Team Emotional Intelligence: A Social Network Perspective

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Abstract

Estimates suggest that 60% of teams fail to achieve their objectives, posing an important and challenging research question for academia. Emotional intelligence represents a significant concept developed upon the foundation of interpersonal relationships. Research has demonstrated that team emotional intelligence, whether conceptualized at the micro-individual or macro-holistic level, plays a crucial role in enabling teams to successfully attain their goals. However, extant research has yet to investigate the influence of team emotional intelligence that emerges from emotional intelligence behavioral exchanges among subsets of team members. Accordingly, this research examines team emotional intelligence from a novel perspective—the dyadic level (two individuals in a one-to-one relationship, i.e., actor-target)—by conceptualizing it as an emergent state within team processes and investigating it through the integration of team member exchange theory and social network methodology. Specifically, this study conducts empirical research on team emotional intelligence as represented by the network formed from exchange relationships among dyadic units within the team (referring to the target' s perception of emotional intelligence behaviors enacted by the actor toward them), with the aim of theoretically elucidating the characteristics of emotional intelligence behavioral exchanges within teams, the bottom-up process of emotional intelligence development from the individual to the team level, and the impact effects of dyad-based team emotional intelligence, thereby providing concrete recommendations for improving team management practice.

Full Text

Team Emotional Intelligence from a Social Network Perspective*

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Abstract

It is estimated that 60% of teams fail to achieve their goals, presenting a significant and challenging research question for academia. Emotional intelligence is a crucial concept developed from the foundation of interpersonal relationships. Research has demonstrated that both micro-level individual-based and macro-level whole-team conceptualizations of team emotional intelligence play important roles in team success. However, no existing research has examined team emotional intelligence that emerges from emotional intelligence behavior exchanges among local members within a team. To address this gap, this project investigates team emotional intelligence from a novel dyadic-level perspective (one-on-one relationships between two individuals, i.e., actor-target), treating it as an emergent state in team processes and integrating team member exchange theory with social network methodology. Specifically, we conduct empirical research on team emotional intelligence represented by the network formed through exchange relationships at the dyadic unit (referring to the target' s perception of emotional intelligence behaviors enacted by the actor toward them). This approach aims to theoretically reveal the characteristics of emotional intelligence behavior exchange within teams, the bottom-up process through which emotional intelligence develops from the individual to team level, and the effects of dyadic-based team emotional intelligence, thereby providing concrete recommendations for team management practice.

Keywords: Dyadic Level, Interpersonal Relationships, Social Network, Team Emotional Intelligence, Team-member Exchange

1. Problem Statement

Organizations increasingly adopt team-based work models to confront intensifying market competition and technological innovation [**?**, **?**]. However, simply having team members complete interdependent tasks does not automatically lead to effective team performance. It is estimated that 60% of teams fail to achieve their goals [**?**, **?**], presenting an important and challenging research topic for both academics and team researchers.

Task focus and relationship focus represent two critical aspects of team research [**?**, **?**, **?**]. Emotional intelligence is an important concept grounded in interpersonal relationships, defined as the ability to process emotional information in an adaptive manner [**?**, **?**]. Existing research indicates that both individual emotional intelligence as a team input and team emotional intelligence as a team state significantly influence teams [**?**, **?**, **?**, **?**, **?**]. Nevertheless, systematic research remains scarce on the specific role emotional intelligence plays in team member relational interactions and how it influences team processes and subsequently affects team outcomes. Therefore, this project focuses on the "relationship focus" aspect to investigate team emotional intelligence, building upon existing findings to contribute to answering the question of how to better achieve team success.

Current research has examined team emotional intelligence as either a team input (individuals bring emotional intelligence into the team) or an emergent team state (a collective capability developed by the team), exploring their respective impacts on teams. However, team success depends at least partially on team members and their actions (i.e., team inputs and emergent states). While individual-based team emotional intelligence research considers team inputs, such inputs do not automatically translate into effectiveness. Conversely, whole-team-based research considers emergent states but neglects the influence of team inputs. Thus, both approaches have limitations, each addressing only one aspect of the phenomenon. Theoretically, this dichotomous research approach overlooks the question of how initial team input of emotional intelligence (i.e., the combination of multiple individuals' emotional intelligence) transforms into team emotional intelligence as a state, leaving us with limited understanding of the bottom-up emergence process from individual-based input to team state. Although multilevel theory provides an analytical framework for studying emergence processes [**?**, **?**, **?**], no research has yet applied this framework to examine the emergence of team emotional intelligence.

Furthermore, interactions among team members occur to some extent at the dyadic level during collaborative work. Team emotional intelligence can also be investigated from the dyadic perspective. Studying emotional intelligence at the dyadic unit not only extends our examination of antecedents (such as how combinations of individual emotional intelligence as team inputs influence it) but also reveals how dyadic-level emotional intelligence behaviors further contribute to the emergence of whole-team emotional intelligence states. Theoretically, dyadic-based research can bridge the gap between team inputs and emergent team states, overcoming the deficiency in understanding how individual emotional intelligence within teams emerges through bottom-up processes to create team emotional intelligence. More importantly, this approach can integrate multiple variables (both within-level and cross-level) within an input-process-output framework to thoroughly examine the antecedents, consequences, and boundary conditions corresponding to team emotional intelligence, thereby providing a more comprehensive and deeper understanding of the specific role emotional intelligence plays in team processes. Practically, such research can offer clear management recommendations for promoting team development (e.g., when to intervene, at what level to intervene, and which specific team processes to target) to enhance team effectiveness.

