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MASTER THESIS

Study of Team Innovation Performance predictors: The intervening effect of College Students' Entrepreneurial Team Faultlines

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ABSTRACT

Objective- This paper aims to examine the mechanisms of team innovation climate on team innovation performance, through the mediating role of transactive memory system. And see the moderation effect of identity-based team faultlines & knowledge-based team faultlines on the relationship of transactive memory system and innovation performance.

Methodology-This cross-sectional empirical study, through a questionnaire form, survey 104 student entrepreneurial teams in China, totaling 472 participants. The data was aggregated at team level of analysis using SPSS27, and examine with multiple regression analysis and bootstrap analysis.

Findings-This study explored the boundary conditions for the use of transactive memory system on team innovation performance, and the results showed that the effects of transactive memory system on team innovation performance were positively moderated by knowledge-based faultline and negatively moderated by identity-based faultline, but the moderating effect was not significant when the level of Identity-based team faultline was low.

Limitations-First, the main source of data for this study is the university student entrepreneurial teams in China. Second, the study is mainly a cross-sectional study. It is more difficult to track the dynamic changes. Third, the measurement for team faultlines not consider other implicit indicators such as personality traits, positions, etc.

Practical implications- College entrepreneurial leaders should not only look for people with the same profession, technology, background and experience to form a team, but also build a properly differentiated team, selecting some members with different professional backgrounds and experiences to form a team, and avoiding members with too big an age gap to form a team, which will be more helpful to the team's innovation.

Keywords- Team faultlines, team innovation climate, team innovation performance, transactive memory system.

1. INTRODUCTION

As an important force in innovation and entrepreneurship, college students mainly engage in entrepreneurial activities in the form of teams. The entrepreneurial rate of college students has increased year by year, but the failure rate remains high. Some scholars pointed out that the main reason for the low success rate of college students' entrepreneurial team is the low level of team innovation. The research of Theng and Boon (1996) shows that the most important reason for the low success rate of college entrepreneurial teams is the low level of team innovation. Team innovation is the engine that drives the entrepreneurial team forward, and without innovation, the team loses the motivation to move forward (Van Knippenberg, 2017).

According to Wang (2012), unlike other entrepreneurial teams, the members of college students' entrepreneurial teams are all college students, who are different from the ordinary members of other teams in that they have higher academic qualifications, better professional foundation, and are relatively more specialized in terms of ability and technical level, which makes them more inclined to develop high and new technologies. At the same time, as college students and young people, they have high entrepreneurial enthusiasm and strong sense of innovation, which allows them to choose entrepreneurial activities on their own initiative.

Furthermore, as college students and young people, they have high enthusiasm for entrepreneurship, high energy and innovation consciousness, which allows them to choose entrepreneurial activities on their own initiative. In addition, due to their less social experience and lack of capital accumulation, they are more in favor of entrepreneurial projects with less investment and less risk, which makes it easier for them to absorb the experience, and they can start again even if they fail (Lazar et al., 2020). Therefore, the advantages of university students' entrepreneurial team can be summarized as follows: active thinking, strong innovation ability, high enthusiasm for entrepreneurship; better professional knowledge and technology foundation; strong learning ability, good at grasping opportunities.

Teams are often made up of employees from different backgrounds (e.g. different genders, ages, values, perceptions, etc.), which raises the issue of team diversity. Therefore,

team composition is a key factor affecting the innovation level of college students' entrepreneurial teams (Kammet & Shuman, 1990), with appropriately differentiated team members can help brainstorm between members and can contribute to innovative. In the process of entrepreneurial team formation, a team is by a collection of people with different professional backgrounds and personality traits, who may come from all over the country or even the world and may have completely different characteristics (Yang et al., 2010), such as education, age, personality, and so on. The differences in these characteristics tend to cause team members with the same characteristics to identify with each other and gather together, thus forming multiple subgroups with some of the same characteristics.

The dividing line between subgroups is defined as the **team faultlines** (Lau & Murnighan, 1998), based on one or more unique characteristics. From the viewpoint of cognitive variety, cholars Williams and O'Reilly (1997) argue that team diversity can bring potential advantages to team processes and outputs. The members of team faultlines have different knowledge, so they can easily communicate with each other to generate a collision of ideas and thus facilitate innovation (Tajfel & Turner, 1986).

