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Subjective time in organizations: Conceptual clarification, integration, and implications for future research

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†Shortly after completing her work on this manuscript, Sucheta sadly passed away. We would like to dedicate this paper to the inspiration, enthusiasm, and dedication that Sucheta has given to us, and to the research on temporal phenomena in organizations more broadly.

Summary

Despite the rapid growth of organizational research on subjective time, the extant literature is fragmented due to a lack of conceptual clarification and integration of temporal constructs. To address this fragmentation, we synthesize temporal research from both organizational behavior and adjacent disciplines (i.e., strategy, entrepreneurship, and organizational theory) and introduce a framework that allocates temporal constructs according to their basic conceptual nature (trait–state) and level of analysis (individual–collective). We employed the Linguistic Inquiry and Word Count text analysis to determine the trait–state property of the constructs and a coding method to determine their level of analysis. This framework categorizes four generic types of subjective time: *individual temporal disposition*, *individual temporal state*, *collective temporal state*, and *collective temporal disposition*. We clarify the conceptualizations of the temporal constructs belonging to each of the four archetypes of subjective time and review their key findings in the organizational literature. Based on this integrative framework, we identify critical knowledge gaps in the current state of research and chart a future agenda with specific suggestions.

KEYWORDS

multilevel research, subjective time, temporal constructs, trait–state distinction

1 | INTRODUCTION

Time plays a central role in organizational life (Bluedorn & Denhardt, 1988; Shipp & Cole, 2015). But it does not merely exist objectively as clock time. It is also experienced by organizational actors[1] in subjective ways, as indicated by expressions such as "time flies!" or "we are pressed for time!" Objective time (i.e., clock time) is linear (progressing in a unidirectional way), homogeneous (the passage of each unit is the same), and uniform (identical across individuals and situations); in contrast, subjective time manifests in richer forms that are nonlinear, heterogeneous, and multiform (Ancona et al., 2001; Shipp & Cole, 2015; Shipp & Fried, 2014).

Organizational actors' subjective experience of time varies according to their innate traits, ingrained beliefs, and influences of external situations or events (Bluedorn, 2002; McGrath & Kelly, 1986; Shipp & Fried, 2014). Recent decades have seen a proliferation of organizational behavior (OB) research examining a variety of temporal constructs that capture how time is subjectively valued, understood, used, or perceived in organizational contexts (Kooij, Kanfer, Betts, & Rudolph, 2018; Shipp & Cole, 2015; Shipp, Edwards, & Lambert, 2009). Despite this notable growth in research on subjective time, the literature remains somewhat fragmented and would benefit from conceptual clarification and integration on at least two fronts.

First, conceptual ambiguity caused by "jingle–jangle" fallacies (Block, 1995) pervades in the conceptualizations of many temporal constructs. Jingle fallacy occurs when the same label is used to describe different phenomena. Take *future orientation* as an example—Das and Teng

[1]Following Ancona, Okhuysen, and Perlow (2001), we use the term "organizational actor" to refer to the organizational unit across multiple levels of analysis—from individuals, to teams, to organizations.

(1998) used this term to denote the length of time horizon underlying one's consideration of the future, whereas Balliet and Ferris (2013) used the same term to capture one's attentional focus on the future time frame. Moreover, in the same study, Balliet and Ferris (2013, p. 300) conceptualized *future orientation* as both "individual differences in future orientation" (measured on a Likert scale) and "future-oriented states" (induced in experiments). However, these two phenomena are grounded in fundamentally distinct theoretical perspectives—the former characterizes a dispositional tendency (i.e., trait), whereas the latter features a malleable, situation-elicited state. These jingle fallacies can lead to severe confusions about a construct's content equivalence, conceptual property (trait vs. state), theoretical basis (dispositional vs. situational), and appropriate operationalization (psychometrics vs. experimental manipulation) (Chen, Gully, Whiteman, & Kilcullen, 2000).

On the other hand, jangle fallacy occurs when different labels are attached to substantively identical phenomena (Block, 1995). For instance, the concept labels of *future orientation* (Das & Teng, 1998) and *(future) temporal depth* (Bluedorn, 2002) similarly represent the time horizon of an individual's consideration into the future. Yet, these two distinct labels have triggered divergent research trajectories—the former was mostly adopted by strategy and entrepreneurship research on managerial decision-making (e.g., Martin, Wiseman, & Gomez-Mejia, 2016); the latter was more frequently used by OB researchers to study employee outcomes (e.g., Bluedorn & Martin, 2008). Such jangle fallacies have hindered knowledge integration across temporal research.

Second, existing studies are fragmented with respect to levels of analysis. OB research has placed a skewed emphasis on individual-level studies (Shipp & Cole, 2015). However, scholars contend that subjective time is an omnipresent phenomenon occurring across multiple organizational levels, and increasing research has examined temporal constructs at collective levels, especially in adjacent disciplines (George & Jones, 2000; Mosakowski & Earley, 2000). For example, polychronicity—the proclivity toward the degree of simultaneity in performing multiple work tasks (Slocombe & Bluedorn, 1999)—has been studied at the team level both in OB (*team polychronicity diversity*; Mohammed & Nadkarni, 2014) and in strategy (*top management team (TMT) polychronicity*; Souitaris & Maestro, 2010).

Furthermore, many studies examining collective temporal constructs did not explain the process of emergence from the individual level to the higher level. Although both *team polychronicity diversity* and *TMT polychronicity* reflect team-level phenomena, they may theoretically emerge through different processes (dispersion vs. referent-shift consensus) from individual members' polychronicity and thus require distinct operationalization approaches (Chan, 1998). Subjective time involves omnipresent phenomena occurring at multiple organizational levels, yet scattered temporal research at different levels and the conceptual imprecision regarding the level and origin of (collective) temporal constructs have severely limited our understanding of subjective time as a multilevel phenomenon.

To address the fragmented state of research on subjective time, our review offers an integrative framework that categorizes temporal constructs based on two generic dimensions: (1) trait- versus state-like property and (2) individual versus collective level of analysis. This, in combination, yields four archetypes of subjective time: individual temporal disposition, individual temporal state, collective temporal state, and collective temporal disposition. We clarify the conceptualizations of temporal constructs belonging to each archetype and review their key findings in the organizational research.

Our review aims to contribute to the literature in three related ways. First, we provide greater conceptual clarity, as well as facilitate the integration of diverse and scattered studies on temporal constructs. Second, the comparatively broad scope of this review (incorporating studies at the individual and collective levels, from OB as well as related disciplines) offers a more encompassing view of organizational research on subjective time and thereby extends and complements previously published reviews that have focused exclusively on individual-level temporal construct(s) (e.g., Kooij et al., 2018; Shipp & Cole, 2015). Through the inclusion of both individual- and collective-level studies, our ultimate goal is to encourage OB researchers to apply a "rich, complex, and meaty" multilevel lens (Klein & Kozlowski, 2000) that bridges micro and macro understandings of subjective time. Third, we identify critical issues in the extant literature and provide specific suggestions for future research to address associated challenges. Overall, we seek to synthesize the existing research in a systematic and informative manner, which highlights major knowledge gaps and charts rich and clear pathways to move the field forward.

2 | LITERATURE REVIEW

2.1 | Scope of the review

We focused our review on subjective time in organizational contexts. According to McGrath and Rotchford (1983, p. 61), subjective time has two defining characteristics: (1) It features the subjective nature of time that is "in the eye of the beholder" in contrast to objective time, which is invariant to subjective interpretations; (2) it is considered a focal construct rather than a medium through which changes occur[2].

Because Bluedorn and Denhardt (1988)'s initial review of different conceptions of time (e.g., objective and subjective) in the field of management, there has been a burgeoning interest in this topic among organizational researchers (Shipp & Cole, 2015). Thus, we focused on scholarly work published after 1988. Our review differs from recent reviews and meta-analyses (e.g., Kooij et al., 2018; Rudolph, Kooij, Rauvola, & Zacher, 2018) with respect to our primary goal of providing conceptual clarification and integration of various temporal constructs across studies. The broader scope of this review allows us to complement previously published reviews that predominantly focused on trait-like, individual-level phenomena of subjective time

[2]As studies on trajectories consider time as objective and the medium through which changes occur, we did not include them in this review. We refer readers to other reviews on trajectories including Shipp and Cole (2015) for within-individual changes and Bush, LePine, and Newton (2018) for teams in transitions.

(Shipp et al., 2009; Shipp & Cole, 2015; Shipp & Fried, 2014). Specifically, we also review studies on state-like as well as collective-level phenomena. In addition to studies published in the OB field, we incorporate studies from adjacent disciplines such as strategy, entrepreneurship, and organizational theory. These studies have signified the importance of subjective time at collective levels in organizational contexts (e.g., TMTs; Souitaris & Maestro, 2010) and pointed to collective-level temporal constructs with relevance to OB (e.g., temporal aspects of organizational culture; Blount & Janicik, 2001). We believe that these studies could provide important insights for OB research regarding the prevalence and dynamics of subjective time as multilevel organizational phenomena.

We conducted a systematic literature search following suggested procedures for multilevel, multidisciplinary reviews (Aguinis & Glavas, 2012). First, we included 14 top-tier journals in the organizational sciences (*Academy of Management Journal*, *Academy of Management Review*, *Administrative Science Quarterly*, *Entrepreneurship Theory and Practice*, *Journal of Applied Psychology*, *Journal of Business Venturing*, *Journal of Management*, *Journal of Management Studies*, *Journal of Organizational Behavior*, *Management Science*, *Organizational Behavior and Human Decision Processes*, *Organization Science*, *Personnel Psychology*, and *Strategic Management Journal*), as well as the specialist journal *Time & Society*. We accessed target journals via electronic databases (EBSCO, ProQuest, Google Scholar, and Web of Science) and performed searches using the terms "time," "temporal," and "temporality," in combinations with "subjective," "experience," "perception," "orientation," "characteristic," "personality," "style," "congruity," "state," and the phrase "time management." Peer-reviewed articles containing one or more of these terms in titles, abstracts, or keywords were included. Second, we identified additional sources by comparing our results with those included in prior reviews on subjective time and also by searching for the works of authors who have at least two articles in our sample. Third, we included key book chapters. And finally, we manually screened the reference lists of individual papers to ensure we did not miss out on relevant studies. We then narrowed the resulting pool of studies by applying the two defining criteria of subjective time—time as subjective to organizational actors' interpretations or experiences and as a focal construct rather than a medium through which changes occur (McGrath & Rotchford, 1983). Our literature search yielded 108 articles.