Based on these considerations, this project investigates team emotional intelligence from a novel perspective by treating it as an emergent state in team processes and examining it at the dyadic level (one-on-one relationships between two individuals, i.e., actor-target) through the integration of team member exchange theory and social network methodology. The research focuses on emotional intelligence behavior exchanges among team members (representative examples include: when I encounter obstacles and feel down, they offer support), specifically targeting "the target' s perception of emotional intelligence behaviors enacted by the actor toward them." This dyadic relational behavior serves as

the smallest unit of analysis, and the project explores team emotional intelligence represented by the network structure formed by such relational behaviors within the team. The goal is to understand the specific role of dyadic-based team emotional intelligence in team processes and inform team management practice.

2.1 Concept and Measurement of Team Emotional Intelligence

Currently, two perspectives dominate team emotional intelligence research. The first is the resource perspective, which views emotional intelligence as a relatively stable trait or ability possessed by individuals and considers it an important team resource that individuals bring to the group [**?**, **?**]. Consequently, collective emotional intelligence represents a combination of individual emotional intelligences. Strictly speaking, this perspective does not conceptualize team emotional intelligence as a distinct construct. In terms of measurement, team emotional intelligence from the resource perspective is operationalized through individual-level emotional intelligence assessment. Since individual emotional intelligence can be categorized into ability models and trait models (or mixed models), this perspective also has two measurement orientations: one based on trait models and the other on ability models. When calculating team emotional intelligence scores, existing research primarily uses the aggregation of individual emotional intelligences through summation and averaging. Some studies also calculate variance in team members' emotional intelligence, use the maximum or minimum value of team members' emotional intelligence, or substitute the team leader' s emotional intelligence for team emotional intelligence [**?**, **?**, **?**, **?**].

The second is the interaction perspective, which focuses on behavioral patterns and action rules formed through member interactions in group contexts. It emphasizes the quality of emotion-related problem processing during group interactions, highlighting specific emotional intelligence behavioral manifestations and the actual degree of emotional intelligence utilization [**?**, **?**, **?**]. The most representative definition from this perspective was proposed by Druskat and Wolff, who conceptualized group emotional intelligence as "the ability of a group to develop a set of norms that enable the group to manage emotional processes effectively, thereby enhancing group trust, identity, and efficacy." Measurement tools for this perspective include the scale developed by Hamme (2003) and the Workgroup Emotional Intelligence Profile-Short version (WEIP-S) developed by Jordan and Lawrence (2009) (sample item: "Even when I think team members are wrong, I respect their ideas"). Scoring involves aggregating individuals' perceptions of the overall team situation.

Overall, current team emotional intelligence research remains predominantly individual-based, examining various combinations of individual emotional intelligences to understand team-level effects. Although this approach offers some insights into emotional intelligence phenomena in teams, it neglects team-level characteristics and member interactions. While group-based team emotional in-

telligence concepts and measures highlight holism and partially capture team interactions, their definitions and measurements focus exclusively on group-shared emotions (emotions collectively experienced by group members when interacting with others) while neglecting the processing of divergence emotions (e.g., emotions occurring between two or three members in a four-person team) [?, ?]. Thus, current whole-team-based concepts and measures have clear limitations.

2.2 Empirical Research on Antecedents and Consequences of Team Emotional Intelligence

Empirically, current research primarily examines relationships between team emotional intelligence and various team variables, including team processes such as interpersonal effectiveness [?, ?] and conflict management [?, ?], as well as team outcomes such as team innovation [?, ?], decision quality [?, ?], and team performance [?, ?]. Recent studies have also begun to explore the mechanisms through which team emotional intelligence influences outcomes [?, ?, ?].

Regarding the effects of team emotional intelligence on team outcomes, an early meta-analysis found a correlation of .16 between team emotional intelligence and team performance (K=6, N=304, p<.05) [?, ?]. A meta-analysis in the Chinese context found a correlation of .48 (K=4, N=906, p<.01) [?, ?]. The most recent meta-analysis based on both Chinese and English literature found an overall correlation of .30 between team emotional intelligence and various variables (including process and outcome indicators) (K=28, N=1934, p<.01) [?, ?].

Among these empirical findings, some scholars adopt the resource perspective while others use the interaction perspective. Preliminary meta-analytic results [?, ?] indicate that the correlation coefficients between team emotional intelligence and performance differ across perspectives. Under the resource perspective (e.g., team emotional intelligence measured using Mayer et al.' s MSCEIT tool [?, ?]), the correlation is .23 (K=5, N=131, p<.05), whereas under the interaction perspective (e.g., using the WEIP-S measure), the correlation is .31 (K=9, N=902, p<.01).

In summary, current empirical research on team emotional intelligence falls into two categories: resource perspective studies emphasizing "inherent emotional intelligence traits" as team inputs, and interaction perspective studies emphasizing "expressed emotional intelligence behaviors"in team processes. Despite these two approaches, empirical research on team emotional intelligence remains relatively scarce overall. Moreover, most studies treat team emotional intelligence as an antecedent variable, examining its impact on team process and outcome variables, with few investigating the emergence process of team emotional intelligence or its underlying mechanisms. Regarding the effects of team emotional intelligence, definitive conclusions remain difficult to draw due to the limited number of studies.

2.3 Logical Starting Point of This Study

The above analysis reveals two dominant research paradigms in team emotional intelligence research: the team input paradigm, which treats team emotional intelligence as a combination of individual emotional intelligences and emphasizes "inherent emotional intelligence traits"(typified by the resource perspective), and the team state paradigm, which treats team emotional intelligence as a holistic emergent state and emphasizes "expressed emotional intelligence behaviors" (typified by the interaction perspective). Existing scholars have followed an either-or research approach, studying either the former or the latter.