Cramton and Hinds' (2005) study demonstrated that team faultlines can bring differentiated information to a team, and that subgroup differences can accommodate differences in information perceptions, leading to a better awareness of other people's knowledge and expertise, and improving the team's ability to gather information and integrate knowledge. This cooperative division of labor, based on an individual's in-depth knowledge of another's strengths, is the **transactive memory system**.

Transactive memory system is a system that can improve the team's integration and resource allocation ability by summarizing and integrating the knowledge and expertise of the whole team members, which is formed through the communication and exchange of the team members in the process of accomplishing tasks (Wegner, 1987). In addition, the role of the external environment also has a greater impact, as a good atmosphere helps to improve members' work attitude, promote team member interaction, and create a safe atmosphere for members to share and facilitate innovation activities, which in turn enhances innovation performance. Therefore, the transactive memory system is likely to play a mediating role.

The formation of **team faultlines** may lead to increased conflict among team members, hindering interactions among them and thus reducing team innovation performance (Carton & Cummings, 2012). Or, it may increase cognitive differences among teams, making solutions more innovative (Zhao, Ge, & Liu, 2016), and improving team innovation performance (Tekleab & Quigley, 2014). However, it may not be related to innovation performance (Cannella et al., 2008), or have a more complex relationship.

In the research on college students' teams, it is still only focused on team building and team performance, which is not deep enough and specific enough, and the vision is relatively narrow. Therefore, this study is based on the students' entrepreneurial team, and the mechanism of transactive memory systemy, and team faultlines on team innovation performance in depth.

Research objective

This paper aims to examine mechanism of team innovation climate on team innovation performance, through the mediating role of transactive memory system. And moderation effect of identity-based team faultlines & knowledge-based team faultlines on the relationship of transactive memory system and innovation performance.

2. LITERATURE REVIEW AND HYPOTHESIS

Team Innovation Climate

The definition of innovation climate adopted in this study is consistent with the definition of innovation climate most frequently used by researchers, which is the consensus at the team (or organizational) level regarding how much team (or organizational) processes support and facilitate innovation. (Anderson & West, 1996, 1998).

Scholars such as Amabile et al. (1996), team innovation climate refers to an individual's perception of the work environment around him or her, and it is the external conditions that an individual can experience in the surrounding work environment that enhance his or her ability to innovate. Among the studies on team climate for innovation, the

most representative one is that of West (1998), a British psychologist, who developed the Team Climate Inventory (TCI), based on Anderson and West's (1998) belief that the factors affecting team climate for creativity include vision, security of participation, task orientation, and support for innovation.

Sun (2014) and other scholars point out that team innovation climate is an important contextual variable. When members of entrepreneurial team work closely together in a high innovation atmosphere, members communicate frequently (Tajfel & Turner, 1986), the speed of information exchange increases and the cognitive distance decreases.

Transactive Memory System

The theory of transactive memory system, as a theory of group cognition, describes the specialized division of cognitive labour for learning, remembering, and communicating knowledge from different domains (Wegner, 1987). When it comes to the encoding, storing, and retrieval of data from other substantive domains, team members in interdependent relationships evolved a cooperative division of labor that is known as a transactive memory system. (Wegner, 1985).

Wegner defines transactive memory system as a system in which each member possesses the sum of knowledge (the knowledge stock), and the set of knowledge about who knows what (the collective consciousness) (Wegner et al., 1985). When team members need information but cannot remember it themselves or suspect that their memories are not accurate, they can turn to other team members. In this way, each member's cognitive load is reduced, and they have access to far more specialized knowledge and information than any one individual could have on his or her own. At the same time, the interdependence of the members creates a team knowledge management system that enhances the team's ability to process information.