2.2 | An integrative framework

To provide conceptual clarification and enable the integration of temporal constructs, we focused on the conceptualizations of focal temporal constructs in the reviewed studies. We categorized these constructs based on their trait-/state-like conceptual properties, as well as their individual versus collective levels of analysis.

Psychologists have long regarded the trait–state distinction as fundamental in describing human differences. This is because "these two complementary schemas are part of the extensive theory of psychological causality"—traits are stable, enduring, and internally caused, whereas states are malleable, fleeting, and externally induced (Chaplin, John, & Goldberg, 1988, p. 541). Following this tradition, research on trait-like temporal constructs is rooted in dispositional perspectives that focus on how innate and stable subjective time affects organizational behaviors and performance (e.g., Chen & Nadkarni, 2017; Hecht & Allen, 2005). By contrast, research on state-like constructs is often based on situational perspectives that emphasize the situational determinants of subjective time as it is fleeting and malleable (e.g., Ebert & Prelec, 2007; Perlow, 1999). This trait–state property of temporal constructs dictates the choice of appropriate theoretical perspectives suitable to study subjective time phenomena. Therefore, we regard it as a basic conceptual dimension for categorizing temporal constructs.

Accordingly, we intended to identify the trait-/state-like property of each temporal construct. However, while reviewing the literature, we noted that the trait–state property of temporal constructs has not always been explicitly defined. More importantly, the trait–state distinction may not be strictly categorical, but rather vary on a continuum (Tasselli, Kilduff, & Landis, 2018). For instance, researchers broadly referred to future time perspective (*FTP*) as one's consideration of the future, including the subdimensions of a trait-like "predominant (cognitive) orientation" and a state-like "emotional valence of future events" (Kooij et al., 2018, p. 3). Because *FTP* contains both trait- and state-like components, it tends to be more flexible than one's characteristic attention of *temporal focus* (Shipp et al., 2009) but more stable than a temporary experience of *time pressure* (Ross & Wieland, 1996). Psychologists have long argued that "the (categorical trait–state) distinction is an arbitrary one" (Allen & Potkay, 1981, p. 916), and organizational scholars have increasingly advocated for a continuous view on such a distinction (Tasselli et al., 2018). To alleviate the conceptual imprecision and better integrate temporal constructs on the trait–state dimension, we conducted a systematic content analysis to determine the degree of the trait–state property of each construct (see Section 2.3 below).

Furthermore, we sought to provide greater conceptual clarification and integration of temporal research at different levels of analysis to facilitate the development of theory-driven, multilevel research in the future. To define, justify, and explain the level of each focal construct that constitutes the theoretical system is an essential element in multilevel research (Klein & Kozlowski, 2000). We thus identified the level (individual vs. collective) of each temporal construct. The level of a construct is its level of manifestation in a given theoretical model—the known or predicted level of the phenomenon in question (Klein & Kozlowski, 2000). At the individual level, temporal constructs capture individual phenomena related to subjective time at work. However, temporal constructs may also describe subjective temporal phenomena at higher levels, for instance, whether "groups and organizations share some temporal perceptions" (Ancona et al., 2001, p. 518). These collective experiences may also differ across groups and organizations (George & Jones, 2000). It is therefore important to consider temporal constructs at collective levels of analysis, such as dyads, teams, departments, or organizations.

In combination, these two fundamental dimensions—(1) trait-/state-like conceptual property and (2) individual–collective level of analysis—categorize four generic types of subjective time: individual temporal disposition, individual temporal state, collective temporal state, and collective temporal disposition (Figure 1). We classified temporal constructs across studies into these four archetypes based on the following approaches.

2.3 | Methodology

We identified 29 temporal constructs from our sample. We extracted the conceptualizations of each construct across studies and compiled them to create one text file for each construct. Next, we conducted content analyses to identify the construct's (1) trait-/state-like property and (2) individual versus collective level of analysis.

In order to code each construct's trait-/state-like property, we employed the Linguistic Inquiry and Word Count (LIWC) text analysis program (Pennebaker, Boyd, Jordan, & Blackburn, 2015). LIWC analyzes text by calculating the percentage of words belonging to a certain category (e.g., trait) to the total words of a text file (Pennebaker et al., 2015). This required us to create a dictionary of trait-like and state-like properties based on an established three-stage procedure (see Appendix A). The final dictionary contained a set of 42 words (e.g., "trait," "characteristic," and "stable") for trait and a set of 38 words for state (e.g., "state," "malleable," and "fleeting"). We applied this dictionary to analyze the text file of each construct, which generated the percentages of its trait-like and state-like properties, respectively. We then derived an index to reflect the degree of trait–state property: the difference between the trait-like and state-like percentages divided by the sum of the trait-like and state-like percentages (i.e., 1 = pure trait; −1 = pure state; 0 = equally trait and state like). This resulted in 16 trait-like constructs (0 < indices < 1) and 13 state-like constructs (−1 < indices < 0).

With respect to levels of analysis, two raters (not authors of this manuscript) independently coded each temporal construct according to its individual versus collective level (1 = individual, 2 = collective; initial ICC = .90). Coding inconsistencies were resolved by the raters, which resulted in 15 individual-level constructs and 14 collective-level temporal constructs.

Taken together, these analyses allowed us to allocate each temporal construct to one of the four generic types of subjective time. As shown in Figure 1, these constructs are located along the horizontal line based on their trait–state index values. In the meantime, they are located above and beyond the vertical line based on their individual versus

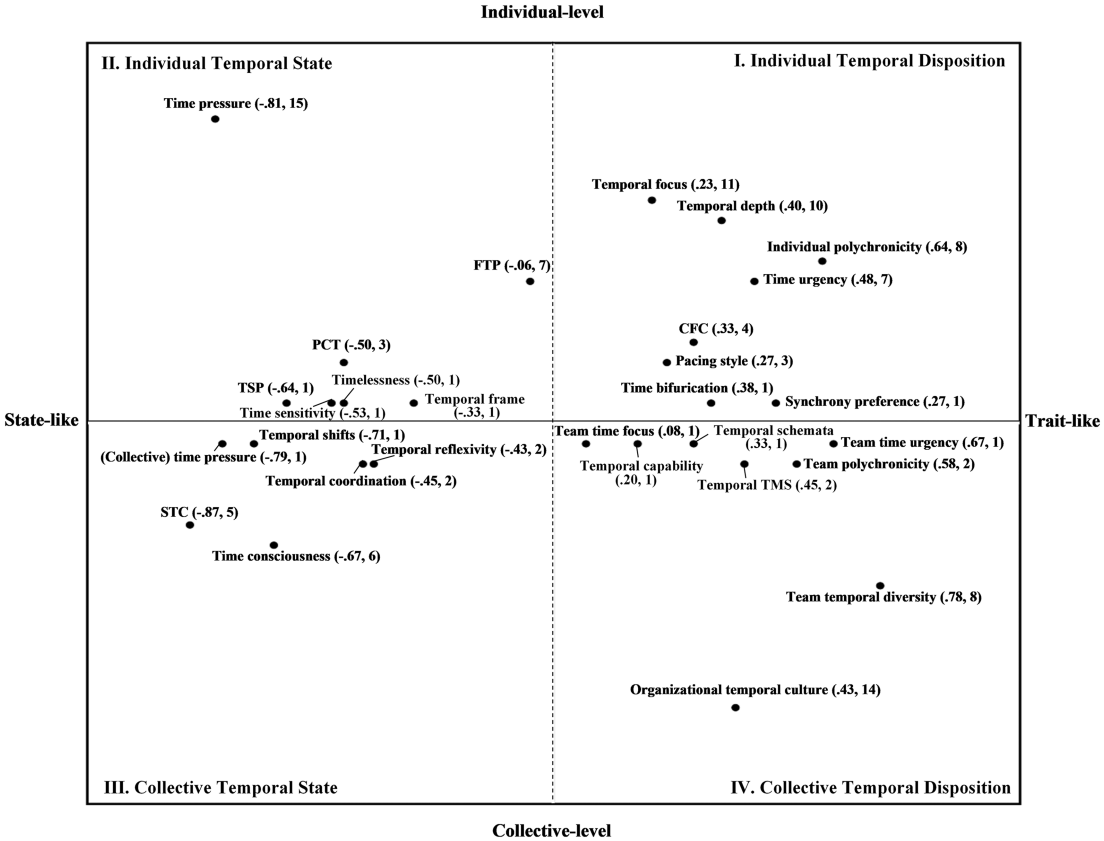

FIGURE 1 An integrative framework for temporal constructs in organizational research. We used a dashed line to denote the trait-state distinction of subjective time to acknowledge that it is not categorical but could vary along a continuum. The solid vertical line indicates the categorical distinction between the individual and collective level of analysis. The temporal constructs are allocated along the horizontal line based on their trait-state index values, and allocated along the vertical line based on the number of studies examining this construct at the individual or collective level. The first number in the bracket following each temporal construct represents its trait-state index and the second number represents the number of studies that have examined this construct

