Administrative Science Quarterly
1–36

DOI: 10.1177/0001839216663504
asq.sagepub.com
SAGE

It's about Time! CEOs' Temporal Dispositions, Temporal Leadership, and Corporate Entrepreneurship

Jianhong Chen[1] and Sucheta Nadkarni[2]

Abstract

How CEOs think and feel about time may have a big influence on their firms' strategies. We examine how two distinct CEO temporal dispositions—time urgency (the feeling of being chronically hurried) and pacing style (one's pattern of effort over time in working toward deadlines)—each influence corporate entrepreneurship, a key strategic behavior. We propose that CEOs' temporal leadership—how they manage the temporal aspects of top management teams' activities—mediates the relationships between their temporal dispositions and corporate entrepreneurship—firms' innovation, corporate venturing, and strategic renewal activities. Using a sample of 129 small and medium-sized Chinese firms, we find that CEOs' time urgency is positively related to their temporal leadership, which in turn is positively related to corporate entrepreneurship. We also examine the effects of three distinct pacing styles: early-action, meaning the CEO exerts the most effort early in the task process and relaxes as the deadline nears; steady-action, meaning the CEO spreads out effort evenly across the time allotted; and deadline-action, meaning the CEO is most active as the deadline nears. We find that the deadline-action style inhibits CEOs' temporal leadership, but the steady-action and early-action styles have similar effects on their temporal leadership. This study explicates the dispositional basis of executives' subjective views of time, demonstrating how CEOs' temporal dispositions shape firms' behaviors.

Keywords: CEO dispositions, temporal leadership, time urgency, pacing style, corporate entrepreneurship

Accelerated changes in competition, technological advances, and customers' preferences have forced firms to think about time and have brought the issue

[1] Peter T. Paul College of Business and Economics, University of New Hampshire
[2] Cambridge Judge Business School, University of Cambridge

of time to the forefront of strategic management research (D'Aveni, Dagnino, and Smith, 2010; Bridoux, Smith, and Grimm, 2013). Emerging literature on executives' subjective views of time suggests that a leader's interpretation of time serves as a temporal filter that molds expectations and evaluations of decision situations and forms the basis for strategic behaviors (Ancona et al., 2001; Das, 2004; Crossan et al., 2005).

But such research is still nascent and can benefit from considering the rich body of findings from research on temporal orientation in psychology, which dates back to Lewin's (1942) view of time and has followed two distinct trajectories: situational and dispositional (Wallace and Rabin, 1960; Holman and Zimbardo, 2009). According to the situational perspective, people's temporal orientations are malleable: over time, as individuals learn from and reflect on the task environment stimuli (e.g., information load, stress), socialization contexts (e.g., culture, social relationships), and life-changing events (e.g., the September 11 attacks) they encounter, they adapt their temporal orientations to suit their environments (De Volder and Lens, 1982; Holman and Silver, 1998, 2005; Trope and Liberman, 2003; Holman and Zimbardo, 2009; Shipp, Edwards, and Lambert, 2009). Strategy research has predominantly adopted the situational perspective to examine a key aspect of temporal orientation, temporal attention, which depends more on situational characteristics than on individuals' dispositions (Das, 1987; Ocasio, 1997; Yadav, Prabhu, and Chandy, 2007; Nadkarni and Chen, 2014; Nadkarni, Chen, and Chen, 2016).

In contrast, according to the dispositional perspective, one's temporal orientation constitutes an innate and stable personality trait that, like fingerprints, is unique to each individual (Goldrich, 1967; Zimbardo and Boyd, 1999). Studies in this stream have made significant progress in identifying and validating specific temporal dispositions, such as time urgency and pacing style, that shape a wide range of individual behaviors and outcomes, including goal-setting, decision-making, and learning behaviors (Landy et al., 1991; Strathman et al., 1994; Bluedorn, 2002; Gevers, Rutte, and Van Eerde, 2006). But the paucity of research from the dispositional perspective in strategy is notable, because upper echelons theory has long held that the organizational goals, structures, processes, and culture within which a firm's strategies are initiated and executed reflect the personality characteristics of its chief leader and the most powerful actor in the firm, the CEO, who enjoys disproportionate, at times almost dominating, influence on the firm's activities (Hambrick, 2007; Finkelstein, Hambrick, and Cannella, 2009).

Building on the dispositional perspective of time in psychology, we examine the strategic implications of two temporal dispositions: time urgency—the feeling of being chronically hurried (Landy et al., 1991)—and pacing style—the pattern of effort distribution over time in working toward deadlines (Gevers, Rutte, and Van Eerde, 2006). These are conceptually distinct time-related traits, each of which describes a unique aspect of how an individual thinks and feels about time (Waller et al., 2001; Mohammed and Nadkarni, 2011). Studies have demonstrated that they both constitute innate traits that are stable over time and have a profound impact on a host of behaviors, such as setting and prioritizing goals, planning, and striving for achievement (Landy et al., 1991; Conte, Landy, and Mathieu, 1995; Claessens, 2004; Gevers, Rutte, and Van Eerde, 2006; Gevers, Mohammed, and Baytalskaya, 2015). CEOs' time urgency and pacing styles are especially pertinent to strategy because scholars have long

recognized that speed (Eisenhardt, 1989; D'Aveni, Dagnino, and Smith, 2010) and pacing (Gersick, 1994; Eisenhardt and Brown, 1998; Klarner and Raisch, 2013) are central to gaining and maintaining early-mover advantages through sensing and seizing yet-to-occur technological and market opportunities ahead of competitors. Time urgency and pacing style allow us to explicate how a CEO's disposition may affect these key strategic activities.

Because research has mainly examined the direct effects of CEOs' temporal orientation, we know little about the intervening mechanisms through which that orientation affects strategic behaviors (Das, 1987; Yadav, Prabhu, and Chandy, 2007; Nadkarni and Chen, 2014; Nadkarni, Chen, and Chen, 2016). Strategy scholars have lamented that the resultant ''black box . . . moves researchers farther and farther away, both empirically and theoretically, from the actual mechanisms underlying observed relationships'' (Lawrence, 1997: 16) and undermines the precision and completeness of the theories specified to explain the relationship between CEOs' dispositions and firms' strategies (Hambrick, 2007). To open this black box, we draw on the personality–leadership behavior–outcome framework, which contends that ''who we are'' (dispositions) shapes ''what we do'' (leadership behaviors), which in turn shapes firms' strategies (outcomes) (Hogan and Kaiser, 2005; Avolio, 2007; DeRue et al., 2011; Johnson et al., 2012; Zaccaro, 2012). Thus CEOs' dispositions influence how they lead, motivate, and interact with top executives, who in turn shape strategic formulation and implementation (Peterson, Galvin, and Lange, 2012; Colbert, Barrick, and Bradley, 2014). We highlight CEOs' temporal leadership—their behaviors pertaining to managing the temporal aspects of top management team activities—as the central intervening mechanism in explaining how CEOs' time urgency and pacing styles shape a key strategic activity of firms, corporate entrepreneurship (Mohammed and Nadkarni, 2011).

Corporate entrepreneurship is the sum of a firm's innovation, corporate venturing, and strategic renewal activities, and it serves as the primary vehicle through which firms adapt to the external environment, gain competitive advantages, and perform effectively (Guth and Ginsberg, 1990; Zahra, 1996; Ireland, Covin, and Kuratko, 2009; Hitt et al., 2011; Shimizu, 2012). Because of its broad scope and strong positive effects on firms' performance, corporate entrepreneurship is increasingly considered a central intermediate performance outcome in the strategy and entrepreneurship literature (Venkatraman and Ramanujam, 1986; Zahra, 1996). Strategic leadership researchers have suggested that proximal intermediate outcomes such as corporate entrepreneurship provide a precise and fine-grained understanding of the performance implications of CEOs' dispositions (Waldman and Yammarino, 1999). Corporate entrepreneurship is particularly suitable for examining the strategic implications of CEOs' temporal dispositions, because it presents significant temporal challenges for top executives: they have a very short window in which to recognize and capture fleeting technological and market opportunities, and implementing innovation, venturing, and renewal initiatives is typically complex and time-consuming (Lerner, Zahra, and Kohavi, 2007; Burgers et al., 2009; Shepherd, Williams, and Patzelt, 2015). The challenging nature of time management inherent in corporate entrepreneurship makes it particularly susceptible to the effects of CEOs' temporal dispositions.

CEOS' DISPOSITIONS AND STRATEGIC OUTCOMES: A PROCESS MODEL

The framework of personality–leadership behavior–outcome, which is increasingly used to explain how a leader's personality influences important outcomes (Hogan and Kaiser, 2005; Avolio, 2007; DeRue et al., 2011), is premised on two prominent perspectives in the personality and leadership literatures. First, according to the trait theory of leadership, leadership behaviors originate from leaders' dispositions—''who we are determines how we lead'' (Hogan and Kaiser, 2005: 175). The personalities of leaders explain how they interact with, motivate, and influence followers and lead their firms (Lord, De Vader, and Alliger, 1986; Judge et al., 2002). Resick et al. (2009) found that core self-evaluation was positively related to CEOs' transformational leadership, whereas narcissism was negatively related to CEOs' contingent reward leadership. Peterson, Galvin, and Lange (2012) showed that narcissism negatively influenced CEOs' servant leadership behaviors, which emphasize followers' development and personal integrity.