The Impact of Team Innovation Climate on Transactive Memory System

Team innovation atmosphere may promote the formation of interactive memory system. A high level of team innovation requires constant communication among team members, and when the team innovation climate is high, the speed of information exchange increases, bringing about a good communication climate that contributes to expertise recognition in the transactive memory system, which is the process by which members of a team learn about the domains in which the other members specialize without having to be specific about the exact information each domain contains (Wegner, 1995) , and the formation of a common ground (Clark, 1995). Team innovation climate is a vital element of innovation (Anderson & West, 1998). Therefore, we hypothesize that:

H_1: Team innovation climate positively affects transactive memory system.

The Impact of Transactive Memory System on Team Innovation Performance

Transactive memory systems positively affect team innovation performance because they allow team members to access sufficient expertise more easily, spark ideas faster, and reduce the time required for the innovation process, while at the same time, team members are able to use their knowledge of each other's expertise to effectively coordinate their interactions and reduce process losses through effective coordination, resulting in better innovation. Bolinger et al. (2009) and Tiwana and McLean (2005)showed that encouraging creativity in groups depends equally on people's readiness to coordinate and integrate the various contributions and views of other group members.

Therefore, we hypothesize that:

H_2: Transactive memory system positively affects team innovation performance.

Transactive Memory System as a Mediator Role

Several scholars have already confirmed the mediating role of transactive memory system. Huang & Liu's study (2021) confirmed the mediating role of transactive memory

system between team psychological safety and team creativity. Meanwhile, Mo and Xie (2009) examined transactive memory system can adequately account for how team learning influences team performance as a mediator.

Transactive memory systems positively affect team innovation performance because they allow team members to access sufficient expertise more easily, spark ideas faster, and reduce the time required for the innovation process, while at the same time, team members are able to use their knowledge of each other's expertise to effectively coordinate their interactions and reduce process losses through effective coordination, resulting in better innovation. They can improve decision-making efficiency through the rational use of cognitive conflicts and help the team to complete complex tasks efficiently (Amason, 1996).

Some scholars, such as Argote (2015), believe that team members' integration and the coordinated use of other members' knowledge and expertise can help teams effectively avoid the learning of redundant knowledge, avoid the process of organizing complicated information, and promote the generation of team innovations. Therefore, we hypothesize that:

H_3: Transactive memory system mediates the relationship between team innovation Climate and Team Innovation Performance.

Team Faultlines

The concept of team faultlines were developed by scholars Lau and Murnighan (1998). First published in Academy of Management Review in 1998, Lau and Murnighanused used team faultline as a theoretical mechanism to explain and explore the effects of team compositional characteristics. Team faultlines are derived from geologic faultlines zones; team faultlines that arise between individual team members due to differences in their personal attributes. Faultline theory suggests that a team is likely to split into several subgroups if team members’ demographic attributes align, and the hypothesised lines that divide these subgroups are termed team faultlines (Lau & Murnighan, 1998).

According to Carton and Cummings (2012), two subgroup types of teams faultlines are important to consider: identity-based subgroups, which would be formed according to the

tenets of social identity, such as gender, age, ethnicity, etc. (Tajfel & Turner, 1986), and knowledge-based subgroups, which would be formed according to the tenets of information processing, such as education background, tenure, etc. (Galbraith, 1974). The identity-based faultline represents the diversity of demographic characteristics, and the knowledge-based faultline represents the diversity of knowledge resources.

Existing research suggests that team faultlines have a major impact on team innovation and team performance, as well as on team cohesion, team communication, and team conflict. For example, Homan (2005) found that team faultlines promoted performance when team members agreed that diversity was beneficial to the team or to them as individuals; Gibson and Vermeulen (2003) found that moderate to high performance was associated with low performance. According to Lau and Murnighan (1998), faultlines can lead to team fragmentation and reduce team output by dividing teams into small groups that are relatively fixed and closed.

Results of previous research on team faultlines and team innovation vary in terms of the magnitude and direction of the effect. In line with Lau and Murnighan's (1998) findings, Dyck and Starke (1999), Li and Hambrick (2005) corroborate that team faultlines reduce team performance. However, some other scholars, such as Bezrukova et al. (2009) and Hart and Van Vugt (2006) have a different viewpoint, and they believe that team faultlines can promote team members' collaborative learning, team information interaction and integration, and enhance team decision-making quality, thus improving team performance.

