

## Conceptualization of Team Temporal Leadership and Its Influence Mechanisms on Team and Individual Effectiveness

**Authors:** Li Yuhui, Yang Chenlu, Li Yuhui

**Date:** 2024-03-24T00:00:00+00:00

### Abstract

Time is the most important intangible resource in organizations. Team temporal leadership, as a key factor in enhancing the efficiency of time utilization within organizations, has received considerable attention in recent years. Based on existing research findings, there remain certain disagreements regarding the conceptual connotation of team temporal leadership, and investigations into its mechanisms of action on team and individual effectiveness are particularly insufficient. Therefore, this study will closely center on the core of “time”, and based on clarifying the conceptual connotation of team temporal leadership and developing indigenous measurement instruments, conduct a series of investigations to explore the multilevel mechanisms through which team temporal leadership influences team and individual effectiveness. This research can not only make significant contributions to the theoretical development of team temporal leadership, but also holds important practical guiding significance for time management in teams and organizations.

### Full Text

## The Conceptual Connotation of Team Temporal Leadership and Its Impact on Team and Individual Effectiveness

**LI Yuhui, YANG Chenlu**

(School of Labor and Human Resources, Renmin University of China, Beijing 100872, China)

**Abstract:** Time is the most important intangible resource in organizations. Team temporal leadership, as a key factor in improving the efficiency of organizational time utilization, has received significant research attention in recent years. However, existing research reveals that the conceptual connotation of team temporal leadership remains controversial, and there is a particular lack

of exploration regarding its mechanisms of action on team and individual effectiveness. Therefore, this study will focus closely on the core element of “time,” clarifying the conceptual connotation of team temporal leadership and developing an indigenous measurement tool as a foundation for a series of studies that explore the multi-level mechanisms through which team temporal leadership influences team and individual effectiveness. This research will not only make significant contributions to the theoretical development of team temporal leadership but also holds important practical implications for time management within teams and organizations.

**Keywords:** Team temporal leadership; Functional leadership theory; Temporal team mental model; Team performance

**Classification Number:** B849:C93

## 1. Problem Statement

In today’ s increasingly competitive market environment and highly uncertain external context, time has become an ever more precious intangible resource for organizational development (Waller et al., 2001). The efficient utilization of time directly impacts operational efficiency, organizational change, strategic implementation, and ultimately, performance outcomes. However, contemporary management practices still suffer from widespread problems of unreasonable scheduling and insufficient time utilization efficiency. According to DT Research Institute’ s *2023 Overtime Survey Report of Young People*, as many as 95.7% of workplace professionals have experienced overtime in their most recent job. Zhaopin’ s *2022 Workplace Overtime Insight Report* indicates that “urgent projects requiring overtime to meet deadlines” has become the primary reason for workplace overtime. Inappropriate scheduling and inefficient time utilization in organizations not only lead to persistent employee overtime and health risks but also hinder dynamic innovation and productive development (e.g., Mohammed & Schillinger, 2022; Yao, Luo, & Zhang, 2021; Qi et al., 2020; Wei & Zhao, 2018; Zhang & Ling, 2015).

In organizational contexts, individual time utilization is closely related to their work teams. Teams have become the basic work unit in contemporary organizations (Mathieu et al., 2017), and individual time efficiency is directly influenced by team collaboration and others’ work progress, particularly in teams with interdependent workflows and tight member coordination. In addressing issues of improving employee efficiency, optimizing time management, and enhancing overall team effectiveness, team leaders play a crucial role (Zaccaro et al., 2001). Against this backdrop, the concept of team temporal leadership has been introduced as a vital factor in enhancing team temporal operational efficiency.

Team temporal leadership refers to leadership behaviors that help structure, coordinate, and manage the rhythm of task completion within teams, including scheduling, synchronizing, and allocating temporal resources (Mohammed & Nadkarni, 2011). Currently, research on team temporal leadership remains

in its preliminary exploratory stage, with several notable limitations: (1) The conceptual connotation of team temporal leadership is unclear, and academic consensus on its conceptual meaning and structural dimensions has not been reached. (2) The scientific validity and effectiveness of existing measurement tools require further verification (Mohammed & Alipour, 2014; Zhang & Ling, 2015). Both the concept and scale development of team temporal leadership are based on Western organizational contexts, and their applicability to the Chinese context requires further investigation. Consequently, directly applying Western-developed team temporal leadership scales in indigenous empirical research may overlook specific connotations and behavioral manifestations of team temporal leadership in the Chinese context, compromising the reliability and validity of such studies. Moreover, as a social influence process, leadership composition varies across national cultures. For instance, in cultural contexts characterized by high power distance and emphasis on interpersonal relationships (Feng et al., 2021), Chinese leaders are more likely to exhibit indigenous leadership styles such as authoritarian and benevolent leadership (Zhou & Long, 2005). Compared with Western countries, China's cultural traditions, political systems, legal environments, and economic systems are all different, making leadership characteristics and behavioral manifestations unique in the Chinese context (Cao et al., 2011). Therefore, developing an indigenous team temporal leadership scale is extremely necessary for improving empirical research in the Chinese context. (3) Research on the mechanisms of team temporal leadership is insufficiently deep, with inadequate focus on the unique conceptual core of "time." Systematic research on team temporal leadership is crucial for both theoretical development and organizational management practice.

First, team temporal leadership aligns with practical organizational needs. In modern organizations, teams have become the basic work unit. Organizations accomplish complex tasks through teams, increase organizational flexibility, and improve overall performance (Mathieu et al., 2017). Team members rarely work in isolation and typically need to collaborate to complete team tasks jointly. However, due to inconsistencies in team members' time perspectives and work rhythms, temporal conflicts among members have become a common challenge in team management (Santos et al., 2016). In such situations, leaders' time management for individual subordinates cannot resolve temporal conflicts among numerous team members. Therefore, the team-level leadership role becomes crucial, requiring team leaders to coordinate overall team scheduling, synchronization, and allocation.

Second, team temporal leadership is essential for achieving multiple organizational goals. When facing complex and dynamic market competition, organizations must consider multiple complex objectives in time management, such as balancing short-term performance with long-term development and 兼顾 production speed and quality (Mohammed & Nadkarni, 2011). A single individual cannot meet multiple temporal demands, but teams typically have richer member structures, allowing team leaders to effectively coordinate members' temporal advantages and integrate their temporal resources to achieve organizational

multiple goals.

Finally, leadership research has increasingly emphasized team leadership. Team leadership theory differs from the broad applicability of general leadership theories, which cannot be directly applied to the team level (Kozlowski & Ilgen, 2006; Morgeson et al., 2010). Team leadership research must consider the uniqueness of team contexts, where members dynamically participate in team processes over time, synchronizing their knowledge, skills, and efforts (Kozlowski & Ilgen, 2006). Compared with individual-level temporal leadership, team temporal leadership considers the dynamic process of temporal coordination and synchronization among team members, better aligning with current research priorities in leadership studies.

Based on theoretical development and management practice needs, this study focuses on team temporal leadership, conducting systematic research: first, clarifying the conceptual connotation of team temporal leadership and developing a measurement tool in the Chinese context; second, analyzing the mechanisms through which team temporal leadership affects team processes and team effectiveness; and finally, exploring its cross-level mechanisms on individual effectiveness. This research not only effectively supplements existing studies on team temporal leadership and makes significant theoretical contributions but also provides important practical guidance for team and individual management.

