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RESEARCH ARTICLE

The relationships between group-affect tone, transactive memory system, and teams' incremental creativity

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Abstract
This study explores the relationships between group-affect tone, teams' transactive memory systems (TMSs), and teams' incremental creativity. Data were collected from 334 team members and 70 team leaders across 70 teams. Results indicate that positive group-affect tone enhances TMS, while negative group-affect tone impedes it. TMS positively impacts team incremental creativity. Additionally, both types of group-affect tone influence incremental creativity through TMS mediation. This research advances TMS theory and group-affect tone, substantiating the affect-cognition model and deepening the understanding of TMS's role in incremental creativity.

Keywords: ANOVA; multiple regression; teams and teamwork; organizational behavior; group dynamics

Introduction

In contemporary organizations, teams are relied upon to accomplish complex tasks due to their diverse expertise (Hülsheger, Anderson, & Salgado, 2009), enabling swift responses to market demands. Integrating members' expertise rapidly is crucial for success, with the team transactive memory system (TMS) being a significant research focus. TMS is a metacognitive process where team members collaboratively share, store, and retrieve specialized knowledge, enhancing team performance (Aissa, Gurău, Psychogios, & Somsing, 2022; He & Hu, 2021; Kim, Kim, & Jo, 2021).

Research has identified factors fostering TMS, including team size (Ren, Carley, & Argote, 2006), member stability (Lewis, Lange, & Gillis, 2005), and knowledge heterogeneity (Zhang, Wang, & Hao, 2020). Leadership styles like transformational (Bachrch & Mullins, 2019) and shared leadership (He & Hu, 2021; Lyndon, Pandey, & Navare, 2022) also enhance TMS.

Team interactions influence TMS through cognitive, motivational, and affective dimensions (Rapp, Maynard, Domingo, & Klock, 2021). Cognitive interactions, such as high trust (Tang, 2014), positive psychological climate (Kim et al., 2021), and social capital (Yan, Peng, & Zha, 2023), foster TMS. Motivational interactions, like high role identification (Pearsall, Ellis, & Bell, 2010) and team self-efficacy (Leo, Filho, Lopez-Gajardo, Garcia-Calvo, & Gonzalez-Ponce, 2023), also promote TMS. However, empirical studies on affective interactions' influence on TMS are scarce (Neff, Fulk, & Yuan, 2014), and there is limited evidence on the relationship between group affective tone and TMS.

Group affective tone, defined as the 'consistent or homogeneous affective reactions among team members' (George, 1990, p. 108), is an affective component of team emergent states (TESs) (Marks, Mathieu, & Zaccaro, 2001). Affect influences individual cognition (Forgas, 2019), such as TMS (Rapp et al., 2021). The empirical relationship between these constructs is relatively new, prompting further

exploration (Rapp et al., 2021). This study links group affective tone with TMS, using the broaden-and-build theory (Fredrickson, 2001) and the 'affect-as-input' theory (Martin & Stoner, 1996), to understand its influence on team creativity.

The broaden-and-build theory suggests that positive affect expands cognitive, attitudinal, and behavioral repertoires, building resources like knowledge and resilience and fostering a happiness-productivity relationship (García-Buades, Peiró, Montañez-Juan, Kozusznik, & Ortiz-Bonnín, 2020). This theory, integrated with the 'affect-as-input' theory (Martin & Stoner, 1996), applies to the team level, proposing that group affective tone influences team cognition, attitudes, and behaviors, aiding in the development of TMS.

The relationship between TMS and team performance is well-documented (He & Hu, 2021; Kim et al., 2021), but its link to team creativity still needs to be explored. While some studies confirm a positive correlation between TMS and team creativity (Aissa et al., 2022; Lv, Liu, Yang, & Cai, 2023), others suggest it may not favor creativity (Peltokorpi, 2008) or propose a non-linear relationship (Peltokorpi & Hasu, 2016). The inconsistencies may stem from different criteria for measuring team creativity, which includes radical and incremental creativity, each with distinct antecedents, processes, and outcomes (Madjar, Greenberg, & Chen, 2011).

Adopting the broaden-and-build theory, this study focuses on TMS's relationship with radical and incremental team creativity. Radical creativity involves original ideas, while incremental creativity focuses on adaptive ideas. Research on these types' antecedents is limited (Li, Lin, & Liu, 2019). This study examines these relationships, highlighting group affective tone's significant impact on TMS and team creativity.