The reason for the different views may be due to the different frame of reference perspectives, based on the information processing view that team faultlines can promote team performance (Homan et al., 2007), and based on the social categorization view that team faultlines can lead to lower team performance (Thatcher & Patel, 2012).

The Impact of Knowledge-Based Faultline on Team Innovation Performance

From a cognitive diversity perspective, O'Reilly and Williams (1997) argue that team diversity can bring potential advantages to team processes and outputs. The members of team

faultlines have different knowledge, so they can easily communicate with each other to generate a collision of ideas and thus facilitate innovation (Tajfel & Turner, 1986). Moreover, members may learn a lot from other members, gain a lot of different perspectives, and see things from other perspectives, thus avoiding "groupthink" (Cannon-Bowers, & Salas, 1993), "solidified thinking" (Lewis, 2003), and promoting the generation of innovative ideas, thus promoting the improvement of the team's innovative performance (Shi et al., 2013). In this case, members in knowledge-based faultlines can easier produce innovation performance on the basis of transactive memory systems. Therefore, we hypothesize that:

H_4: Knowledge-based faultlines positively moderates the relationship between team innovation climate and team innovation performance.

The Impact of Identity-Based Faultline on Team Innovation Performance

Ashforth and Mael (1989) frame their reserach on the Social identify theory, Social categorization theory, and Similarity-attraction theory. They argued that members would categorize themselves into a subgroup based on differences in externally dominant personal characteristics like age and ethnicity, and that once they were accepted into the group, they would prefer to communicate with other in-group members and avoid interacting with outsiders.

Pelled (1996) argues that the disadvantages of differentiated teams become more pronounced especially when some differences are difficult to reconcile, or have a long history of being difficult for members to accept or understand, which can lead to conflicts as well as poor social integration.

Hinds (2000) and Pelled (1996) point out that in a differentiated team, some members may have negative stereotypes of others or discriminate against others, such as members of different races and genders, etc., which makes them prone to conflict and ambivalence. Following this rational and evidences, we hypothesize that:

H_5: Identity-based faultlines negatively moderates the relationship between team innovation climate and team innovation performance.

H_6: The indirect effect of Innovation climate to Team innovation performance through Transactive memory system is moderated by team faultlines.

At figure 1 you can find the hypothesize moderated mediation model.

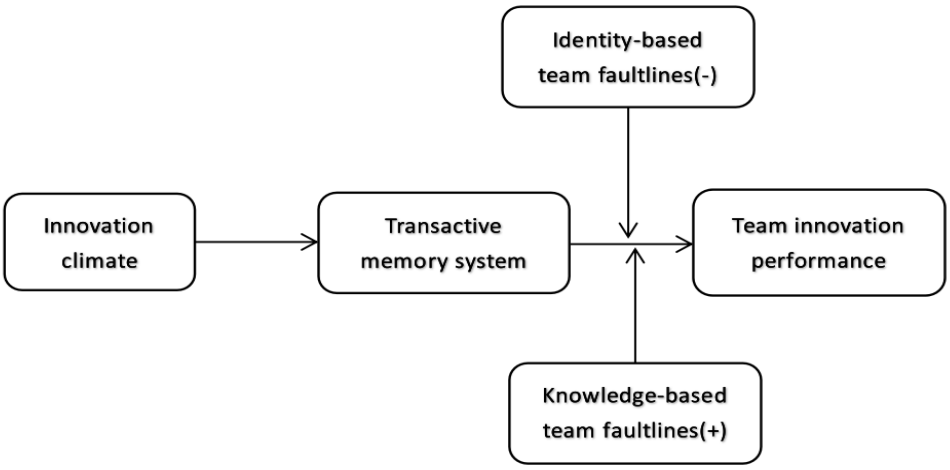

Figure 1. Research model

3. METHODOLOGY

Data collection

We sent 129 sets of questionnaires (totaling 498 questionnaires) to 129 student entrepreneurial teams in China. The members of these teams include alumni with college degree or students, with a status of enterprise legal persons and/or enterprises established within 5 years. The control enterprises period was established from January 1st, 2019 to the present.