TABLE 1 Summary of organizational research on subjective time

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Consideration of future consequences (CFC)	The extent to which individuals base their decisions on the immediate versus future consequences of their actions	Consideration of future consequences	Strathman, Gleicher, Boninger, & Edwards, 1994	Development of the construct of CFC and the measure of the CFC scale
		Concern with future consequences	Joireman, Kamdar, Daniels, & Duell, 2006	In employees with high CFC, a short-term time horizon led to a decline in their organizational citizenship behaviors
		Concern for the future consequences	Balliet & Ferris, 2013	In employees with higher CFC, ostracism was more negatively related to prosocial behavior
		Consideration for future consequences	Zhang, Wang, & Pearce, 2014	CFC was positively related to transformational leadership and in turn leadership effectiveness, and this mediated relationship was more positive in a more stable work environment
Individual polychronicity	The extent to which individuals prefer to be involved with two or more tasks or activities simultaneously	Polychronicity	Slocombe & Bluedorn, 1999	The congruence between individual and work-unit polychronicity positively predicted employee organizational commitment, work performance, and perceived organizational justice
		Polychronicity	Bluedorn, 2002[b]	Polychronicity was negatively related to the stress of dentists
		Polychronicity	Conte & Jacobs, 2003	Train operators' polychronicity was positively related to their absence, lateness, and negatively related to their job performance
		Polychronicity	Conte & Gintoft, 2005	Sales employees' polychronicity positively predicted their job performance including customer service, sales performance, and overall performance
		Polychronicity	Hecht & Allen, 2005	The fit between individual polychronicity and polychronic work opportunities increased employee job satisfaction, self-efficacy, and decreased psychological strain
		Polychronicity	Bluedorn, 2007[b]	Individual polychronicity was positively related orientation to change and tolerance for ambiguity.
		Polychronicity	Lindquist & Kaufman-Scarborough, 2007	Development and validation of an updated measure of individual polychronicity (Polychronic–Monochronic Tendency Scale [PMTS])
		Polychronicity	Agypt & Rubin, 2012	Polychronicity positively predicted employee job satisfaction when the job was characterized by multitasking and multiskill requirements, irregular deadlines, and schedule unpredictability
Pacing style Subdimensions: Early pacing Deadline pacing Steady pacing	Individuals' preferred pattern of distributing their efforts over time in working toward deadlines	Pacing style	Gevers, Claessens, Van Eerde, & Rutte, 2009[b]	Development of a graphic measure of individual pacing style
		Pacing style	Gevers, Mohammed, & Baytalskaya, 2015	Development and validation of a scale measure of Pacing Action Categories of Effort Distribution (PACED)
		Pacing style	Chen & Nadkarni, 2017	CEOs' deadline-action pacing style negatively predicted their temporal leadership behaviors; CEOs' early action and steady action positively predicted temporal leadership

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Synchrony preference	Individuals' willingness to adapt their pace and rhythm within social interactions to create synchrony with others	Synchrony preference	Leroy, Shipp, Blount, & Licht, 2015	Development of the construct of synchrony preference and measure of Synchrony Preference Scale (SPS); synchrony preference increased employees' flexible pacing behaviors, interpersonal facilitation, contribution to team synchrony, and job dedication; synchrony preference increased employees' contribution to team performance, when task interdependence was high
Temporal depth Subdimensions: Past depth Future depth	The temporal distances into the past and future that individuals typically consider when contemplating events that have happened, may have happened, or may happen	Future orientation	Das & Teng, 1998[a]	Individuals' near- and distant-future orientation, in tandem with risk-averting and seeking propensity, yielded four types of risk behaviors that characterized different types of entrepreneurs and non-entrepreneurs
		Future orientation	Das & Teng, 2001[a]	Top managers' near- and distant-future orientations would predict different strategic risk behaviors, depending on their risk propensity (averting or seeking) and decision context (gain or loss)
		Temporal myopia	Miller, 2002	Managers' temporal myopia predicted the errors occurring in their investment decisions on technology
		Temporal depth	Bluedorn, 2002[b]	Development of the construct of temporal depth and a scale measure of temporal depth index (TDI)
		Temporal depth	Bluedorn & Martin, 2008	Past and future temporal depths were positively correlated; Entrepreneurs' future temporal depth was negatively related to life stress.
		Short-termism	Marginson & McAulay, 2008	Managers' individual experience of role ambiguity and their work group members' short-termism were positively related to their short-termism
		Temporal distance	Cojuharenco, Patient, & Bashshur, 2011	Employees' future distance was positively related to their concerns about interactional injustice
		Temporal orientation	Martin et al., 2016	Firm slack and CEOs' current wealth positively predicted CEOs' long-term orientation; CEOs' prospective wealth negatively predicted their long-term orientation
		Temporal depth	Nadkarni, Chen, & Chen, 2016	Executives' past and future temporal depths were differently related to the organizations' competitive aggressiveness depending on the industry velocity
		Temporal orientation	Lin, Shi, Prescott, & Yang, 2018	Top managers' long-term orientation positively predicted strategic decision-making comprehensiveness, decision-making speed, and decision-making creativity
Temporal focus Subdimensions: Past focus Present focus Future focus	The extent to which individuals characteristically devote their attention to perceptions of the past, present, and future	Time perspective	Waller, Conte, Gibson, & Carpenter, 2001[a]	Individuals' future and present time perspectives, combined with time urgency, yielded four temporal prototypes that would predict their deadline perceptions and subsequent time-oriented behaviors
		Future focus	Buehler & Griffin, 2003	Individuals' future focus led to an optimistic prediction bias about task completion time
		Future orientation	Fried & Slowik, 2004[a]	Individuals' future time orientation would influence their preferences for challenging goals and prioritization of work- and nonwork-related goals
		Temporal focus	Foo, Uy, & Baron, 2009	Entrepreneurs' state positive affect positively predicted their state future temporal focus, which increased their subsequent effort on venture tasks beyond what was immediately required

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
		Temporal focus	Shipp et al., 2009	Conceptualization of temporal focus construct and development of Temporal Focus Scale (TFS) measure
		Temporal focus	Shipp & Jansen, 2011[a]	Employee temporal focus would influence their perceptions of person–environment fit
		Temporal orientation	Cojuharenco et al., 2011	Employee future focus positively predicted concerns about distributive justice, and present focus positively predicted concerns about interactional injustice
		Future orientation	Balliet & Ferris, 2013	For employees with higher future orientation, ostracism was more negatively related to prosocial behavior
		Temporal focus	Nadkarni & Chen, 2014	CEOs' past, present, and future foci were differently related to their organizations' rate of new product introduction (NPI) depending on the environmental dynamism
		Time perspective	Saraiva & Iglesias, 2016	Present focus and future focus were positively related to individuals' competitive behavior, but only when the individuals were under time pressure
		Time perspective	Przepiorka, 2016	Entrepreneurs had higher future time perspective than non-entrepreneurs; entrepreneurs' future time perspective was positively correlated with entrepreneurial success
Time bifurcation	The ability of individuals to view present and future events with entirely different mindsets	Time bifurcation	Miller & Sardais, 2015[c]	Entrepreneurs' ability to bifurcate time made them capable of embracing paradoxical requirements for new venture development, including being both optimistic and realistic and being both flexible and persistent
Time urgency	Individuals constant concern with the passage of time and the general feeling of being chronically hurried	Time urgency	Landy, Rastegary, Thayer, & Colvin, 1991	Development of the time urgency construct and its measure (Behaviorally Anchored Rating Scales [BARS])
		Time urgency	Conte, Landy, & Mathieu, 1995	Established the convergent and discriminant validity of time urgency
		Time urgency	Conte, Mathieu, & Landy, 1998	Established the nomological and predictive validity of time urgency
		Time urgency	Waller et al., 2001[a]	Individuals' time urgency, combined with time perspective, yielded four temporal prototypes that would predict their deadline perceptions and subsequent time-oriented behaviors
		Individual general hurriedness	Jansen & Kristof-Brown, 2005	The fit between individual and workgroup hurriedness positively predicted employee job satisfaction and helping behavior
		Chronic time pressure	Szollos, 2009	Conceptualizations of chronic time pressure
		Time urgency	Chen & Nadkarni, 2017	CEO time urgency positively predicted temporal leadership behaviors and in turn firm corporate entrepreneurship

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Individual temporal states				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Future time perspective (FTP) Subdimensions:	The general concern of an individual for and corresponding consideration of one's future	Future time perspective	Bal, Jansen, van der Velde, de Lange, & Rousseau, 2010	FTP positively predicted employees' developmental psychological contract fulfillment; when employees had high FTP, their economic and socioemotional psychological contract fulfillment related more positively to employee obligations
		Future time perspective	Kooij & Van De Voorde, 2011	Losses in subjective general health negatively predicted open-ended FTP but positively predicted limited FTP; open-ended FTP increased growth motives, and limited FTP increased generativity motives; past open-ended FTP positively predicted future open-ended FTP via increased subjective general health
		Future time perspective	Baltes, Wynne, Sirabian, Krenn, & de Lange, 2014	Older workers' FTP positively predicted their promotion focus, which in turn positively predicted the use of selection, optimization, and compensation coping behaviors at work
		Future time perspective	Korff, Biemann, & Voelpel, 2017	Organization's human resource management systems and motivation-enhancing practices were positively related to employees' FTP; employee FTP positively predicted job satisfaction and affective organizational commitment
		Future time perspective	Rudolph et al., 2018[d]	Individual sociodemographic factors, personality, affective traits, and agentic traits predicted FTP; FTP predicted individuals' achievement-related outcomes, well-being, health behavior, risk-related behavior, and retirement planning-related outcomes
Occupational FTP (OFTP)	Individuals' perceptions of their future in the employment context	Occupational future time perspective	Weikamp & Göritz, 2015	Individuals' OFTP decreased over time, and the decrease was faster among younger people than among older people
		Occupational future time perspective	Rudolph et al., 2018[d]	Individual characteristics (age, job tenure, organizational tenure, education, and physical health), and job complexity and autonomy predicted OFTP; OFTP predicted employee job attitudes, motivations, performance, and well-being
Perceived control of time (PCT)	Individuals' sense of mastery over how they allocate their time	Perceived control of time	Macan, 1994	Time management training and the preference for organization positively predicted employees' PCT; employee PCT predicted higher job satisfaction and fewer job-induced tensions
		Perceived control of time	Claessens, Van Eerde, Rutte, & Roe, 2004	Planning behavior and job autonomy increased, and workload decreased employees' PCT; PCT reduced employees' work strain and increased job satisfaction and performance
		Perceived temporal flexibility	Evans, Kunda, & Barley, 2004[c]	Contractor workers perceived themselves to be free from organizations' normative and coercive control over time, but the perceived temporal flexibility rarely led them to schedule time in a more flexible way