Literature review

Transactive memory systems

A team TMS is defined as a 'cooperative division of cognitive labor among team members for encoding, storing, and retrieving information from different domains that they depend on each other to manage' (Wegner, 1987). In essence, team members act as external information repositories, each specializing in their areas of expertise while relying on others for knowledge in different domains. Through prolonged interactions, members become aware of 'who knows what' and 'who knows who knows what' (Austin, 2003, p. 866). Each member is responsible for their expertise and collaboration to complete team tasks.

TMS comprises three components: specialization, credibility, and coordination (Lewis, 2003). Specialization involves identifying each person's expertise and assigning tasks accordingly. Credibility refers to members trusting the expert advice of others and using this information in decision-making. Coordination involves extracting and providing knowledge as needed to integrate information and accomplish tasks.

TMS functions as a 'team knowledge pool' and embodies 'collaborative integration', crucial for smooth team operations in rapidly changing and complex organizational environments. Individual members cannot master all required knowledge; thus, utilizing others' memory structures as external memory reduces cognitive load (Wegner, 1995). Specialization deepens for individuals, reduces redundancy, diversifies team knowledge, and increases available information, enhancing team learning (Lewis, 2003; Lewis et al., 2005). Teams with an established TMS perform better on tasks than those without (Moreland & Myaskovsky, 2000).

Group-affect tone

Groups, like individuals, experience various affective states, known as group-affect tone, defined as 'consistent or homogeneous affective reactions within a group' (George, 1990, p.108). According to emotional contagion theory (Hatfield, Cacioppo, & Rapson, 1994), team members can transmit moods implicitly or explicitly during interactions, resulting in a consistent affective state

(Barsade, 2002; Bartel & Saavedra, 2000). Individual moods influence others, forming a shared mood state (Bartel & Saavedra, 2000; Kelly & Barsade, 2001).

Group-affect tone can be positive (PGAT) or negative (NGAT), emphasizing homogeneous positive or negative affect states within a group (George, 1995). Empirical studies have shown that group affect influences team interactions and outcomes, such as collective efficacy (Kim & Shin, 2015), information elaboration (Huang, Liu, Cheung, & Sun, 2022), and team performance and innovation (Shin, Kim, & Lee, 2019; To, Tse, & Ashkanasy, 2015).

Previous literature on TMS indicates its influence on team interactions and outcomes, such as knowledge sharing (Yan et al., 2023), team learning (Kim et al., 2021), and team creativity and innovation (Aissa et al., 2022; Lv et al., 2023). However, the relationship between team affective tone and TMS on team creativity must still be explored (Rapp et al., 2021).

According to the broaden-and-build theory (Fredrickson, 2001), affect influences cognition, attitudes, and actions. Positive affect increases cognitive flexibility (Isen, Daubman, & Nowicki, 1987), positive emotions (Walter & Bruch, 2008), and prosocial behavior (Bartlett & DeSteno, 2006), developing enduring resources like knowledge (Shin, 2014), resilience (Sagone & Indiana, 2017), and positive social interactions (Rhee, 2007). The 'affect-as-input' theory (Martin & Stoner, 1996) suggests that current emotions provide information to adjust behavior accordingly. Positive affect signals that actions are favorable, while negative affect signals that actions should be inhibited. These theories apply at the team level (Peñalver, Salanova, Martínez, & Schaufeli, 2019; Rusdi & Wibowo, 2022). Based on these theoretical perspectives, this study proposes the relationship between team affective tone and TMS.

The relationship between group-affect tone and TMSs

Group affective tone and TMSs are both types of TESs, which are classified into team processes and emergent states (Marks et al., 2001). TES can be affective, cognitive, or motivational and vary dynamically with the team's inputs, processes, and outcomes, significantly impacting team performance (Mathieu & Luciano, 2019).

Rapp et al. (2021) reviewed empirical studies on TES from 2000 to 2020, identifying over 50 constructs categorized into seven types. They highlighted the importance of affective and cognitive TES, noting that group affective tone and TMS fall into these categories. While antecedents of TMS have been studied, less attention has been given to the relationships between TMS and other TESs (Rapp et al., 2021, p.77).

According to the broaden-and-build theory (Fredrickson, 2001), affect significantly impacts cognitive processes and behaviors. This study posits that group affective tone influences cognitive interactions among team members, particularly the information processing involved in specialization and collaboration.