## 2.1 The Conceptual Connotation of Temporal Leadership

The concept of temporal leadership was initially proposed at the organizational level. Ancona et al. (2001) argued that top management teams need to manage organizations across multiple temporal frameworks, creating unified temporal structures for organizations to ensure adaptation to external technological and competitive cycles, thereby forming temporal leadership. Halbesleben et al. (2003) subsequently noted that temporal activities such as managing temporal frameworks, adjusting rhythms, identifying time-related differences, and synchronizing members' paces should be integral parts of the leadership role. Op't Hoog (2009) proposed individual-level temporal leadership, defining it as leader behaviors that help leaders and followers cope with temporal complexity, including self-referenced and shifted-reference temporal leadership. Chinese scholars Zhang and Ling (2015) defined temporal leadership as leaders' time management behaviors that help ensure tasks are completed on schedule while enhancing subordinates' time-related well-being, according to their individual temporal traits and task characteristics—a definition recognized by some Chinese scholars (Ma et al., 2021; Wei et al., 2022; Han, 2021). Mohammed and Nadkarni (2011) proposed the concept of team-level temporal leadership, defining it as leadership behaviors that help structure, coordinate, and manage the rhythm of task completion within teams, and developed a corresponding measurement scale.

Conceptual dimensions of temporal leadership can be mainly divided into three

perspectives. The first perspective views temporal leadership as a task-oriented, unidimensional construct. Representative scholars Mohammed and Nadkarni believe temporal leadership includes three key behaviors: scheduling (e.g., reminding team members of deadlines, setting intermediate milestones), temporal synchronization (e.g., coordinating team members to complete work on time), and temporal resource allocation (e.g., preparing for emergencies and issues promptly), aiming to solve three types of temporal problems: temporal ambiguity, temporal conflict of interest, and temporal resource scarcity (McGrath, 1991), and define it as task-oriented leadership behavior. The second perspective views temporal leadership as a two-dimensional construct comprising both task and relationship orientation. Myer and Mohammed (2012) supplemented the connotation of temporal leadership based on Mohammed and Nadkarni's definition, arguing that besides task orientation, temporal leadership should also include relationship orientation. Relationship-oriented temporal leadership includes showing respect, appreciation, and support for subordinates' time-related problems and their preferences for handling these problems, specifically including conflict management, rewarding behaviors, and caring behaviors regarding temporal references. Chinese scholars Zhang and Ling's definition of temporal leadership aligns to some extent with Myer and Mohammed's two-dimensional perspective, emphasizing both timely task completion and subordinates' subjective experiences. The third perspective views temporal leadership as comprising five dimensions: temporal autonomy, temporal planning, temporal reminders, temporal pressure, and temporal awareness (Op't Hoog, 2009). Due to weak theoretical foundations and insufficiently rigorous research methods, this perspective has not been widely recognized or applied by other scholars.

Thus, the conceptual connotation and dimensions of temporal leadership remain controversial, and scholars in this field recognize this critical issue and call for clarification of temporal leadership's conceptual connotation. Among them, Zhang and Ling pointed out that the conceptual connotation and legitimate status of temporal leadership urgently need clarification. Wei and Zhao (2018) suggested in their research that attention should be paid not only to task-oriented temporal leadership but also to exploring the mechanisms of relationship-oriented temporal leadership, indicating that temporal leadership may have different functional and attributional connotations, types, and dimensions that await further exploration. Although Mohammed and Alipour (2014) recognized the two-dimensional structure of task and relationship orientation in their review article, subsequent empirical verification of this two-dimensional structure is still lacking. Chinese scholars Qi et al. (2020) proposed that the conceptual connotation and measurement of temporal leadership should be further developed and improved in combination with the Chinese context.

## 2.2 Research on Outcome Variables and Mechanisms of Temporal Leadership

Through comprehensive analysis of temporal leadership literature, current outcome variables of temporal leadership mainly include four categories: employee performance, employee work behavior, employee subjective experience, and organizational outcomes. Empirical studies have found that temporal leadership can effectively enhance subordinates' innovative performance (Zhang et al., 2020). Regarding employee behavior, temporal leadership effectively promotes subordinates' innovative behavior (Xiao et al., 2022), bootlegging behavior (Li & Ye, 2021), helping behavior (Zhang & Ling, 2016), proactive change behavior (Wei et al., 2022), and can also reduce subordinates' workplace deviance (Wan et al., 2021). Regarding employee subjective experience, temporal leadership can promote subordinates' thriving at work (Li & Ye, 2021) and subjective well-being (Yao, Luo, & Zhang, 2021). Additionally, research has found that temporal leadership can enhance organizational internationalization speed (Cheng et al., 2022), competitive advantage (Mahmood & Arslan, 2020), and innovation ambidexterity (Chen & Liu, 2020).

Mechanism research on temporal leadership mainly includes cognition, emotion, and motivation. First, cognitive mechanism studies have found that temporal leadership can reduce perceived illegitimate tasks, thereby decreasing subordinates' workplace deviance (Wan et al., 2021); temporal leadership can also promote subordinates' thriving at work by enhancing perceived cooperative goals (Li & Ye, 2021). Second, regarding emotional mechanisms, temporal leadership can have differential effects on individual innovative behavior and helping behavior through dual emotional paths of harmonious passion and obsessive passion (Xiao et al., 2022; Zhang & Ling, 2016); temporal leadership can also promote employees' proactive change behavior through the mediating role of positive emotions (Wei et al., 2022) or promote innovative performance by enhancing vitality levels (Zhang et al., 2020). Regarding motivation, temporal leadership may lead subordinates to break certain social rules for efficiency (Pro-social rule breaking for efficiency), which typically involves generating new ideas, thereby enhancing subordinates' innovative performance (Zhang et al., 2020); temporal leadership may also influence subordinates' bootlegging behavior through the mediating role of self-efficacy (Li & Ye, 2021). Additionally, some studies have found that temporal leadership can enhance subordinates' subjective well-being through work-family enrichment mechanisms (Yao, Luo, & Zhang, 2021).

Through this review of temporal leadership outcomes and mechanisms, we can see that although temporal leadership research has accumulated certain achievements, these studies still cannot profoundly reveal the core mechanisms of temporal leadership, lacking unique perspectives and insights distinct from traditional leadership behaviors. The most significant difference between temporal leadership and traditional leadership behaviors such as transformational and transactional leadership lies in placing "time" at the core of the concept, aiming to solve time-related problems in organizational management. Therefore, mech-

anism research on temporal leadership needs to focus on the conceptual core of “time,” such as deeply exploring the roles of subordinates’ temporal skills, temporal cognition, or subjective temporal experience. Moreover, most current studies still adopt cross-sectional designs, resulting in insufficiently robust causal relationships and external validity that needs further improvement.

### 2.3 Research on Moderating Effects of Temporal Leadership

Another research theme of temporal leadership involves exploring its moderating effects. For example, how temporal leadership effectively mitigates the negative impacts of temporal pressure or illegitimate tasks, and how it enhances the positive effects of subordinates’ temporal characteristics. Specifically, temporal leadership can strengthen the positive effects of challenging temporal pressure on job security and individual creativity, while weakening the negative effects of hindering temporal pressure on job security and individual creativity (Zhang et al., 2022; Liu et al., 2017). Temporal leadership can also positively moderate the relationship between temporal pressure consistency before and after task allocation and the work well-being of new-generation employees; high-level temporal leadership is more likely to stimulate the promoting effect of temporal pressure consistency on work well-being (Yao, Luo, Zhang, & Yan, 2020). Second, temporal leadership can alleviate the negative effects of illegitimate tasks. When employees face illegitimate tasks, temporal leadership can help them effectively cope with both their own tasks and illegitimate tasks, balance employees’ temporal resources, and effectively reduce the negative impacts of illegitimate tasks on subordinates (Ma et al., 2021). Third, temporal leadership can enhance the positive effects of subordinates’ deadline rhythm styles and polychronicity on new product development effectiveness (Op’ t Hoog, 2009).

### 2.4 Current Status of Team Temporal Leadership Research

The concept of team temporal leadership was explicitly proposed by Mohammed and Nadkarni based on the time-interaction-performance theory, defined as leadership behaviors that help structure, coordinate, and manage the rhythm of task completion within teams, including scheduling, temporal synchronization, and temporal resource allocation. Mohammed and Nadkarni clarified that team temporal leadership belongs to task-oriented leadership behavior. Myer and Mohammed argued that team temporal leadership should also include relationship orientation besides task orientation. These two perspectives remain controversial, and no studies have further verified or integrated them.