Second, building on the behavioral paradigm of leadership (Judge and Piccolo, 2004; Judge, Piccolo, and Ilies, 2004), strategic leadership researchers have argued that CEOs' leadership behaviors influence strategic activities by shaping how they define and communicate their strategic vision and goals, as well as how they mobilize and coordinate the activities of the top management team (TMT) (Waldman and Yammarino, 1999; Peterson et al., 2003; Ling et al., 2008; Resick et al., 2009). Because the TMT is the dominant coalition and chief decision-making body with primary responsibility for crafting the firm's strategies (Hambrick and Mason, 1984; Carpenter, Geletkanycz, and Sanders, 2004; Hambrick, 2007), the ways in which a CEO coordinates, communicates, and influences the TMT's activities determine strategy formulation and implementation across the organization. CEOs' transformational, transactional, and visionary leadership shape key strategic behaviors and outcomes such as corporate entrepreneurship and innovation (Elenkov, Judge, and Wright, 2005; Ling et al., 2008).

By integrating the tenets of trait theory and the behavioral paradigm, the personality–leadership behavior–outcome framework contends that the influence of a leader's personality on outcomes is transmitted through his or her leadership behaviors (Hogan and Kaiser, 2005; Avolio, 2007; DeRue et al., 2011; Johnson et al., 2012; Zaccaro, 2012). Although sparse, empirical studies have shown that CEOs' leadership behaviors (e.g., transformational leadership and servant leadership) mediate the effects of their traits (e.g., emotional stability, consciousness, narcissism) on firms' performance (Peterson, Galvin, and Lange, 2012; Colbert, Barrick, and Bradley, 2014). Drawing on this framework, we develop a process model to propose how CEOs' temporal dispositions influence the key strategic activities of corporate entrepreneurship through their temporal leadership behaviors.

CEOs' Temporal Dispositions

We focus on two conceptually distinct temporal dispositions: time urgency and pacing style (Mohammed and Angell, 2004). Time urgency, a subcomponent of the type A behavior pattern, is a relatively stable trait (Landy et al., 1991; Conte, Mathieu, and Landy, 1998). Time-urgent people are acutely aware of

the passage of time and feel chronically hurried (Waller et al., 2001). They often create aggressive internal deadlines and use them as markers of the timely completion of team tasks (Landy et al., 1991; Conte, Landy, and Mathieu, 1995). They regularly check work progress, increase others' awareness of the remaining time, and motivate others to accomplish commitments within the allotted time (Rastegary and Landy, 1993; Waller, Giambatista, and Zellmer-Bruhn, 1999). Because they strive for timely completion of all scheduled activities, time-urgent people are efficient in the use of time, work very fast, and serve as clock-setters for group activities. In contrast, non-time-urgent individuals, who feel less hurried and constrained by time, tend to put little emphasis on internal deadlines, are relaxed, and do not feel the need to intensify efforts or push others to meet deadlines (Conte, Mathieu, and Landy, 1998; Waller et al., 2001; Mohammed and Nadkarni, 2011).

Pacing style, a term first introduced by Blount and Janicik (2001), refers to how individuals distribute their effort over time in working toward deadlines. As a relatively stable behavioral tendency, pacing style is represented as a continuum of how closely the intensity of work is paced to the deadline (Gevers, Rutte, and Van Eerde, 2006; Gevers, Mohammed, and Baytalskaya, 2015). At the low end of the continuum is the early-action style. Early-action individuals spend most of their effort at the beginning and finish the task long before the deadline so that they can relax when the deadline is close. They also stimulate others to get busy at the beginning but tend to be less active when close to the actual deadline (Gevers et al., 2009). At the high end of the continuum is the deadline-action style, which means the pacing is very close to the deadline and individuals start very late, intensifying their effort only as the deadline gets close. Deadline-action individuals tend to overemphasize task execution and motivate and energize themselves and others to maximize efficiency at the last moment (Mohammed and Harrison, 2013). In between the two ends is the moderate pacing distribution represented by a steady-action style. Steady-action individuals tend to spread out effort over work activities evenly. They keep activities well organized, have a strong sense of direction, and constantly set subgoals and monitor others' work progress over time (Mohammed and Nadkarni, 2011). Pacing style is related to varied behaviors and outcomes, such as goal setting and prioritizing, planning, preference for order, preference for unpredictability, and job performance (Claessens, 2004; Gevers, Mohammed, and Baytalskaya, 2015).

Using eight samples from two countries, Gevers, Mohammed, and Baytalskaya (2015) found that pacing style and time urgency capture distinct time-related characteristics. Whereas time urgency captures *when* work is due, pacing style reflects *how* individuals allocate their time between the start and end of a task (Mohammed and Nadkarni, 2011). Time-urgent individuals view time as their enemy and are stressed and pressured as a deadline approaches (Landy et al., 1991). Neither early-action nor deadline-action-style individuals experience the chronic hurriedness about deadlines that time-urgent individuals do. Early-action people perform most activities at the beginning but feel relaxed and become less active close to the deadline. Deadline-action people are fully energized and motivated only when the deadline is close, when they can work furiously, pulling all-nighters to try to get the work completed just before the deadline (Gevers et al., 2009). In contrast, time-urgent individuals feel chronically hurried throughout the task duration but feel particularly

anxious close to the deadline. This is the key difference between early-action/deadline pacers and time-urgent individuals.

CEOs' Temporal Leadership

Temporal leadership has its origins in the time, interaction, and performance theory, which highlights the core activities defining the temporal patterning of internal group interaction: scheduling, temporal coordination, and the allocation of temporal resources (McGrath and Rotchford, 1983). These core temporal activities allow groups to adjust effectively to external temporal parameters and enhance their timeliness and performance (McGrath and Kelly, 1986). Although the theory does not specify who is charged with carrying out these temporal activities, leadership scholars have contended that team leaders are often in charge of implementing temporal activities in teams (Ancona et al., 2001; Halbesleben et al., 2003). Ancona et al. (2001) introduced the term ''temporal leadership'' to address time-related challenges that leaders face, such as managing multiple time frames and deciding on the speed and timing of team actions. Halbesleben et al. (2003) stressed that leadership behaviors should incorporate temporal activities such as adjusting to different tempos, recognizing time-related differences, and synchronizing the working cycles of members. Mohammed and Nadkarni (2011) conceptualized, operationalized, and validated the construct of temporal leadership in teams.

Temporal leadership, defined as the set of a leader's behaviors pertaining to the management of the temporal aspects of a team's task, includes three interrelated activities: scheduling, temporal synchronization, and the allocation of temporal resources (Mohammed and Nadkarni, 2011). Scheduling specifies a clear timeline of when the various team activities should be completed. Team leaders break the total available time frame into different temporal milestones associated with completing a set of subgoals for each member and for the team as a whole. Each temporal milestone serves as a marker for tracking and reviewing the progress of members and of the team, as well as for making necessary adjustments to ensure a task's timely completion (Gersick, 1994; Halbesleben et al., 2003). Temporal synchronization addresses the question of ''how'' and involves temporally sequencing and coordinating different team members' activities. Team leaders create a coherent temporal framework to ensure that each team member carries out the assigned action at the appropriate time, and they continually adjust this framework to accommodate gaps, delays, and deviations (Maruping et al., 2015). The allocation of temporal resources refers to distributing time across team activities in an efficient and effective way, especially when time pressure is intense (Mohammed and Nadkarni, 2011). Team leaders prioritize the team's task goals, efficiently allocate time to different subtasks, and create built-in blocks of time for unexpected contingencies (Maruping et al., 2015). These three activities are closely intertwined and together constitute the temporal structure for team-level activities (Halbesleben et al., 2003). For example, creating built-in times for contingencies and sequencing team members' activities are crucial to setting detailed schedules and interim milestones, and synchronizing team members' activities requires a clear schedule. Therefore, temporal leadership is conceptualized as a unified and coherent construct (Mohammed and Nadkarni, 2011; Maruping et al., 2015).

Temporal leadership behaviors have been shown to enhance teams' performance (Mohammed and Nadkarni, 2011) and determine how effectively teams respond to time pressure (Maruping et al., 2015). They help team leaders better communicate complex time frames, facilitate within-group temporal coordination, and create coherent internal temporal structures so that teams can better adjust their internal tempo, rhythm, and working cycles to those of external environments and adapt to environmental demands in a timely manner (Ancona et al., 2001; Waller et al., 2001).