We argue that these two paradigms can be integrated within a unified framework. Trait activation theory posits that possessing a certain ability or trait does not necessarily lead to behavioral expression; such expression only occurs in situations suitable for that ability or trait [**?**, **?**]. Strong situation theory notes that when strong situations emerge, individual behavior no longer follows conventional patterns [**?**, **?**]. The underlying assumption of both theories is that possessing a certain ability (or trait) does not equal expressing corresponding behavior, and the transformation between them is constrained by situational factors. Extending these theories, we contend that in broader contexts (such as teams), we can further distinguish between "inherent emotional intelligence traits" and "expressed emotional intelligence behaviors," viewing them as a process from the former to the latter.

Furthermore, team member exchange theory demonstrates that exchanges among team members constitute an important form of team work and life, significantly influencing the achievement of individual and team-level goals [**?**, **?**, **?**]. However, emotional intelligence behavior exchanges at the dyadic level have not attracted researchers' attention. We remain unclear about how such behavior exchanges influence teams. Building on team member exchange theory, this project focuses on examining emotional intelligence behavior exchanges between paired members in team contexts.

Specifically, this study distinguishes between "inherent emotional intelligence traits" and "expressed emotional intelligence behaviors" in team contexts, viewing them as a process. It centers on emotional intelligence behavior exchanges among team members, examining the network structure formed by such relational behaviors (referring to the total quantity of "one person' s perception of another' s emotional intelligence behaviors toward them" in the team and the distribution pattern of such behaviors) as a new construct of team emotional intelligence. Regarding the conceptualization of individual emotional intelligence, we base our definition on Mayer et al.' s (2008) ability model (emotional intelligence includes four abilities: emotion perception, emotion integration, emotion understanding, and emotion management) for two primary reasons: first, it is currently recognized as having a clear structure; second, it measures a relatively stable ability that aligns well with our research objectives.

Overall, by challenging the implicit assumption in previous research (the either-

or mindset), this study investigates the issue of "emotional intelligence behavior exchanges among team members and their antecedents and consequences" within a new process-based framework (viewing the transition from "inherent emotional intelligence traits" to "expressed emotional intelligence behaviors" as a process). This approach aims to deepen our understanding of emotional intelligence phenomena within teams and better serve team management practice.

3. Research Framework

3.1 Conceptual Foundation

The emotional intelligence behaviors examined in this project differ from those mentioned in existing literature because we focus on relational behaviors at the dyadic unit rather than independent behaviors based on a single individual (representative behavior: "I am very good at controlling my own emotions") or an individual' s perception of whole-team behaviors (representative behavior: "I can identify team members' hidden true feelings). Previous team emotional intelligence research, whether from the resource or interaction perspective, has used a single entity as the unit of analysis—either focusing on the individual or the whole team. The smallest unit of analysis in this study is behavior at the dyadic level. This behavior is enacted by an actor (one team member) and directed toward a target (another team member), and can be observed and felt by the target (e.g.," When I complain about work, he proactively inquires and offers comfort"). It focuses on the dyad, which fundamentally differs from past research.

In team contexts, members engage in various exchanges through interactions to jointly complete interdependent tasks and achieve collective goals. This study focuses specifically on emotional intelligence behavior exchanges between paired members. The exchange involves an actor and a target, representing a process where the actor takes action (e.g., encouragement) in response to the target' s emotions (e.g., depression). These exchanges include both high emotional intelligence behaviors (e.g., "When I am happy about completing a task, he seizes the moment to motivate me") and low emotional intelligence behaviors (e.g., "When I am pleased with my excellent performance, he considers it merely normal").

Beyond the content of these exchanges (positive vs. negative), this study also examines the structure formed by such exchanges within the team. This structure refers to the total quantity of emotional intelligence behavior exchanges at the dyadic unit and their distribution patterns among team members. The combination of content and structure represents the team emotional intelligence construct examined in this project.

3.2 Research Content

Based on this conceptual foundation, this project proposes three sub-studies: (1) how to measure team emotional intelligence; (2) the formation process of team

emotional intelligence; and (3) the specific effects of team emotional intelligence.

3.2.1 Measurement of Team Emotional Intelligence Based on the concept of dyadic-level emotional intelligence behavior exchange and drawing upon Shen et al.' s (2014) preliminary research and literature on emotion regulation [**?**, **?**], we propose examining four typical exchange behaviors from two dimensions: the actor' s regulation direction (enhancement vs. reduction) and the target' s emotional state (negative vs. positive). These four behaviors can be summarized as: increasing positive energy (actor' s actions that strengthen the target' s positive emotions), increasing negative energy (actor' s actions that intensify the target' s negative emotions), decreasing positive energy (actor' s actions that weaken the target' s positive emotions), and decreasing negative energy (actor' s actions that reduce the target' s negative emotions). These correspond to four typical phenomena in real interpersonal interactions: adding flowers to brocade (adding brilliance to something already outstanding), hitting someone when they' re down, making sarcastic remarks, and providing timely help.

Building on this conceptual model and grounded in implicit cognitive schema theory [**?**, **?**] and team member exchange theory [**?**, **?**], we will collect typical behavioral items reflecting the characteristics of these four categories and then process these items following standard scale development procedures to create a psychometrically sound measurement instrument. The specific procedures are as follows:

(1) Based on the conceptual model, collect typical behaviors reflecting emotional intelligence manifestation among team members from four aspects. We will primarily use open-ended questionnaires to survey individuals with team work experience to collect relevant items. After categorizing and merging the collected items, we will supplement them with additional items through literature and theoretical analysis.

(2) Develop the initial questionnaire. Based on the collected items, we will organize group discussions with project team members and enterprise personnel to further supplement and refine the item collection, and compile the initial questionnaire. After developing the initial questionnaire, we will consult relevant researchers to evaluate its face validity and content validity, resulting in the final pre-test questionnaire.