The conceptual connotation of team temporal leadership has certain similarities with time management, but they differ significantly in terms of action direction and behavioral content. Time management refers to behaviors aimed at effectively utilizing time when performing certain goal-directed activities (Claessens et al., 2007), including identifying needs, setting goals to meet needs, prioritizing tasks, and matching tasks with temporal resources through planning, schedul-

ing, and list-making activities (Francis-Smythe & Robertson, 1999). Specifically, time management involves: first, clarifying what one wants to accomplish, including anchoring long-term goals, setting short-term goals, reviewing goals, and ranking them by relative importance; next, determining what tasks to complete to achieve these goals, including task decomposition, prioritizing tasks, and setting task deadlines; finally, examining available time and starting with the most important tasks, matching tasks with available time using lists, including creating schedules, evaluating schedules, setting temporal reminders, and regularly tracking progress (Lakein, 1973; Peeters & Rutte, 2005; Macan et al., 1990; Macan, 1994). Team temporal leadership and time management differ in action direction: team temporal leadership focuses on leaders' allocation and management of other members' temporal resources within teams, whereas time management can allocate and manage temporal resources for both oneself and others (Zhang & Ling, 2015). Regarding behavioral content, team temporal leadership includes scheduling, temporal synchronization, and temporal resource allocation, highlighting not only its important role in improving team work efficiency and ensuring timely task completion but also reflecting team coordination and cooperation in achieving goals. In contrast, although time management also involves temporal scheduling and allocation, it does not emphasize the "temporal synchronization" process of team coordination.

There are two existing measurement tools for team temporal leadership. First, Mohammed and Nadkarni developed a unidimensional 7-item scale for task-oriented team temporal leadership. Scale items include partial modifications of time planning and temporal reminder scales (Janicik & Bartel, 2003; Gevers et al., 2006) and additional items written by the authors. This scale currently has the highest recognition and widest application range, but it still has some limitations: first, scale items are adapted from other scales or written by the authors themselves, without guaranteed content validity; second, the internal structure of the scale has not been validated; additionally, there is a certain degree of contradiction between the theoretical comprehensiveness of the team temporal leadership concept and the unidimensional structure of the measurement tool (Zhang & Ling, 2015). Second, Myer and Mohammed developed a two-dimensional 10-item scale including both task-oriented and relationship-oriented team temporal leadership. This scale was developed using the deductive method to generate initial items and used confirmatory factor analysis to validate the task-relationship two-dimensional structure. However, this scale has not been widely recognized or adopted subsequently, mainly because the deductive method typically requires mature theories or models, while team temporal leadership research is still in its infancy, and using the deductive method may be limited by theoretical constraints and researcher subjectivity, resulting in incomplete or inaccurate scales. Moreover, both existing team temporal leadership scales were developed based on Western contexts and may lack certain specific behavioral manifestations of team temporal leadership in the Chinese context. Therefore, future research should clarify the conceptual connotation and legitimate status of team temporal leadership as soon as possible and use a

combination of deductive and inductive methods to develop more scientific and comprehensive indigenous team temporal leadership scales, providing a solid foundation for future related research.

The impact outcomes of team temporal leadership are limited to two categories: team performance and team behavior. Numerous studies have shown that team temporal leadership enhances team performance (Mohammed & Nadkarni, 2011; Santos et al., 2016; Yuan & Lo, 2018; Zhang & Cen, 2015), team innovation performance, and team creativity (Liu et al., 2021; Ma & Yan, 2021; Wei et al., 2021). Additionally, some studies have found that team temporal leadership can promote team innovative behavior (Wei & Zhao, 2018), team learning behavior (Liu et al., 2017), and effectively reduce team unethical pro-organizational behavior (Qi et al., 2020).

Regarding the mechanisms of team temporal leadership, they mainly include team cognition, team motivation, team psychological states, and team behavior. In terms of team cognition, team temporal leadership can influence team outcomes by promoting team temporal reflection (Liu et al., 2017), team temporal consensus (Ma & Yan, 2021), temporal team mental models (Zhang & Cen, 2015), and reducing team temporal conflict (Santos et al., 2016). Regarding team motivation, studies have found that team temporal leadership influences team unethical pro-organizational behavior through the chain mediation of team members' temporal focus and work focus (Qi et al., 2020). Regarding team psychological states, team temporal leadership helps team members psychologically detach from work during non-work time, thereby affecting subsequent team innovative behavior (Wei & Zhao, 2018). Regarding team behavior, team temporal leadership can promote team innovation through team long-term learning or team information exchange (Liu et al., 2021; Wei et al., 2021).

Research on team temporal leadership as a moderating variable shows that it helps enhance the positive effects of team temporal diversity and team temporal pressure. Team temporal leadership can effectively reduce temporal conflicts caused by team temporal diversity (Najam et al., 2018) and promote the positive effect of team temporal diversity on team performance (Mohammed & Nadkarni, 2011). Moreover, through effective allocation of temporal resources, team temporal leadership can better resolve team members' dilemmas of temporal resource scarcity and enhance the promoting effects of team temporal pressure on team processes, leader-member exchange, team performance, and team tacit knowledge sharing (Yao, Luo, Zhang, & Zhong, 2021; Maruping et al., 2015). Team temporal leadership can also strengthen the positive effect of challenging temporal pressure on team reflection and weaken the negative effect of hindering temporal pressure on team reflection (Yao, Luo, Zhang, & Xiong, 2020).

## 2.5 Existing Research Problems

Through reviewing domestic and international research, we find that team temporal leadership plays a significant role in promoting team processes, improving overall team performance, and alleviating temporal pressure within teams, demonstrating its necessity in team management. However, this research area still has many deficiencies. First, the conceptual connotation of team temporal leadership needs clarification, specifically regarding what dimensions it includes. Moreover, the scientific validity and applicability of team temporal leadership measurement tools in the Chinese context require verification. Second, research on the mechanisms of team temporal leadership remains insufficiently deep. Previous studies have mostly conducted simple explorations from perspectives of team cognition, team motivation, and team psychological states, while lacking in-depth analysis of mechanisms related to team interaction processes and team emotions. Additionally, insufficient attention has been paid to the cross-level mechanisms of team temporal leadership on individuals. How team temporal leadership affects individual effectiveness and the mechanisms through which individual time management skills, temporal cognition, motivation, and other factors play roles are key propositions awaiting revelation.

## 3. Research Framework

This study will conduct systematic research on team temporal leadership, clarifying its conceptual connotation, exploring its mechanisms on team effectiveness and individual effectiveness, and thereby establishing a logical relationship network of team temporal leadership. Specifically, it includes three sub-studies: Study 1 analyzes the conceptual connotation of team temporal leadership and develops an effective indigenous measurement tool; Study 2 will use multi-time-point, multi-source questionnaire surveys to explore multiple mechanisms through which team temporal leadership influences team effectiveness from perspectives of team cognition, team interaction processes, and team emotions. Specifically, it examines the multiple chain mediating effects of temporal team mental model, team communication quality, and team positive affective tone, as well as the moderating effect of team task interdependence; Study 3 will use hierarchical linear modeling to explore the cross-level mechanisms through which team temporal leadership influences individual effectiveness, including examining the multiple chain mediating effects of time management skill, temporal predictability, effort during goal pursuit, and thriving at work. The theoretical model diagram is shown in Figure 1 [Figure 1: see original paper].

### 3.1 Conceptual Connotation and Scale Development of Team Temporal Leadership

Functional leadership theory is one of the most frequently used theoretical perspectives in team leadership research. The primary responsibility of team leaders is to personally handle or arrange for members to handle anything that does

not adequately meet team needs (McGrath, 1962). Team leaders are viewed as key roles responsible for meeting team management needs, identifying and solving team problems, and being accountable for team functions (Hackman & Walton, 1986; Zaccaro et al., 2001). Hackman and Walton (1986) further elaborated on this proposition: “If a leader ensures, through various means, that all functions for task completion and team maintenance are adequately fulfilled, then the leader has done his job.” Notably, their emphasis on task completion and team maintenance acknowledges the task-relationship dichotomy in team leadership functions. In systematic reviews of team leadership function classifications, it has also been found that team leadership functions typically emphasize both task completion and developing team members or maintaining team socio-emotional states (Kozlowski et al., 2016). The dichotomy of team leadership behavior has also been supported in meta-analyses, which show that task-oriented leadership behavior can explain 12% of team performance variance, while relationship-oriented leadership behavior can explain 10% of team performance variance (Burke et al., 2006).