A positive affect tone facilitates the development of TMS by enhancing cognitive flexibility, increasing the likelihood of discussing task-relevant information, and supporting expertise-retrieval processes (Hong, 2013; Yuan, Carboni, & Ehrlich, 2010). It also promotes cooperation, trust, and willingness to share information, leading to better coordination and integration of tasks (Kim & Shin, 2015). Members respect each other's expertise, fostering accurate division of labor and deep discussions (Shin, 2014), ultimately enhancing the team's knowledge base and TMS (Hood, Bachrach, Zivnuska, & Bendoly, 2016; Mell, van Knippenberg, & van Ginkel, 2014). Thus, the first hypothesis is:

Hypothesis 1a: Positive group-affect tone is positively related to TMS.

Conversely, a negative affect tone restricts cognition and actions, leading to lower trust, increased interpersonal conflicts, and defensive relationships (Felps, Mitchell, & Byington, 2006; Jordan, Lawreence, & Troth, 2006). This environment hinders information exchange and expertise

recognition, impairing the TMS. Members may withhold information or improperly divide tasks, preventing knowledge from becoming shared (Hong, 2013; Yuan et al., 2010). Consequently, the second hypothesis is:

Hypothesis 1b: Negative group-affect tone is negatively related to TMS.

Radical team creativity and incremental team creativity relative to TMSs

Previous research has established a positive relationship between TMS and team performance (Kim et al., 2021; He & Hu, 2021; Lyu et al., 2022). However, findings on the relationship between TMS and team creativity have been inconsistent and inconclusive. Some studies suggest a positive link between TMS and team creativity and innovation (Aissa et al., 2022; Fan et al., 2016; Lv et al., 2023), while others propose a non-significant or curvilinear relationship (Peltokorpi, 2008; Peltokorpi & Hasu, 2016).

This study suggests that the inconsistency may be due to different indicators of team creativity. Team creativity involves the production of novel and useful ideas (Amabile, 1996), traditionally viewed as a uniform construct encompassing novelty and usefulness (Gilson & Madjar, 2011). Recent studies, however, distinguish between radical and incremental creativity (Gilson & Madjar, 2011; Madjar et al., 2011; Sung & Choi, 2021).

Radical creativity involves substantial departures from existing practices, emphasizing breakthroughs and risk-taking (Madjar et al., 2011; Tiberius, Schwarzer, & Roig-Dobón, 2021). Incremental creativity involves minor modifications to existing practices, focusing on adaptive ideas and minor changes (Madjar et al., 2011; Tiberius et al., 2021). Different precursors influence these two types of creativity (Gilson & Madjar, 2011).

Given the inconsistent findings on TMS and team creativity, this study hypothesizes that TMS has a stronger positive relationship with incremental creativity than radical creativity. TMS benefits incremental creativity through stable team environments that facilitate the coordination and integration of expertise. Incremental creativity thrives in environments with established expertise and regular communication (Peltokorpi, 2008; Tang, 2015). TMS supports this by enhancing internal knowledge creation and ongoing adaptation (Bierly & Chakrabarti, 1996; Madjar et al., 2011). Hence, the first hypothesis is:

Hypothesis 2: TMSs have a stronger positive relationship with team incremental creativity than radical creativity.

The mediating role of teams' TMSs in the relationship between group-affect tone and incremental team creativity

Group affective tone significantly impacts team performance and creativity, aligning with the view that happiness leads to productivity (García-Buades et al., 2020). However, few studies have examined how group-affect tone contributes to team creativity. Previous research has explored social processes (Reiter-Palmon, Wigert, & de Vreede, 2012), such as collective efficacy (Kim & Shin, 2015) and regulatory focus state (Emich & Vincent, 2020), as mediators. Cognitive processes have been less studied (Huang et al., 2022; Shin et al., 2019). A recent meta-analysis (Peñalver, Salanova, & Martínez, 2020) identified few studies examining the cognitive mediators between group-affect tone and team performance.

This study proposes that TMS mediates the relationship between group-affect tone and team creativity, based on the broaden-and-build theory (Fredrickson, 2001) and the 'affect-as-input' theory (Martin & Stoner, 1996). Positive affect broadens cognition and behaviors, developing intellectual and social resources that enhance team creativity (Emich & Lu, 2021; Emich & Vincent, 2020).