Corporate Entrepreneurship

Corporate entrepreneurship, also referred to as intrapreneurship, is a broad, multi-dimensional concept that lies at the intersection of entrepreneurship and strategic management (Hitt et al., 2001; Dess et al., 2003), defined as a set of firm activities encompassing innovation, corporate venturing, and strategic renewal (Zahra, 1996). Distinct from an entrepreneurial orientation that reflects a firm's dispositional style of strategy making or its commitment to entrepreneurial practices, corporate entrepreneurship captures the concrete entrepreneurial behaviors and activities of a firm (Zahra, 1996; Simsek, Veiga, and Lubatkin, 2007; Ling et al., 2008). Innovation reflects a firm's commitment to creating and introducing new products, processes, and organizational systems or methods (Zahra and Covin, 1995). Corporate venturing captures a firm's creation of businesses in existing or new fields, markets, or industries, either internally or externally (Zahra, 1995). Strategic renewal reflects the degree to which a firm revitalizes its operations by changing its business scope and competitive approaches (Guth and Ginsberg, 1990). These three components are intertwined, mutually supportive, and reinforcing (Simsek and Heavey, 2011), making corporate entrepreneurship a coherent and unitary construct (Ling et al., 2008). Because innovation, corporate venturing, and strategic renewal are all considered major strategic initiatives, corporate entrepreneurship has a strong prescriptive value and has been shown to be an effective means of achieving superior financial performance (Zahra, 1993, 1995; Zahra and Covin, 1995; Yiu and Lau, 2008; Simsek and Heavey, 2011).

Research has examined two broad sets of antecedents to corporate entrepreneurship: environmental and organizational. Environmental factors such as dynamism, complexity, and munificence have been shown to influence corporate entrepreneurship (Zahra, 1993; Simsek, Veiga, and Lubatkin, 2007), as have organizational factors such as technological and management capabilities (Yiu, Lau, and Bruton, 2007), corporate governance (Zahra, 1996), resources (Yiu and Lau, 2008; Hornsby et al., 2009; Kelley, Peters, and O'Conner, 2009), strategic decision-making processes (Heavey et al., 2009), and management practices and systems (Barringer and Bluedorn, 1999).

Scholars increasingly recognize the crucial role of top executives such as CEOs in driving a firm's corporate entrepreneurship activities. CEOs occupy unique positions at the apex of their organizations and control core and complementary assets essential to corporate entrepreneurship (Dess et al., 2003; Zahra, Filatotchev, and Wright, 2009), and thus they shoulder significant responsibility for promoting it (Ireland, Covin, and Kuratko, 2009). Yet studies examining the role of CEOs in shaping corporate entrepreneurship activities are sparse. An exception is Ling et al. (2008), who found that CEOs'

transformational leadership influenced TMTs' characteristics, which in turn affected corporate entrepreneurship.

We focus on the relationship among CEOs' temporal disposition, temporal leadership, and corporate entrepreneurship. We chose corporate entrepreneurship as the key intermediate outcome for several reasons. First, the entrepreneurship literature increasingly regards corporate entrepreneurship behaviors as prerequisites for improving a firm's financial performance (Zahra, 1996; Ling et al., 2008). Researchers have advocated the use of corporate entrepreneurship as a dependent variable, because such an intermediate outcome ''takes us beyond the 'black box' approach that seems to characterize the exclusive use of financial indicators'' (Venkatraman and Ramanujam, 1986: 803).

Second, strategic leadership scholars contend that CEOs' performance can best be represented by such intermediate outcomes because executives typically exert influence on the firm's performance through behaviors such as adaptation to environmental changes and innovation (Waldman and Yammarino, 1999). Based on this premise, several studies have used corporate entrepreneurship or one of its components, innovation, as a dependent variable in examining the strategic effects of CEOs' traits and leadership styles (Elenkov, Judge, and Wright, 2005; Ling et al., 2008).

Finally, corporate entrepreneurship is particularly susceptible to CEOs' temporal dispositions, because it presents significant temporal challenges for top executives. On the one hand, the entrepreneurial context is characterized by intense time pressure (Shepherd, Williams, and Patzelt, 2015). Top executives have a very short window in which to recognize and capture fleeting technological and market opportunities, and a delay in recognizing opportunities may prevent a firm from entering a new market and introducing a new product. On the other hand, innovation, corporate venturing, and strategic renewal activities are very complex and time consuming, involving many interrelated events and processes, each with different temporal demands (Floyd and Lane, 2000; Katila and Ahuja, 2002; Burgers et al., 2009). Under tight time pressure, these temporal demands may conflict with each other, creating significant challenges for top executives. An acute focus on and sensitivity to time, the temporal sequencing of key activities, and determination of time-sensitive priorities are all pivotal to successfully recognizing and executing corporate entrepreneurship activities (Bird and West, 1998).

CEOs' Time Urgency

We expect that CEOs' time urgency will foster the core temporal leadership activities of scheduling, synchronizing, and efficiently allocating temporal resources. Because time-urgent people are acutely aware of time (Landy et al., 1991), time-urgent leaders chalk out a clear timeline for completing tasks, create internal deadlines, and regularly check the work progress of the team and of each member against deadlines to ensure the timely completion of group activities (Rastegary and Landy, 1993; Mohammed and Harrison, 2013). Conte, Landy, and Mathieu (1995) found that time urgency related positively to scheduling, suggesting that CEOs' time urgency is likely to be consequential for scheduling in the strategic context. The strategy literature has long recognized that CEOs shoulder the main responsibility for key strategic tasks, such as setting clear timelines of strategic goals for TMT members and using temporal

milestones to track their progress (Schreyögg and Steinmann, 1987; Harrison, 1991).

By bringing the topic of time to the forefront of team activities, time-urgent individuals also serve as clock setters for group activities and motivate team members to complete their tasks (Waller et al., 2001). Time-urgent leaders temporally sequence various subactivities in the correct order and accurately map the times when each task activity should be accomplished (Mohammed and Harrison, 2013). Such clarity in the temporal sequencing of group activities fosters temporal synchronization, which is important in strategic decision making. Strategy research suggests that one of the main challenges CEOs face is ''to discover and manage the optimal temporal progression of various processes . . . which makes effective synchronization critical'' (Barkema, Baum, and Mannix, 2002: 921). As the top leader, the CEO is responsible for coordinating and synchronizing the TMT's internal pace so that temporal conflicts are dramatically reduced, time lags are shortened, and environmental changes are detected earlier (Gersick, 1994; Ancona and Chong, 1996; Crossan et al., 2005). Time-urgent CEOs strive to continuously adjust the working pace of each TMT member, coordinate it with the overall strategic goals of the firm, and improve the synchronization of various TMT activities with external environmental changes.

Finally, because time-urgent individuals view time as a scarce resource, time-urgent leaders will prioritize group tasks (Rastegary and Landy, 1993; Mohammed and Harrison, 2013). They are particularly alert to unforeseen contingencies and expend significant effort in anticipating potential obstacles and creating built-in spare time to accommodate such contingencies (Conte, Mathieu, and Landy, 1998). Such efficient time allocation is especially important in the strategic context, because time is the scarcest resource for CEOs (Mankins, 2004). CEOs' inefficient time allocation can result in delayed strategic decisions and missed new market and technological opportunities (Yakura, 2002). A time-urgent CEO will prioritize the strategic activities on the agenda, specify when TMT members will reach decisions on key urgent strategic issues, and build in time for unexpected environmental changes, all of which will result in strong temporal leadership. Thus,

Hypothesis 1 (H1): CEOs' time urgency will be positively related to their temporal leadership.

CEOs' Pacing Style

We expect that CEOs' pacing style will have an inverted-U-shaped relationship with temporal leadership such that steady-action CEOs (those with moderate scores on pacing style) will better promote temporal leadership activities (scheduling, synchronization, and efficient allocation of temporal resources) than early-action and deadline-action CEOs (those with low and high scores on pacing style, respectively). First, steady-action leaders are better at scheduling than early-action and deadline-action leaders. Although both early-action and steady-action styles reflect deliberate and planned scheduling behaviors, early-action-style leaders tend to focus on completing tasks early so that they can relax close to the deadline. Early-action leaders are less receptive to feedback and are more prone to premature closure of team tasks than steady-action

leaders, who not only engage in advance planning but also continuously update the end-goal schedules and temporal milestones until the deadline (Gevers, Mohammed, and Baytalskaya, 2015). Strategy research has described how advance planning without receptivity to feedback and regular reevaluation of strategic situations (as exhibited by CEOs with an early-action style) can result in strategic activities being forced along fixed time scales that prematurely end those activities and preclude the further refinement and improvement essential to smooth and timely implementation (Brown and Eisenhardt, 1997; Grant, 2003). In contrast, the receptivity to feedback and proactivity in reevaluating goals and circumstances at regular intervals typical of steady-action CEOs are central to fostering the TMT's responsiveness and adaptability in strategic decision making (Gersick, 1994; Barringer and Bluedorn, 1999). Such adaptability in scheduling is an essential component of temporal leadership (Mohammed and Nadkarni, 2011).