Functional leadership theory essentially raises the question: “What must leaders do to facilitate team task completion and relationship maintenance?” (Mumford et al., 2000). Answering this question requires considering the challenges team leaders face when managing team tasks and team relationships. Team temporal leadership aims to solve three temporal problems within teams: temporal ambiguity, temporal conflict of interest, and temporal resource scarcity (Mohammed & Nadkarni, 2011). These temporal problems not only hinder timely task completion but also cause interpersonal conflicts and resource tensions (Santos et al., 2016), requiring team leaders to employ not only task-oriented leadership behaviors to ensure smooth team work progress but also relationship-oriented leadership behaviors to alleviate interpersonal tensions caused by temporal conflicts. Moreover, considering the uniqueness of the Chinese context, such as people-centered values like benevolent governance, serving the public good, and prioritizing the people, a social atmosphere that values “harmony” and interpersonal harmony (Li & Shi, 2005), and benevolent leadership in Chinese indigenous leadership research (Zhou & Long, 2005), all indicate the universality and research necessity of “relationship-oriented” leadership behaviors in the Chinese context. Therefore, based on functional leadership theory and the uniqueness of the Chinese context, this study posits that team temporal leadership should simultaneously include both task-oriented and relationship-oriented dimensions.

After clarifying the conceptual connotation of team temporal leadership, this study will further develop an effective and contextually appropriate measurement scale for team temporal leadership through a rigorous scale development process. Specifically, using a combination of deductive and inductive methods, through literature review and interviews with team leaders and members, we will code and identify the typical characteristics and basic structure of team temporal leadership. Based on literature and interview content, we will construct an item pool reflecting the connotation of team temporal leadership, then use exploratory factor analysis to form different dimensions of team temporal leader-

ship, apply confirmatory factor analysis for structural validation, subsequently test the scale's reliability, content validity, convergent validity, discriminant validity, and criterion validity, and finally form an effective indigenous measurement scale for team temporal leadership.

### 3.2 Mechanisms of Team Temporal Leadership on Team Effectiveness

In team research, team effectiveness is one of the important outcome variables (Mathieu et al., 2008). Team effectiveness comprises two aspects: team performance and team members' affective reactions (Mathieu et al., 2008). Team performance refers to the extent to which teams achieve expected goals; team members' affective reactions include satisfaction, commitment, and team viability (Mathieu et al., 2008). Team viability represents the long-term stability of team members, typically measured by the degree to which team members desire to remain in the team. This study will use team performance and team viability as key indicators of team effectiveness and examine the mechanisms of temporal team mental model, team communication quality, and team positive affective tone.

Temporal team mental model is team members' simultaneous consensus on subjective time (pace style, time orientation, urgency, etc.) and objective time (time points, speed, rhythm, scheduling, etc.) (Zhang & Cen, 2015). According to functional leadership theory, team temporal leadership can solve the problems of temporal ambiguity, temporal conflict of interest, and temporal resource scarcity within teams through key activities such as scheduling, temporal synchronization, and temporal resource allocation (Mohammed & Nadkarni, 2011), thereby ensuring good team functioning and promoting the formation of temporal team mental models (Zhang & Cen, 2015). Specifically, team temporal leadership can effectively allocate members' time and reasonably plan, arrange, coordinate, and remind them of their work progress, rhythm, and pace (Mohammed & Alipour, 2014; Mohammed & Nadkarni, 2011), a process that helps team members develop consistent understanding of task time, i.e., forming a temporal team mental model (Zhang & Cen, 2015). Crossan et al. (2005) proposed that understanding temporal problems in the environment enables leaders to set the context for team activities and develop more comprehensive and flexible temporal approaches, which likely promotes employees' understanding of and adaptation to each other. If leaders can establish clear temporal frameworks and communicate project goal-related temporal frameworks to members through schedules, reminders, and temporary milestones, they can effectively alleviate temporal conflicts among team members and create clearer consensus on team goals and objective temporal requirements (Halbesleben et al., 2003). Additionally, team temporal leadership can effectively utilize individual diversity in temporal concepts (Schriber & Gutek, 1987; Gevers et al., 2006) to achieve common understanding in subjective time. Based on this, this study infers that team temporal leadership will positively promote the formation of

temporal team mental models and proposes the following hypothesis:

**Hypothesis 1:** Team temporal leadership positively influences temporal team mental model.

Team communication is a necessary team process for exchanging different views with other members, promoting mutual feelings, and improving team effectiveness (Marlow et al., 2017). Team communication comprises three aspects: communication frequency, communication quality, and communication content, with team communication quality considered to play a more critical and direct role than other aspects (Marlow et al., 2017). Team communication quality is defined as the degree of clarity, effectiveness, completeness, fluency, and timeliness of communication among team members (González-Romá & Hernández, 2014). Temporal team mental model means team members have consensus on temporal perspectives, work rhythms, and time urgency, and possess unified temporal frameworks, schedules, and temporary milestones (Zhang & Cen, 2015). This temporal consensus and consistency can ensure timely responses to communication interactions initiated by others and timely communication feedback, alleviating the decline in communication quality caused by untimely team communication (Halbesleben et al., 2003), thereby improving team communication quality (Jain et al., 2016). Second, temporal team mental model means team members have common understanding of task and sub-node deadlines, prompting team members to fully mobilize their own resources or surrounding available resources into work and focus more on team tasks (Wei & Zhao, 2018). This not only ensures that team members receive each other's communication information in a timely manner but also helps them accurately understand each other's information, forming closed-loop communication (Marlow et al., 2017). Based on this, this study infers that temporal team mental model can positively influence team communication quality.

Team communication is not only key to team interaction processes but also an important factor affecting team effectiveness (Wu et al., 2013; Aissa et al., 2022). First, high-quality communication within teams helps members quickly reach consensus on interdependent tasks, clarify respective team roles, define team norms, establish cognitive models, and provide mutual support, which facilitates effective task coordination and cooperation among team members, thereby improving team effectiveness (Lester et al., 2002). Second, from an interpersonal interaction perspective, high-quality communication promotes more effective sharing and feedback, making it easier to establish social connections with others, cultivate team members' sense of connection and identification, and increase attention to others and trust levels among members (Altschuller & Benbunan-Fich, 2010), thus promoting both team performance and team viability. Based on this, this study proposes the following hypotheses:

**Hypothesis 2a:** Temporal team mental model positively influences team communication quality.

**Hypothesis 2b:** Team temporal leadership positively influences team perfor-

mance through the chain mediation of temporal team mental model and team communication quality.

**Hypothesis 2c:** Team temporal leadership positively influences team viability through the chain mediation of temporal team mental model and team communication quality.

Additionally, from an affective perspective, temporal team mental model may also promote team positive affective tone. Team affective tone refers to the aggregation of similar affective states among team members; if all members in a team are relatively excited, enthusiastic, and energetic, the team is considered to have a positive affective tone (Sy et al., 2005). Temporal team mental model means team members have consistent schedules in their minds, which can reduce fuzzy cognitive understanding of task time among team members, enabling them to have consistent goals regarding team tasks and focus on completing important tasks (Guthrie & Hollensbe, 2004). Groups with consistent goals and common commitment to completing team tasks have stronger cohesion (Robbins & Madrigal, 2019), and harmonious team member relationships mean team members can obtain interpersonal support (Nootjarat et al., 2015), thereby enhancing positive affective tone within the team. Second, team members with shared temporal mental models understand each other's task nodes and progress, which can effectively reduce temporal conflicts within the team (Santos et al., 2016), bringing more positive affective experiences to team members.