We only consider teams with a total number of not less than 3 members (including team leaders). Moreover, members who have joined the team for less than one year were not selected, due to the needs of the study of members with some seniority in the team.

Data collection started from July 2023 to August 2023, and, first, 498 questionnaires were distributed by email and telephone, totaling 420 questionnaires for the team as a whole. After excluding the questionnaires that were not matched by team leaders and team members,

104 sets of valid questionnaires were finally obtained, totaling 472 questionnaires, of which 104 questionnaires were filled in by leaders and 368 questionnaires were filled in by team members.

Methods

This empirical research used a field questionnaire form to collect data. We test research hypotheses with SPSS v.27 software. We perform several statistical analyses startegies (e.g.; descriptive statistics, reliability and validity, multiple regression analysis and Bootstrap analysis).

First, we perform the **aggregation analysis**. Respondents were grouped according to team leader-team member correspondence. Data obtained from the individual level of the same team members was aggregated to the team level for subsequent analyses at team level..

Second, we test the **reliability and validity** of study variables to guarantee the quality of the data collected through questionnaires.

Third, we run the **multiple regression analysis**. A multiple regression model was established and the relationship between the five variables was tested.

Finally, **Bootstrap analysis** was conducted to examine the role of the mediating variables at different levels of moderation, and to show the moderated mediation effect pattern more clearly.

Measures

Innovation Climate. The Team Climate Inventory (TCI) was used to assess the team's climate for innovation. The TCI scale developed by Anderson and West (1998) has 36 items (short form version), including 4 sub-dimensions: vision, participative safety, task orientation and support for innovation. This four- factor theory of climate work group innovation was anticipated by West (1990), and has been proved to be predictive of innovation (West & Anderson, 1996). These items were assessed on a five-point Likert scale ranging from (1) "*Not at all*" to (5) "*To a very great extent*". Eamples of items are "Team work results are very

novel", "Lots of ideas come out of team work". Cronbach's α of this scale is 0.82.

Transactive Memory System. The 14-items scale of the transactive memory system refers to the studies of Qu and Li (2011), Lewis (2004), and Shi et al. (2013), and has 3 dimensions: expertise, trust, and coordination. Researchers generally agree that transactive memory systems improve team performance because they allow members to quickly acquire expertise in a wide range of areas and improve the integration of knowledge. Item examples are *"Each team member has specialized knowledge of some aspect of our project", "I know which team members have expertise in specific areas*". Cronbach's alpha for this scale is 0.88.

This part of the questionnaire was sent to the team members and was responded on a five point Likert scale ranging from (1) *Not at all*" to (5) *"To a very great extent*".

Team Innovation Performance. Team Innovation Performance was measured using a XXX items scale developed by Lovelace et al., (2001). It contains 4 dimensions: innovativeness of the team's product, the number of innovations or new ideas introduced by the team, the team's overall technical performance, and the team's adaptability to changes. Item examples are: "*Team work results are very novel", "Lot of ideas come out of team work".* The Cronbach alpha of the scale is 0.82

Because team innovation performance is difficult to measure with an objective financial indicator, Barrick et al. (1998) suggest using subjective judgment. This part of the questionnaire was only sent to the team leaders and was assessed through a five-point Likert scale ranging from (1) "*Not at all*" to (5) "*To a very great extent*".

Knowledge-Based & Identity-Based Faultlines. An early form of measuring faultlines is assessing strength using Thatchers Fau ratio as the percentage of group variation accounted for by the strongest division (Thatcher et al. 2003). In this study, five demographic characteristics (i.e., gender, age, education, specialty and tenure) were selected This indicates that a team has n members and q member's characteristics. Age and gender were used for the identity based faultline; while education, specialty, and tenure were used for the knowledge-based Faultline. Consequently, teams were divided into several subteams in S ways, dividing the intergroup sum of squares of the subteams under each grouping method,

The sum of squares of the overall characteristics of the team is the strength of the team's faultline (Fa_u).

$$Fau_{g} = \frac{\sum_{j=1}^{q}\sum_{k=1}^{2} n_k^g (\bar{x}_{jk} - \bar{x})^2}{\sum_{j=1}^{q}\sum_{k=1}^{2}\sum_{i=1}^{n_k^g} (\bar{x}_{ijk} - \bar{x})^2}, g = 1,2,3\ldots, \quad S$$

Control Variables. Scholars such as Gibso and Vermeulen (2003) have shown that team size and team age have an impact on team innovation performance, so we decided controlling for these variables when exploring team innovation model.