Contrary to steady-action-style leaders, deadline-action leaders push themselves and their team members toward task completion only when the deadline is close (Gevers, Mohammed, and Baytalskaya, 2015), and they tend to underestimate the time requirements for lengthy information processing and brainstorming of alternative strategies to effectively complete the task (Mohammed and Harrison, 2013). Because strategic stimuli are often vague, ill-informed, and competing, it is especially important that CEOs plan ahead and leave enough time for TMTs to comprehensively screen alternatives and select the best solutions (Slotegraaf and Atuahene-Gima, 2011). The last-minute and rushed approach of deadline-action CEOs is likely to inhibit the scheduling activity of temporal leadership.

Second, steady-action leaders are likely to be better at temporal synchronization than early-action and deadline-action leaders. Early-action leaders temporally sequence team members' activities so that they complete the work well ahead of time, making early-action leaders prone to considerably reducing the team's coordination and sequencing efforts close to the deadline. The laxity of early-action leaders in continuously assessing gaps between planned and actual work progress, the misalignment of team members' activities, and unforeseen delays may undermine their efficiency in temporal sequencing close to the deadline (Mohammed and Nadkarni, 2011). In contrast to early-action leaders, steady-action leaders strive to maintain consistency and clarity in the temporal sequencing structures of work activities, from the beginning right to the deadline (Gevers, Rutte, and Van Eerde, 2006). Strategy scholars suggest that such uniform and clear sequencing of team activities, rather than the irregular patterns and rhythms associated with long periods of inactivity, enables periodic adjustments, generates a state of ''flow'' within TMTs, pushes TMT members to ''stop and think,'' and allows members to discover the optimal temporal synchronization of various processes (Gersick, 1994; Brown and Eisenhardt, 1997; Okhuysen and Waller, 2002).

In contrast, the deadline-action style inhibits temporal synchronization by imposing strong pressure on team members to meet the stringent time requirement (Mohammed and Harrison, 2013). This time crunch leaves little room for the CEO to track the progress of work at different points in time, to coordinate diverse work assignments of TMT members, or to synchronize strategic pacing temporally with external environmental changes. Both temporal

coordination of internal TMT activities and synchronization of strategic pacing externally are essential to CEOs' temporal leadership (Ancona et al., 2001).

Finally, steady-action leaders are more efficient in allocating temporal resources than early-action and deadline-action leaders. Although both early-action and steady-action leaders create temporal buffers by examining the task early, early-action leaders strive to avoid deadline work and tend to be inefficient when tasks are still unfinished close to the deadline (Mohammed and Harrison, 2013). In contrast, steady-action leaders attempt to prepare for deadline work by engaging in early task organization and regularly reviewing and reprioritizing teams' activities. Thus ''the steady action style is better positioned to absorb risks associated with unanticipated delays and situational constraints'' (Gevers, Mohammed, and Baytalskaya, 2015: 18). Strategy research suggests that long periods of inactivity (typical of early-action CEOs when they are close to a deadline) may lock TMTs into their existing structures and mental models, whereas a steady and rhythmic pattern could allow TMTs to refine and improve their strategies continuously and achieve flexibility (Vermeulen and Barkema, 2002). Recently, Klarner and Raisch (2013) demonstrated that a steady-paced, regular rhythm of strategic activities fosters adaptation to the environment.

In contrast to steady-action leaders, deadline-action leaders are likely to cut things too close and offer no temporal safeguard for completing the task on schedule (Gevers, Rutte, and Van Eerde, 2006). Strategy scholars have emphasized that CEOs need to prioritize goals for their TMT members ahead of time and create built-in blocks of time for them to deal with unforeseen contingencies (Ancona et al., 2001; Crossan et al., 2005). But deadline-action CEOs cannot give their TMTs enough leeway, resulting in an inefficient allocation of resources. Thus we expect that a steady-action style will maximize CEOs' temporal leadership compared with an early-action or deadline-action style:

Hypothesis 2 (H2): CEOs' pacing style will have an inverted-U-shaped relationship to their temporal leadership.

CEOs' Temporal Leadership and Corporate Entrepreneurship

We expect that CEOs' temporal leadership will be positively related to corporate entrepreneurship. First, corporate entrepreneurship involves multiple complex subactivities with different, sometimes competing timelines (Dess et al., 2003). Thus it is important for the CEO to help the TMT set clear goals and specific time frames for corporate entrepreneurship activities so that TMT members in turn can empower others in the organization to design courses of actions and execute strategies in a timely manner (Ireland and Hitt, 1999). Laying out clear schedules and creating long-term strategic goals and sets of interim milestones and subgoals can allow the TMT to provide a clear road map for organizational members in charge of individual corporate entrepreneurship activities, as well as to balance different time requirements across different corporate entrepreneurship activities being simultaneously performed across the organization. Thus clear and adaptive scheduling of strategic activities within the TMT can ensure a coherent and integrated plan of action for formulating and implementing corporate entrepreneurship activities across the organization. Moreover, establishing temporal milestones can help TMTs track and monitor the progress of each strategic activity and facilitate the timely

execution of corporate entrepreneurship initiatives. Lerner, Zahra, and Kohavi (2007) showed that mapping clear temporal trajectories of future strategic goals and creating plans of actions are central to undertaking corporate entrepreneurship activities.

In addition, corporate entrepreneurship activities are highly uncertain and time-pressured (Shepherd, Williams, and Patzelt, 2015). To capture fleeting opportunities, TMTs need to temporally synchronize corporate entrepreneurship activities both within the organization and with environmental demands. Internally, TMTs need to communicate and coordinate with different functional areas and resolve conflicting temporal demands quickly under tight time pressure (Dess et al., 2003; Zahra, Filatotchev, and Wright, 2009). Temporal synchronization provides a well-defined time structure and allows TMTs to sequence the timing of various interconnected strategic activities undertaken by different work units so as to ensure their smooth implementation. Externally, top executives need to synchronize innovative activities with customers', competitors', and technological demands in the targeted market (Halbesleben et al., 2003). By temporally synchronizing the internal organizational pace with external environmental changes, CEOs and TMT members can provide a coherent temporal organizing framework for the firm as a whole, better incorporate updated feedback, manage transitions to work on changes that have occurred, and make adaptations quickly, all of which are central to corporate entrepreneurship (Ancona and Chong, 1996; Crossan et al., 2005).

Finally, because innovation, new business venturing, and renewal activities require new knowledge and perhaps completely different routines, considerable time and the commitment of a firm's top executives are required to formulate and implement these activities (Zahra, 1995; Dess et al., 2003; Hornsby et al., 2009). Efficiently allocating temporal resources prioritizes innovative ideas and new strategic initiatives above other demands to ensure that TMTs devote significant managerial time and effort to overseeing corporate entrepreneurship initiatives. Moreover, TMTs need to sift through the uncertainties and ambiguities and identify the emergent errors, pauses, and gaps in pursuing corporate entrepreneurship activities (Shimizu, 2012). As Garvin and Levesque (2006: 107) stated, ''Failures are common in new-business creation, and corporations need to be clear on when—and how—they will decide to pull the plug . . . but most critical is senior managers' willingness to make timely go or no-go decisions.'' Building in extra time for unexpected contingencies and errors gives the TMT enough time to adjust strategic directions based on feedback and promotes the smooth implementation of corporate entrepreneurship activities (Halbesleben et al., 2003). Thus we predict:

Hypothesis 3 (H3): CEOs' temporal leadership will be positively related to corporate entrepreneurship.

The Mediating Role of CEOs' Temporal Leadership

According to the personality–leadership behavior–outcome framework, the primary way in which leaders' dispositions affect outcomes is through their behaviors (Hogan and Kaiser, 2005; Avolio, 2007; DeRue et al., 2011; Johnson et al., 2012; Zaccaro, 2012). In this sense, leaders' dispositional attributes are indirect predictors of outcomes, whereas leadership behaviors are direct predictors of

outcomes (Van Iddekinge, Ferris, and Heffner, 2009). Supporting this contention, studies have shown that CEOs' leadership behaviors mediate the relationship between their dispositions (e.g., Big Five personality traits, narcissism) and strategic outcomes (Peterson, Galvin, and Lange, 2012; Colbert, Barrick, and Bradley, 2014). Accordingly, we propose that CEOs' temporal leadership behaviors will mediate the relationship of their temporal dispositions to corporate entrepreneurship activities:

Hypothesis 4a (H4a): CEOs' temporal leadership will mediate the relationship between CEOs' time urgency and corporate entrepreneurship.

Hypothesis 4b (H4b): CEOs' temporal leadership will mediate the relationship between CEOs' pacing style and corporate entrepreneurship.