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Time pressure Subdimensions:	The extent to which individuals feel that they need to work at a pace faster than usual or have insufficient time to finish their tasks at work	Time-based pressure	Kinicki & Vecchio, 1994	Managers' experienced time pressure positively correlated with the average leader–member exchange quality with their subordinates but negatively correlated with the variance in the leader–member exchange quality with their subordinates
		Time pressure	Ross & Wieland, 1996	Time pressure inhibited managers' perception of common ground in negotiations and in turn affected their choice of mediating strategies (pressing, compensating, integrating, and inaction) in the negotiation
		Time famine	Perlow, 1999[c]	Constant interruptions from workgroup members led to employees' experience of time famine, which inhibited the individual employee's productivity
		Time pressure	De Dreu, 2003	High time pressure led individuals to process information in a less systematic way and rely more on cognitive heuristics when making judgments in negotiations
		Experience of time scarcity	Kaufman-Scarborough & Lindquist, 2003	Individuals' experience of time scarcity predicted inefficient mental actions, processes, and planning
		Perceived time pressure	Kobbeltvedt, Brun, & Laberg, 2005	Time pressure experienced by cadets led them to make less favorable rescue-operation plans, in terms of lower security, probability of success, and quality
		Time pressure	Wu, Parker, & de Jong, 2014	Time pressure was positively related to employees' innovation behavior; when time pressure was high, employees' need for cognition was less positively related to innovation behavior
		Perceived time pressure	Beck & Schmidt, 2013	Individuals' perceived time pressure positively predicted state mastery goal orientation and negatively predicted state performance-avoid goal orientation and state performance-prove goal orientation
		Time pressure	Saqib & Chan, 2015	Time pressure led individuals to be risk seeking over gains and risk averse over losses
		Time pressure	Saraiva & Iglesias, 2016	Individuals' feeling of time pressure was positively related to their competitive behavior
		Time pressure	Prem, Ohly, Kubicek, & Korunka, 2017	Time pressure experienced by employees in the morning positively predicted the day-level challenge appraisal of the work situation and in turn their learning at the end of the workday
		Time pressure	Stiglbauer, 2017	When job autonomy was high, time pressure increased work engagement (WE) in employees with an external locus of control (LOC) but decreased WE in employees with an internal LOC
Creative time pressure	The extent to which individuals feel they have insufficient time to develop creative ideas at work	Creative time pressure	Baer & Oldham, 2006	Employees' experienced creative time pressure had an inverted-U-shaped relation with their creativity, when employees received a high level of support for creativity at work
		Creative time pressure	Sijbom, Anseel, Crommelinck, De Beuckelaer, & De Stobbeleir, 2018	When creative time pressure was low, the relationship between feedback source variety and employee creative performance increased exponentially, such that employees exhibited greater creative performance at higher levels of feedback source variety

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Anticipated time pressure	The time pressure individuals anticipate on a future task	Anticipated time pressure	Leroy & Glomb, 2018	When interrupted while performing a task, individuals' anticipated time pressure upon resuming the interrupted task increased attention residue (thoughts about the previous task while performing the new task) and in turn decreased performance on the interrupting task
Time structure and purpose (TSP)	The perception of one's use of time to be structured and purposive	Time structure and purpose	Mudrack, 1999	Established the nomological validity of time structure and purpose
Temporal frame	Individuals' construal of the future regarding the direction of its advent	Temporal frame	Crilly, 2017	CEOs' ego-moving frame (i.e., the person moves toward the future), compared with a time-moving frame (future moves toward the person), was associated with a stronger focus on the short-term investment returns
Time sensitivity	Individuals' attentional focus on certain aspects of time	Time sensitivity	Ebert & Prelec, 2007	Various experimental manipulations (e.g., a visual cue for time intervals to future time) increased individuals' time sensitivity; time pressure manipulation decreased time sensitivity; time sensitivity reduced the discounting of reward in the near future and increased the discounting of reward in the far future
Timelessness	Individuals' experience of transcending time	Timelessness	Mainemelis, 2001[a]	Various personal (e.g., intrinsic motivation), task (e.g., immediate feedback), and work environment (e.g., autonomy) factors would predict the experience of timelessness at work; timelessness would increase employee creativity at work
Collective temporal states				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
(Collective) time pressure	Team members' perception of the scarcity of time available to complete tasks	Perceived time pressure	Maruping, Venkatesh, Thatcher, & Patel, 2015	Teams' perceived time pressure had an inverted-U relationship, with an overall negative trend, with team transition, action, and interpersonal process, and this relationship was attenuated by strong team temporal leadership
Shared temporal cognition (STC)	Team members' shared understanding of the time-related aspects of executing collective tasks	Shared cognition on time	Gevers, Rutte, & van Eerde, 2004[a,b]	Group communication processes (e.g., goal setting) would predict team shared cognitions on time; team shared cognition on time would be associated with the team's coordinated action
		Shared temporal cognition	Gevers, Rutte, & van Eerde, 2006	The similarity in individual pacing styles and the exchange of temporal reminder increased teams' shared temporal cognitions; shared temporal cognition inhibited deadline meeting when the team had an averaged deadline pacing style but promoted deadline meeting when the team had an averaged early-action pacing style

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
		Temporal consensus	Gevers & Peeters, 2009	Members' dissimilarity in conscientiousness negatively predicted the team's temporal consensus; team temporal consensus positively predicted member satisfaction partially via coordinated action
		Shared temporal cognition	Mohammed & Nadkarni, 2014	Team shared temporal cognition positively predicted team performance; when shared temporal cognition was low, team polychronicity diversity negatively predicted team performance
		Temporal consensus	Gevers, Rispens, & Li, 2016	Team members' pacing style diversity negatively predicted the team's temporal consensus; temporal consensus positively predicted team collaboration
Temporal coordination	The team processes of adjusting temporal aspects of workflows such as to schedule deadlines, coordinate paces of effort, and specify time allocation	Temporal coordination	McGrath, 1991[a]	Workgroups would encounter three general temporal problems (temporal ambiguity; conflicting temporal interests and requirements; and scarcity of temporal resources) that require their temporal coordination
		Temporal coordination	Montoya-Weiss, Massey, & Song, 2001	Temporal coordination weakened the negative effect of avoidance conflict management behavior but strengthened the negative effect of compromise conflict management behavior on the performance of global virtual teams
Temporal reflexivity	The extent to which organizational actors question, articulate, and rethink the temporal assumptions anchoring the organizational practices	Temporal reflexivity	Orlikowski & Yates, 2002[a]	Temporal reflexivity facilitated organizational actors producing and reproducing various temporal structures to guide, orient, and coordinate their ongoing activities, which in turn shaped the temporal rhythm and form of their daily practices
		Temporal reflexivity	Reinecke & Ansari, 2015[c]	Temporal reflexivity helped to reconstruct the organization's model to bridge the competing temporal structures of market-based model (i.e., linear, clock-oriented time) and development-based model (i.e., nonlinear, process-oriented model)
Temporal shifts	The changes in a collective's experiences of time such as the sense of time pressure	Temporal shifts	Staudenmayer, Tyre, & Perlow, 2002[c]	Unusual organizational events triggered temporal shifts; temporal shifts facilitated organizational change by creating a trigger of change, providing resources needed for change, acting as a coordinating mechanism, and serving as a credible symbol of the need to change
Time consciousness	The extent to which group members pay attention to time such as the total time limit of and the time left for the group task	Awareness of time and deadlines	Gersick, 1988[c]	The midpoint of project calendars increased teams' awareness of time and deadlines, which changed the team's task-pacing behavior toward deadline
		Attention to time	Gersick, 1989	The midpoint of allotted time for creative projects increased teams' attention to time, which in turn changed the team's pacing patterns
		Time mentions	Lim & Murnighan, 1994	During a dyad-level negotiation task, negotiators' explicit mentions of time were more frequent in the second half than in the first half of negotiation time
		Attention to time	Waller, Zellmer-Bruhn, & Giambatista, 2002	Groups steadily increased attention to time as the task deadlines approached; changes in deadlines increased groups' attention to time

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
		Time awareness	Chang, Bordia, & Duck, 2003	Time awareness of project groups increased in both a linear and a nonlinear pattern (i.e., a significant increase after the midpoint of allotted task deadline) as the deadline approached
		Time consciousness	Labianca, Moon, & Watt, 2005	Atypical starting times increased task groups' time consciousness compared with prototypical starting times
Collective temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Team polychronicity	The extent to which group members collectively prefer to be engaged in multiple tasks simultaneously	Team polychronicity	Kaplan, 2008[a,b]	Various individual factors (e.g., individual polychronicity and time urgency of team members) and organizational formalization would influence team polychronicity; team polychronicity would affect team effectiveness depending on task and contextual factors (e.g., time constraints)
		(Top management) team polychronicity	Souitaris & Maestro, 2010	Top management team (TMT) polychronicity increased strategic decision speed and in turn the organization's financial performance; TMT polychronicity decreased strategic decision comprehensiveness and in turn the organization's financial performance; overall, TMT polychronicity positively predicted the organization's financial performance
Team temporal diversity Subdimensions:	The variation in team members' time-based individual characteristics	Temporal diversity	Mohammed & Harrison, 2013[a]	Team diversity of temporal differences would interact with team task types and task complexity to predict team performance
Chronotype diversity	The diversity in members' biological dispositions toward the optimal timing of daily periods of activity and rest	Chronotype diversity	Volk, Pearsall, Christian, & Becker, 2017[a]	Chronotype diversity would inhibit team coordination, information processing, and backing up behaviors, but these effects would become positive when teams have high chronotype recognition; chronotype diversity would increase relationship conflict and reduce team cohesion via the formation of chronotype subgroups
Pacing style diversity	The diversity in members' pacing styles	Pacing style diversity	Mohammed & Nadkarni, 2011	Pacing style diversity was more positively related to team performance when team temporal leadership was stronger
		Pacing style diversity	Gevers et al., 2016	Pacing style diversity increased team collaboration when both team action planning and temporal familiarity were high, but it decreased collaboration when either action planning or temporal familiarity was low
Polychronicity diversity	The diversity in members' polychronicity	Polychronicity diversity	Mohammed & Nadkarni, 2014	Polychronicity diversity negatively predicted team performance, when team shared temporal cognition (STC) was low or when temporal transactive memory system (TMS) was high
Temporal focus diversity	The diversity in members' temporal focus	Heterogeneity of time orientations	West & Meyer, 1998	Heterogeneity of future time orientations in TMTs was positively related to changes in the strategic intensity of new ventures
		Time perspective heterogeneity	Gibson, Waller, Carpenter, & Conte, 2007[a]	Team national cultural diversity would increase, whereas firm global integration and environmental volatility would decrease, time perspective diversity in multinational organization (MNO) teams; time perspective diversity would increase their innovativeness of knowledge creation but decreased the speed of knowledge creation and transfer

