rosseel, 2012) indicated that this more parsimonious version fits the data significantly better than the original ($\Delta\chi^2 = 77.544$, $\Delta df = 45$, $p < .001$), strengthening the robustness of the proposed model and the confidence in the validity of the findings.

The results of the four supplementary analyses are presented in detail in our Online Appendix 5 (https://osf.io/u6c4k).

Discussion Study 1

The results of Study 1 provide initial support for our hypotheses. We demonstrated that (1) DSM are positively associated with psychological safety and (2) DSM are indirectly related to work-related satisfaction and team performance through psychological safety. The results provide the long overdue empirical evidence for the overall positive role of DSM and psychological safety as an underlying mechanism of the relation between DSM and work outcomes.

However, the study is not without limitations. It was conducted within the context of agile project teams and, thus, our findings may have been influenced by the presence of broader factors such as the agile work context or organizational culture. While we controlled for other agile practices in our supplementary analysis, we did not control for broader contextual factors. Thus, the effects observed may not be solely attributable to DSM. In addition, the study relied on self-report measures to assess the extent to which DSM are practiced. However, this approach lacks a comparison with teams that do not conduct DSM, which would provide clearer evidence for the importance of these meetings. Finally, as the construct of psychological safety represents shared perceptions of team members (Edmondson & Lei, 2014) it would be appropriate to collect team-level data for the study and to focus on team-level outcomes instead of individual perceptions of work-related outcomes.

To address some of the limitations of Study 1, we employed a different study design in a non-agile context. Specifically, we conducted a follow-up study with an experimental design that introduces DSM as a group work intervention. Given the challenges of implementing experimental designs in corporate settings, we opted to use university students as participants for this second study.

Study 2

Method

Procedure and participants

Study 2 employs an experimental design to investigate DSM as an intervention and its impact on psychological safety, work-related satisfaction, and perceived team performance. In contrast to Study 1, which was conducted in organizational agile teams using a survey design, Study 2 was conducted in a university setting with student teams. This shift in the research setting allowed for greater experimental control and internal validity. A between-subjects design was used with two conditions: an experimental group, where teams conducted DSM daily for five days, and a control group, where teams did not implement DSM but followed alternative instructions. Participants were not aware of these conditions and study goals. Participants voluntarily signed up for the study, were randomly assigned to teams of three, and then randomly allocated to either the experimental or control condition. Each team received a fixed start date and, on Day 1 of the study

week, a joint email detailing their assignment and the identities of their team members, requiring them to self-organize their collaboration. All teams were given the task to complete within five workdays, which involved the development of a short training concept for employees to promote sustainability in a company. On the fifth day, all teams submitted their presentations, with the best team receiving a book voucher as an incentive. The control group met only on Days 1 and 5, whereas the experimental group additionally held 15-minute DSM on Days 2, 3, and 4. During these DSM, they were instructed to answer the following three questions: *What did I work on yesterday?, What will I work on today?*, and *Are there any obstacles that are blocking me from reaching our goals*? Full task instructions can be found in Online Appendix 2 (https://osf.io/u6c4k). Participants also completed a brief online survey each day from Day 2 to Day 5 to track participation and collect study data.

The study took place between November 2022 and November 2023. Participants were Bachelor's and Master's students of psychology. Of 126 registered participants, nine withdrew after receiving the task, leaving 117 students (93%) who completed the study. Only those who completed surveys from Day 1 to Day 4 were included in the analysis ($N = 108$, 86%). The experimental group comprised 21 teams (58 individuals), and the control group included 19 teams (50 individuals). Most participants were female (84%), and under 25 years old (87%). Like Study 1, participation in this study was voluntary, data were stored and processed anonymously, and informed consent was obtained for both participation and publication.

Measures

Self-reported measures were collected via an online survey. Data was collected at two time points: T1 (Day 3) and T2 (Day 5). Psychological safety was assessed at T1, after three days of teamwork, and the three outcome variables were measured at T2, following task completion and presentation submission. All items were scored on 5-point Likert scales ranging from "strongly disagree" to "strongly agree." Reliability estimates were acceptable (Table 3). The full questionnaire is available in Online Appendix 1 (https://osf.io/u6c4k).

Daily stand-up meetings. DSM were operationalized through an experimental design with an experimental group and a control group. In the multi-level data analysis, DSM are included as a binary variable (0 = no DSM, 1 = DSM). As a manipulation check, DSM were also measured via self-report using the same three-item scale as in Study 1 (Tripp et al., 2016). A mixed model analysis in SPSS (IBM Corporation, 2024) with the team variable as a random factor showed a significant effect of the intervention on DSM, $F(1, 106) = 581.204$, $p < .001$, confirming the effectiveness of the experimental manipulation.

Psychological safety. Psychological safety was assessed using the 4-item short version of the PsySafety-Check (Fischer & Huettermann, 2020), based on Edmondson's original scale (1999) scale. An example item includes "It is safe to take a risk in our team." The factor loadings for the items ranged from .50 to .83, which is considered acceptable (Hair et al., 2013). This short version was chosen because it demonstrates better measurement quality than the original 7-item version by Edmondson, as it excludes the negatively worded (reversed) items.

Work-related satisfaction. Because the job satisfaction measure used in Study 1 was not directly transferable to the academic group work context, we used a contextually adapted proxy to capture work-related satisfaction. The use of proxy variables is methodologically appropriate when original measures are not applicable, provided that their selection is carefully justified to ensure measurement validity and minimize potential bias (Seltzer, 2020). Therefore, we adapted the general satisfaction scale from Hackman and Oldham (1975) to measure satisfaction with team collaboration as a proxy for work-related satisfaction. The scale included three items, which are "All in all, I am very satisfied with how the team collaborates", "I can hardly imagine a better team collaboration", and "I am very satisfied with the way we work together." The factor loadings for the items ranged from .79 to .95, indicating excellent measurement quality.