METHOD

Research Setting

The empirical context for this study is small- and medium-sized Chinese enterprises (SMEs) operating in high-tech industries. With SMEs accounting for 50 percent of its gross domestic product (GDP), entrepreneurship is an integral part of China's economy (*Forbes,* 2012), and high-tech industries are especially suitable contexts for examining corporate entrepreneurship activities (Srivastava and Lee, 2005; Kelley, Peters, and O'Connor, 2009). The intense competition, rapid technology changes, and frequent shifts in customer preferences in high-tech industries render firms' existing skills and products obsolete very quickly. Firms are required to search continually for new technology and product opportunities, to enter new markets frequently, and to engage in ongoing renewal of their strategies and organizational systems (Ireland, Covin, and Kuratko, 2009; Zahra, Filatotchev, and Wright, 2009). Corporate entrepreneurship offers a useful path to gaining competitive advantage and superior firm performance in such environments (Shimizu, 2012). Finally, because SMEs have few intervening levels of management and external influences (e.g., boards, capital markets) (Ling et al., 2008), CEOs play a more pivotal role in formulating and implementing strategies in SMEs than in large public firms (Simsek, Heavey, and Veiga, 2010).

Sample and Data Collection

We collected survey data from SMEs located in three high-tech industrial parks in China's Guangdong and Shandong provinces, which are leading hubs of high-tech industries in China (Shandong Statistical Bureau, 2012) and host China's largest clusters of SMEs spanning a wide range of high-tech industries (National Bureau of Statistics of China, 2012). We developed the survey instrument in several steps. First, we designed an English version of the questionnaire. Next, following established back-translation practices (Qian, Cao, and Takeuchi, 2013), two raters (not the authors) fluent in both English and Chinese independently translated the survey instrument from English into Chinese, and another two raters translated it back to English (Boyd et al., 2013). To improve face validity, we pilot-tested the survey on 10 Chinese senior managers (not included in the main sample) and revised the instrument accordingly.

We obtained a list of all firms with fewer than 500 employees located in the three high-tech industrial parks.[1] One of the authors set up face-to-face meetings with the CEOs of the SMEs in the industrial parks. During each meeting, one of the authors outlined the research project and the commitment to the research process that would be required from top executives, encouraged participation, ensured the confidentiality of responses, promised that each participating firm would receive an executive summary of the findings when this study was completed, and indicated that an administrative assistant we hired from the industrial park administrative offices would follow up. We also asked CEOs to identify all of their TMT members and send each of them a memo to encourage their participation. Prior studies also suggest that local assistants from industrial park administrative offices in China know the firms' management within their parks in person and that such personal relationships could increase the response rate (Qian, Cao, and Takeuchi, 2013; Cao, Simsek, and Jansen, 2015), so we hired three administrative assistants, one from each of the industrial parks. We hand-delivered the questionnaires to these administrative assistants, who distributed them and collected responses from each CEO and the TMT members. To ensure privacy and the confidentiality of responses, we instructed the CEOs and TMT members to return their responses directly to these administrative assistants in sealed envelopes with no visible identifiers (e.g., name, job title). The administrative assistants followed up with nonrespondents via phone calls or in-person visits.

From the 348 SMEs, 158 CEOs agreed to participate in the study. We collected data at three different times from these firms. At time t_1, we sent the CEOs a temporal disposition and demographic survey. At time t_2, two weeks later, we sent out the CEO temporal leadership surveys, to be filled out by at least three TMT members other than CEOs. At time t_3, six months later, we asked CEOs and at least three TMT members to fill out surveys on corporate entrepreneurship activities. Using multiple key informants and the temporal separation allowed us to avoid common method bias and strengthened the inference of directionality in the relationship between CEOs' temporal disposition and firms' corporate entrepreneurship (Podsakoff et al., 2003). We used the six-month time lag because six months is a reasonable time period for CEOs' traits to be reflected in firms' strategic behaviors and outcomes (Nadkarni and Herrmann, 2010; Peterson, Galvin, and Lange, 2012).

We retained in the sample firms from which we received responses from the CEO and at least three TMT members (Colbert et al., 2008). The final sample satisfying this criterion consisted of 129 firms from 13 industries. This response rate of 37 percent is higher than the typical response rates (12 to 14 percent) reported in prior survey studies of TMTs (Hambrick, Geletkanycz, and Fredrickson, 1993). Consistent with prior studies (Ensley, Pearson, and Amason, 2002; Smith, Collins, and Clark, 2005), an average of 3.58 TMT members (56 percent of total TMT members) from each firm participated in the

[1] It is exceedingly difficult to conduct primary research on CEOs and TMTs because "it requires very intrusive access to large numbers of executives and TMTs, who are notoriously unwilling to submit themselves to scholarly poking and probing" (Hambrick, 2007: 337). Using a sample of SMEs affords us the opportunity to meet the unique challenges of collecting data from CEOs and TMTs in three different time periods and simultaneously helps us to ensure a good response rate and maximize the validity of the study. Following previous literature (Arend, 2006) and the definition of the U.S. Small Business Administration, we used 500 employees as a cutoff to define SMEs.

study. We found no significant mean differences in firm size (t = –0.42, *n.s.*) and firm age (t = –1.57, *n.s.*) between responding and non-responding firms.

Measures

CEOs' time urgency. We assessed time urgency with a six-item scale derived from the task-related hurry subscales of a measure developed by Landy and colleagues (1991). These subscales have demonstrated strong validity and reliability and have been used in prior research (e.g., Mohammed and Nadkarni, 2011). Examples of items included ''people that know me well agree that I tend to do most things in a hurry'' and ''I often feel very pressed for time.'' We asked CEOs to rate these six items using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) (α = 0.72).

CEOs' pacing style. Consistent with previous research (Gevers, Rutte, and Van Eerde, 2006; Mohammed and Nadkarni, 2011), we measured pacing styles by using five graphs, each with a written description below it. Examples of descriptions below graphs included ''I start right away and finish the work long before the deadline'' (early-action style); ''I work steadily on the task, spreading it out evenly over time'' (steady-action style); and ''I do most of the work in a relatively short time before the deadline'' (deadline-action style). Respondents read these descriptions and selected the graph that best captured how they pace their work when performing a task. Thus this measure is a behaviorally anchored rating scale (BARS), which is less susceptible to cognitive bias and rating errors than a non-BARS scale (Mohammed and Nadkarni, 2011). The first graph reflected an early-action style and the last depicted a deadline-action style, while the midpoint showed a steady-action style. The second and fourth intermediate graphs reflected moderate tendencies toward early- and deadline-action styles, respectively (Gevers, Rutte, and Van Eerde, 2006). Because the graphs were ordered continuously, a lower score indicates an early-action style and a higher score represents a deadline-action style.

CEOs' temporal leadership. We adapted Mohammed and Nadkarni's (2011) seven-item temporal leadership scale, which has demonstrated strong reliability. The original scale was designed for team project settings with the referent as ''your project leader''; we modified the referent to ''the CEO of your firm.'' Examples of items include ''to what extent does the CEO of your firm pace the top management team so that work is finished on time?,'' ''to what extent is the CEO of your firm effective in coordinating the top management team to meet deadlines?,'' and ''to what extent does the CEO of your firm prepare and build in time for contingencies, problems, and emerging issues?'' We improved the scale's clarity and relevance to the strategic context based on feedback from 10 CEOs working in Chinese SMEs. Modifying established scales to improve their face validity is common in studies of executives (e.g., Li, Poppo, and Zhou, 2008). At least three TMT members (excluding CEOs) in each firm rated the seven items on a 5-point scale (1 = not at all, 5 = a great deal). Cronbach's alpha was .78 at the individual level and .80 at the team level. Checks for aggregation of the CEO temporal leadership scale revealed acceptable values (ICC(1) = .56; ICC(2) = .83; mean $r_{wg\ (j)}$ = .96; F = 5.74, $p < .001$). We averaged the responses of TMT members to derive the CEO temporal leadership scores.

Corporate entrepreneurship. We measured corporate entrepreneurship by an established 16-item scale, which broadly measures a firm's actual (rather than preferred) entrepreneurial activities on innovation (five items), corporate venturing (five items), and strategic renewal (six items) (Zahra, 1996; Ling et al., 2008; Simsek and Heavey, 2011). Examples of items include ''the extent to which the firm has introduced a large number of new products to the market,'' ''the extent to which the firm has found new niches in current markets,'' and ''the extent to which the firm has redefined the industries in which it competes.'' At least three TMT members (including CEOs) in each firm filled out the scale (individual-level α: .90, team-level α: .92).

Given that the scale was designed to reflect innovation, business venturing, and strategic renewal, we expected to confirm a three-factor structure underlying the corporate entrepreneurship construct. Therefore we hypothesized the full corporate entrepreneurship measurement model, which represents it as a second-order factor indicated by three first-order factors (innovation, corporate venturing, and strategic renewal). We analyzed the full measurement model by using both individual-level data and team-level data (individual-level data: χ^2 = 433.87, 101 d.f.; CFI: .95; NFI: .94; IFI: .95; RMSEA: .09; team-level data: χ^2 = 178.43, 101 d.f.; CFI: .97; NFI: .93; IFI: .97; RMSEA: .08). These results confirm a three-dimensional structure underlying the corporate entrepreneurship construct. Checks for within-group agreement of the scales revealed acceptable values (ICC(1) = .54; ICC(2) = .79; mean $r_{wg\ (j)}$ = .97; F = 4.77, $p < .001$), so we computed an aggregated corporate entrepreneurship score by averaging individual responses of TMT members.