(3) Conduct pilot and formal testing. We will use the pre-test questionnaire to conduct small-scale surveys of enterprise employees, revise the pre-test questionnaire based on the analysis results, develop the formal survey questionnaire (which will include, in addition to the developed scale items, other measurement tools for validating the scale' s validity), and use this questionnaire to conduct formal team surveys to collect data for examining the scale' s reliability and validity.

(4) Conduct statistical analysis of the data and develop the final scale. Using

SPSS and Mplus software, we will perform correlation analysis, regression analysis, exploratory factor analysis, and confirmatory factor analysis to examine the scale' s reliability and validity, resulting in the final measurement instrument. We expect to develop two versions of the questionnaire (full and brief). The full version will include four dimensions (corresponding to the four behavioral categories in the conceptual model), with four items per dimension, totaling 16 items. The brief version will include two dimensions: positive behaviors (combining increasing positive energy and decreasing negative energy) and negative behaviors (combining increasing negative energy and decreasing positive energy), with four items per dimension, totaling 8 items.

Using the brief version as an example, we illustrate how to measure team emotional intelligence with the developed questionnaire. First, survey every team member using the questionnaire to collect information about positive (including increasing positive energy and decreasing negative energy) and negative (including increasing negative energy and decreasing positive energy) emotional intelligence behaviors enacted among team members. Second, transform the collected data using social network analysis methods [**?**, **?**]. Specifically, following methods used in previous social network research [**?**, **?**, **?**, **?**, **?**], we will first transform the positive and negative emotional intelligence behavior exchange data collected within the team, then use social network analysis software (e.g., Pajek) to calculate the total quantity (density) and distribution (decentralization) of positive and negative behaviors. Third, measure team emotional intelligence using four structural indicators: positive behavior density, positive behavior decentralization, negative behavior density, and negative behavior decentralization (see Figure 1 [Figure 1: see original paper]).

If using the full version questionnaire, team emotional intelligence can be measured with eight structural indicators. Positive behavior density can be subdivided into density of increasing positive energy behaviors and density of decreasing negative energy behaviors. Positive behavior decentralization can be subdivided into decentralization of increasing positive energy behaviors and decentralization of decreasing negative energy behaviors. Negative behavior density can be divided into density of increasing negative energy behaviors and density of decreasing positive energy behaviors. Negative behavior decentralization can be subdivided into decentralization of increasing negative energy behaviors and decentralization of decreasing positive energy behaviors.

3.2.2 Formation Process of Team Emotional Intelligence Dyadic-based team emotional intelligence is a state that emerges during team processes. This section primarily examines how this team emotional intelligence forms—that is, why different emotional intelligence structures emerge in team processes. We know that the emergence of a team state depends on multiple factors. As one type of team state, the formation of team emotional intelligence structure is also influenced by various factors. Building on existing literature, this project

examines the emergence of team emotional intelligence based on one team input (i.e., individuals with varying emotional intelligences as team inputs), primarily revealing the formation process from both individual and team interaction perspectives. The specific formation path is shown in Figure 2 [Figure 2: see original paper].

At the individual level, we propose that individuals with higher emotional intelligence (based on ability model measurement) will exhibit more emotional intelligence behaviors in teams. Trait activation theory suggests that when conditions suitable for trait expression are provided, the trait is more likely to manifest in related behaviors [**?**, **?**, **?**]. Team work encompasses rich information related to both interpersonal and personal emotions. Differences among team members in values, interests, perspectives on issues, and work modes make conflicts and emotional reactions difficult to avoid in teams. Individuals with higher emotional intelligence have more opportunities to exhibit corresponding behaviors —they are more likely to detect emotion-related cues early through their keen emotion perception abilities and use their strong emotion regulation abilities to intervene proactively and minimize negative emotional impacts. Thus, the team context provides an important backdrop that facilitates the transformation of emotional intelligence capabilities into corresponding behaviors. Therefore, we propose:

H1-1: Individuals with higher emotional intelligence will exhibit more emotional intelligence behaviors in teams.

Self-managing teams especially entail substantial requirements for processing affective information [**?**, **?**]. Through interactions and collaboration, team members collectively generate varying degrees of emotions. Although different team types (e.g., self-directed teams vs. teams with designated leaders) may differ in the extent of affective information processing required, teams generally provide a context with high demands for processing emotional information. Research has found that emotion regulation ability moderates the relationship between information processing demands and positive affect [**?**, **?**]. That is, when facing different information processing requirements, emotion regulation ability represents a key individual difference in how employees maintain higher levels of positive affect. Emotion regulation is an important branch of emotional intelligence capabilities. In contexts with high affective information processing demands, higher emotional intelligence should also lead to more positive emotions. Because individuals with high emotional intelligence possess strong emotion regulation abilities, they not only feel confident in successfully handling high demands for affective information processing but also draw upon past successful experiences to approach such demands with a more positive mindset, which further promotes more positive emotions in the team work context. Therefore, we propose:

H1-2: In team contexts, the higher an individual' s emotional intelligence, the more likely they are to experience positive emotions.

The broaden-and-build model of positive emotions posits that positive emotions expand people' s momentary thought-action repertoires, broaden the scope of thinking and action, and promote the generation of many new ideas and action tendencies [**?**, **?**, **?**]. Based on this theory, we argue that when individuals with high emotional intelligence experience more positive emotions, these emotions will prompt them to exhibit more emotional intelligence behaviors, such as more actively recognizing and interpreting their own and others' emotions, more deeply solving emotion-related problems in interpersonal processes, and generating more extensive ideas for helping others. Therefore, we propose:

H1-3: Positive emotions positively influence individuals' exhibition of emotional intelligence behaviors in teams.