This study adopts this perspective, proposing that TMS mediates the relationship between group-affect tone and incremental team creativity.

Positive group-affect tone (PGAT) enhances TMS by fostering cognitive flexibility, positive emotions, and prosocial behavior (Bartlett & DeSteno, 2006; Isen et al., 1987; Walter & Bruch, 2008). It promotes high-quality interactions, information exchange, and a willingness to integrate expertise, improving incremental team creativity. Conversely, negative group-affect tone (NGAT) restricts cognition, increases interpersonal conflicts, and reduces information sharing (Felps et al., 2006; Lin, He, Baruch, & Ashforth, 2016), hindering TMS and incremental creativity. Thus, the following hypotheses are proposed:

Hypothesis 3a: PGAT positively influences TMS, thereby enhancing incremental creativity.

Hypothesis 3b: NGAT negatively influences TMS, thereby reducing incremental creativity.

Method

Data and sample

The study's samples were collected from work teams at Taiwanese corporations in two stages. Initially, data were gathered from two industrial parks in northern Taiwan. The study focused on teams with complementary skills working toward common goals. Prospective participants were contacted via telephone and mail to explain the research purpose, requirements, and survey procedures. Approval for team members' participation was obtained from human resource managers through company contacts.

Before distributing the questionnaires, the study team reiterated the sample requirements to the human resource managers. These requirements specified that teams should be minor units working toward common goals with a clearly defined immediate supervisor, the team leader. The designated team leaders were those who frequently interacted with team members and were directly responsible for team performance outcomes. Once the human resource managers identified the teams and informed them about the survey, we mailed the survey packages to the team supervisors. Each package included survey guidelines (in yellow), team-leader surveys (in blue), team-member surveys (in white), and small gifts for participants. On the yellow documents, as noted above, were guidelines describing the three main parts of the survey: first, a brief of the research purpose; second, our explanations of what is meant by 'team', what types of teams we preferred (e.g., such small project-oriented teams as R&D teams and quality-improvement teams); and third, procedures for the distribution, recovery, and return of the surveys, including the instruction that team members were to seal their completed surveys in the attached personal envelopes, thus reducing team members' possible concern about exposing their responses to supervisors. Team leaders distributed the survey to team members and completed the survey themselves. After collecting the completed surveys, each team leader was instructed to mail them to us via the attached return envelopes.

We surveyed 490 team members and 98 team leaders across 98 teams. Responses were received from 445 members and 89 leaders in 89 teams, achieving a 90.1% response rate. Following Timmerman (2005), invalid surveys were excluded, including data from 19 teams with less than two-thirds participation. This resulted in the removal of 111 members and 19 leaders, leaving valid data from 333 members and 70 leaders in 70 teams. The samples spanned various sectors: marketing and service (35.7%), manufacturing (30%), technology (27.1%), healthcare (5.7%), and government (1.4%). Among the team leaders, 70.6% were male, averaging 39.1 years (SD = 8.8). Education levels included 7.1% with doctoral degrees, 28.6% with master's degrees, 57.1% with undergraduate degrees, and 7.2% with no college degree. Their average tenure as leaders was 46.2 months (SD = 46.8).

Among team members, 68.2% were male, with an average age of 30.9 years (SD = 6.1). Education levels included 2.7% with doctoral degrees, 34.3% with master's degrees, 52.4% with undergraduate degrees, and 10.5% with no college degree. The average team size was 6.1 members (SD = 3.8), with an

average team longevity of 81.8 months (SD = 96.8) and an average affiliation duration of 40.2 months (SD = 44.4). The most common team sizes were three-member teams (22.9%) and five-member teams (18.6%), with team sizes ranging from 3 to 20 members.

Measurement

Positive and negative group-affect tone

PGAT and NGAT were assessed using the Positive and Negative Affect Schedules (Watson, Clark, & Tellegen, 1998). The survey contained 10 items for each tone, using a 5-point Likert scale. Team members indicated their feelings during team interactions over the past 3 months. Cronbach's αs for positive and negative moods were .94 and .93, respectively.

Transactive memory systems

TMS was measured using a scale adapted from Lewis (2003). The scale consisted of 15 items rated on a 5-point Likert scale. Items included statements about specialized knowledge and team coordination. Items included 'Each team member has specialized knowledge of some aspect of our project.' The composite TMS score had a Cronbach's α of .82.