Control variables. We controlled for industry, firm, TMT, and CEO variables that could serve as potential alternative explanations. We controlled for *environmental dynamism*—the continuity and stability of technological and market changes in a firm's environment—which can pressure companies to renew themselves and pursue corporate entrepreneurship opportunities (Zahra, 1993). Following Simsek, Heavey, and Veiga (2010), we used established perceptual measures of environmental dynamism (a four-item scale). Examples of items include ''the extent to which the tastes and preferences of your customers in your principal industry have become hard to forecast over the past years.'' We controlled for four firm-level variables: size, past performance, unabsorbed slack resources, and firm product portfolio. Large firms, which tend to be more bureaucratic and inertial than small firms, are less likely to engage in corporate entrepreneurship activities (Zahra, 1996). *Firm size* was measured as the logarithm of the number of employees. High *past performance* strengthens the value of existing strategies and promotes the status quo, whereas low performance alerts TMTs of the necessity for renewal and innovation (Greve, 2003). We asked TMT members to rate (on a 1-to-5 Likert scale) their previous year's sales growth, which is a more reliable dimension of SMEs' performance than other objective income-based measures, because SMEs have a high motivation to minimize taxable income but no motivation to minimize reported sales (Schulze et al., 2001; Brouthers, Brouthers, and Werner, 2003). Because corporate entrepreneurship activities are costly and require financial resources, the availability of *unabsorbed slack*—excess, uncommitted liquid and easy-to-recover resources—is key to

pursuing corporate entrepreneurship activities (Zahra, 1996). We measured unabsorbed slack by the four-item scale developed by Ling et al. (2008). A sample item is ''the extent to which your firm has had plentiful resources to produce its products and/or service.''

We also controlled for SMEs' *type of product portfolio*, consumer or commodity, because competitiveness and differentiation are much higher for consumer products than for the more standardized commodity products. Firms with consumer products face much stronger pressure to create added value for consumers through innovative, market expansion, and renewal behaviors designed to allow them to stay competitive than do firms with commodity products (Murphy and Enis, 1986). We asked the marketing heads in all sampled SMEs to list their primary products, and then we used a triangulated approach to categorize the products into commodity and consumer products. First, we mapped the products of our sampled SMEs on the products listed in the United Nations Commodity Trade Statistics database to identify commodity products; those not listed in the database were categorized as consumer products. To improve face validity, we also asked three marketing consultants to independently categorize the products of the sampled firms as consumer (0) or commodity (1). There was consensus among the three consultants. None of our sampled firms produced both commodity and consumer products, so we created a dummy control variable indicating the product portfolio of each company (0 = consumer product; 1 = commodity).

We controlled for TMT size (number of members constituting a TMT) and heterogeneity, both of which determine the skills, perspectives, and cognitive diversity of TMTs and shape corporate entrepreneurship activities (Qian, Cao, and Takeuchi, 2013). We created a composite measure of TMT heterogeneity based on the heterogeneity of members' educational background (Herfindal–Hirschman index; high school, bachelor, master, Ph.D.), functional background (Herfindal–Hirschman index; production-operations, R&D and engineering, accounting and finance, management and administration, marketing and sales, law, personnel and labor relations, and others), and firm tenure (the standard deviation of the number of years TMT members had spent in the firm). Consistent with prior research (Hambrick, Cho, and Chen, 1996), we used the sum of the three standardized heterogeneity measures to create a parsimonious composite TMT heterogeneity index. Finally, because demographics influence a CEO's skills and abilities in precipitating innovation and change, we controlled for CEO age, education (number of years of schooling completed after high school), and tenure (a composite of CEO firm and position tenure) (Wiersema and Bantel, 1992).

RESULTS

We tested the hypotheses using the stepwise hierarchical regression approach (Aiken and West, 1991). In step 1, we entered only the controls. In step two, we added the main effects of CEOs' time urgency and pacing style on CEOs' temporal leadership. In step three, we added the squared term of pacing style. Table 1 provides the descriptive statistics and correlations among the study variables. Table 2 shows the regression results.

Table 1. Means, Standard Deviations, and Correlations (N = 129)*

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CEO age	43.05	7.72													
2. CEO education	2.87	.81	.06												
3. CEO tenure	6.09	4.05	.36	.00											
4. TMT size	6.33	3.77	.26	.01	.32										
5. TMT demographic diversity	−.09	1.81	.08	.06	.40	.00									
6. Firm size†	4.00	1.46	.27	.15	.51	.67	.18								
7. Slack	3.58	.57	−.04	−.07	.04	.23	−.04	.18							
8. Past performance	3.28	.73	−.05	.04	.20	.34	−.03	.35	.29						
9. Firm product portfolio	.22	.41	.08	.09	.02	.02	−.07	.08	−.12	.05					
10. Environmental dynamism	2.79	.69	.01	−.14	.02	−.02	−.12	−.16	−.08	−.07	−.07				
11. CEO time urgency	3.77	.55	−.07	−.07	−.01	−.04	.08	−.01	.26	.10	.01	.23			
12. CEO pacing style	2.36	1.29	.07	.05	.06	.01	−.12	.07	−.25	−.08	−.01	.11	−.11		
13. CEO temporal leadership	3.94	.50	.01	−.14	.02	.03	−.09	.00	.31	.13	−.18	.10	.30	−.16	
14. Corporate entrepreneurship	3.46	.45	−.19	−.04	.14	.07	−.09	.14	.38	.27	.03	.06	.29	−.17	.38

* Correlations greater than .17 are significant at $p < .05$; greater than .23 are significant at $p < .01$.

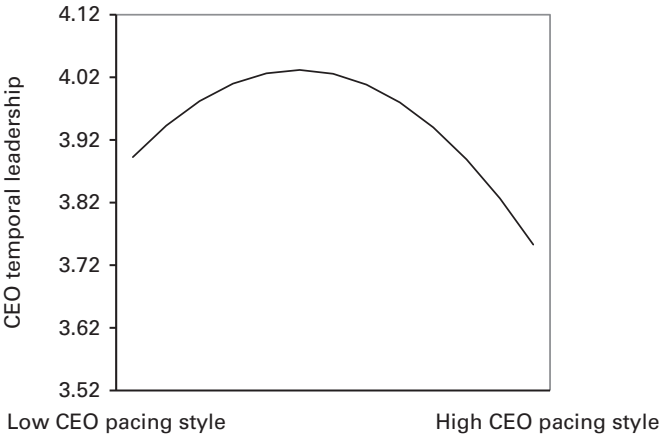
† Natural logarithm.

Table 2. Regression Results of CEO Temporal Dispositions, CEO Temporal Leadership, and Corporate Entrepreneurship (N = 129)

	CEO temporal leadership			Corporate entrepreneurship			
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Controls							
CEO age	.06	.07	.07	−.25••	−.24••	−.24••	−.26••
CEO education	−.10	−.09	−.09	−.01	.01	.01	.02
CEO tenure	.04	.07	.02	.24•	.27••	.21•	.21•
TMT size	−.08	−.06	−.06	−.14	−.12	−.13	−.11
TMT demographic diversity	−.08	−.14	−.10	−.15	−.21•	−.17	−.14
Firm size b	−.02	−.02	.01	.11	.12	.15	.15
Slack	.29•••	.20•	.19	.34•••	.26••	.26••	.21•
Past performance	.09	.07	.07	.12	.10	.10	.08
Firm product portfolio	−.13	−.15	−.14	.07	.05	.07	.10
Environmental dynamism	.09	.03	.06	.09	.04	.08	.07
Main effects							
CEO time urgency		.23••	.25••		.18•	.21•	.15
CEO pacing style		−.10	−.02		−.11	−.03	−.02
CEO pacing style squared			−.20•			−.21•	−.17•
CEO temporal leadership							.22••
F	2.19	2.61	2.85	4.46	4.46	4.79	5.18
R^2	.16	.21	.24	.27	.31	.35	.39
Adjusted R^2	.08	.13	.16	.21	.24	.28	.31

• $p < .05$; •• $p < .01$; ••• $p < .001$.

Figure 1. Effect of CEOs' pacing style on their temporal leadership.



CEOs' Temporal Dispositions, Temporal Leadership, and Corporate Entrepreneurship

As shown in model 2, table 2, CEOs' time urgency related positively to CEOs' temporal leadership, supporting H1, but the linear effect of CEOs' pacing style on temporal leadership was nonsignificant. In model 3, CEOs' pacing style squared had a significant negative effect on temporal leadership. Figure 1 graphically depicts this nonlinear relationship between CEOs' pacing style and temporal leadership. The slope of the right-hand side of the graph depicting high levels of CEO pacing style or deadline-action style is much steeper than the relatively flat slope of the progression from early-action style to steady-action style depicted on the left-hand side of the curve. To further clarify the differential effects of CEOs' early-action, steady-action, and deadline-action styles on temporal leadership, we conducted subgroup analysis (HSD test) (Preacher et al., 2005). We made pairwise comparisons of temporal leadership scores across early-action, steady-action, and deadline-action styles. Results of the HSD test indicated that the CEO subgroup with deadline-action style (mean = 3.32) had significantly lower temporal leadership scores than the CEO early-action (mean = 3.97, $p < .05$) and steady-action subgroups (mean = 3.99, $p < .05$). But there was no significant difference between the CEO early-action and steady-action subgroups. These results confirm that the deadline-action style inhibited temporal leadership but suggest that the CEO steady-action style does not confer any advantage over the early-action style in promoting temporal leadership. Taken together, these results do not support the inverted-U-shaped relationship proposed in H2.