4. RESULTS

Aggregation analysis

Since this study was analyzed at the team level, but the evaluations of the two variables, Team innovation climate and Transactive memory system, were collected at the individual level, the data at the individual level must be aggregated to the team level, Results of the aggregation analyses are shown in Table 1.

Table1. Individual-Team level aggregation analysis

variable	Rwg(j)	ICC(1)	ICC(2)
Team innovation climate	0.86	0.26	0.83
Transactive memory system	0.80	0.30	0.88

First, in order to verify whether team members' evaluations are consistent, (i.e., internal consistency), we calculated the Rwg (j) coefficients of the team's innovation climate and transactive memory system. The mean value of Rwg (j) is 0.80 for the innovation climate, and the mean value of Rwg (j) is 0.86 for the transactive memory system.

We then calculated the intragroup correlation coefficients (ICC) of team innovation climate and transactive memory system, and obtained for Team innovation climate an ICC (1) of 0.30, and ICC (2) of 0.88. For Transactive memory system an ICC (1) of 0.26, and ICC (2)

of 0.83. these ratios meet the criterion of James (1982) that the ICC (1) should be >0.05, and the ICC (2) >0.5. Therefore, the two variables can be aggregated at the team level.

Correlation analysis

Descriptive statistics (mean, standard deviations, and zero order correlations) are shown in Table2. Team innovation climate is positively associated to transactive memory system ($r = 0.153$, $p < 0.01$). Transactive memory systems is positively related to team innovation performance ($r = 0.366$, $p < 0.01$). Team innovation climate is only significantly associate with Team innovation performance ($r = 0.313$, $p < 0.01$).

Table 2. Means, Standard Deviations, and Intercorrelations of Variables

	M	SD	1	2	3	4	5	6	7
1.Team size	5.32	1.36							
2.Team age	3.27	1.07	**0.541***						
3.Knowledge-based team faultline	0.45	0.21	**0.181***	0.240					
4.Identity-based team faultline	0.56	0.24	-0.125	-0.072	**-0336****				
5.Transactive memory system	3.41	0.87	0.235	0.334	**0.217****	**-0.319****	(0.88)		
6.Team innovation climate	2.82	0.49	0.081	0.097	0.055	-0.140	0.153	(0.87)	
7.Team innovation performance	3.16	1.10	0.114	0.125	**0.276****	**-0.294****	**0.366****	**0.314****	(0.82)

Notes. N=104, significant at *p<0.05,**p<0.01, ***p<0.001. Cronbach α are shown in the diagonal

Reliability and validity test

Hensen (2001) pointed out that the size of the internal consistency coefficient is related to the purpose of the study and the use of test scores, and the reliability coefficients of applied and validation studies should be above 0.8, and above 0.9 is better. As shown in Table 3, the overall reliability of the scale is 0.925, and the Cronbach's alpha of each variable is more than 0.8, indicating that the reliability of the research instrument is good.

Table 3. Cronbach's α coefficient test table

Variable	Items	Cronbach's α	Overall Cronbach's α
Team innovation climate	36	0.87	0.92
Transactive memory system	14	0.88	
Team innovation performance	4	0.82	

The correlation between the different variables was then tested by KMO and Bartlett's sphericity test.

Table 4. KMO and Bartlett's sphericity test.

Kaiser-Meyer-Olkin metric of sampling adequacy		0.736
Bartlett's Bartlett sphericity test	approximate chi-square	208.889
	df	45
	Sig.	0.0000

The result shows that the KMO value of the scale is 0.714 and the result of the sphericity test reaches the significance level of 0.001. There is good consistency between the questions and there is no need to delete related questions.