Integrating trait activation theory and the broaden-and-build model of positive emotions [**?**, **?**, **?**, **?**], we contend that the team context creates an environment for individuals with high emotional intelligence capabilities to exhibit more emotional intelligence behaviors. When facing high demands for emotional information processing, individuals with high emotional intelligence, due to their capabilities, feel confident in handling emotional issues and respond positively even when encountering difficulties. This mindset promotes more positive emotions, which further expand their thinking and action space, leading to the exhibition of more emotional intelligence behaviors. Therefore, we further propose:

H1-4: Positive emotions mediate the positive relationship between individual emotional intelligence and individuals' exhibition of emotional intelligence behaviors in teams.

At the team level, we propose that higher average team emotional intelligence is more likely to foster a positive team affective climate. Drawing on team composition research [**?**, **?**, **?**, **?**], we analyze how two typical scenarios of high average team emotional intelligence influence team positive affective climate: first, when team members are relatively homogeneous and generally possess high emotional intelligence; second, when team members are somewhat heterogeneous, with one or a few members having very high emotional intelligence and others at moderate levels. In the first scenario, when team members generally have high emotional intelligence, everyone can better understand emotion-related cues during team processes, avoid losing their temper, control their emotions even when frustrated, and know how to work in ways acceptable to others. Such teams clearly foster a more positive team climate. The second scenario can also create a more positive affective climate, though the primary contributors are those few high emotional intelligence members. Their presence means that when conflicts arise, they mediate and help eliminate misunderstandings. When the team faces difficulties or troubles, they step forward to lead positive problem-solving efforts. These cohesion-enhancing actions promote the formation of a positive team climate. Based on this analysis of both scenarios, we propose:

H1-5: The higher the team' s average emotional intelligence, the more easily a positive team affective climate is formed.

Positive behavior density in team emotional intelligence refers to the total quantity of actor-target relationship links based on increasing positive energy and decreasing negative energy behaviors within the team, while positive behavior decentralization describes whether these relationship links are concentrated on one or a few team members or evenly distributed across all members, with more even distribution representing greater decentralization [**?**, **?**, **?**]. Extending the broaden-and-build theory to the team level, we argue that a positive team affective climate positively influences the exhibition of team-level emotional intelligence behaviors. Team members experiencing positive affect (climate), through shared positive emotions, will further broaden their interpersonal scope, engage in more frequent interactions, generate stronger helping intentions, and exhibit more acts of recognition and affirmation. These increased behaviors will manifest both quantitatively (increased density) and in breadth (extended to more team members). Therefore, we propose:

H1-6: Team positive affective climate influences team emotional intelligence (positive behavior density and positive behavior decentralization).

Combining H1-5 and H1-6, we further propose:

H1-7: Team average emotional intelligence influences team emotional intelligence (positive behavior density and positive behavior decentralization) through team positive affective climate.

Third, regarding mutual influence between individuals and teams, we argue that individuals and teams influence each other through the interaction between individual positive affective experiences and team positive affective climate, based on emotional contagion mechanisms and positive affect cycle research [**?**, **?**, **?**, **?**, **?**]. The specific relationships are as follows: First, individual positive affective experiences, through one-to-one and one-to-many transmission mechanisms, continuously spread to team members, enabling more and more members to feel the positive aspects, thereby forming a team positive affective climate. Second, the team positive affective climate, in turn, affects individuals within the team. When members perceive their team as positive and healthy, they feel proud to be part of it, which stimulates their sense of belonging and identification with the team, further strengthening their positive affective experiences. Therefore, we propose:

H1-8: Teams with members who have more positive affective experiences are more likely to develop a team positive affective climate.

H1-9: Team positive affective climate cross-level influences individual positive affective experiences.

Resource perspective research on team emotional intelligence suggests that team members' individual emotional intelligence serves as a resource brought into the team. As shown by the dashed line on the far left of Figure 2, the input of individual emotional intelligence capabilities influences the team's average emotional intelligence capability. Additionally, we argue that individual emotional intel-

ligence behavior exhibition influences dyadic-based team emotional intelligence. Individual emotional intelligence behavior includes both behaviors related to processing others' emotions in interpersonal processes and behaviors related to processing one' s own emotions. The concept of dyadic-based team emotional intelligence primarily reflects the former. Due to conceptual overlap (behaviors related to processing others'emotions include interactions with paired members), we argue that individual emotional intelligence behavior exhibition influences the positive behavior density of team emotional intelligence. Although individual emotional intelligence behavior exhibition may also influence the positive behavior decentralization of team emotional intelligence, we do not hypothesize this relationship here. Therefore, we propose:

H1-10: Teams whose members exhibit more emotional intelligence behaviors have higher team emotional intelligence (positive behavior density).

3.2.3 Specific Effects of Team Emotional Intelligence This section examines the consequence effects of team emotional intelligence and the conditions under which these effects occur. Building on existing research, we argue that dyadic-based team emotional intelligence significantly influences team processes and outcomes, with these effects varying under different conditions. Specifically, we examine both the direct effects of team emotional intelligence on team outcomes and the processes through which these effects occur.

We select two indicators as representative team outcome variables: team task performance and team viability, as they are commonly used criteria for successful teams [**?**, **?**]. We select knowledge integration capability (representing cognitive processes) and collective affective commitment (representing affective processes) as mediating variables to understand the cognitive and affective mechanisms through which team emotional intelligence influences team outcomes. Additionally, we use team task interdependence as a moderator to examine the boundary conditions of team emotional intelligence' s effects on team processes and outcomes. The specific hypothesized relationships among these variables are shown in Figure 3 [Figure 3: see original paper].