Radical creativity and incremental creativity

Team creativity was assessed using items from Madjar et al. (2011), rated on a 7-point Likert scale. Radical creativity included originality in teamwork, while incremental creativity involved using existing ideas in new ways. Cronbach's αs were .91 and .80, respectively.

Control variables

According to team-related literature, this study controlled for team size, team longevity, demographic variables, and task interdependence, as these variables influence team affect tone and TMS (Bartel & Saavedra, 2000; Hülsheger et al., 2009). Additionally, we controlled for industry and team character (R&D vs. non-R&D teams). Mean scores for team tenure and longevity, as well as standard deviations for gender, age, and education, were calculated as team composition variables.

Data aggregation and validity of the measures

We used the agreement index (r_{wg}) to assess whether individual members' responses could be aggregated at the team level. Median r_{wg} values higher than .70 are considered sufficient (Chen, Mathieu, & Bliese, 2005). Our results showed median r_{wg} values of .97, .76, and .98 for PGAT, NGAT, and TMSs, respectively, indicating strong agreement among team members (Klein & Kozlowski, 2000). We also calculated intra-class correlations (ICCs) at the individual level ($ICC_{(1)}$) and group level ($ICC_{(2)}$) (Chen et al., 2005). The results were: PGAT (.15 for $ICC_{(1)}$ and .41 for $ICC_{(2)}$), NGAT (.14 for $ICC_{(1)}$ and .41 for $ICC_{(2)}$), and TMSs (.16 for $ICC_{(1)}$ and .44 for $ICC_{(2)}$). Although $ICC_{(2)}$ values are slightly below the recommended .60 threshold, aggregation is justified due to the group-level construct of group-affect tone, sensitivity of $ICC_{(2)}$ to team size, and high r_{wg} values.

We conducted a confirmatory factor analysis to examine the validity of the hypothesized five-factor model. Using Mplus Version 7.4 (Muthén & Muthén, 1998), we reduced the number of indicators for PGAT, NGAT, and TMSs, resulting in three new indicators for PGAT and NGAT, four for TMSs, three for team performance, and two for team creativity. The confirmatory factor analysis, with bootstrapping and maximum likelihood estimations, showed that the five-factor model ($\chi 2$ (94) = 159.1, $p < .00$; CFI = .93; RMSEA = .10; SRMR = .06) provided a better fit than the one-factor model ($\chi 2$ (104) = 709.1, $p < .00$; CFI = .31; RMSEA = .29; SRMR = .24) (Bentler, 1995). These results indicate the adequacy of the hypothesized five-factor model.

Results

Table 1 shows the means, standard deviations, and correlations for all variables of interest. PGAT is significantly and positively related to TMSs ($r = .45$, $p < .001$) and radical creativity ($r = .27$, $p < .05$) but not significantly related to incremental creativity ($r = .12$, n.s.). NGAT is significantly and negatively related to TMSs ($r = -.47$, $p < .001$) and not significantly related to radical creativity ($r = .10$, n.s.) or incremental creativity ($r = .08$, n.s.). There is a correlation between TMSs and radical creativity ($r = .23$, $p < .10$) and between TMSs and incremental creativity ($r = .33$, $p < .001$).

We tested the hypotheses using hierarchical regression analyses (see Table 2), mean-centering all predictor variables to interpret parameters and reduce multicollinearity (Aiken & West, 1991).

Model 2 of Table 2 shows that, after controlling for industry, team size, team character, gender, age, education, team tenure, team longevity, and task interdependence, and including both group-affect tones in the regression equation, PGAT is significantly and positively related to TMSs ($\beta = .42$, $p < .001$) and NGAT is significantly and negatively related to TMSs ($\beta = -.35$, $p < .001$), supporting Hypotheses 1a and 1b.

Hypothesis 2 proposed that TMSs affect incremental creativity. After controlling for similar demographic variables and both PGAT and NGAT, Model 4 of Table 2 shows TMSs are significantly and positively related to incremental creativity ($\beta = .49$, $p < .01$). Model 6 shows no significant relationship between TMSs and radical creativity ($\beta = .18$, n.s.). These results support Hypothesis 2.