As shown in model 7 in table 2, CEOs' temporal leadership was positively related to corporate entrepreneurship after the effects of CEOs' time urgency and pacing style were controlled for, supporting H3.

Mediation Effects of CEOs' Temporal Leadership

We tested the mediation hypotheses (H4a and H4b) by using the three requirements outlined by Baron and Kenny (1986): (1) the independent variables

(CEOs' time urgency, CEOs' pacing style squared) should relate to corporate entrepreneurship, (2) the independent variables (CEOs' time urgency, CEOs' pacing style squared) should be associated with the mediator (CEOs' temporal leadership), and (3) the effects of the independent variables (CEOs' time urgency, CEOs' pacing style squared) on corporate entrepreneurship should be diminished once the mediator (CEOs' temporal leadership) is entered. In models 5 and 6 in table 2, CEOs' time urgency related positively to corporate entrepreneurship. The linear effect of CEOs' pacing style on corporate entrepreneurship was nonsignificant, but the effect of CEOs' pacing style squared on corporate entrepreneurship was significant and negative. In model 7, once CEOs' temporal leadership was entered, the effects of CEOs' time urgency and pacing style squared term on corporate entrepreneurship were diminished. These results suggest that CEOs' temporal leadership partially mediates the positive relationship between CEOs' time urgency and corporate entrepreneurship, and CEOs' temporal leadership partially mediates the nonlinear relationship between CEOs' pacing style and corporate entrepreneurship.

Because Baron and Kenny's (1986) sequential approach does not provide an explicit test of mediation, we ran the traditional Sobel test (Sobel, 1982) to explicitly assess the magnitude of the indirect effects of CEOs' temporal dispositions on corporate entrepreneurship. CEOs' time urgency exerted strong indirect effects on corporate entrepreneurship through their temporal leadership ($Z = 1.97$, $p < .05$), and the indirect effect of CEOs' pacing style squared was marginally significant ($Z = –1.69$, $p < .10$).

Although the Sobel test explicitly evaluates indirect effects, it has been criticized for its strict sampling distribution assumptions, which can mask significant effects, particularly for complex nonlinear relationships (MacKinnon et al., 2002; Hayes and Preacher, 2010). As Preacher and Hayes (2004: 718) stated, ''One of the assumptions necessary for the Sobel test is that the sampling distribution of the *ab* (the indirect effect) is normal . . . it is suspicious of the use of the normal distribution for computing the *p* value for the Sobel test because the sampling distribution of *ab* may not be normal.'' Indeed, because the indirect effect is the product of two parameters, the sampling distribution of products is skewed, with nonzero kurtosis, and the assumption of normal distribution is difficult to justify (Preacher and Hayes, 2004). For this reason, ''The use of the Sobel test and other methods that rely on a standard error estimate and the use of the normal distribution is discouraged by experts in mediation analysis when the goal is to make an inference about the size of an indirect effect'' (Hayes and Preacher, 2010: 645).

To overcome the limitations of the Sobel test, Preacher and Hayes (2004) introduced the bootstrapping test of the indirect effect, which does not impose the assumption of normality of the sampling distribution. This test draws 5,000 random samples with replacement from the original sample and calculates the indirect effect from each bootstrap sample, yielding a sampling distribution that can be used to construct a confidence interval (CI). It provides evidence of mediation if the bias-corrected 95-percent CI does not include zero for indirect effects. ''Unlike intervals derived from methods that assume normality of the sampling distribution of the statistic of interest, such as the Sobel test, bootstrap confidence intervals tend to be asymmetric, resembling more closely the true sampling distribution of products of normal random variables'' (Hayes and Preacher, 2010: 646). For this reason, the bootstrapping procedure is

considered ''almost always more powerful than Sobel's test'' (Zhao, Lynch, and Chen, 2010: 200) and has become the standard for testing mediation effects in the management field (Gong, Huang, and Farh, 2009; Mell, Van Knippenberg, and van Ginkel, 2014). We adopted Hayes' (2013) SPSS macro ''PROCESS'' to assess the indirect effects of CEOs' time urgency on corporate entrepreneurship through CEOs' temporal leadership. The result showed that the indirect effect of CEOs' time urgency on corporate entrepreneurship through their temporal leadership was positive and significant (β = .052, 95-percent CI = .013, .124).

Because the effect of CEOs' pacing style on their temporal leadership is nonlinear, we used Hayes and Preacher's (2010) SPSS macro ''MEDCURVE,'' which is specifically designed to estimate mediation hypotheses involving nonlinear systems of relationships and has been used in the management field (e.g., Guillaume, Van Knippenberg, and Brodbeck, 2014). This approach defines the instantaneous indirect effect, which quantifies the effect of the predictor and outcome through the mediator at low (mean minus one standard deviation), moderate (mean), and high (mean plus one standard deviation) levels of the predictor. The 95-percent bootstrap CIs for the instantaneous indirect effect of CEOs' pacing style on corporate entrepreneurship through their temporal leadership were for relatively low (.028, 95-percent CI = –.007, .092), moderate (–.004, 95-percent CI = –.023, .011), and relatively high (–.037, 95-percent CI = –.089, –.008) CEO pacing styles. It shows that the instantaneous indirect effects of CEOs' early-action style and steady-action style are not statistically different from zero, as zero is subsumed in each confidence interval. Thus the increasing pacing style scores reflecting progression from CEOs' early-action style to steady-action style do not seem to exert any discernible effect on corporate entrepreneurship through changes in CEOs' temporal leadership. At relatively high levels of CEOs' pacing style depicting deadline-action style, however, the indirect effect is negative and statistically different from zero, meaning that increasing scores for CEOs' deadline-action style would lower corporate entrepreneurship through changes in CEOs' temporal leadership. Taken together, the Sobel tests and the bootstrapping procedure both support the mediation tests proposed in H4a and H4b.

Robustness Checks

We conducted several additional analyses to confirm the robustness of the results. First, we used additional controls—environmental munificence, environmental complexity, firm age, R&D intensity, and TMT mean age. The results were consistent with those of the main analyses. Second, CEOs on average may have higher scores on temporal leadership than the general population. Such a restricted range of independent variables can create significant bias in regression (Schmidt, Oh, and Le, 2006). Thus we used correction procedures suggested by Sackett and Yang (2000) and obtained results consistent with our main results. Finally, the attraction–selection–attrition theory suggests that CEOs with certain dispositions may be attracted to some contexts but may avoid others (Schneider, 1987). We followed the procedures used by Chatterjee and Hambrick (2007) and Chin, Hambrick, and Treviño (2013) to correct for this potential endogeneity. We first regressed CEOs' temporal dispositions on industry dummies, firms' geographic locations (0 = Guangdong,

1= Shandong), and CEOs' founding status (1 = founder, 0 = non-founder). Certain industrial sectors (e.g., fast versus slow changing) may favor CEOs with specific time-urgency and pacing-style profiles. Similarly, research suggests that agglomeration effects of geographically concentrated related firms exist for different provinces because of variations in industry infrastructure, labor markets, proximity to suppliers and buyers, government policies, and economic conditions (Ellison, Glaeser, and Kerr, 2010). Because the SMEs in the sample were located in two provinces that differed with regard to these agglomeration factors, the geographic location may serve as a selection condition for CEOs with certain time-urgency and pacing-style profiles. Because founding CEOs start from scratch and shape organizational context, they are less subject to organizational context selection than non-founding CEOs, who select or avoid existing organizational contexts (Schneider, 1987). We used the regression coefficients of industry, geographic, and founding status dummies to compute each CEO's predicted time urgency and pacing style scores and included these scores as endogeneity controls in the analysis. These results were consistent with the main results.

DISCUSSION

We integrated the temporal disposition research from psychology with upper-echelon and leadership theories to examine the strategic implications of CEOs' temporal dispositions. The objectives of this study were twofold. The first was to explicate the dispositional basis of CEOs' temporal orientation by examining conceptually rigorous and methodologically valid dispositional constructs from psychology: time urgency and pacing style. The second objective was to explain how CEOs' temporal dispositions influence a key strategic behavior: corporate entrepreneurship. Building on the personality–leadership behavior–outcome framework, we proposed CEOs' temporal leadership as the intervening mechanism in the effect of CEOs' temporal dispositions on corporate entrepreneurship.