Existing research has found that team emotional intelligence significantly influences team outcomes such as performance, innovation, and decision-making. However, these findings are based on individual-combination or whole-team conceptualizations of team emotional intelligence. We argue that dyadic-based team emotional intelligence should have stronger explanatory power for team outcomes than existing conceptualizations. Compared to individual-based team emotional intelligence, which emphasizes simply bringing the right people together, the dyadic-based concept focuses on emotional intelligence behaviors exhibited during actual team work processes—that is, the joint actions of team members through specific dyadic interactions. This focus on how team members work together should have more pronounced effects on teams. Unlike whole-team-based concepts that emphasize overall team capability as a state, dyadic-based team emotional intelligence specifies the target of "emotional in-

telligence behaviors" to each individual team member. Such behaviors directly influence corresponding members' attitudes, behaviors, and effort levels. While whole-team-based team emotional intelligence does not necessarily affect every member, and even when it does, its impact may be constrained by other factors, the "emotional intelligence behaviors" emerging from dyadic interactions have more direct and obvious effects on team members' attitudes, behaviors, and effort levels. These effects directly impact members' work engagement and thus should have stronger explanatory power for team outcomes.

Below we analyze how team emotional intelligence based on positive behavior density and distribution patterns influences team task performance and team viability. Positive behaviors in team emotional intelligence refer to dyadic-level behaviors where the target receives increasing positive energy (e.g., the actor shows appreciation for the target' s achievements) and decreasing negative energy (e.g., the actor shows concern and comfort for the target' s low mood) from the actor. Under equal conditions, the more such positive behaviors in the team (greater density) and the more they occur among different team members (more decentralized), the better the team will complete its tasks and the higher the team performance. This is because encouragement, support, and help from peers directly influence the target' s work engagement, leading to greater contributions to the team. When many targets, especially a large proportion of members, experience such behaviors, the impact on the team becomes more pronounced. Simultaneously, the density and distribution pattern of these positive behaviors also affect team viability. Team viability refers to a team' s capacity to retain its members through emotional attachment and members' willingness to stay together as a team [**?**, **?**, **?**]. When targets experience increasing positive energy and decreasing negative energy behaviors from actors, and when these behaviors are more evenly distributed among team members, the team becomes more capable of maintaining and enhancing members' ability to work together on ongoing team tasks through this social relational process. These behaviors satisfy team members' most fundamental emotional needs, and need fulfillment further strengthens their attachment to the team and willingness to remain, making the team more viable. Based on this analysis, we propose:

H2-1: Team emotional intelligence (positive behavior density and positive behavior decentralization) significantly influences team outcomes (team task performance and team viability).

Teams are social systems with emergent cognitive and affective characteristics [**?**, **?**]. Therefore, this project primarily examines the mechanisms through which team emotional intelligence influences team outcomes based on both cognitive and affective processes. Specifically, we use knowledge integration capability as a representative of group cognitive processes and collective affective commitment as a representative of affective processes to explore how dyadic-based team emotional intelligence influences team outcomes.

First, regarding the team process based on knowledge integration capability, knowledge integration capability can be subdivided into two aspects: the effi-

ciency and effectiveness of information sharing within the team, and the quality of internal team communication [**?**, **?**]. Uniqueness and openness are two dimensions for measuring information sharing [**?**, **?**]. Information uniqueness refers to the extent to which information is shared among team members, ranging from completely shared (possessed by all team members) to not shared at all (possessed by only one member). Information openness refers to the breadth of information exchange, including aspects such as team goals, work progress, and coordination. Resource-based theory posits that resources can be converted into capabilities that create performance advantages [**?**, **?**, **?**]. We use this theory to explain how team emotional intelligence influences team outcomes through knowledge integration capability.

Emotional intelligence behavior exchanges among team members that increase positive energy and decrease negative energy create relational behaviors representing team emotional intelligence. This team emotional intelligence essentially constitutes a structural resource based on relationships within the team, possessing both relational and structural characteristics. Building on Gardner et al.' s (2012) research, we argue that this relationship-based structural resource influences knowledge integration capability. On one hand, this resource promotes team information sharing because high-density positive behaviors imply frequent communication, which provides smooth channels for information dissemination and sharing. Decentralized positive behaviors help broaden the distribution width of knowledge and information within the team. On the other hand, this resource also promotes internal team communication because high-density and decentralized positive behaviors indicate good interactive relationships among team members, which reduces transaction costs in communication and promotes high-quality internal team communication.

Meanwhile, knowledge integration capability also influences team outcomes represented by team task performance and team viability. Once knowledge integration capability emerges, it further integrates resources within the team, creating conditions for successfully achieving team goals and attaining good team task performance [**?**, **?**]. Frequent information sharing and good internal team communication also further enhance team members' relationships and strengthen team cohesion [**?**, **?**], fostering their willingness to continue working together. Based on the combined analysis of team emotional intelligence influencing knowledge integration capability and knowledge integration capability influencing team outcomes, we propose:

H2-2: Team emotional intelligence (positive behavior density and positive behavior decentralization) indirectly influences team outcomes (team task performance and team viability) through knowledge integration capability.

Second, regarding the team process based on collective affective commitment, similar to organizational affective commitment, collective affective commitment can be defined as team members' emotional attachment to, identification with, and involvement in the team [**?**, **?**]. Team emotional intelligence emerges from dyadic emotional intelligence behavior exchanges, and behaviors between paired

members that increase positive energy and decrease negative energy bring positive affective experiences to team members. A theory of social exchange relationships posits that under dyadic exchange relationships, positive affective processes promote commitment behaviors [**?**, **?**]. According to this theory, positive behaviors in team emotional intelligence should also enhance team members' collective affective commitment. Acts similar to "providing timely help" and "adding flowers to brocade"make people feel the warmth of the team, thereby promoting a sense of belonging and resulting in emotional commitment to the team. On the other hand, existing research shows that collective affective commitment is strongly correlated with team performance [**?**, **?**]. Emotional attachment and commitment are also linked to investing in a relationship—the stronger the emotional connection, the greater the tendency to maintain the relationship [**?**, **?**]. Therefore, collective affective commitment should predict team members' willingness to remain and continue working as a team. Based on the combined analysis of team emotional intelligence influencing collective affective commitment and collective affective commitment influencing team outcomes, we propose:

H2-3: Team emotional intelligence (positive behavior density and positive behavior decentralization) indirectly influences team outcomes (team task performance and team viability) through collective affective commitment.