Perceptions of team performance. Similar to the adaptation made for job satisfaction, it was necessary to use different proxies to measure perceived team performance in this study. Therefore, we focused on participants' subjective evaluations of team

Table 3. Item means, item standard deviations, correlations, and reliabilities among the variables of Study 2.

	M	SD	1	2	3	4	5	6
1. Daily stand-up meetings (binary variable)	–	–	–					
2. Psychological safety (T1)	3.97	0.77	.30**	(.75)				
3. Work-related satisfaction (T2)	3.98	0.97	.19	.47**	(.91)			
4. Satisfaction with team performance (T2)	3.93	0.92	.24*	.53**	.64**	(.90)		
5. Team efficacy (T2)	4.44	0.70	.22*	.45**	.52**	.66**	(.82)	
6. Team learning behaviour (T2)	3.14	1.15	.37**	.46**	.45**	.49**	.29**	(.89)

$N = 108$. Cronbach's α are shown on the diagonal. *$p < .05$, **$p < .01$.

functioning across several key dimensions, which together provide a more comprehensive approximation of behavioural performance in student work groups. To this end, we employed three different scales as proxies for perceptions of team performance: First, we developed a satisfaction with team performance scale, consisting of the following three items: "All in all, I am very satisfied with our team's performance," "I am very satisfied with the quality of our work," and "I am satisfied with the way we correct errors in order to deliver high quality". In addition, we used Edmondson's (1999) team efficacy scale and team learning behaviour scale as further performance indicators. Both scales contained three items. Example items are "With focus and effort, this team can do anything we set out to accomplish" (i.e., team efficacy), and "We regularly take time to figure out ways to improve our team's work processes" (i.e., team learning behaviour). The factor loadings indicated high measurement quality, ranging from .83 to .89 for satisfaction with team performance, .74 to .81 for team efficacy, and .83 to .88 for team learning behaviour.

Data analysis

We used structural equation modelling in RStudio, as in Study 1, accounting for the hierarchical data structure (i.e., students nested within teams) by using the *cluster* function in the *lavaan* package (Rosseel, 2012) and defining teams as a group variable. This approach adjusts standard errors and model fit indices to account for dependencies within clusters, such as team members within teams. To assess within-team agreement, we calculated the intraclass correlation coefficient ICC(1) as an aggregated statistic, which ranged from .24 (i.e., satisfaction with collaboration) to .42 (i.e., team learning behaviour) indicating moderate within-team agreement. The R code is available in the Online Appendix 3 (https://osf.io/u6c4k). The descriptive statistics of Study 2 are presented in Table 3.

Results

Measurement model

We tested the measurement model consisting of five latent variables and their items as reflective indicators, which are (1) psychological safety, (2) work-related satisfaction, (3) satisfaction with team performance, (4) team efficacy, and (5) team learning behaviour. The CFA results suggested an adequate fit, $\chi^2(94) = 144.972$, CFI = .96, TLI = .94, RMSEA = .07, SRMR = .06. Factor loadings ranged from .50 to .95 and all indicators loaded significantly on their intended latent factors ($p < .0001$).

Total effects

The test of the total effects showed a good model fit ($\chi2(56) = 100.488$, CFI = .96, TLI = .95, RMSEA = .08, SRMR = .06). The total effect of DSM on satisfaction ($\gamma = .16$, $p = .139$) was not significant. The total effects of DSM on performance outcomes were positive and significant:

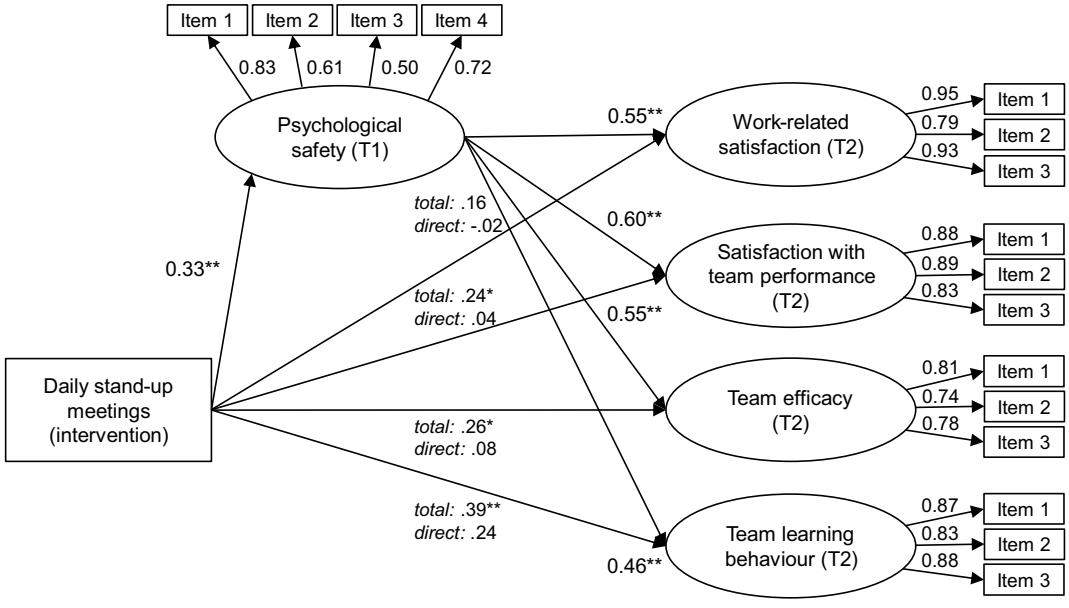

Figure 3. Results of the structural equation model for Study 2.
N = 108. Total = total effect, direct = direct effect. Path coefficients are standardized. *$p < .05$, **$p < .01$.