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
		Time perspective diversity	Mohammed & Nadkarni, 2011	Future time perspective diversity was not related to team performance, nor did it interact with team temporal leadership to predict team performance
Time urgency diversity	The diversity in members' time urgency	Time urgency diversity	Mohammed & Angell, 2004	Time urgency diversity was less positively related to team relationship conflict when team processes including leadership, coordination, and communication were more frequent
		Time urgency diversity	Mohammed & Nadkarni, 2011	Time urgency diversity was more positively related to team performance when team temporal leadership was stronger
Team temporal focus	The aggregated temporal focus of team members	(TMT) future time orientation	West & Meyer, 1998	Greater average future time orientations in TMT members positively predicted changes in the strategic direction of the organization
Team time urgency	The aggregated time urgency of members within a team	Aggregate group hurriedness	Jansen & Kristof-Brown, 2005	When individual and workgroup hurriedness were congruent, employees' psychological strain increased with increasing hurriedness; employees were less strained in groups when the aggregate group hurriedness was lower than the individual hurriedness
Temporal schemata	Teams' shared cognitive frameworks that give form and meaning to experience about time and deadline	Temporal schemata	Labianca et al., 2005	Task starting time aligning with team temporal schemata decreased the team's errors in calculating the remaining time relative to deadline and promoted the team's time consciousness, earlier transition from planning phase to action phase, and team performance
Temporal transactive memory systems (TMS)	The set of unique knowledge domains held by specific members combined with a shared understanding of who knows what and when that knowledge is needed	Temporal transactive memory systems	Mohammed & Nadkarni, 2014	Temporal TMS amplified the negative effects of team polychronicity diversity on team performance, in a way that when temporal TMS was high, polychronicity diversity was negatively related to team performance
		Temporal familiarity	Gevers et al., 2016	When teams' temporal familiarity and action planning were high, team pacing style diversity was positively related to team collaboration
(Organizational) temporal capability	An organization's ability to attend to multiple conceptions of time and effectively sequence, pace, and combine planned change processes	Temporal capability	Huy, 2001[a]	An organization's temporal capability would facilitate the enactment of planned large-scale organizational change that involves a significant alteration of many organizational elements, such as formal structures, work systems, beliefs, and social relationship
Organizational temporal culture	An organization's cultural norms, beliefs, and values regarding how time is to be perceived and understood within the organization	Sociotemporal norms	Blount & Janicik, 2001[a]	Temporal norms embedded in an organization's culture would influence the organizational actors' perceptions and construal of the organization's temporal structure such as schedules, rhythms, and routines
Subdimensions:		Shared beliefs about temporality	Granqvist & Gustafsson, 2016[c]	Organizational actors' temporal institutional work (i.e., how they construct, navigate, and capitalize on timing norms in their attempts to change institutions) created shared beliefs of temporality

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Emphasis on quality over speed	The degree to which the organizational culture emphasizing the importance of quality (over) speed of work	Time orientation emphasizing quality over speed	Moyle, 1995	An organization's temporal culture emphasizing quality over speed was positively related to the employees' well-being and job satisfaction
		Organization's emphasis on speed	Perlow, Okhuysen, & Repenning, 2002[c]	The organization's emphasis on speed created a "speed trap" where organizational actors believed they had to make ever faster decisions to survive
Polychronicity	The degree to which the organizational culture prefers polychronicity	Organizational culture of polychronic values	Bluedorn, Kalliath, Strube, & Martin, 1999	The development of the measure of polychronicity as a dimension of organizational culture (Inventory of Polychronic Values; IPV)
Temporal depth	The degree to which the organizational culture focuses on short and long temporal horizon	Short-term versus long-term orientations	Das & Teng, 2000[a]	The conflict between organizations' short-term and long-term orientations would be negatively associated with the stability of the organization's strategic alliances
		Organizational culture of long- versus short-term orientation	Zahra, Hayton, & Salvato, 2004	An organizational culture toward a long-term orientation positively predicted the firm's entrepreneurship, whereas a short-term orientation negatively predicted entrepreneurship, and these relationships were stronger in family firms than in nonfamily firms
		Long-term orientation	Lumpkin & Brigham, 2011[a]	The conceptualization and construct development of long-term orientation in family firms
		Temporal orientation	Souder & Bromiley, 2012	Firm performance above managerial aspirations and executives' long-term orientation increased the time horizon of the organization's temporal orientation
		Temporal orientation	Wang & Bansal, 2012	Organizations' long-term orientation positively predicted its financial performance; in organizations with a long-term orientation, corporate social responsibility (CSR) activities increased firm financial performance, whereas in organizations with a short-term orientation, CSR activities decreased financial performance
		Temporal myopia	Vuori & Huy, 2016[c]	An organization's top managers' externally focused fear and middle managers' internally focused fear led to the organization's temporal myopia
		Long-term orientation	Flammer & Bansal, 2017	The adoption of executives' long-term incentives increased the organizations' long-term orientation; organizational long-term orientation positively predicted firm value, operating performance, and investment in long-term strategies

(Continues)

TABLE 1 (Continued)

Individual temporal dispositions				
Constructs	**Representative definition**	**Original concept**	**Study**	**Key findings**
Temporal focus	The degree to which the organizational culture focuses on the past, present, and future	(Organizational) time orientation	Moyle, 1995	The organizational culture emphasizing a strong future orientation was positively associated with the employees' well-being and job satisfaction
		Organizational time orientations	Ofori-Dankwa & Julian, 2001[a]	Different organizational time orientations would be differently related to the organization's internal processes as well as the response to and enactment of its environment
		Organizational culture of time orientation	Fried & Slowik, 2004[a]	Employees in a strong futuristic organizational culture would be more inclined to be involved in nonchallenge tasks as transitory learning experiences for future challenging tasks

Notes:
[a]theoretical papers;
[b]book chapters;
[c]qualitative study;
[d]review or meta-analysis

collective level categorical distinction. We then allocated the individual-level and collective-level constructs, respectively, along the vertical line based on the number of studies examining each construct, which approximately reflects the frequency of research on this phenomenon at the individual versus collective levels. Table 1 summarized the temporal constructs and the key findings in each study.

3 | A TYPOLOGY OF TEMPORAL CONSTRUCTS AND RELATED RESEARCH

In this section, we introduce the four archetypes of subjective time (individual temporal disposition, individual temporal state, collective temporal state, and collective temporal disposition). We review and illustrate the conceptualizations of the specific temporal constructs belonging to each of these four archetypes, based on how frequently the constructs have been studied and how much they reflect similar temporal phenomena.

3.1 | Individual temporal disposition

The temporal constructs in quadrant I (Figure 1) represent varied forms of individual-level, trait-like subjective time in organizations, which capture relatively consistent and enduring ways of thinking about or using time. These constructs are relatively stable across time and situations. Scholars have used the term "temporal personality" to describe such forms of subjective time, which are "like fingerprints," unique to each individual (Ancona et al., 2001; Chen & Nadkarni, 2017). Thus, we generally refer to this type of subjective time as individual temporal disposition. It denotes the characteristic ways in which individuals subjectively use, understand, value, or think about time.

Temporal focus and *temporal depth* reflect relatively stable cognitive dispositions (i.e., how individuals think about time) in relation to the past, present, and future, but they capture orthogonal temporal features—the former emphasizes the direction of a temporal frame, whereas the latter highlights its length (Shipp et al., 2009). Although either construct has been studied frequently, the aforementioned jingle–jangle fallacies are prevalent in this research. As shown in Table 1, the same label of "(future) temporal orientation" was used to describe both *temporal focus* (e.g., Cojuharenco et al., 2011; Fried & Slowik, 2004) and *temporal depth* (e.g., Das & Teng, 1998, 2001; Lin et al., 2018)—the jingle fallacy. In the meantime, different labels such as "time perspective" (e.g., Przepiorka, 2016; Waller et al., 2001) were used to describe *temporal focus*; "temporal distance" (Cojuharenco et al., 2011), "short-termism" (Marginson & McAulay, 2008), and "temporal myopia" (Miller, 2002) were employed to refer to *temporal depth*—the jangle fallacy. To alleviate those jingle–jangle fallacies, we adopted Shipp et al. (2009) and Bluedorn (2002)'s conceptualizations to clarify the definitions of these two constructs (see Table 1). Specifically, *temporal focus* represents the extent to which individuals characteristically devote attention to the past, present, and future, and these three temporal foci are independent dimensions

rather than a single dimension lying along a continuum (Shipp et al., 2009). *Temporal depth* refers to the distance into the past and the future from the present that people consider when contemplating events (Bluedorn, 2002). Individuals' past and future temporal depths were shown to be positively correlated (Bluedorn, 2002; Bluedorn & Martin, 2008).