Next, we examine the boundary conditions of these effects based on task interdependence. Task interdependence refers to the degree to which a task requires team members to interact, particularly regarding access to critical resources and the creation of workflows that require cooperative action [**?**, **?**, **?**]. Task interdependence is a prerequisite for team formation, and varying degrees lead to different interaction patterns among team members [**?**, **?**]. When task interdependence is high, group members require more mutual contact and have greater needs for productive cooperation. When task interdependence is low, team members work more independently, and their contributions are pooled rather than integrated [**?**, **?**].

We argue that the strength of the effect of dyadic-based team emotional intelligence on team processes (knowledge integration capability and collective affective commitment) depends on team task interdependence. High task interdependence means work outcomes depend on others, with relatively weak individual control over work, resulting in increased work uncertainty. This uncertainty can easily trigger negative emotional reactions such as psychological anxiety and lack of security. Once negative emotions accumulate, they are likely to lead to withdrawal from cooperative behaviors, such as reduced open expression of viewpoints or information exchange. A large quantity and wide distribution of dyadic-based emotional intelligence exchange behaviors within the team can clearly mitigate these negative emotional effects, promote knowledge sharing and open expression of uncertainty, and increase emotional investment. In contrast, under low task interdependence, group members do not require frequent interaction or need to share skill and resource information for successful performance; team members can contribute without direct interaction with each

other, making social aspects less important. In such contexts, socially-based team emotional intelligence lacks conditions to function and cannot demonstrate its advantages for knowledge integration capability and collective affective commitment. For these reasons, we expect that under high task interdependence, the relationship between team emotional intelligence and team processes will be stronger. We propose:

H2-4: The positive effect of team emotional intelligence (positive behavior density and positive behavior decentralization) on team processes (knowledge integration capability and collective affective commitment) is moderated by team task interdependence. The stronger the task interdependence, the more pronounced the effect of team emotional intelligence on team processes.

Combining H2-2, H2-3, and H2-4, we further propose:

H2-5: Team task interdependence moderates the indirect effect of team emotional intelligence (positive behavior density and positive behavior decentralization) on team outcomes (team task performance and team viability) through team processes (knowledge integration capability and collective affective commitment). The stronger the task interdependence, the more pronounced this indirect effect.

Although we have introduced the research content in three major aspects, during the actual research process we will combine the formation process and specific effects, measuring team-based emotional intelligence (both whole-team-based and dyadic-based) multiple times according to team development cycles. This approach will allow us to control for individual-based and whole-team-based emotional intelligence to understand the incremental effect of dyadic-based team emotional intelligence on team processes and outcomes, and to examine the dynamic change process of team emotional intelligence as a state. Overall, this project will integrate three types of team emotional intelligence concepts (individual-based, dyadic-based, and whole-team-based) within an input-process-output model [**?**, **?**] to reveal the unique role played by dyadic-based team emotional intelligence in teams.

4. Theoretical Construction

Current team emotional intelligence research primarily considers two conceptual and measurement angles: the team individual angle (e.g., aggregating from individuals to the team) and the team whole angle (e.g., individuals' perceptions of the overall team situation) [**?**, **?**, **?**, **?**, **?**]. However, research based solely on these two angles is insufficient to capture the full picture of team emotional intelligence. For example, when considering a single person in a team context, does an individual with a certain level of emotional intelligence capability necessarily exhibit corresponding behaviors, and what situations promote or inhibit such behavioral expression (e.g., why do high emotional intelligence individuals sometimes exhibit low emotional intelligence behaviors, or why do low emotional intelligence individuals sometimes exhibit high emotional intelli-

gence behaviors)? When considering multiple people (e.g., a four-person team), will a team member apply emotional intelligence resources equally to the other three members, or will they enact different emotional intelligence behaviors based on closeness of relationships, and what factors influence these behavioral expressions? When considering the whole team, how does emotional intelligence develop from the individual to the team level? These questions merit further investigation.

This project argues that emotional intelligence phenomena in teams are complex and can be studied from at least three angles: the team individual, the team whole, and interactions among partial team members. Currently, the angle of interactions among partial team members has not received sufficient research attention. However, focusing on interactions among partial team members offers unique advantages for explaining certain emotional intelligence phenomena in teams. For example, it provides a bridge for explaining how emotional intelligence develops from the individual to the team level. It is more targeted for studying how team members differentially or equally apply emotional intelligence resources to other members. It provides a specific context for studying why individuals with particular emotional intelligence capabilities exhibit different emotional intelligence behaviors. Therefore, this project addresses the neglected angle by integrating achievements from team member exchange, social network analysis, and emotional intelligence research to conduct exploratory research on team emotional intelligence at the dyadic level. Specifically, it examines three interrelated issues: the measurement of dyadic-based team emotional intelligence, the formation process of dyadic-based team emotional intelligence, and its effects. Corresponding to these three issues, the theoretical construction of this project is manifested in three specific aspects.