Team positive affective tone is a pleasant perceptual state of team members (Estrada et al., 1994), which is considered helpful for information integration within teams (Estrada et al., 1997) and collaboration among members (Jordan et al., 2006), thereby promoting team performance (Pirola-Merlo et al., 2002). Second, when team members are in positive moods, they view things optimistically and are more likely to have positive views of colleagues (Ilies et al., 2006). Research has found that positive affective tone leads to interpersonal attraction (Gouaux & Gouaux, 1971), social interaction and identification (Ilies et al., 2006), and they are more likely to help colleagues (Ilies et al., 2006), thus potentially promoting team viability. Based on this, this study proposes the following hypotheses:

**Hypothesis 3a:** Temporal team mental model positively influences team positive affective tone.

**Hypothesis 3b:** Team temporal leadership positively influences team performance through the chain mediation of temporal team mental model and team positive affective tone.

**Hypothesis 3c:** Team temporal leadership positively influences team viability through the chain mediation of temporal team mental model and team positive affective tone.

Furthermore, this study explores the boundary role of team task characteristics.

Team task interdependence is one of the most prominent features of team tasks, referring to the degree to which improvements in team performance from team members' efforts depend on other members' efforts (Wageman & Baker, 1997). The stronger the team task interdependence, the more important coordination functions become for team goals (Arnold & Tafkov, 2019). When team task interdependence is high, team members' task time nodes and rhythm styles will affect other members' task progress, making the role of team temporal leadership particularly prominent. Team leaders can promote the formation of shared temporal mental models within teams by setting time nodes and coordinating time. Conversely, when team task interdependence is low, the functional demand for cooperation and coordination in team operations is lower, members' work is relatively independent, and the coordination advantages of team temporal leadership cannot be fully utilized, potentially causing team members' dissatisfaction with temporal coordination, weakening the promoting effect of team temporal leadership on shared temporal mental models. Based on this, this study proposes the following hypotheses:

**Hypothesis 4a:** Team task interdependence positively moderates the effect of team temporal leadership on temporal team mental model.

**Hypothesis 4b:** Team task interdependence positively moderates the indirect effect of team temporal leadership on team performance/team viability through the chain mediation of temporal team mental model and team communication quality.

**Hypothesis 4c:** Team task interdependence positively moderates the indirect effect of team temporal leadership on team performance/team viability through the chain mediation of temporal team mental model and team positive affective tone.

### 3.3 Cross-level Mechanisms of Team Temporal Leadership on Individual Effectiveness

Functional leadership theory posits that team leaders' responsibility is to personally handle or arrange for members to handle anything that does not adequately meet team needs (McGrath, 1962), thereby ensuring good team functioning. The essence of team temporal leadership is to solve three temporal problems within teams: temporal ambiguity, temporal conflict of interest, and temporal resource scarcity (Mohammed & Nadkarni, 2011). Solving these temporal problems means achieving timely team task completion and avoiding team temporal conflicts and resource tensions (Santos et al., 2016), i.e., ensuring good team functioning. Morgan et al. (1993) believe that good team functioning means the smooth advancement of two activities: taskwork and teamwork, with the former referring to individual members' activities to complete tasks and the latter referring to various interactions among team members to complete tasks (Zhou & Wang, 2005). Therefore, functional leadership theory can not only explain the mechanisms of team temporal leadership on team effectiveness from the

teamwork perspective but also explain the cross-level mechanisms of team temporal leadership on individual effectiveness from the perspective of promoting individual taskwork activities.

Time management skill refers to a series of abilities, techniques, and strategies used to effectively plan, allocate, and utilize temporal resources to achieve personal or organizational goals (Macan, 1994). Time management skill includes goal setting and prioritization, monitoring goal progress, and managing productivity (Rapp et al., 2013), such as setting goals at the beginning of temporal frameworks, planning and prioritizing daily activities, and creating to-do lists (Britton & Tesser, 1991). Team temporal leadership provides clear direction and action paths for team members by setting clear task nodes and arranging task priorities. By clarifying the team's overall goals and expectations and setting specific work tasks and time nodes for members, it helps subordinates understand the importance and requirements of time management, thereby cultivating their time management skills. Moreover, leaders have more interpersonal interactions with their direct subordinates, making their behaviors highly visible; leaders' good habits in setting sub-nodes and tracking task progress can promote subordinates' learning and imitation (Mayer et al., 2012), thereby improving subordinates' time management skills. Based on this, this study proposes the following hypothesis:

**Hypothesis 5:** Team temporal leadership positively influences subordinates' time management skill.

Temporal predictability refers to the degree to which the "preparatory period" or "idle period" of uncertainty is reduced before work tasks or events (Grondin & Rammsayer, 2003). When temporal predictability is high, there is a low level of unpredictable waiting periods between tasks, meaning individuals have conscious expectations of when tasks or events will begin. Conversely, low temporal predictability means individuals do not know the exact timing of tasks or events, creating uncertain expectations (Grondin & Rammsayer, 2003). Team temporal leadership includes developing clear temporal schedules and temporal resource allocation, with leaders providing timely reminders, which helps subordinates grasp the occurrence time and intervals of tasks, thereby improving temporal predictability. Additionally, strong time management skill means individuals can clearly prioritize tasks and allocate time to them, having clear plans and expectations for task sequence and timing. Research has pointed out that individuals with high-level time management skills can more accurately estimate task occurrence time and duration (Francis-Smythe & Robertson, 1999), meaning high-level time management skill can improve temporal predictability. Based on this, this study proposes the following hypotheses:

**Hypothesis 6a:** Team temporal leadership positively influences subordinates' temporal predictability.

**Hypothesis 6b:** Time management skill positively influences subordinates' temporal predictability.

Effort during goal pursuit refers to the degree to which individuals work hard through behaviors to achieve goals (Beck et al., 2017). Temporal predictability can prompt individuals to devote themselves fully to work tasks, enhancing their effort during goal pursuit. Specifically, when temporal predictability is low, individuals spend considerable time waiting for uncertain task arrangements or events, and must allocate cognitive resources to subjective temporal judgment and time estimation (Cahoon & Edmonds, 1980), making it difficult for them to concentrate on tasks, resulting in lower effort during goal pursuit. When temporal predictability is high, individuals have clear cognition of task duration and subsequent task start times, and do not need to spend excessive energy on subjective temporal judgment. Meanwhile, clear task timing and node arrangements will prompt individuals to devote themselves fully to tasks (Wei & Zhao, 2018). Existing research has pointed out that temporal predictability allows individuals to focus more attention on tasks themselves (Zhao et al., 2022). Therefore, this study believes that temporal predictability can effectively promote individuals' effort during goal pursuit.

Individual effort is a key element in ensuring task progress (Morgan et al., 1993). When individuals allocate more effort to specific goals, they typically achieve higher individual performance (Schmidt & DeShon, 2010). Effort during goal pursuit is also a process of individual growth and learning, during which individuals have stronger engagement in the activities they undertake, perceiving themselves as indispensable components of goal completion (Harter et al., 2002). Individuals can experience their own value in this process and obtain satisfaction and well-being from hard work. Moreover, effort during goal pursuit means high focus on current tasks, making individuals less likely to be troubled by other matters, such as being free from negative impacts of other work demands or family affairs (Boudreaux & Ozer, 2013), thereby enhancing individual well-being. Based on this, this study proposes the following hypotheses:

**Hypothesis 7a:** Temporal predictability positively influences effort during goal pursuit.

**Hypothesis 7b:** Team temporal leadership positively influences subordinates' job performance through the chain mediation of time management skill, temporal predictability, and effort during goal pursuit.

**Hypothesis 7c:** Team temporal leadership positively influences subordinates' well-being through the chain mediation of self-time management skill, temporal predictability, and effort during goal pursuit.