As Figure 1 presents, *time urgency* and *individual polychronicity* reflect relatively strong individual dispositions concerning the use of time. *Time urgency* captures how fast individuals generally experience the passage of time, and those with high time urgency tend to feel and behave chronically hurried across situations (Conte et al., 1995; Landy et al., 1991). *Individual polychronicity* denotes individuals' proclivity toward the degree of simultaneity in conducting multiple work tasks (Slocombe & Bluedorn, 1999). Our review shows that researchers have used relatively consistent construct labels and conceptualizations to examine time urgency and individual polychronicity (e.g., Agypt & Rubin, 2012; Hecht & Allen, 2005; Waller et al., 2001).

Similarly, existing research has been largely consistent in studying the temporal constructs of *consideration of future consequences* (CFC) and *pacing style* yet regarded them as less trait-like than time urgency and individual polychronicity (Figure 1). *CFC* represents the extent to which individuals think about the future consequences of their current behavior (Strathman et al., 1994). Although CFC involves a future focus, it emphasizes the "intrapersonal struggle" between the present and future and thus one's tendency to resolve this dilemma in favor of one of the other (Joireman et al., 2006; Strathman et al., 1994). *Pacing style* describes a person's preferred pattern of allocating efforts in working toward deadlines—whether the most time is spent at the beginning (early pacing), at the end (deadline pacing), or whether time is spent evenly (steady pacing) (Gevers et al., 2009). Scholars have considered pacing style as less than a "stable part of a person's personality" but "more stable than transitory states" (Gevers et al., 2006; Gevers et al., 2015, p. 503).

More recently, researchers have developed new constructs to capture other aspects of individual temporal disposition. Leroy et al. (2015, p. 761) used *synchrony preference* to describe the willingness to adapt one's pace and rhythm to synchronize with others and defined it as "a stable individual difference." *Time bifurcation* denotes the individual ability to consider present and future events with entirely different mindsets (Miller & Sardais, 2015). Similar to the nature of cognitive ability, time bifurcation tends to capture a relatively trait-like characteristic of individuals (Chen et al., 2000; Miller & Sardais, 2015).

In sum, as shown in Table 1, OB research has made significant progress in developing and validating a variety of individual temporal dispositional constructs, with emerging research continuing to explore new dispositions.

3.2 | Individual temporal state

In contrast to temporal dispositions that represent relatively stable and enduring individual characteristics, some other forms of subjective time are more fleeting and malleable to situational influences (Ancona et al., 2001). We refer to such state-like, individual-level temporal constructs in quadrant II (Figure 1) as "individual temporal states." In general, individual temporal states reflect how individuals temporarily perceive and acquire their senses about time through situated experiences (Blount & Leroy, 2007). Grounded in a situational perspective, studies have largely shown how organizational environments act as situational determinants to shape individual temporal states (Table 1).

Our review suggested that *time pressure* is one of the most widely studied individual temporal states (Figure 1). Although there are other labels including "perceived time pressure" (Beck & Schmidt, 2013), "time famine" (Perlow, 1999), and "experience of time scarcity" (Kaufman-Scarborough & Lindquist, 2003), the phenomenon of *time pressure* generally refers to the extent to which individuals feel they have insufficient time to finish work (Kinicki & Vecchio, 1994; Stiglbauer, 2017; Wu et al., 2014). Notably, the subjective, perceptual nature of time pressure makes it distinct from "time constraint" as an externally imposed, objective limit of time, which often serves as an antecedent of employees' time pressure at work (Ross & Wieland, 1996; Saqib & Chan, 2015). Moreover, researchers have examined time pressure concerning the specific task of creativity—*creative time pressure* (e.g., Baer & Oldham, 2006). Recently, Leroy and Glomb (2018) proposed *anticipated time pressure* to describe one's perceived time pressure anticipated for a future task. Our review indicated that time pressure is a highly state-like construct, with research showing that it is often shaped by situational factors such as interruptions at work and susceptible to experimental manipulations (e.g., De Dreu, 2003; Perlow, 1999).

Another frequently studied individual temporal state is *FTP*, defined as "a general concern for and corresponding consideration of one's future," which "can be conceptualized both as a trait and as a state" (Kooij et al., 2018, p. 3). Specifically, some scholars have considered it a "flexible, cognitive–motivational" state (Bal et al., 2010; Korff et al., 2017). Yet, other research referred to FTP as an individual difference and showed that the construct has a certain degree of stability over time (Kooij et al., 2018; Weikamp & Göritz, 2015). In a recent meta-analysis, Kooij et al. (2018) integrated prior conceptualizations of FTP and decoupled its dimensionalities into different trait-like and state-like subdimensions. As a specific aspect of FTP, the *occupational FTP* focuses on employees' consideration of the future in the employment context (Rudolph et al., 2018).

Furthermore, there is a notable paucity of research examining employees' *perceived control of time (PCT)*, the sense of mastery over how one allocates one's time (Macan, 1994), and *time structure and purpose (TSP)*, the degree to which individuals perceive their use of time to be structured and purposive (Mudrack, 1999). These two constructs are commonly related to how employees perceive their use of time in the workplace. Research has shown that they are shaped by organizational procedures and task characteristics such as job autonomy, therefore reflecting malleable states that are subject to environmental influences (Claessens et al., 2004; Evans et al., 2004).

Finally, emerging research has investigated several other forms of state-like subjective time. *Time sensitivity* captures individuals'

temporary attention to certain aspects of time, such as duration, time intervals, and timing (Ebert & Prelec, 2007). The authors conceptualized *time sensitivity* as a cognitive state "enabled by sufficient motivation, time, and cognitive resources" and demonstrated that individuals' time sensitivity is susceptible to attention manipulations (Ebert & Prelec, 2007, p. 1424). In contrast to the attention to time, *timelessness* was proposed to describe the experience of transcending time and defined as a "motivated state" capturing the momentary loss of sense of time because of employees' total involvement in the task at hand (Mainemelis, 2001). Last, *temporal frame* represents one's construal of the future in relation to the direction of its advent—whether the person is moving toward the future (ego-moving frame) or the future is moving toward the person (time-moving frame) (Crilly, 2017). Based on a cognitive-linguistic lens, Crilly (2017) argued that temporal frame reflects how individuals make sense of time regarding how time is perceived spatially, which is distinct from the stable individual characteristics of temporal focus.

Overall, studies on individual temporal state have heavily centered on the constructs of time pressure and FTP (Table 1). Yet, researchers have uncovered other meaningful individual temporal state phenomena at work (e.g., perceived control of time, time sensitivity, and timelessness), which call for more scholarly attention in the future.

3.3 | Collective temporal state

The temporal constructs located in quadrant III of Figure 1 represent the state-like subjective time of a collective unit. We refer to these constructs as "collective temporal state." Similar to individual temporal states, they are flexible over time and malleable to situational influences (George & Jones, 2000). Collective temporal states involve shared perceptions as well as interactive processes of a higher level unit with regard to the subjective experiences of time (Ancona et al., 2001; McGrath, 1991).

The constructs of *time consciousness*, *shared temporal cognition* (STC), *(collective) time pressure*, and *temporal shifts* generally capture shared temporal perceptions. *Time consciousness* denotes the extent to which group members collectively pay attention to time, such as the total time limit and the remaining time of group tasks (Labianca et al., 2005). Although scholars have used other labels including "attention to time" (Gersick, 1989; Waller et al., 2002) and "time awareness" (Chang et al., 2003), we adopted Labianca et al. (2005)'s clearly defined construct of "time consciousness" to describe this phenomenon. Research has generally shown that groups differ in the attention they pay to time as they progress through the timeline of group tasks or projects, and thus time consciousness largely represents a flexible and malleable state (Chang et al., 2003; Gersick, 1988; Lim & Murnighan, 1994).

STC captures team members' shared understanding of the temporal aspects of executing team tasks (Gevers et al., 2006; Mohammed & Nadkarni, 2014), which has been attached with other labels, such as "temporal consensus" (e.g., Gevers & Peeters, 2009) and "shared cognition on time" (Gevers et al., 2004). As shown in Figure 1, *STC* reflects a relatively state-like collective temporal state, with research demonstrating that it is shaped by the diversities of members' pacing style and the personality trait of conscientiousness (Gevers et al., 2009; Gevers et al., 2016).

Comparatively, *(collective) time pressure* and *temporal shifts* have drawn much less scholarly attention. Only a recent study has evidenced that teams collectively experience *(collective) time pressure* at work—members' shared perception of the scarcity of time available to complete team tasks (Maruping et al., 2015). Using an inductive approach, Staudenmayer et al. (2002, p. 583) focused on the changing experiences of collective temporal perceptions triggered by unusual organizational events such as production shutdown; accordingly, the authors proposed the construct of *temporal shifts* to emphasize "changes in a collective's experience of time," including the perceptions of time pressure, time horizons, sense of competing time demands, and sense of control over time.

Furthermore, our review suggests that—although conceptualized as less state-like than shared temporal perceptions—the interactive processes of a collective in relation to subjective time experiences and perceptions also reflect collective temporal states (Figure 1). The constructs of *temporal coordination* and *temporal reflexivity* capture such interactive processes. At the team level, *temporal coordination* describes how members collectively adjust the temporal aspects of workflows by scheduling deadlines, coordinating paces, and specifying time allocations in team tasks (McGrath, 1991; Montoya-Weiss et al., 2001). At the organizational level, *temporal reflexivity* captures the collective process of organizational actors questioning, articulating, and rethinking the temporal assumptions anchoring organizational practices (Reinecke & Ansari, 2015). Research indicates that temporal reflexivity can be triggered by conflicts between an organization's market- and process-based models or shaped by the organization's daily ongoing practices (Orlikowski & Yates, 2002; Reinecke & Ansari, 2015).