Testing the mediating effect of TMSs

Hypothesis 3a proposed that PGAT influences incremental creativity through TMSs. Using the SPSS PROCESS macro (Hayes, 2013), we tested indirect effects with bias-corrected confidence intervals using bootstrapping (5,000 repetitions). Indirect effects are significant if confidence intervals exclude zero. We examined PGAT's paths via TMSs to radical and incremental creativity, controlling for industry, team size, team character, gender, age, education, team tenure, team longevity, task independence, and NGAT. Table 3 shows Path A results: the 95% confidence interval for PGAT's indirect effect on incremental creativity via TMSs is [.06, .67], and for radical creativity via TMSs is [−.11, .40]. Thus, PGAT significantly influences incremental creativity mediated by TMSs.

Hypothesis 3b proposed that NGAT influences incremental creativity via TMSs. Controlling for industry, team size, team character, gender, age, education, team tenure, team longevity, task independence, social desirability, and PGAT, Table 3 shows Path B results. The 95% confidence interval for NGAT's indirect effect on incremental creativity via TMSs is [−.58, −.04], and for radical creativity via TMSs is [−.37, .05]. TMSs mediate the negative relationship between NGAT and incremental creativity.

Discussion

Most empirical studies suggest that TMS positively influences team creativity (Aissa et al., 2022; Lv et al., 2023). However, few studies have examined the antecedents of group affect concerning TMS, particularly the factors that promote or impede participation in transactive processing within teams. This study combines broaden-and-build theory (Fredrickson, 2001) and TMS theory to develop an empirical framework linking group-affect tone, TMS, and team creativity. We propose that group-affect tone predicts TMS, influencing teams' incremental creativity through TMS.

The study reveals that PGAT significantly enhances TMS, while NGAT significantly impedes it. These results underscore that group-affect tone is crucial for developing TMS in teams. Both constructs are part of the team emergence state construct (Marks et al., 2001; Rapp et al., 2021). While previous research has often focused on either group-affect tone or TMS individually, this study considers both to examine their interrelationship. Following Rapp et al.'s (2021) call for more empirical

Table 1. Descriptive statistics and correlation coefficients

Variables	*M*	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Industry	4.2	1.5	-												
2. Team size	6.1	3.8	−.13	-											
3. Team char.[b]	.40	.49	−.10	.03											
4. Gender[a]	.25	.25	.02	.15	.06										
5. Age[a]	4.0	3.3	−.11	.11	−.05	−.07									
6. Education[a]	.34	.36	.10	.28*	.08	.19	.13								
7. Team tenure	35.7	30.6	−.22+	.18	−.01	−.07	.21+	.20+							
8. Team long.[b]	81.8	96.8	−.04	.13	−.08	−.10	.52***	.13	.42***						
9. Task ind.[b]	3.57	.33	.26*	−.10	−.09	−.02	−.10	.10	.01	−.06					
10. PGAT[b]	3.33	.41	.33*	−.21+	−.07	−.21+	.06	.02	−.31**	−.06	.13				
11. NGAT[b]	1.74	.47	.02	−.03	−.05	−.21+	.34**	−.05	−.13	−.29*	−.22+	−.06			
12. TMS[b]	3.76	.23	.37*	−.02	.12	−.10	−.21+	−.00	−.11	−.14	.35**	.45***	−.47***		
13. R.C.[b]	4.90	1.0	.24*	.23*	.07	.00	−.13	.22+	−.13	.07	−.06	.27*	.10	.23+	
14. I.C.[b]	5.47	.81	.23+	.16	.16	−.06	.10	.20+	.06	.13	.07	.12	.08	.33***	.54***

$N = 70$.
[a]Gender, age, and education were conducted by calculating the standard deviation.
[b]Team char. = team character, Team long. = team longevity, Task ind. = task independence, PGAT = positive group affective tone, NGAT = negative group affective tone, TMS = transactive memory system, R.C. = radical creativity, I.C. = incremental creativity.
'+' < .10, *$p < .05$, **$p < .01$, ***$p < .001$.