Thriving at work refers to a psychological state in which individuals simultaneously experience "vitality" and "learning" at work (Spreitzer et al., 2005). Temporal predictability can prevent individuals from wasting attention on temporal judgment and waiting; focusing attention on tasks can generate more positive experiences (Zhao et al., 2022). Positive experiences can effectively buffer employees' psychological and physiological depletion, stimulating their vitality and growth development (Kleine et al., 2019; Wu et al., 2015). Moreover, tem-

poral predictability sets clear temporal goals for task completion. Research has found that driven by ideals and aspirations, employees are more motivated to take proactive work behaviors, such as learning new knowledge, exploring novel work procedures, and helping others (Wallace et al., 2016). These proactive work behaviors can promote employees' learning growth and work vitality, serving as the "engine" of thriving at work.

Thriving at work, as a positive work experience state, helps individuals understand what they are doing, how to do it, and enhances individual work efficiency and adaptability (Spreitzer & Porath, 2014). Thriving at work means individuals have higher levels of energy and vitality, which helps individual work engagement and improves individual performance (Schaufeli et al., 2006). Individuals thriving at work can also acquire more work skills and knowledge resources through learning, which helps adapt to different work requirements and thereby improves individual performance (Cross et al., 2001). Moreover, research has found that when individuals thriving at work feel energetic and vigorous, they can effectively reduce negative emotions (Porath et al., 2012), psychological stress, and emotional exhaustion (Jo et al., 2020; Niessen et al., 2017), and have higher life satisfaction and subjective well-being (Zhai et al., 2020). Based on this, we propose the following hypotheses:

**Hypothesis 8a:** Temporal predictability positively influences thriving at work.

**Hypothesis 8b:** Team temporal leadership positively influences subordinates' job performance through the chain mediation of time management skill, temporal predictability, and thriving at work.

**Hypothesis 8c:** Team temporal leadership positively influences subordinates' well-being through the chain mediation of time management skill, temporal predictability, and thriving at work.

#### 4. Theoretical Contributions

This paper focuses on team temporal leadership as a key team leadership behavior. Team temporal leadership emphasizes the important role of team leaders in team time management, helping to address multiple team temporal demands, complete complex work tasks, and thereby improve team performance (Mohammed & Nadkarni, 2011). However, current literature does not deeply explore team temporal leadership, and its conceptual connotation, measurement tools, and mechanisms still await further exploration. From both management practice and theoretical construction perspectives, systematic research on team temporal leadership is urgently needed. Based on this, this study constructs a theoretical research system for team temporal leadership.

By constructing this theoretical research system, this study will make contributions in three aspects. First, this study addresses fundamental issues urgently needed in the team temporal leadership research field, clarifying and defining its conceptual connotation and developing an indigenous measurement tool. The

basic issues of conceptual connotation and measurement tools have not reached consensus or validation, which seriously hinders the vigorous development of this field. This study makes foundational and important basic contributions to the development of this field. Second, this study grasps the research frontier of team temporal leadership, supplementing and promoting theoretical research. Research on the mechanisms of team temporal leadership remains insufficient and incomplete. This study examines the multiple mediating effects of temporal team mental model, team communication quality, and team positive affective tone from perspectives of team cognition, team interaction processes, and team emotions, and also examines the moderating effect of team task interdependence from the perspective of team task characteristics. Moreover, this study conducts further in-depth exploration of the cross-level mechanisms of team temporal leadership, including the multiple mechanisms of subordinates' time management skill, temporal predictability, effort during goal pursuit, and thriving at work, effectively supplementing the research frontier. Third, this study serves important contemporary management practice needs. In today's business market, technology and customer needs change rapidly. Organizations must not only continuously develop innovative products and services but also deliver them to market faster than competitors. How to more efficiently utilize temporal resources within organizations is an urgent problem that management practice needs to solve. Based on important management practice needs, by examining the effects and mechanisms of team temporal leadership on team and individual effectiveness, this study provides important reference value for urgently needed time management problems within organizations.

## References

- Cao, Y., Wu, C., & Song, J. (2011). The behavioral structure and measurement of high-performance team leaders: A study in the context of Chinese indigenous culture. *China Soft Science*, (7), 131-144.
- Cheng, C., He, Y., Yan, L., & Jia, L. (2022). How does organizational time management affect the speed of enterprise internationalization? *Foreign Economics & Management*, 44(1).
- Feng, J., Liu, S., & Wu, W. (2021). Research on the indigenous development of humble leadership in the Chinese context. *Management Review*, 33(9), 211-223.
- Han, J. (2021). Research on the influence of temporal leadership on employee voice behavior. *Shanghai Management Science*, 43(3), 27-33.
- Li, C., & Shi, K. (2005). The structure and measurement of transformational leadership. *Acta Psychologica Sinica*, 37(6), 803-811.
- Li, M., & Ye, H. (2021). Temporal leadership, cooperative goal perception, and thriving at work: The moderating role of shared work time. *Human Resources Development of China*, 38(9), 19-32.

- Liu, B., Xu, L., & Qi, L. (2017). Temporal leadership and team learning behavior: A survey study based on construction project teams. *China Soft Science*, (1).
- Liu, X., Zhang, X., & Cui, T. (2017). Research on the relationship between time pressure and creativity: The cross-level moderating role of temporal leadership. *R&D Management*, 29(5), 13-21.
- Ma, J., & Yan, J. (2021). Temporal leadership, team temporal consensus, and team creativity: The moderating role of employee synchrony preference. *R&D Management*, 33(3), 84-96.
- Ma, L., Chen, T., Xie, P., & Zhao, X. (2021). The impact of illegitimate tasks on employee innovative behavior: The roles of psychological detachment and temporal leadership. *Science & Technology Progress and Policy*, 38(13), 135-142.
- Qi, L., Liu, B., Xu, L., & Ren, Z. (2020). Temporal leadership, temporal focus, work focus, and employee unethical pro-organizational behavior under temporal framework. *Journal of Industrial Engineering and Engineering Management*, 34(5), 75-85.
- Wei, W., Wang, Y., Zhao, H., & Zhang, Q. (2021). The influence of team temporal leadership on team creativity in polychronicity contexts. *Management Review*, 33(4).
- Wei, W., & Zhao, H. (2018). Team temporal leadership and team innovative behavior: Based on the perspective of team psychological detachment from work. *Nankai Business Review*, 21(4), 39-49.
- Wei, Y., Ma, L., & Xie, P. (2022). The influence of temporal leadership on employee proactive change behavior under the proactive motivation model. *Science & Technology Progress and Policy*, 39(18).
- Wu, J., Huang, P., & Yan, D. (2015). The generation of thriving at work and its impact on innovative performance: An empirical study from high-tech enterprises in Guangdong Province. *Soft Science*, 29(7), 110-113.
- Wu, L., Liu, J., Liang, S., & Wu, W. (2013). Abusive supervision and team performance: The mediating effects of team communication and collective efficacy. *Management Review*, 25(8), 151-159.
- Yao, Z., Luo, J., & Zhang, X. (2021). Time creates happiness: The mechanism of temporal leadership on subjective well-being. *Journal of Industrial Engineering and Engineering Management*, 35(4).
- Yao, Z., Luo, J., Zhang, X., & Xiong, Z. (2020). R&D team time pressure, team reflection, and innovation performance. *Studies in Science of Science*, 38(8).
- Yao, Z., Luo, J., Zhang, X., & Yan, J. (2020). Temporal pressure consistency and new-generation employee innovative performance. *R&D Management*, 32(2).