Table 4. Direct and indirect effects of Study 2 using bootstrapping (10,000 replications).

Direct effects	*Est.*	*SE*	*p*	*CI 95%*
H1: Daily stand-up meetings ➔ Psychological safety (T1)	.33	.18	.005	(.15, .83)
Daily stand-up meetings ➔ Work-related satisfaction (T2)	−.02	.18	.823	(−.39, .31)
Daily stand-up meetings ➔ Satisfaction with team performance (T2)	.04	.16	.689	(−.25, .38)
Daily stand-up meetings ➔ Team efficacy (T2)	.08	.13	.435	(−.16, .37)
Daily stand-up meetings ➔ Team learning behaviour (T2)	.24	.29	.076	(−.05, 1.08)
Psychological safety (T1) ➔ Work-related satisfaction (T2)	.55	.16	<.001	(.35, .97)
Psychological safety (T1) ➔ Satisfaction with team performance (T2)	.60	.15	<.001	(.36, .95)
Psychological safety (T1) ➔ Team efficacy (T2)	.55	.10	<.001	(.26, .66)
Psychological safety (T1) ➔ Team learning behaviour (T2)	.46	.27	.014	(.14, 1.20)
Indirect effects	***Est.***	***SE***	***p***	***CI 95%***
H2: Daily stand-up meetings ➔ Psychological safety (T1) ➔ Work-related satisfaction (T2)	.18	.12	.005	(.10, .55)
H3: Daily stand-up meetings ➔ Psychological safety (T1) ➔ Satisfaction with team performance (T2)	.20	.12	.010	(.08, .56)
H3: Daily stand-up meetings ➔ Psychological safety (T1) ➔ Team efficacy (T2)	.18	.09	.010	(.05, .40)
H3: Daily stand-up meetings ➔ Psychological safety (T1) ➔ Team learning behaviour (T2)	.15	.15	.031	(.03, .62)

N = 108. All parameter estimates are presented as standardized coefficients. *Est.* = fully standardized estimates, *SE* = standard error, *p* = significance level, *CI* = confidence interval, H = hypothesis, *T* = measuring time.

satisfaction with team performance ($\gamma = .24$, $p = .048$), team efficacy ($\gamma = .26$, $p = .038$), and team learning behaviour ($\gamma = .39$, $p = .001$).

Direct and indirect effects

In our hypothesized path model, the results also indicate a good model fit, $\chi 2(105) = 153.833$, CFI = .96, TLI = .95, RMSEA = .06, SRMR = .06. The standardized parameter estimates for the model are presented in Figure 3. The effect of DSM on psychological safety was positive and significant ($\gamma = .33$, $p = .005$). Thus, Study 2 also supported Hypothesis 1. The effects of psychological safety on work-related satisfaction ($\gamma = .55$, $p < .001$), satisfaction with team performance ($\gamma = .60$, $p < .001$), team efficacy ($\gamma = .55$, $p < .001$), and team learning behaviour ($\gamma = .46$, $p = .014$) were positive and significant. The direct effects of DSM on the four outcome variables were not significant (work-related satisfaction: $\gamma = -.02$, $p = .823$; satisfaction with team performance: $\gamma = .04$, $p = .689$; team efficacy: $\gamma = .08$, $p = .435$; and team learning behaviour: $\gamma = .24$, $p = .076$). Results of mediation analyses (see Table 4) show that the indirect effects of DSM via psychological safety on satisfaction ($\gamma_{indirect} = .18$, $p = .005$) and on performance outcomes (satisfaction with team performance: $\gamma_{indirect} = .20$, $p = .010$, team efficacy: $\gamma_{indirect} = 0.18$, $p = .010$, team learning behaviour: $\gamma_{indirect} = .15$, $p = .031$) were positive and significant. A significant total effect of DSM on performance, but not direct effects, supported mediation. The total effect of DSM on satisfaction was not significant, yet following O'Rourke and MacKinnon (2018), mediation is plausible when indirect and direct effects have opposing signs. This pattern in Study 2 confirmed psychological safety as a mediator between DSM and satisfaction. Thus, Hypotheses 2 and 3 were also supported by Study 2.

Discussion Study 2

To address the limitations of Study 1, Study 2 was designed to strengthen internal validity. DSM was examined as an individual practice, independent of an agile organizational context. Moreover, DSM was implemented as a direct intervention, ensuring experimental control. Overall, the results of Study 2 supported our hypotheses, suggesting that psychological safety serves as a key underlying mechanism linking DSM to work-related outcomes. Nevertheless, this study also has limitations, which will be discussed in more detail in the general discussion section.

General discussion

DSM are commonly used in agile teams and beyond to improve communication, coordination, and decision-making among team members. Several studies highlight psychological safety as a key factor that can enhance the effectiveness in agile teams (Alami et al., 2024; Buvik & Tkalich, 2022; Marder et al., 2021; Peeters et al., 2022). We tested our hypotheses in a field study in the context of agile software development and in an experimental study with university students. Our results showed that DSM are directly and positively related to individual perceptions of psychological safety (H1). Additionally, DSM were indirectly and positively related to individual perceptions of work-related satisfaction (H2) and of team performance (H3), both via psychological safety. Thus, our three hypotheses were supported in both studies.