Multiple regression analysis

Mediation effect test

Hypothesis testing was conducted using multiple regression and the results are shown in Table 5. Model 2 showed a significant effect of team innovation climate on the transactive memory system ($\beta = 0.124$, $p < 0.01$), and Hypothesis H_1 was supported.

Model 3 tested that the transactive memory system also had a positive effect on team innovation performance ($\beta = 0.366$, $p < 0.001$), and Hypothesis H_2 was supported.

Model 5 shows the relationship between the independent variables and the dependent variable after adding the mediator, from which it is found that the coefficient of the

independent variable innovation climate on team innovation performance (β = 0.165, p > 0.05) becomes not significant after adding the transactive memory system, so the transactive memory system mediates the relationship between the team innovation climate and the team innovation performance and it is a complete mediator, then the hypothesis Hypothesis H_3 is supported.

Table 5. Mediation effect test.

Variables	Transactive memory system		Team innovation performance		
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Control Variables					
Team size	0.03	0.03	0.02	0.03	0.03
Team age	0.04	0.04	0.03	0.04	0.04
Independent variable					
Team innovation climate		**0.124***		**0.200***	0.165
Mediator					
Transactive memory system			**0.366***		**0.283***
R^2	0.091	0.115	0.134	0.122	0.192
R^2 change	0.091	0.103	0.128	0.109	0.175
F	4.496	9.120***	21.751***	9.696***	11.032***

Notes. N= 104, *p< 0.05, **p< 0.01, *** p< 0.001.

Moderation effects test

Table 6 tests the moderating effect of the two types of team faultlines. Models 1 and 2 test the moderating effect of Identity-based team Faultline and Knowledge-based team faultlines between the relationship of transactive memory system and team innovation performance, using the transactive memory system as the independent variable and team innovation performance as the dependent variable.

The results showed a significant relationship between the interaction of identity-based team faultline and transactive memory system (β = -0.214, p < 0.01), with the identity-based team faultline acting as a negative moderator between the mediator and team innovation performance. Hypothesis H_4 is supported.

Meanwhile, the results of Model 2 showed that the interaction of knowledge-based team faultline and transactive memory system (β = 0.262, p< 0.01) was significant, then knowledge-based team faultline performs a moderating role between the social mediator and team innovation performance and Hypothesis H_4 was corroborated

Table 6. Moderation effect test.

Variables	**Team Innovation Performance**	
	Model1	Model2
Control Variables		
Team size	**-0.02***	0.03
Team age	0.02	0.04
Independent variable		
Team innovation climate	0.123	0.119
Moderator		
Identity-based faultlines	-0.145	-0.064
Knowledge-based faultlines	0.08	0.19
Interactions		
Transactive memory syst. × Identity-based faultlines	**-0.214****	
Transactive memory syst. × Knowledge-based faultlines	**0.262****	
R^2	0.127	0.230
R^2 change	0.108	0.201
F	6.298***	8.163***

Notes. N=104, *p<0.05, **p<0.01, ***p<0.001.

Bootstrap Moderated Mediation Effects Test

In order to see the pattern of mediated effects with moderation in more detail, Bootstrap effect tests were used in this study. The boot sample size selected was 5000, under 95% confidence interval [0.170, 1.223], which does not contain 0. This implies that there is a significant mediated-moderation effect, thus, the hypothesis H_5 s established, in accordance with the moderator values of mean, one plus SD and minus one standard deviation. That way we can distinguish between the three levels of Identity-based team faultline degrees, (Results are shown in Table 7), when one standard deviation below the mean, the 95% confidence interval is [-1.280, -0.262], and the result does not contain 0, indicating that in the low level of

identity-based team faultline, the role of the transactive memory system to form innovation performance is inhibited by the significant effect. When the identity-based team faultline is the mean, the 95% confidence interval is [-0.823, -0.117], and when the Identity-based team faultline is one standard deviation above the mean, the 95% confidence interval is [-0.493, 0.199].