Overall, despite the growth of research on collective temporal states, some constructs have only been considered by theoretical or qualitative works (e.g., temporal shifts and temporal reflexivity). Future OB studies may offer more quantitative evidence to promote the validity and generalizability of these temporal constructs.

3.4 | Collective temporal disposition

We use "collective temporal disposition" to describe the trait-like, collective-level temporal constructs located in quadrant IV (Figure 1). Collective temporal dispositions represent a collective unit's subjective beliefs, values, or capabilities about time, which are relatively stable and immune to situational changes, thus representing specific temporal characteristics of the collective unit. They reflect both the compositions of the unit members' individual temporal dispositions and the unique, enduring temporal characteristics of the collective unit as a whole (Mohammed & Harrison, 2013; Schriber & Gutek, 1987).

At the team level, the most widely studied construct of collective temporal disposition is *team temporal diversity*—the variance in team members' individual temporal dispositions including time urgency (e.g., Mohammed & Angell, 2004), polychronicity (Mohammed &

Nadkarni, 2014), pacing style (e.g., Gevers et al., 2016), temporal focus (Mohammed & Nadkarni, 2011), and chronotype (i.e., biological predispositions toward the optimal timing of daily periods of activity and rest; Volk et al., 2017). Because these forms of team temporal diversity generally denote "persistent differences in how members think about and value time" (Mohammed & Harrison, 2013, p. 244), they reflect a team's stable temporal characteristics.

Some other studies have focused on the shared or average temporal dispositions of teams. Based on a cultural perspective, Souitaris and Maestro (2010) conceptualized *TMT polychronicity*—members' mutual preference for engaging in multiple tasks simultaneously—as "a cultural dimension" that is specific and persistent to the TMT. Other researchers have used the mean level of team members' time urgency (Jansen & Kristof-Brown, 2005) and temporal focus (West & Meyer, 1998) to capture overall *team time urgency* and *team temporal focus*. Because time urgency and temporal focus reflect individual temporal dispositions (Conte et al., 1995; Shipp et al., 2009), the team averages of time urgency and temporal focus tend to indicate relatively trait-like features of the team. However, the trait-state property of these two constructs has not been clearly articulated by prior research.

A small number of studies has examined other temporal constructs reflecting collective temporal dispositions. *Temporal transactive memory system*—the set of unique knowledge held by members combined with a shared understanding of who knows what and when the knowledge is needed—subsumes three facets: knowledge specialization within the team, ability of members to efficiently work together, and trust in each other's knowledge (Mohammed & Nadkarni, 2014). Whereas the first two facets reflect relatively stable team features, the third facet (trust) seems to be more state like. As a whole, *temporal transactive memory system* tends to be trait like but not as stable as those directly composed by individual temporal dispositions (e.g., temporal diversity; Figure 1). The other promising but poorly studied construct is the *temporal schemata* of teams, referring to a team's generalized cognitive framework that gives form and meaning to members' experiences of time (Labianca et al., 2005). Scholars have argued that "schemata have a tendency to endure," and when a team comes into existence, it establishes a temporal schema that differentiates its members' understanding and experience of time from that of others (Balogun & Johnson, 2004, p. 525; Labianca et al., 2005). Thus, temporal schemata capture a trait-like characteristic of the team.

At the organizational level, *organizational temporal culture*—an organization's values and norms regarding how time is perceived and understood within the organization (also labeled as "sociotemporal norms," Blount & Janicik, 2001; "shared beliefs about temporality," Granqvist & Gustafsson, 2016)—has been widely studied, especially in areas of strategy and organizational theory (Table 1). Specifically, scholars have examined different facets of organizational temporal culture including emphasis on quality over speed (e.g., Moyle, 1995), polychronicity (Bluedorn et al., 1999), temporal depth (e.g., Zahra et al., 2004), and temporal focus (e.g., Fried & Slowik, 2004). Because organizational culture is considered "an organizational trait" that reflects the deeply rooted beliefs and values specific to the organization (Denison, 1996), organizational temporal culture represents a collective temporal disposition (Figure 1). Finally, Huy (2001) proposed the construct of *temporal capability* to describe an organization's ability to attend to multiple conceptions of time (e.g., sequencing, timing, and pacing). Similar to the cognitive and behavioral abilities of individuals (Chen et al., 2000), temporal capability, to some degree, captures the collective temporal disposition of organizations (Figure 1).

In sum, organizational scholars across different areas (OB, strategy, entrepreneurship, and organizational theory) have studied collective temporal dispositions, but OB research has mostly focused on team temporal diversity. Future OB research may borrow insights from those adjacent areas to better and more completely understand other aspects of temporal phenomena related to collective temporal dispositions.

Building on the above four sections (Sections 3.1–3.4), our literature review together suggests that although the past three decades have seen substantial growth of research on subjective time, knowledge gaps remain and offer opportunities for future development. In the next section, we delineate those gaps and suggest future research avenues to advance our understanding of subjective time.

4 | CURRENT KNOWLEDGE GAPS AND FUTURE RESEARCH AGENDA

We identified three critical gaps in the current literature. First, we considered the conceptual imprecision of temporal constructs as the primary issue inhibiting future research. Accordingly, we suggested how our integrative framework could help overcome this issue and facilitate future study both on examining existing constructs and discovering new temporal constructs. Second, we noted that extant research has largely focused on a single temporal construct in each individual study. Because different forms of subjective time often exist simultaneously and operate conjunctively, we urge future research to examine multiple temporal constructs in tandem. Finally, as subjective time functions across organizational levels whereas prior studies mostly focused on a single level of analysis, we encourage future research to investigate subjective time as a multilevel phenomenon.

In the following sections, we illustrate each knowledge gap and the associated challenges. We also build on our integrative framework to offer specific suggestions to address those challenges, thereby charting a clear and rich future research agenda.

4.1 | Conceptual imprecision as the primary hurdle

Our review noted that conceptual imprecision of temporal constructs concerning the trait–state property and level of analysis is prevalent in the literature. Because conceptual precision serves as a cornerstone for theory building and empirical investigations (Chaplin et al., 1988; Klein & Kozlowski, 2000), we place this issue front and center. The imprecision regarding the trait–state property of temporal constructs has led researchers to conceptualize the same construct in inconsistent ways, which can further result in misspecifications of its antecedents and consequences. For example, although *temporal focus* has been mainly conceptualized as a trait-like construct (e.g., Nadkarni &

Chen, 2014; Shipp et al., 2009; Shipp & Jansen, 2011), some researchers considered it as state-like attention (Foo et al., 2009). Accordingly, Foo et al. (2009) found that the (state-like) temporal focus was determined by individuals' state positive affect. However, based on a dispositional perspective, (trait-like) temporal focus is unlikely to be affected by a state. This theoretical confound also resulted in problematic operationalization. So did Foo et al. (2009) measure state-like temporal focus with the temporal focus scale, a scale that was originally designed based on a trait-like conceptualization of temporal focus (Shipp et al., 2009).

Although the individual versus collective level of temporal constructs has mostly been well clarified, we often encounter conceptual imprecision regarding the emergence of many collective-level constructs (see Mohammed and Nadkarni (2014) for an exceptional example). Such conceptual clarification is also crucial for operationalizing the collective-level construct because it dictates the choices of measurement at the lower level and data aggregation to the higher level (Chan, 1998). For example, constructs of collective temporal state (quadrant III) and disposition (quadrant IV) could emerge through different processes from the individual level. *STC* of teams is assumed to originate in individual temporal perceptions and converge among team members (Mohammed & Nadkarni, 2014). Because it emerges as a shared, consensual state of the team, it needs to be measured using the referent of "our team" and then aggregated to the team level based on sufficient within-group agreement (Gevers et al., 2006). In contrast, the collective temporal disposition of *team temporal diversity* is based on team compositions (Mohammed & Harrison, 2013). Because members' inputs to the team composition can be distinctly different, depending on individual characteristics, team temporal diversity is not presumed to coalesce among members (Klein & Kozlowski, 2000). Thus, it is measured as the team-level distribution of individual dispositions, with no need for statistical justification for higher level aggregation (Mohammed & Nadkarni, 2011).

In what follows, we explain how our integrative framework could help future research overcome the conceptual imprecision and thus facilitate examinations on existing temporal constructs as well as the exploration of new constructs.

4.1.1 | Examining existing temporal constructs

Albeit generic, our integrative framework presents a promising first step to promote the conceptual precision of temporal constructs in the extant literature. Due to the ambiguity and inconsistency in their conceptualizations, a major challenge confronting future research to examine those constructs would be clarifying their trait–state properties. In this regard, our review could inform future research on how the trait–state nature of a given temporal construct has been mainly conceptualized, and we encourage future studies to adopt an aligned conceptualization of the construct suggested by our framework (Figure 1).

Moreover, future research may confuse the focal level of analysis when investigating temporal phenomena that have been theorized at different organizational levels (e.g., *individual polychronicity*, Slocombe & Bluedorn, 1999; *team polychronicity*, Kaplan, 2008; *organizational temporal culture of polychronicity*, Bluedorn et al., 1999). Our framework could offer guidance for choosing and clarifying the appropriate level of analysis for the constructs under examination.

4.1.2 | Discovering new temporal constructs

Our framework also presents fruitful opportunities for future research to discover new temporal constructs. We noted that research on individual temporal states (quadrant II) has heavily centered on *time pressure* and *FTP*. Similarly, although scholars have increasingly examined collective-level phenomena of subjective time (quadrants III and IV), our knowledge about constructs in these quadrants is still nascent. Nevertheless, our review suggests that there likely are many unexplored, theoretically distinct forms of subjective time that manifest across the four archetypes. For instance, the feeling that time is scarce and passes fast could be reflected in an individual temporal disposition (*time urgency*, Conte et al., 1995), individual temporal state (*time pressure*, Kinicki & Vecchio, 1994), collective temporal state (*collective time pressure*, Maruping et al., 2015), and collective temporal disposition (*organizational temporal culture of emphasis on speed*, Moyle, 1995).