Theoretical contributions

Our findings contribute to two research streams and offer a methodological advancement, deepening the understanding of DSM, their potential impacts on satisfaction and performance, and the role of psychological safety in these relationships. First, although DSM are a core practice in agile work (Stray et al., 2017), research on their specific benefits remains limited and has yielded mixed results, with prior studies also reporting negative effects such as decreased satisfaction and trust (Stray et al., 2016, 2017, 2020). Our studies provide initial quantitative evidence of their overall positive effects on individual perceptions of satisfaction and team performance. These findings support claims that DSM enhance collaboration, transparency, and efficiency, aligning with recent research findings linking agile practices to job satisfaction (Koch et al., 2023; Tripp et al., 2016) and team performance (Alami et al., 2024; Junker et al., 2022; Malik et al., 2021; Peeters et al., 2022). Furthermore, by isolating DSM as a distinct agile practice, our work directly addresses recent calls for more differentiated analyses of distinct agile practices and their outcomes (Huck-Fries et al., 2025; Rietze & Zacher, 2023).

Second, our study extends research on how agile practices, specifically DSM, contribute to psychological safety. While psychological safety has been well studied in traditional teams (Edmondson, 1999; Frazier et al., 2017), its development through targeted interventions, such as structured agile meeting formats, remains underexplored (Edmondson & Bransby, 2023). Consistent with psychological safety theory (Edmondson, 1999), our findings showed that DSM foster a safe space for employees to voice concerns, seek feedback, and engage in learning without fear of negative consequences – supporting the idea that agile social practices promote psychological safety (Hennel & Rosenkranz, 2021). From an IMO perspective (Mathieu et al., 2008; Ilgen et al., 2005), DSM serve as structured inputs that enhance communication, transparency, and problem-solving, fostering psychological safety as an emergent team state and explaining its role in linking DSM to key team outcomes. This also supports Junker et al.'s (2024; 2025) proposition that agile practices mobilize socio-emotional resources, sustaining team effectiveness. Additionally, our findings align with broader research on agile practices, such as Peeters et al. (2022), who identified psychological safety as a mediator between agile work principles, team engagement, and performance. They are also in line with studies highlighting the role of team reflexivity and learning in fostering psychological safety and performance (Buvik & Tkalich, 2022). By demonstrating that DSM promote open communication, idea-sharing, and collaboration, our study offers deeper insights into the mechanisms linking agile practices to satisfaction and performance, thereby addressing recent calls to examine proposed mechanisms for distinct agile practices (Huck-Fries et al., 2025).

Third, we contribute methodologically to DSM and psychological safety research. Prior studies have been largely qualitative or descriptive (Hennel & Rosenkranz, 2021; Stray et al., 2017), limiting generalizability. Our multi-design, quantitative approach allows broader conclusions beyond case studies. By examining DSM in two contexts with different operationalizations, we enhance the robustness of our findings. Additionally, our longitudinal design offers insights into temporal precedence of variables, extending previous research that relied on cross-sectional data.

Limitations and future research

Although our two studies offer valuable insights, several limitations must be acknowledged, opening avenues for future research. First, reliance on self-reports, except for DSM in Study 2, raises concerns about common method bias (Podsakoff et al., 2003). Although anonymity and multiple measurement waves may have helped mitigate this problem, future research should incorporate objective measures like external performance ratings or behavioural analyses of team communication patterns (Ferguson et al., 2024; Lehmann-Willenbrock, 2025; Lehmann-Willenbrock et al., 2011).

Second, another limitation concerns the level of analysis. Psychological safety is inherently a team-level construct (Edmondson, 1999), yet Study 1 relied solely on individual-level data. Study 2 addressed this by incorporating team-level structures, but the focus was on the individual level. Larger team samples are needed for more robust multilevel modelling. Moreover, while our studies primarily assessed individual perceptions of psychological safety and work-related outcomes, future research should also shift focus to team-level outcomes.

Third, time lags may pose another limitation. Study 1 used a six-week interval, whereas Study 2 involved only two days. Beyond these short-term effects, longer time lags may reveal different effects (Edmondson & Bransby, 2023). Additionally, Study 2 lacked baseline comparisons of psychological safety between groups, which future research should address with measurements before the interventions.

Fourth, measurement consistency posed a challenge. In Study 1, relatively low factor loadings (<.50) for the psychological safety and team performance scales may have resulted from negatively worded, reversed items. To address concerns regarding measurement quality, we conducted a robustness check by removing all items with factor loadings below .50 and retested the model. The results showed an even better model fit and consistent confirmation of the hypothesized relationships, suggesting that measurement quality did not substantially influence our main findings. Nevertheless, future research could apply alternative, better-validated measures of psychological safety and team performance to further enhance clarity, validity, and reliability.

Fifth, comparability of the findings of Study 1 and Study 2 is somewhat limited due to differences in research contexts and the operationalization of outcome variables. In Study 2, adapted proxies for work satisfaction and team performance perceptions were used to fit the specific context of short-term, student-based teamwork, where participants collaborated over only five days on a clearly defined task. In contrast, Study 1 involved agile teams working together in organizational settings over an extended period. These contextual differences in task duration, team dynamics, and professional experience likely influenced how team outcomes were perceived and reported. Moreover, while Study 2 ensured strong experimental control, the reliance on a student sample in temporary teams may limit the generalizability of findings to real-world workplace settings. In contrast, Study 1 included working professionals, offering broader applicability but lower internal validity. Therefore, although the overall pattern of results across both studies was consistent, future research should aim to replicate Study 2's experimental design within established workplace teams to strengthen generalizability across diverse organizational contexts.