Table 7. Bootstrap in different levels of moderation

Moderator: Identity-based team faultline	Effect	BootSE	BootLLCI(95%)	BootULCI(95%)
low	-0.682	0.254	-1.281	-0.262
moderate	-0.386	0.177	-0.823	-0.117
high	-0.088	0.175	-0493	0.199

Similarly, the sample size is chosen to be 5000, and the 95% confidence interval overall [0.085, 1.598] does not contain 0, so there is a moderated mediation effect that is significant, i.e., hypothesis H_6 was supported. The results are shown in Table 8, when knowledge-based team faultline is one standard deviation below the mean, the 95% confidence interval is [-0.438, 0.469], and the result contains 0, which indicates that the effect of the transactive memory system to innovation is not significant in the low-level knowledge-based team faultline. the transactive memory system to form innovation performance is not significant. The 95% confidence interval is [0.064, 0.801] when the knowledge-based team faultline is the mean, and [0.207, 1.404] when the knowledge-based team faultline is one standard deviation above the mean.

Table 8. Bootstrap in different levels of moderation

Moderator: *Knowledge-based team faultline*	Effect	BootSE	BootLLCI(95%)	BootULCI(95%)
low	0.026	0.228	-0.438	0.469
moderate	0.347	0.186	0.064	0.801
high	0.669	0.301	0.207	1.404

5. DISCUSSION AND CONCLUSION

The results of empirical tests on 104 college entrepreneurial teams corroborate the above hypotheses. This study explored the boundary conditions for the use of transactive memory system on team innovation performance, and the results showed that the effects of transactive memory system on team innovation performance were positively moderated by knowledge-based faultline and negatively moderated by identity-based faultline, but the moderating effect was not significant when the level of Identity-based team faultline was low.

At the same time, the mediating effect of the interaction memory system was examined. Based on the theory social identity theory, team faultlines theory and social cognition theory, the mechanism of team faultlines on team innovation performance is explored. In this research, team faultlines is divided into information cognitive team faultlines and social categorization team faultlines, among which, information cognitive team faultlines has a positive impact on team innovation performance, while social categorization team faultlines has a negative impact on team innovation performance.

In the dynamic and complex market environment, how to improve the team innovation performance of college entrepreneurs has become the focus of scholars. This study not only enriches the research on the relationship between team faultlines, transactive memory system, team innovation performance and team innovation climate, but also provides some valuable insights for human resource management practice and innovation and entrepreneurship education in colleges and universities.

Results confirms that the knowledge-based team faultline has a positive effect on the team innovation performance, while the identity-based team faultline has a negative effect on the team innovation performance. Therefore, college entrepreneurial leaders should not only look for people with the same profession, technology, background and experience to create a team, but also build a properly differentiated team, selecting some members with different professional backgrounds and experiences to create a team, and avoiding members with too big differences among attributes, (such as an age gap) to form a team, which will be more helpful to the team's innovation.

Limitations and Future Directions

The first is the limitation of research design. We plan a cross-sectional study, due to the time constraint of the project. Results from the sample collected cannot infer causality and limit the conclusions as it is more difficult to track the dynamic changes in the relationship between variables.

Second, although the self-reported character of the measures, we had the strategy to use two informants. We cannot completely discard the possibility of common method bias (Podsakoff. 2003).

Third the nature of the sample, which limits the generalizability to other organizational settings. Future research should consider other settings to test this research.

Lastly, the measurement for team faultlines not consider implicit indicators such as personality traits, industry, positions only focus on gender, age and other explicit indicator Future studies could investigate some specific factor of teams faultlines, such as age-based faultlines, cultural-based faultlines and their impact on team effectiveness.

Or focus on the team faultlines for which industry is more beneficial than detrimental, or more detrimental than beneficial. Also, we can consider the problem of optimal allocation of shared and specialized knowledge. Too much overlapping of members' knowledge can create groupthink or become a burden (Cannon-Bowers, & Salas 1993). However, over-specialization without focusing on the complementarity and dependence of areas of expertise will form "islands of expertise" (Lewis, 2003), which will not function as an interactive memory system. Therefore, how much knowledge needs to be overlapped? How much specialization is appropriate? These are questions that need to be answered in future research.

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