- Yao, Z., Luo, J., Zhang, X., & Zhong, J. (2021). Research on the influence of team time pressure on team tacit knowledge sharing. *R&D Management*, 33(2), 83-96.
- Zhang, G., & Cen, J. (2015). Research on the temporal coordination mechanism of knowledge teams and its impact on effectiveness. *Science Research Management*, 36(6), 145-156.
- Zhang, J., & Ling, W. (2015). A review and prospect of temporal leadership research: An organizational behavior perspective. *Foreign Economics & Management*, 37(1), 3-10.
- Zhang, J., & Ling, W. (2016). The influence of temporal leadership on employee helping behavior: The roles of work passion and proactive personality. *Journal of Psychological Science*, 39(4).
- Zhou, H., & Long, L. (2005). Combining kindness with authority, leading by virtue: A review of paternalistic leadership research. *Advances in Psychological Science*, 13(2), 227-238.
- Zhou, Y., & Wang, E. (2005). The functions, determinants, and effectiveness of team leadership. *Advances in Psychological Science*, 13(6), 780-787.
- Aissa, N. B., Gurău, C., Psychogios, A., & Somsing, A. (2022). Transactional memory systems in virtual teams: Communication antecedents and the impact of TMS components on creative processes outcomes. *Technological Forecasting and Social Change*, 174, 121235.
- Altschuller, S., & Benbunan-Fich, R. (2010). Trust, performance, and the communication process in ad hoc decision-making virtual teams. *Journal of Computer-Mediated Communication*, 16(1), 27-47.
- Ancona, D. G., Goodman, P. S., Lawrence, B. S., & Tushman, M. L. (2001). Time: A new research lens. *Academy of Management Review*, 26(4), 645-663.
- Arnold, M. C., & Tafkov, I. D. (2019). Managerial discretion and task interdependence in teams. *Contemporary Accounting Research*, 36(4), 2467-2493.
- Beck, J. W., Scholer, A. A., & Hughes, J. (2017). Divergent effects of distance versus velocity disturbances on emotional experiences during goal pursuit. *Journal of Applied Psychology*, 102(7), 1109-1123.
- Boudreaux, M. J., & Ozer, D. J. (2013). Goal conflict, goal striving, and psychological well-being. *Motivation and Emotion*, 37(3), 433-443.
- Britton, B. K., & Tesser, A. (1991). Effects of time-management practices on college grades. *Journal of Educational Psychology*, 83(3), 405-410.
- Burke, C. S., Stagl, K. C., Klein, C., Goodwin, G. F., Salas, E., & Halpin, S. M. (2006). What type of leadership behaviors are functional in teams? A meta-analysis. *The Leadership Quarterly*, 17(3), 288-307.

- Cahoon, D., & Edmonds, E. M. (1980). The watched pot still won' t boil: Expectancy as a variable in estimating the passage of time. *Bulletin of the Psychonomic Society*, 16(2), 115-116.
- Chen, J., & Liu, L. (2020). Reconciling temporal conflicts in innovation ambidexterity: The role of TMT temporal leadership. *Journal of Knowledge Management*, 24(8), 1899-1920.
- Claessens, B. J. C., van Eerde, W., Rutte, C. G., & Roe, R. A. (2007). A review of the time management literature. *Personnel Review*, 36(2), 255-276.
- Cross, R., Parker, A., Prusak, L., & Borgatti, S. P. (2001). Knowing what we know: Supporting knowledge creation and sharing in social networks. *Organizational Dynamics*, 30(2), 100-120.
- Crossan, M., Cunha, M. P. E., Vera, D., & Cunha, J. (2005). Time and organizational improvisation. *Academy of Management Review*, 30(1), 129-145.
- Estrada, C. A., Isen, A. M., & Young, M. J. (1994). Positive affect improves creative problem solving and influences reported source of practice satisfaction in physicians. *Motivation and Emotion*, 18(4), 285-299.
- Estrada, C. A., Isen, A. M., & Young, M. J. (1997). Positive affect facilitates integration of information and decreases anchoring in reasoning among physicians. *Organizational Behavior and Human Decision Processes*, 72(1), 117-135.
- Francis-Smythe, J. A., & Robertson, I. T. (1999). On the relationship between time management and time estimation. *British Journal of Psychology*, 90(3), 333-347.
- Gevers, J. M., Rutte, C. G., & van Eerde, W. (2006). Meeting deadlines in work groups: Implicit and explicit mechanisms. *Applied Psychology*, 55(1), 52-72.
- González-Romá, V., & Hernández, A. (2014). Climate uniformity: Its influence on team communication quality, task conflict, and team performance. *Journal of Applied Psychology*, 99(6), 1042-1058.
- Gouaux, C., & Gouaux, S. M. (1971). The influence of induced affective states on the effectiveness of social and nonsocial reinforcers in an instrumental learning task. *Psychonomic Science*, 22(6), 341-343.
- Grondin, S., & Rammsayer, T. (2003). Variable foreperiods and temporal discrimination. *The Quarterly Journal of Experimental Psychology Section A*, 56(4), 731-765.
- Guthrie, J. P., & Hollensbe, E. C. (2004). Group incentives and performance: A study of spontaneous goal setting, goal choice and commitment. *Journal of Management*, 30(2), 263-284.
- Hackman, J. R., & Walton, R. E. (1986). Leading groups in organizations. In P. S. Goodman (Eds.), *Designing effective work groups* (pp. 72-119). Jossey-Bass.

- Halbesleben, J. R. B., Novicevic, M. M., Harvey, M. G., & Buckley, M. R. (2003). Awareness of temporal complexity in leadership of creativity and innovation: A competency-based model. *The Leadership Quarterly*, 14(4-5), 433-454.
- Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology*, 87(2), 268-279.
- Ilies, R., Scott, B. A., & Judge, T. A. (2006). A multilevel analysis of the effects of positive personal traits, positive experienced states and their interactions on intraindividual patterns of citizenship behavior at work. *Academy of Management Journal*, 49(3), 561-575.
- Jain, A. K., Fennell, M. L., Chagpar, A. B., Connolly, H. K., & Nembhard, I. M. (2016). Moving toward improved teamwork in cancer care: The role of psychological safety in team communication. *Journal of Oncology Practice*, 12(11), 1000-1011.
- Janicik, G. A., & Bartel, C. A. (2003). Talking about time: Effects of temporal planning and time awareness norms on group coordination and performance. *Group Dynamics: Theory, Research, and Practice*, 7(2), 122-134.
- Jo, H., Aryee, S., Hsiung, H. H., & Guest, D. (2020). Fostering mutual gains: Explaining the influence of high-performance work systems and leadership on psychological health and service performance. *Human Resource Management Journal*, 30(2), 198-225.
- Jordan, P. J., Lawrence, S. A., & Troth, A. C. (2006). The impact of negative mood on team performance. *Journal of Management & Organization*, 12(2), 131-145.
- Kleine, A. K., Rudolph, C. W., & Zacher, H. (2019). Thriving at work: A meta-analysis. *Journal of Organizational Behavior*, 40(9-10), 973-999.
- Kozlowski, S. W. J., & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest*, 7(3), 77-124.
- Kozlowski, S. W. J., Mak, S., & Chao, G. T. (2016). Team-centric leadership: An integrative review. *Annual Review of Organizational Psychology and Organizational Behavior*, 3, 21-54.
- Lakein, A. (1973). *How to get control of your time and your life*. New American Library.
- Lester, S. W., Meglino, B. M., & Korsgaard, M. A. (2002). The antecedents and consequences of group potency: A longitudinal investigation of newly formed work groups. *Academy of Management Journal*, 45(2), 352-368.
- Li, M., & Ye, H. (2021). Temporal leadership and bootlegging behavior of employees: The mediating effect of self-efficacy. *Frontiers in Psychology*, 12, 633261.