Sixth, the broader organizational context may also play a role in DSM effectiveness. While Study 2 examined DSM outside an agile environment, it remains unclear whether DSM effects are independent of agile frameworks or contingent on them. Future research should systematically integrate factors such as organizational agility (Petermann & Zacher, 2022), agile mindset (Augner & Schermuly, 2024; Eilers et al., 2022), and distinctions between agile-as-a-tool vs. agile-as-a-culture (Magistretti & Trabucchi, 2025) Clarifying these interactions could help determine whether DSM functions similarly across different organizational settings.

Seventh, a potential confounding factor in Study 2 is that teams in the DSM condition had more interaction time than those in the control group. This may have contributed to psychological safety improvements independent of the DSM format. Since frequent meetings and shared time spent together are inherent to DSM, it remains unclear whether additional contact time represents a confound or an integral feature of the intervention. Future studies could control for contact time within team, for example, by extending initial meetings (i.e., to 75 min) in the control group to match the DSM condition's interaction levels.

Eights, the rise of remote and hybrid work environments (Kniffin et al., 2021) could further complicate the understanding of DSM effectiveness. We did not systematically capture the meeting format in Study 1, but most likely DSM occurred online due to the software development context and the COVID-19 pandemic. Study 2 explicitly instructed participants to meet virtually. Given that remote teams often span different locations and time zones, virtual DSM may help overcome geographical barriers, foster trust, and enhance teamwork quality and cohesion, but they may also face challenges such as cultural differences in communication styles or the overwhelming nature of highly frequent virtual interaction (Huck-Fries et al., 2025; Paasivaara et al., 2009). Future research should explore whether DSM have different effects in virtual versus in-person settings, taking cultural and contextual factors into account.

Finally, the effects of DSM may depend on specific team and contextual factors, including how DSM are structured, facilitated, and integrated into the team's workflow. The previously reported mixed outcomes of DSM (Stray et al., 2016, 2017, 2020) suggest that the benefits of DSM are context-dependent and warrant further investigation across different organizational settings and working conditions. Previous work has proposed factors that may moderate the effectiveness of

agile practices, such as team connectedness (Carmeli et al., 2009), the congruence between personal needs and actual team practices (Benlian et al., 2025), the quality of agile coaching (Marder et al., 2021), and team reflexivity (Buvik & Tkalich, 2022). More specifically, based on qualitative data from interviews and observations, Stray et al. (2016) identified a wide range of factors that may influence the benefits of DSM directly, including, for example, the degree of self-management within the team, the level of knowledge redundancies, the visualization of tasks, the number of participants, conducting DSM while standing (vs. sitting), the level of information-sharing, avoiding mere progress reporting, focusing discussions on problem-solving, and the frequency and duration of DSM. Our studies did not account for these potential moderating factors, as they focused exclusively on the mediating role of psychological safety. Future research would benefit from empirically examining how these and other contextual variables may shape the effectiveness of DSM.

Practical implications

This study provides practical insights for organizations, teams, and leaders aiming to foster psychological safety in the workplace. Importantly, psychological safety does not develop automatically, but it needs to be continuously developed and maintained over time (Edmondson & Lei, 2014). First, our findings suggest that organizations could adopt DSM as targeted interventions to cultivate a psychologically safe team climate. This may involve structuring DSM with explicit norms that promote active listening, turn-taking, and appreciative communication, and developing clear guidelines for applying DSM in different organizational contexts. Second, the benefits of DSM extend beyond agile and technology-driven contexts to traditional settings such as academic group work, highlighting that DSM are adaptable and scalable across various team structures. Non-agile organizations, including large enterprises or public institutions, could therefore also benefit from customizing DSM formats to foster collaboration and psychological safety. Third, facilitation quality might play a crucial role in shaping the meeting climate. Both leaders and team members should be trained in psychological safety principles and facilitation techniques, such as modelling vulnerability by sharing challenges, actively inviting contributions from more quiet members, and responding appreciatively to input. Fourth, fostering psychological safety through DSM not only benefits individual teams, but can also advance broader organizational goals such as employee retention. Research shows that agile practices can enhance retention through increased job satisfaction (Issa et al., 2019; Setor & Joseph, 2020). Thus, organizations could embed DSM facilitation skills and psychological safety training into team and leadership development programmes. Overall, DSM offer a low-cost, high-impact tool for building more resilient and collaborative teams, ultimately strengthening team effectiveness.

Conclusion

This paper explored the role of DSM for psychological safety within teams. Our findings show that DSM are positively associated with psychological safety, which mediates their impact on work-related satisfaction and perceptions of team performance. This provides initial empirical evidence for the positive effects and mechanisms of DSM. The findings shed new light on the potential of DSM in fostering a psychologically safe team culture, underscoring their relevance and effectiveness.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Sarah Rietze http://orcid.org/0000-0001-6211-8627
Hannes Zacher http://orcid.org/0000-0001-6336-2947

Data availability statement

Analysis code, the data set and materials are available as Online Appendices via https://osf.io/u6c4k.