First, it contributes to the foundational theory of emotional intelligence. This project proposes a dyadic-based team emotional intelligence concept and model and explores how to measure it. Specifically, by focusing on emotional intelligence behavior exchanges at the dyadic unit in teams and building on previous research [**?**, **?**, **?**], we propose a model for measuring emotional intelligence behavior exchanges at the dyadic unit within teams from four aspects: increasing positive energy, increasing negative energy, decreasing positive energy, and decreasing negative energy. Based on this, we further propose measuring team emotional intelligence through two structural aspects: the total quantity of emotional intelligence behavior exchanges at the dyadic unit (including positive and negative behavior density) and their distribution patterns (including positive and negative behavior decentralization). This concept and measurement theoretically extend existing state-based team emotional intelligence research. Although one category of existing team emotional intelligence research also views team emotional intelligence as an emergent state in team processes, it differs substantially from the dyadic-based team emotional intelligence examined in this project. The primary difference lies in the smallest unit of analysis: existing state-based team emotional intelligence concepts use the team as the smallest unit [**?**, **?**, **?**], whereas this project uses the dyad as the smallest

unit. The second difference lies in measurement: existing research primarily uses content-focused indicators [?, ?, ?], whereas this project uses structural-focused indicators. The dyadic-based team emotional intelligence concept and measurement proposed in this project not only enrich the foundational theory of emotional intelligence research but also respond to recent calls in organizational behavior to integrate affective phenomena and social exchange processes [?, ?, ?].

Second, it contributes to the process theory of team emotional intelligence. Exploring how and why team emotional intelligence emerges (i.e., the emergence process) helps us understand more clearly why specific outcomes occur and how to implement appropriate interventions to promote or correct these outcomes. Currently, both resource perspective and interaction perspective research on team emotional intelligence rarely examines the emergence process of team emotional intelligence [?, ?, ?, ?]. This project proposes a cross-level, interwoven process model of team emotional intelligence formation mediated by positive affective interactions (see Figure 2). Specifically, this project argues that emotional intelligence capability as a resource input influences emotional intelligence behavior exhibition at both individual and team levels. At the individual level, the transition from "inherent emotional intelligence capability" to "exhibiting emotional intelligence behaviors" is mediated by positive affect. At the team level, aggregated individual emotional intelligence capabilities influence the total quantity and distribution of positive behaviors in team emotional intelligence through positive affective climate. Vertically, in addition to the initial state of emotional intelligence as a resource input from individuals to the team and the resulting state of individual emotional intelligence behavior influencing the total quantity of team positive behaviors, the two mediating states generated at the horizontal level—individual positive affect and team positive affective climate—influence each other. That is, the team positive affective climate resulting from team emotional intelligence cross-level influences individual positive affective experiences based on emotional intelligence capabilities, while these individual positive affective experiences bottom-up influence the team positive affective climate. In this way, initial individual emotional intelligence develops into dyadic-based team emotional intelligence through the bottom-up process. By examining one formation process of team emotional intelligence, this project takes an important step toward "unraveling the black box of team emotional intelligence emergence."

Third, it contributes to the functional theory of team emotional intelligence. A fundamental proposition of this project is that dyadic-based team emotional intelligence has stronger explanatory power for team outcomes than the two existing research streams (individual-based and whole-team-based). Because dyadic-based team emotional intelligence emphasizes specific dyadic interactions among team members and the emotional intelligence behaviors exhibited, and because the "emotional intelligence behaviors" in dyadic-based team emotional intelligence target each individual team member, these behaviors directly influence corresponding members' attitudes, behaviors, and effort levels, thereby affecting

team outcomes. Therefore, it should have stronger predictive power for team outcomes than individual-based and whole-team-based team emotional intelligence. Building on this proposition, this project further reveals the mechanisms through which team emotional intelligence influences team outcomes: dyadic-based team emotional intelligence shapes team outcomes (team performance and team viability) through two team processes—cognitive process, represented by team knowledge integration capability, and affective process, represented by collective affective commitment. Moreover, these shaping effects are influenced by the moderator variable of team task interdependence. These mechanisms differ from existing research in two main ways. First, the conceptual basis differs: this project highlights the structural functions of team emotional intelligence (i.e., total quantity and distribution of positive behaviors), whereas previous research has only examined content-based functions (shared or aggregated perceptions of emotional intelligence). Second, the analytical framework differs: this project considers both cognitive and affective emergence channels while also incorporating boundary conditions, whereas previous research has only examined mediating processes [**?**, **?**, **?**] or single mediating processes under specific boundary conditions [**?**, **?**, **?**]. The mechanisms revealed in this project thus expand the functional theory of team emotional intelligence.

Beyond these three theoretical contributions, another contribution of this project is providing a conceptual foundation for in-depth examination of emotional intelligence-related issues. Previous research on team emotional intelligence has primarily used it as an antecedent variable, such as examining the impact of "team emotional intelligence" (individual-based or whole-team-based) on "team processes" (e.g., intrateam conflict [**?**, **?**]; team trust [**?**, **?**]). As a team state, dyadic-based team emotional intelligence can serve not only as an antecedent or outcome variable in team research (as in content 2 and 3 of this project) but also as a process variable. For example, when examining the relationship between team emotional intelligence (individual-based or whole-team-based) and team processes, or when investigating how individual-based team emotional intelligence develops into whole-team-based team emotional intelligence, dyadic-based team emotional intelligence can be proposed as a mediating variable. Additionally, the total quantity and distribution of emotional intelligence behavior exhibition at the dyadic level within teams continuously change across different team development stages. Future research can use the team emotional intelligence concept proposed in this project to conduct dynamic process studies of emotional intelligence, examining the changing process of emotional intelligence in teams and its different effectiveness, thereby better explaining how emotional intelligence influences teams.

In conclusion, unlike previous research on team emotional intelligence based on individuals or the whole team, this project proposes and examines a new team emotional intelligence concept at the dyadic level (one-on-one relationships between two individuals, i.e., actor-target). Specifically, the project treats team emotional intelligence as a team state emerging from exchange relationships be-

tween paired members during team work processes and examines it through the integration of team member exchange theory and social network methodology. This research not only provides a unique perspective for examining emotional intelligence phenomena in teams but also opens a new field for workplace emotional intelligence research.

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Note: Figure translations are in progress. See original paper for figures.