We therefore encourage future OB research to explore new forms of subjective time, especially those capturing state-like and/or collective-level phenomena. In this regard, our framework could provide a roadmap to help uncover such temporal constructs—by mapping the existing temporal constructs onto another quadrant in Figure 1. We suggest at least two specific pathways. First, future research may discover new constructs by shifting toward the state dimension (i.e., between quadrants I and II, or between III and IV) and consider the state-like manifestations of existing trait-like constructs (e.g., a state-like form of *individual polychronicity*) or, vice versa, by exploring trait-like phenotypes of state-like constructs (e.g., individuals' trait-like tendency of *time sensitivity*). Second, novel temporal constructs could also be identified by moving existing constructs to a different level of analysis (i.e., between quadrants I and IV, or II and III). For instance, future research may examine an individual's temporal disposition similar to the collective-level *temporal schemata*, and likewise, researchers could explore the collective equivalent of individual *FTP*. In addition, our framework offers potential for discovering new constructs by mapping existing ones onto different quadrants in other ways (e.g., from quadrant I to III, Figure 1).

Overall, regardless of examining existing or novel temporal constructs, we encourage future research to provide precise conceptualizations, at least in terms of the fundamental trait–state property and level of analysis of temporal constructs. Addressing conceptual imprecision also serves as a precondition to tackle the challenges discussed in the following, which are related to considerations of multiple constructs in tandem and the development of multilevel research.

4.2 | Paucity of research linking multiple temporal constructs

Although the field has made substantial progress in developing diverse temporal constructs, our knowledge about their interplay remains

limited. Because different forms of subjective time are likely to coexist and function conjunctively to affect organizational outcomes, examining one construct at a time could be essentially insufficient. Yet, the variety of temporal constructs may also create challenges for researchers to select the most relevant ones to investigate simultaneously. Questions facing such future research could center on which constructs to choose and how to examine their interplay.

Our integrative framework suggests two broad approaches. The first approach is to consider multiple temporal dispositions within quadrant I or IV in concert. An individual simultaneously possesses multiple temporal dispositions (Shipp et al., 2009), and co-consideration of them may uniquely predict employee behaviors and outcomes. Similarly, a collective unit can have multiple temporal characteristics (Mohammed & Nadkarni, 2011), and different combinations of its collective temporal dispositions may lead to distinct organizational outcomes. Thus, we encourage future research to examine the interplay of diverse and coexisting temporal dispositions of the same organizational actor, in order to gain more complete and nuanced understandings of the effects of those temporal dispositions.

Specifically, at the individual level, future studies may examine how the combination of different temporal dispositions gives rise to an employee's "temporal profile," which might better predict their time-related behaviors (see Waller et al., 2001, for a notable theoretical example of the co-consideration of time urgency and future temporal focus). At the team level, future research could build on team faultline theories (Lau & Murnighan, 1998) to examine how the simultaneous existence and alignment of multiple temporal diversity attributes may create faultlines within the team, which could exert impact on team outcomes above and beyond that of a single diversity attribute. At the organizational level, future research may investigate how different aspects of organizational temporal culture jointly shape organizational outcomes. For example, the organizational culture of long temporal depth may facilitate the idea-generation phase of creativity, whereas the temporal culture of emphasis on speed may promote idea implementation (Ofori-Dankwa & Julian, 2001; Rosing, Frese, & Bausch, 2011). Considering the interplay of these two aspects may help to better understand the processes of organizational creativity and innovation.

The second approach is to focus on a process perspective by linking temporal dispositions and states (i.e., the constructs in quadrants I and II or those in quadrants III and IV). Particularly, the "distal trait–proximal state–performance outcome" paradigm contends that, because state-like experiences are more proximal to specific tasks or situations than trait-like characteristics, they likely serve as mechanisms that transmit the effect of traits on performance outcomes (Chen et al., 2000). Building on this paradigm, future research could examine how temporal dispositions (quadrant I or IV) trigger related temporal states (quadrant II or III), which in turn affects organizational behavior and performance. For example, the effects of time urgency on employee outcomes may be mediated by the employee's perceived time pressure as the proximal state.

Indeed, our review noted that much of prior research only tested direct relationships between temporal dispositions and organizational outcomes but overlooked the mediating processes. Specifically, research on individual temporal dispositions has mainly shown their effects on employee behaviors and performance without examining the cognitive, affective, or motivational mechanisms that convey these effects. Moreover, as temporal diversity is often a "double-edged sword" for teams, a lack of investigation of its potentially opposing mechanisms may lead to null findings on team performance (Mohammed & Nadkarni, 2011). Overall, a black box remains—we know very little about *why* subjective time affects behaviors and outcomes. As such uncertainty prevails, we might misattribute the actual mechanisms underlying the observed effects of subjective time (Chen & Nadkarni, 2017). The process-based approach suggested by our framework could provide future research with one potential direction to address this black box issue.

4.3 | Scarcity of multilevel research

We observed that organizational research on subjective time has mostly focused on a single level of analysis. Yet, as the increasing complexity of organizational tasks and structures has necessitated employees to work in teams, teams to collaborate on joint projects, and differentiated departments to coordinate activities, the field calls for more theory-driven, multilevel research to better understand how subjective time exists and functions across organizational levels. However, to apply a multilevel lens, future research may encounter crucial questions such as how do individual-level temporal constructs manifest at higher levels of analysis; do the temporal constructs generalize across levels of analysis; and how does higher level subjective time influence lower level phenomena?

Using our framework as a basis, we suggest two general steps for developing multilevel studies by considering temporal constructs across the individual level (quadrant I or II) and collective level (quadrant III or IV). In the first step, researchers might provide theoretical justifications for higher level temporal constructs. We argued previously that conceptual clarification of collective-level temporal constructs serves as a basis for crafting multilevel research. Researchers therefore need to delineate models that explicate forms of bottom-up construct emergence from the individual to the collective level. Indeed, multilevel researchers have long emphasized that when studying higher level constructs, researchers should explain, in considerable detail, the theoretical processes presumed to yield the emergence of these constructs at the higher level of analysis (Klein & Kozlowski, 2000).

In a second step, researchers could develop and test cross-level or homologous theories (Chen, Bliese, & Mathieu, 2005) that specify how these multilevel temporal constructs affect outcomes across levels of analysis. Our framework (Figure 1) implies two ways to examine potential top-down, cross-level effects. First, collective-level temporal states and dispositions (quadrants III and IV) may act as situational determinants to exert direct effects on individual temporal states (quadrant II). For example, the team's *collective time pressure* and the *organizational temporal culture of emphasis on speed* may

increase individual members' *time pressure* at work. Second, collective-level subjective time (quadrants III and IV) may act as contextual boundary conditions to moderate the effects of individual temporal dispositions (quadrant I) on employee outcomes. For instance, the effect of *time urgency* on employee job performance could be strengthened or weakened (rather than determined) by the team *collective time pressure* or the *organizational culture of emphasis on speed*.

5 | CONCLUSION

Scholarly attention to subjective time in the OB field has been growing—but in a fragmented and unsystematic way. We reviewed research on temporal constructs in OB and related disciplines and assigned these constructs to four archetypes of subjective time, according to their state–trait property and level of analysis. In doing so, our integrative framework lends fundamental conceptual clarification and integration to a variety of temporal constructs. We believe it provides a basis to guide the development of future studies to investigate subjective time as a multiform, multilevel phenomenon.

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APPENDIX A

LIWC DICTIONARY GENERATION FOR TRAIT-/STATE-LIKE PROPERTIES

We developed a dictionary to extract the trait- and state-like properties of each temporal construct identified in our literature review. Following the established practices of dictionary generation for LIWC (Pennebaker et al., 2015), we created and validated the dictionary through three steps.

In the first step, we generated a list of words associated with the trait-like and state-like dimensions of psychological constructs. The generation of the two groups of words (trait like and state like) was based on their theoretical definitions and explanations in the psychological and OB literature (Allen & Potkay, 1981; Chaplin et al., 1988; Robbins & Judge, 2014; Tasselli et al., 2018; Waller, Okhuysen, & Saghafian, 2016). We further expanded the word list by including their additional synonyms using *Roget's 21st Century Thesaurus* (Princeton Language Institute & Kipfer, 2005). The preliminary dictionary contained 66 words for trait-like property and 71 words for state-like property.

In the second step, we verified the content validity of the initial set of words. Following recommended procedures for establishing content validity (Nunnally & Bernstein, 1994), we identified five subject matter experts (psychological and organizational scholars who hold expert knowledge about the conceptualization of trait-like and state-like properties). These scholars were presented the list of words (organized alphabetically) and asked to categorize each word to one of the categories: "trait-like," "state-like," and "unclear." We removed the word categorized as "unclear" and retained those in "trait-like" and "state-like" categories that reached 100% consensus among the raters.

In the final step, we conducted follow-up discussions with the raters on the relevance of each word to the theoretical definitions of trait-like and state-like constructs. We further excluded words with low relevance based on the discussions. As listed below, the final dictionary consisted of 42 words for trait-like property and 38 words for state-like property:

Trait like			State like		
Ability	Identity	Propensity	Adjust	Feeling	Reactive
Attribute	Inclination	Regular	Alter	Fleeting	Responsive
Belief	Independent	Resistant	Arising	Flexible	Sense
Capability	Inherent	Routine	Awareness	Fluctuate	Situational
Characteristic	Innate	Stable	Brief	Impression	State
Chronic	Inner	Static	Change	Irregular	Stimulus
Competence	Long-lasting	Sustain	Circumstance	Malleable	Temporary
Consistent	Norm	System	Contextual	Manipulate	Transient
Constant	Pattern	Tendency	Dependent	Modify	Transitory
Disposition	Permanent	Trait	Dynamic	Mood	Unstable
Durable	Persistent	Unchanging	Emergent	Occasionally	
Endure	Personality	Unique	Emotion	Occurrent	
Feature	Predisposition	General	Environmental	Perception	
Fixed	Preference	Predominant	Ephemeral	Process	

*The dictionary also captured alternative tenses of the words used.