References

Akan, O. H., Jack, E. P., & Mehta, A. (2020). Concrescent conversation environment, psychological safety, and team effectiveness: Examining a mediation model. *Team Performance Management: An International Journal*, *26*(1/2), 29–51. https://doi.org/10.1108/TPM-07-2019-0079

Alami, A., Zahedi, M., & Krancher, O. (2023). Antecedents of psychological safety in agile software development teams. *Information and Software Technology*, *162*, 107267. https://doi.org/10.1016/j.infsof.2023.107267

Alami, A., Zahedi, M., & Krancher, O. (2024). The role of psychological safety in promoting software quality in agile teams. *Empirical Software Engineering*, *29*, 119. https://doi.org/10.1007/s10664-024-10512-1

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Augner, T., & Schermuly, C. C. (2023). Agile project management and emotional exhaustion: A moderated mediation

process. *Project Management Journal*, *54*(5), 491–507. https://doi.org/10.1177/87569728231151930

Augner, T., & Schermuly, C. C. (2024). Beyond a buzzword: The agile mindset as a new research construct in organizational psychology. *Journal of Managerial Psychology*. Advance online publication. *40*(3), 274–288. https://doi.org/10.1108/JMP-04-2024-0261

Benlian, A., Pinski, M., & Adam, M. (2025). *Team-enacted use versus developer-needed use of agile practices: How perceptual (in-)congruence and team feedback-seeking shape developer well-being*. *Information systems research*. Advance online publication. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5188237

Blau, P. M. (1964). Justice in social exchange. *Sociological Inquiry*, *34*, 193–206. https://doi.org/10.1111/j.1475-682X.1964.tb00583.x

Buvik, M., & Tkalich, A. (2022). Psychological safety in agile software development teams: Work design antecedents and performance consequences. *Proceedings of the 55th Hawaii International Conference on System Sciences* (pp. 7332–7341). University of Hawai'i at Mānoa. https://doi.org/10.24251/HICSS.2022.880

Carmeli, A., Brueller, D., & Dutton, J. E. (2009). Learning behaviours in the workplace: The role of high-quality interpersonal relationships and psychological safety. *Systems Research & Behavioral Science*, *26*, 81–98. https://doi.org/10.1002/sres.932

Chan, C. A. C., Pearson, C., & Entrekin, L. (2003). Examining the effects of internal and external team learning on team performance. *Team Performance Management: An International Journal*, *9*(7/8), 174–181. https://doi.org/10.1108/13527590310507426

Ćirić, D., & Gračanin, D. (2017). Agile project management beyond software industry. *Proceedings of the XVII International Scientific Conference on Industrial Systems (IS'17)* (pp. 1–6). Novi Sad, Serbia: University of Novi Sad, Faculty of Technical Sciences.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, *44*(2), 350–383. https://doi.org/10.2307/2666999

Edmondson, A., & Bransby, D. P. (2023). Psychological safety comes of age: Observed themes in an established literature. *Annual Review of Organizational Psychology & Organizational Behavior*, *10*(1), 55–78. https://doi.org/10.1146/annurev-orgpsych-120920

Edmondson, A., & Lei, Z. (2014). Psychological safety: The history, renaissance, and future of an interpersonal construct. *Annual Review of Organizational Psychology & Organizational Behavior*, *1*(1), 23–43. https://doi.org/10.1146/annurev-orgpsych-031413-091305

Eilers, K., Peters, C., & Leimeister, J. M. (2022). Why the agile mindset matters. *Technological Forecasting & Social Change*, *179*, 121650. https://doi.org/10.1016/j.techfore.2022.121650

Ferguson, S. A., Van De Zande, G., & Olechowski, A. (2024). No risk, no reward: Towards an automated measure of psychological safety from online communication. *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*, (253), 1–7. https://doi.org/10.1145/3613905.3650923

Fischer, J., & Huettermann, H. (2020). *PsySafety-Check (PS-C): Fragebogen zur Messung psychologischer Sicherheit in Teams* [Test documentation]. ZIS - Leibniz-Institut für Sozialwissenschaften. https://doi.org/10.6102/zis279

Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., & Vracheva, V. (2017). Psychological safety: A meta-analytic review and extension. *Personnel Psychology*, *70*(1), 113–165. https://doi.org/10.1111/peps.12183

Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied Psychology*, *60*(2), 159–170. https://doi.org/10.1037/h0076546

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate data analysis* (7th ed). Pearson New International ed.). Pearson Education.

Handke, L., Klonek, F., O'Neill, T. A., & Kerschreiter, R. (2022). Unpacking the role of feedback in virtual team effectiveness. *Small Group Research*, *53*(1), 41–87. https://doi.org/10.1177/10464964211057116

Hennel, P., & Rosenkranz, C. (2021). Investigating the "socio" in socio-technical development: The case for psychological safety in agile information systems development. *Project Management Journal*, *52*(1), 11–30. https://doi.org/10.1177/8756972820933057

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *The American Psychologist*, *44*(3), 513–524. https://doi.org/10.1037/0003-066X.44.3.513

Huck-Fries, V., Spitzer, R., Thatcher, J., & Krcmar, H. (2025). (No) need to apply agile? A review of the literature and agenda for future research on job satisfaction in agile information systems development. *Business & Information Systems Engineering*, *67*, 55–81. https://doi.org/10.1007/s12599-024-00916-0

Hummel, M., Rosenkranz, C., & Holten, R. (2015). The role of social agile practices for direct and indirect communication in information systems development teams. *Communications of the Association for Information Systems*, *36*(15), 273–300. https://doi.org/10.17705/1CAIS.03615

IBM Corporation. (2024). *IBM SPSS statistics for windows* (29.0.2.0).