Table 2. Results of regression coefficients for group affective tone, transactive memory system, and teams' creativity

	TMS		Incremental creativity		Radical creativity	
	M1	M2	M3	M4	M5	M6
Control variables						
Industry	.33**	.24*	.26*	.11	.24+	.10
Team size	.06	.11	.16	.12	.24+	.27*
Team character[b]	.19+	.20	.19	.10	.07	.07
Gender[a]	.07	.10	−.11	−.12	−.09	.01
Age[a]	−.11	−.09	.05	.06	−.24+	−.34*
Education[a]	−.10	−.13	.11	.16	.20	.19
Team tenure	.07	.09	.00	.01	−.13	.01
Team longevity[b]	−.06	.04	.09	.05	.20	.15
Task independence[b]	.28*	.19*	.04	−.05	−.12	−.13
Independent variables						
PGAT[b]		.42***		−.10		.28+
NGAT[b]		−.35**		.25+		.27+
TMS[b]				.49**		.18
R^2	.28*	.55***	.17	.29*	.23+	.35
$\triangle R^2$	.28*	.27***	.17	.12*	.23+	.12
F	2.50*	6.35***	1.32	1.90+	2.00+	2.46*

$N = 70$.
[a]Gender, age, and education were conducted by calculating the standard deviation.
[b]PGAT = positive group affective tone, NGAT = negative group affective tone, TMS = transactive memory system.
'+' < .10, *p < .05, **p < .01, ***p < .001.

Table 3. Results of the indirect relationship between group affective tone, transactive memory system, and teams' creativity

	Effect	Boot SE	Boot LLCI	Boot ULCI
Path A				
PGAT-TMS-Incremental creativity	.30	.15	.06	.67
PGAT-TMS-Radical creativity	.13	.13	−.11	.40
Path B				
NGAT-TMS-Incremental creativity	−.22	.13	−.58	−.04
NGAT-TMS-Radical creativity	−.10	.10	−.37	.05

$N = 70$. Conducting 5,000 bootstrap samples for indirect effects and 95% confidence intervals reported.
PGAT = positive group affective tone, NGAT = negative group affective tone, TMS transactive memory system.

studies on the relationships between different team emergence state constructs, this study confirms that group-affect tone is a suitable antecedent for TMS.

Additionally, the study shows that PGAT positively influences incremental creativity via TMS, while NGAT negatively affects it. This contributes to the TMS literature by clarifying why the relationship between TMS and team creativity is unstable. The primary reason is the different metrics used to measure team creativity. The study suggests that TMS benefits incremental creativity more by distinguishing between radical and incremental creativity. Incremental creativity involves minor modifications and improvements within established workflows, making it well-suited to teams with a well-developed TMS. Thus, the results broaden the application of TMS theory, particularly regarding its relationship with incremental creativity.

From the group literature affect tone, empirical research on its mechanisms impacting team creativity has been scarce (Peñalver et al., 2020). This study deepens the understanding by proposing that TMS mediates the relationship between group-affect tone and team creativity. The broaden-and-build theory (Fredrickson, 2001) supports this perspective, explaining how group-affect tone impacts recognition of expertise, division of labor, and integration processes, ultimately affecting incremental creativity.

Recent literature suggests different antecedents and processes for radical and incremental creativity (Gilson & Madjar, 2011), including motivation and learning approaches (Malik et al., 2019; Jaussi & Randel, 2014; Li et al., 2019). This study provides evidence that TMS is more suitable for incremental creativity, contributing to the ongoing exploration of creativity's antecedents.

Limitations and recommendations for future research

This study has limitations. First, the cross-sectional design with self-reported data limits causal assertions. Future research should use temporally lagged designs to clarify causality. Second, while group-affect tone is addressed as an antecedent of TMS, other variables like communication processes (Yan, Hollingshead, Alexander, Cruz, & Shaikh, 2021) and team leadership (Lyu et al., 2022) also deserve attention. Further exploration of different team emergence states and their relationship with TMS (Rapp et al., 2021) is needed, including psychological safety climate (Kim et al., 2021) and affective trust (Qu, Xu, Wang, Wu, & Wang, 2023).

Third, the mechanisms through which TMS influences team creativity, especially the connections with radical and incremental creativity, merit further investigation. Incremental creativity involves exploitative learning, while radical creativity focuses on explorative learning (Madjar et al., 2011). The influence of TMS on these types of creativity may depend on the learning approach adopted by team members, which future studies should explore.

Finally, boundary conditions applicable to the TMS-team creativity relationship, such as power distance, in-group collectivism (Bachrach et al., 2019), market dynamism (Bachrch & Mullins, 2019), and knowledge heterogeneity (Zhang et al., 2020), need further examination. Future research should elaborate on the applied frameworks and theories regarding TMS.

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