- Liu, Z., Liu, X., & Zhang, X. (2021). How to solve the time dilemma? The influence of team temporal leadership on team innovation performance. *Frontiers in Psychology*, 12, 634133.
- Macan, T. H. (1994). Time management: Test of a process model. *Journal of Applied Psychology*, 79(3), 381-391.
- Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology*, 82(4), 760-768.
- Mahmood, A., & Arslan, A. (2020). Ahead of the curve: Leveraging antecedents of corporate entrepreneurship to pull off competitive advantage. *Frontiers in Psychology*, 11, 531886.
- Marlow, S. L., Lacerenza, C. N., & Salas, E. (2017). Communication in virtual teams: A conceptual framework and research agenda. *Human Resource Management Review*, 27(4), 575-589.
- Maruping, L. M., Venkatesh, V., Thatcher, S. M. B., & Patel, P. C. (2015). Folding under pressure or rising to the occasion? Perceived time pressure and the moderating role of team temporal leadership. *Academy of Management Journal*, 58(5), 1313-1333.
- Mathieu, J. E., Hollenbeck, J. R., van Knippenberg, D., & Ilgen, D. R. (2017). A century of work teams in the journal of applied psychology. *Journal of Applied Psychology*, 102(3), 452-467.
- Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future. *Journal of Management*, 34(3), 410-476.
- Mayer, D. M., Aquino, K., Greenbaum, R. L., & Kuenzi, M. (2012). Who displays ethical leadership, and why does it matter? An examination of antecedents and consequences of ethical leadership. *Academy of Management Journal*, 55(1), 151-171.
- McGrath, J. E. (1962). *Leadership behavior: Some requirements for leadership training*. Prepared for U.S. Civil Service Commission Office of Career Development. Washington, DC.
- McGrath, J. E. (1991). Time, interaction, and performance (TIP): A theory of groups. *Small Group Research*, 22(2), 147-174.
- Mohammed, S., & Alipour, K. K. (2014). It's time for temporal leadership: Individual, dyadic, team, and organizational effects. *Industrial and Organizational Psychology*, 7(2), 178-182.
- Mohammed, S., & Nadkarni, S. (2011). Temporal diversity and team performance: The moderating role of team temporal leadership. *Academy of Management Journal*, 54(3), 489-508.

- Mohammed, S., & Schillinger, D. (2022). Translating time-based research into team interventions: An actionable, evidence-based approach. *Journal of Clinical and Translational Science*, 6(1), e2.
- Morgan Jr, B. B., Salas, E., & Glickman, A. S. (1993). An analysis of team evolution and maturation. *The Journal of General Psychology*, 120(3), 277-291.
- Morgeson, F. P., DeRue, D. S., & Karam, E. P. (2010). Leadership in teams: A functional approach to understanding leadership structures and processes. *Journal of Management*, 36(1), 5-39.
- Mumford, M. D., Zaccaro, S. J., Harding, F. D., Jacobs, T. O., & Fleishman, E. A. (2000). Leadership skills for a changing world: Solving complex social problems. *The Leadership Quarterly*, 11(1), 11-35.
- Myer, A. T., & Mohammed, S. (2012, April). *Team temporal leadership: Construct development and validation*. Paper presented at the 27th Annual Conference of the Society for Industrial and Organizational Psychology, San Diego, CA.
- Najam, U., Inam, A., Awan, H. M., & Abbas, M. (2018). The interactive role of temporal team leadership in the telecom sector Pakistan: Utilizing temporal diversity sustainable knowledge sharing. *Sustainability*, 10(5), 1309.
- Niessen, C., Mäder, I., Stride, C., & Jimmieson, N. L. (2017). Thriving when exhausted: The role of perceived transformational leadership. *Journal of Vocational Behavior*, 103, 41-51.
- Nootjarat, R., Chantatub, W., & Chongstitvatana, P. (2015). The moderating effect of leader centrality on team cohesion and performance in software development projects. *International Journal of Business and Information*, 10(3), 295-322.
- Op' t Hoog, T. (2009). *Lighting up the effects of individual temporal characteristics and temporal leadership on individual NPD effectiveness* (Master' s thesis). Eindhoven University of Technology.
- Peeters, M. A. G., & Rutte, C. G. (2005). Time management behavior as a moderator for the job demand-control interaction. *Journal of Occupational Health Psychology*, 10(1), 64-75.
- Pirola-Merlo, A., Härtel, C., Mann, L., & Hirst, G. (2002). How leaders influence the impact of affective events on team climate and performance in R&D teams. *The Leadership Quarterly*, 13(5), 561-581.
- Porath, C., Spreitzer, G., Gibson, C., & Garnett, F. G. (2012). Thriving at work: Toward its measurement, construct validation, and theoretical refinement. *Journal of Organizational Behavior*, 33(2), 250-275.
- Rapp, A. A., Bachrach, D. G., & Rapp, T. L. (2013). The influence of time management skill on the curvilinear relationship between organizational citizen-

- ship behavior and task performance. *Journal of Applied Psychology*, 98(4), 668-677.
- Robbins, J. E., & Madrigal, L. (2019). Team cohesion: Demonstrating one team's strong bonds in relation to environment, leadership and attitude. *Strategies*, 32(1), 36-40.
- Santos, C. M., Passos, A. M., Uitdewilligen, S., & Nübold, A. (2016). Shared temporal cognitions as substitute for temporal leadership: An analysis of their effects on temporal conflict and team performance. *The Leadership Quarterly*, 27(4), 574-587.
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, 66(4), 701-716.
- Schmidt, A. M., & DeShon, R. P. (2010). The moderating effects of performance ambiguity on the relationship between self-efficacy and performance. *Journal of Applied Psychology*, 95(3), 572-581.
- Schriber, J. B., & Gutek, B. A. (1987). Some time dimensions of work: Measurement of an underlying aspect of organization culture. *Journal of Applied Psychology*, 72(4), 642-650.
- Spreitzer, G., Sutcliffe, K., Dutton, J., Sonenshein, S., & Grant, A. M. (2005). A socially embedded model of thriving at work. *Organization Science*, 16(5), 537-549.
- Spreitzer, G. M., & Porath, C. (2014). Self-determination as nutriment for thriving: Building an integrative model of human growth at work. In M. Gagné (Eds.), *The Oxford handbook of work engagement, motivation, and self-determination theory* (pp. 245-258). Oxford University Press.
- Sy, T., Côté, S., & Saavedra, R. (2005). The contagious leader: Impact of the leader's mood on the mood of group members, group affective tone, and group processes. *Journal of Applied Psychology*, 90(2), 295-305.
- Wageman, R., & Baker, G. (1997). Incentives and cooperation: The joint effects of task and reward interdependence on group performance. *Journal of Organizational Behavior*, 18(2), 139-158.
- Wallace, J. C., Butts, M. M., Johnson, P. D., Stevens, F. G., & Smith, M. B. (2016). A multilevel model of employee innovation: Understanding the effects of regulatory focus, thriving, and employee involvement climate. *Journal of Management*, 42(4), 982-1004.
- Waller, M. J., Conte, J. M., Gibson, C. B., & Carpenter, M. A. (2001). The effect of individual perceptions of deadlines on team performance. *Academy of Management Review*, 26(4), 586-600.
- Wan, W., Wang, A., & Li, L. (2021). Temporal leadership and employee workplace deviance: The role of perceived illegitimate tasks. *Social Behavior and*

*Personality: An International Journal*, 49(7), 1-11.

Xiao, H., Zhang, Z., & Zhang, L. (2022). Is temporal leadership always beneficial? The role of job passion and synchrony preference. *Personnel Review*, 51(1), 299-316.

Yuan, C.-C., & Lo, S.-H. (2018). Relationship among team temporal leadership, competency, followership, and performance in Taiwanese pharmaceutical industry leaders and employees. *Journal of Career Development*, 45(3), 227-238.

Zaccaro, S. J., Rittman, A. L., & Marks, M. A. (2001). Team leadership. *The Leadership Quarterly*, 12(4), 451-483.

Zhai, Q., Wang, S., & Weadon, H. (2020). Thriving at work as a mediator of the relationship between workplace support and life satisfaction. *Journal of Management & Organization*, 26(2), 168-184.

Zhang, J., van Eerde, W., Gevers, J. M. P., & Zhu, W. (2020). How temporal leadership boosts employee innovative job performance. *European Journal of Innovation Management*, 24(1), 23-42.

Zhang, X., Yao, Z., Qunchao, W., & Tsai, F. S. (2022). Every coin has two sides: The impact of time pressure on employees' knowledge hiding. *Journal of Knowledge Management*, 26(8), 2084-2106.

Zhao, H. H., Deng, H., Chen, R. P., Parker, S. K., & Zhang, W. (2022). Fast or slow: How temporal work design shapes experienced passage of time and job performance. *Academy of Management Journal*, 65(6), 1769-1797.

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

*Source: ChinaXiv – Machine translation. Verify with original.*