Issa, L., Alkhatib, M., Al-Badarneh, A., & Qusef, A. (2019). Employee retention in agile project management. *2019 10th International Conference on Information and Communication Systems (ICICS)* (pp. 160–165). IEEE. https://doi.org/10.1109/IACS.2019.8809132

Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From input-process-output models to IMOI models. *Annual Review of Psychology*, *56*(1), 517–543. https://doi.org/10.1146/annurev.psych.56.091103.070250

Junker, T. L., Bakker, A. B., & Derks, D. (2024). Toward a theory of team resource mobilization: A systematic review and model of sustained agile team effectiveness. *Human Resource Management Review*, *35*(1), 1–19. https://doi.org/10.1016/j.hrmr.2024.101043

Junker, T. L., Bakker, A. B., Derks, D., & Molenaar, D. (2023). Agile work practices: Measurement and mechanisms. *European Journal of Work & Organizational Psychology*, *32*(1), 1–22. https://doi.org/10.1080/1359432X.2022.2096439

Junker, T. L., Bakker, A. B., Derks, D., & Pletzer, J. L. (2025). Work engagement in agile teams: Extending multilevel JD-R theory. *Journal of Organizational Behavior*. Advance online publication. *46*(4), 512–529. https://doi.org/10.1002/job.2860

Junker, T. L., Bakker, A. B., Gorgievski, M. J., & Derks, D. (2022). Agile work practices and employee proactivity: A multilevel study. *Human Relations*, *75*(12), 2189–2217. https://doi.org/10.1177/00187267211030101

Kniffin, K. M., Narayanan, J., Anseel, F., Antonakis, J., Ashford, S. P., Bakker, A. B., Bamberger, P., Bapuji, H., Bhave, D. P., Choi, V. K., Creary, S. J., Demerouti, E., Flynn, F. J., Gelfand, M. J., Greer, L. L., Johns, G., Kesebir, S., Klein, P. G., Lee, S. Y. & Vugt, M. V. (2021). COVID-19 and the workplace: Implications, issues, and insights for future research and action. *The American Psychologist*, *76*(1), 63–77. https://doi.org/10.1037/amp0000716

Koch, J., Drazic, I., & Schermuly, C. C. (2023). The affective, behavioural and cognitive outcomes of agile project management: A preliminary meta-analysis. *Journal of Occupational & Organizational Psychology*, *96*, 678–706. https://doi.org/10.1111/joop.12429

Koch, J., & Schermuly, C. C. (2021). Who is attracted and why? How agile project management influences employee's attraction and commitment. *International Journal of Managing Projects in Business*, *14*(3), 699–720. https://doi.org/10.1108/IJMPB-02-2020-0063

Leblanc, P.-M., Harvey, J.-F., & Rousseau, V. (2024). A meta-analysis of team reflexivity: Antecedents, outcomes, and boundary conditions. *Human Resource Management Review*, *34*(4), 101042. https://doi.org/10.1016/j.hrmr.2024.101042

Lehmann-Willenbrock, N. (2025). Dynamic interpersonal processes at work: Taking social interactions seriously. *Annual Review of Organizational Psychology & Organizational Behavior*, *12*, 133–158. https://doi.org/10.1146/annurev-orgpsych-110622-035421

Lehmann-Willenbrock, N., Meyers, R. A., Kauffeld, S., Neininger, A., & Henschel, A. (2011). Verbal interaction sequences and group mood: Exploring the role of team planning communication. *Small Group Research*, *42*(6), 639–688. https://doi.org/10.1177/1046496411398397

Lindsjørn, Y., Sjøberg, D. I. K., Dingsøyr, T., R, B. G., & Dybå, T. (2016). Teamwork quality and project success in software development: A survey of agile development teams. *The Journal of Systems & Software*, *122*, 274–286. https://doi.org/10.1016/j.jss.2016.09.028

Magistretti, S., & Trabucchi, D. (2025). Agile-as-a-tool and agile-as-a-culture: A comprehensive review of agile approaches adopting contingency and configuration theories. *Review of Managerial Science*, *19*(1), 223–253. https://doi.org/10.1007/s11846-024-00745-1

Malik, M., Sarwar, S., & Orr, S. (2021). Agile practices and performance: Examining the role of psychological empowerment. *International Journal of Project Management*, *39*(1), 10–20. https://doi.org/10.1016/j.ijproman.2020.09.002

Marder, B., Ferguson, P., Marchant, C., Brennan, M., Hedler, C., Rossi, M., Black, S., & Doig, R. (2021). 'Going agile': Exploring the use of project management tools in fostering psychological safety in group work within management discipline courses. *International Journal of Management Education*, *19*(3), 100519. https://doi.org/10.1016/j.ijme.2021.100519

Mathieu, J. E., Gallagher, P. T., Domingo, M. A., & Klock, E. A. (2019). Embracing complexity: Reviewing the past decade of team effectiveness research. *Annual Review of Organizational Psychology & Organizational Behavior*, *6*, 17–46. https://doi.org/10.1146/annurev-orgpsych-012218-015106

Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team effectiveness 1997-2007. A review of recent advancements and a glimpse into the future. *Journal of Management*, *34*(3), 410–476. https://doi.org/10.1177/0149206308316061

McHugh, O., Conboy, K., & Lang, M. (2012). Agile practices: The impact on trust in software project teams. *IEEE Software*, *29*(3), 71–76. https://doi.org/10.1109/MS.2011.118

Newman, A., Donohue, R., & Eva, N. (2017). Psychological safety: A systematic review of the literature. *Human Resource Management Review*, *27*(3), 521–535. https://doi.org/10.1016/j.hrmr.2017.01.001

O'Rourke, H. P., & MacKinnon, D. P. (2018). Reasons for testing mediation in the absence of an intervention effect: A research imperative in prevention and intervention research. *Journal of Studies on Alcohol and Drugs*, *79*(2), 171–181. https://doi.org/10.15288/jsad.2018.79.171

Paasivaara, M., Durasiewicz, S., & Lassenius, C. (2009). Using scrum in distributed agile development: A multiple case study. *Proceedings of the 2009 4th IEEE International Conference on Global Software Engineering (ICGSE)* (pp. 195–204). IEEE. https://doi.org/10.1109/ICGSE.2009.27

Peeters, T., Van De Voorde, K., & Paauwe, J. (2022). The effects of working agile on team performance and engagement. *Team Performance Management: An International Journal*, *28*(1–2), 61–78. https://doi.org/10.1108/TPM-07-2021-0049

Petermann, M. K. H., & Zacher, H. (2021). Development of a behavioral taxonomy of agility in the workplace. *International Journal of Managing Projects in Business*, *14*(6), 1383–1405. https://doi.org/10.1108/IJMPB-02-2021-0051

Petermann, M. K. H., & Zacher, H. (2022). Workforce agility: Development and validation of a multidimensional measure. *Frontiers in Psychology*, *13*, 841862. https://doi.org/10.3389/fpsyg.2022.841862

Pikkarainen, M., Haikara, J., Salo, O., Abrahamsson, P., & Still, J. (2008). The impact of agile practices on communication in software development. *Empirical Software Engineering*, *13*(3), 303–337. https://doi.org/10.1007/s10664-008-9065-9

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Prediger, S., & Schermuly, C. C. (2025). How agile working increases innovative work behavior: The role of psychological empowerment and communication media. *Project Management Journal*. Advance online publication. https://doi.org/10.1177/87569728251314457

Prommegger, B., Huck-Fries, V., Wiesche, M., & Krcmar, H. (2019). Agile and attached: The impact of agile practices on agile team members' affective organisational commitment. *Proceedings of the 14th International Conference on Wirtschaftsinformatik* (pp. 861–875). Siegen, Germany.

Rietze, S., & Zacher, H. (2022). Relationships between agile work practices and occupational well-being: The role of job demands and resources. *International Journal of Environmental Research and Public Health*, *19*(3), 1258. https://doi.org/10.3390/ijerph19031258

Rietze, S., & Zacher, H. (2023). Agile Arbeitspraktiken: Chancen und Risiken für das berufliche Wohlbefinden. *Gruppe Interaktion Organisation Zeitschrift für Angewandte Organisationspsychologie (GIO)*, *54*(4), 483–498. https://doi.org/10.1007/s11612-023-00712-6

Rigby, D., Sutherland, J., & Noble, A. (2018). Agile project management: Agile at scale. *Harvard Business Review*, *2*, 88–96. https://hbr.org/2018/05/agile-at-scale

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, *48*(2), 1–36. https://doi.org/10.18637/jss.v048.i02

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research*, *8*(2), 23–74. https://doi.org/10.23668/psycharchives.12784

Schonfeld, I. S., & Mazzola, J. J. (2013). Strengths and limitations of qualitative approaches to research in occupational health psychology. In R. R. Sinclair, M. Wang, & L. E. Tetrick (Eds.), *Research methods in occupational health psychology: Measurement, design, and data analysis* (pp. 268–289). Routledge/Taylor & Francis Group.

Schwaber, K., & Sutherland, J. (2017). *The scrum Guide: The definitive Guide to scrum: The rules of the game*. https://scrumguides.org/docs/scrumguide/v2017/2017-Scrum-Guide-US.pdf

Seltzer, R. G. N. (2020). The perilous use of proxy variables. *Evaluation & the Health Professions*, *44*(4), 428–435. https://doi.org/10.1177/01632787209033

Setor, T. K., & Joseph, D. (2020). When agile means staying: A moderated mediated model. *Journal of Computer Information Systems*, *62*(1), 186–195. https://doi.org/10.1080/08874417.2020.1759160

Stray, V., Moe, N. B., & Bergersen, G. R. (2017). Are daily stand-up meetings valuable? A survey of developers in software teams. In X. Franch, P. Mersmann, & J. Simmonds (Eds.), *Product-focused software process improvement. Lecture notes in business information processing* (Vol. 283, pp. 274–281). Springer. https://doi.org/10.1007/978-3-319-57633-6_20

Stray, V., Moe, N. B., & Sjoberg, D. I. K. (2020). Daily stand-up meetings: Start breaking the rules. *IEEE Software*, *37*(3), 70–77. https://doi.org/10.1109/MS.2018.2875988

Stray, V., Sjøberg, D. I. K., & Dybå, T. (2016). The daily stand-up meeting: A grounded theory study. *The Journal of Systems & Software*, *114*, 101–124. https://doi.org/10.1016/j.jss.2016.01.004

Tripp, J. F., Riemenschneider, C. K., & Thatcher, J. B. (2016). Job satisfaction in agile development teams: Agile development as work redesign. *Journal of the Association for Information Systems*, *17*(4), 267–307. https://doi.org/10.17705/1jais.00426

Van Woerkom, M., & Van Engen, M. L. (2009). Learning from conflicts? The relations between task and relationship conflicts, team learning and team performance. *European Journal of Work & Organizational Psychology*, *18*(4), 381–404. https://doi.org/10.1080/13594320802569514

VersionOne. (2022). *15th state of agile report*. https://digital.ai/resource-center/analyst-reports/state-of-agile-report