Dispositional Perspective of CEOs' Temporal Orientation

The dominant situational perspective defines CEOs' temporal orientation as malleable and situationally constructed (Das, 1987; Yadav, Prabhu, and Chandy, 2007; Nadkarni and Chen, 2014; Nadkarni, Chen, and Chen, 2016), but this study shows that CEOs' deeply ingrained and stable temporal tendencies—their time urgency and pacing style—shape their temporal leadership behaviors, which in turn influence their firms' key strategic initiatives (corporate entrepreneurship). The dispositional perspective of this study is especially notable because temporal traits are deeply ingrained, often operate subtly, ''beneath'' awareness, and are typically not a part of overt communication and exchanges in decision-making contexts (Mohammed and Harrison, 2013: 244). Yet these temporal tendencies permeate how CEOs communicate and interact with top executives and in turn influence a wide range of strategic behaviors and outcomes. The failure to identify the underlying dispositional temporal source of executives' strategic choices and behaviors has hindered our understanding of how time manifests in strategy making. By illustrating the influence of CEOs' time urgency and pacing style on a key strategic behavior (corporate

entrepreneurship), this study brings CEOs' temporal dispositions to the forefront of research on their temporal orientation.

Time urgency and pacing style are conceptually distinct temporal dispositions that have received extensive attention in the psychology literature (Blount and Janicik, 2001; Waller et al., 2001; Mohammed and Nadkarni, 2011). The distinct patterns of relationships of CEOs' time urgency and pacing styles to their temporal leadership and in turn to corporate entrepreneurship activities underscore the unique strategic implications of each and demonstrate that temporal dispositions are central to the manifestation of time in CEOs' key strategic behaviors. In line with our prediction, CEOs' time urgency related positively to temporal leadership and in turn corporate entrepreneurship. Interestingly, we did not find support for the hypothesized inverted-U-shaped effect of CEOs' pacing style on their temporal leadership. Rather, CEOs' pacing style had a non-linear relationship. The nonsignificant indirect effects of low and moderate levels of CEOs' pacing style on corporate entrepreneurship through temporal leadership suggest an absence of significant differences in the effects of CEOs' early-action and steady-action styles. But there was a strong negative effect at high levels of CEOs' pacing style, confirming the dysfunctionality of the deadline-action pacing style for temporal leadership and in turn corporate entrepreneurship.

The surprising results on CEOs' pacing style could be attributed to the firm and industrial contexts surrounding the Chinese high-tech SMEs we studied. Because SMEs typically are structurally simple and have streamlined operations, they are agile, flexible, and fast in converting new strategic ideas into behaviors (Hitt, Hoskisson, and Harrison, 1991; Chen and Hambrick, 1995). Because of this structural and operational flexibility, SMEs adopt new ideas early without any significant integration and coordination costs (Dean, Brown, and Bamford, 1998). The costs of integrating new ideas into existing structures are relatively low, and SMEs can derive their competitive advantage predominantly from consistently staying ahead of the competition through early timing; as a result, receptivity to feedback and continuous adjustment associated with the steady-action style may not provide any additional benefits beyond those of CEOs' early-action style in promoting temporal leadership and corporate entrepreneurship activities in SMEs.

Conversely, because large organizations are structurally complex, with disparate activities and well-established processes, they have established knowledge and resource bases that are interrelated in complex ways to provide advantages such as economies of scale and reliability (Elbanna and Child, 2007). Unlike SMEs, which are nimble and structurally flexible, large firms face structural inertia and high costs of integrating new ideas into existing systems and processes (Ahuja and Lampert, 2001; Katila, 2002). Launching innovations, venturing, and renewal activities require considerable changes to the existing infrastructure and development of common interfaces (Leiponen and Helfat, 2010). Pushing new ideas and initiatives early, without incorporating feedback and substantial continuous refinement to existing structures, may usurp established advantages and disrupt the existing infrastructure in large firms (Helfat, 1997). Thus the feedback and continuous refinement associated with CEOs' steady-action style are essential to successfully and smoothly integrating corporate entrepreneurship initiatives within existing established structures and systems in large companies. Accordingly, in large firms, CEOs' steady-action

style is likely to foster temporal leadership and corporate entrepreneurship activities better than the early-action style. Klarner and Raisch (2013) found that the steady pacing of strategic activities was most beneficial for large European insurance companies (those with revenues over €100 million).

The lack of support for the hypothesized inverted-U effect of CEOs' pacing style could also be explained by the high-tech industrial environments, in which opportunities are ample but transient (D'Aveni, Dagnino, and Smith, 2010). In these environments, TMTs can capture market and technological opportunities free of competition and block rivals' chances to enter that market through early-mover timing even though the first finished attempt is relatively rough, without any adjustments and refinement (Lieberman and Montgomery, 1988; Lee et al., 2000; Katila and Chen, 2008). Therefore steady-action CEOs' receptivity to feedback, focus on continuous refinement, and adjustment up to the deadline do not provide any additional benefits in capturing fleeting opportunities beyond the behavior of early-action-style CEOs who tend to pace TMT activities early and far ahead of the deadline.

The differential effects of CEOs' steady-action and early-action styles may be more apparent in the slow-changing low-tech industries, however, in which opportunities are rare and the potential for feedback-learning is high (Nadkarni and Chen, 2014). In such environments, continuous refinement and acute sensitivity to feedback, rather than early timing, are essential to successfully realizing opportunities. Available corporate entrepreneurship opportunities are relatively sparse, and failure to realize them can result in huge setbacks in furthering strategic initiatives (Srivastava and Lee, 2005; Kelley, Peters, and O'Connor, 2009). Therefore, in stable industries, the continuous adjustments and receptivity to feedback associated with CEOs' steady-action style may lead to higher levels of temporal leadership and corporate entrepreneurship activities than the purely early-timing focus of the CEOs' early-action style. Exploring the effects of CEOs' pacing styles in such stable and mature contexts may highlight increased benefits of CEOs' steady-action pacing style over early-action style in fostering temporal leadership and in turn corporate entrepreneurship.

Opening the Black Box of CEOs' Temporal Orientation

Our study sheds light on how CEOs' temporal dispositions influence strategic activities. Previous research has examined the direct relationship between CEOs' temporal orientations and strategic behaviors such as innovation and competitive aggressiveness without directly theorizing and measuring the intervening mechanisms (Das, 1987; Yadav, Prabhu, and Chandy, 2007; Nadkarni and Chen, 2014; Nadkarni, Chen, and Chen, 2016), so we have not understood why and how CEOs' temporal orientation is consequential to key strategic behaviors. We built on the personality–leadership behavior–outcome framework (Hogan and Kaiser, 2005; Avolio, 2007; DeRue et al., 2011; Johnson et al., 2012; Zaccaro, 2012) to theorize and test CEOs' temporal leadership as the core intervening mechanism by which their temporal dispositions (time urgency) influence strategic behaviors (corporate entrepreneurship). The mediation results confirmed that CEOs' temporal leadership accounts for the effects of their time urgency and pacing styles on corporate entrepreneurship.

The behavioral explanation for the relationship between CEOs' temporal orientation and strategic behaviors introduced in this study is conceptually distinct from the attention-based explanation implied in research on CEOs' temporal orientation (Yadav, Prabhu, and Chandy, 2007; Nadkarni and Chen, 2014). Drawing on the attention-based view (Ocasio, 1997), these studies rest on the assumption that CEOs' temporal orientations serve as attentional filters that shape how they selectively perceive strategic stimuli, interpret noticed cues, and evaluate strategic options. Whereas the attentional mechanism emphasizes individual CEOs' perceptions and interpretations, the behavioral leadership framework describes how CEOs synchronize the joint actions of TMTs, share key strategic information, interact, and communicate with TMT members. Strategy leadership scholars increasingly stress that such a CEO–TMT interface is central to explaining the effects of CEOs' attributes on firm-level strategies (Peterson et al., 2003; Ling et al., 2008). Hambrick (1994: 180) stated that ''the top group leader has a disproportionate, sometimes nearly dominating, influence on the group's various characteristics and outcomes.'' Thus the effects of TMTs on firm-level strategies do not occur in isolation from the CEO. Rather, TMTs' interactions, processes, and choices can be traced to CEOs' leadership styles and dispositions. By demonstrating that CEOs' temporal dispositions exert indirect influences on corporate entrepreneurship through their temporal leadership behaviors, this study introduces a new behaviorally rooted explanation of the strategic implications of CEOs' dispositions. Future studies could build on our research to explicitly test other intervening behavioral (e.g., TMT behavioral integration), cognitive (e.g., strategic decision-making speed and comprehensiveness), and motivational process variables (e.g., TMT efficacy) to enrich our understanding of the underlying mechanisms driving the strategic implications of CEOs' temporal orientations.

This study also extends the personality–leadership behavior–outcome framework by bringing the ''temporal lens'' to the forefront. As the first to theorize and test the mediating effect of temporal leadership in strategy settings, this study goes beyond previous empirical work that has focused on transformational and servant leadership as the main mechanisms of transmitting the effects of CEOs' traits to strategic behaviors and outcomes (e.g., Peterson, Galvin, and Lange, 2012; Colbert, Barrick, and Bradley, 2014). This is especially notable because leadership scholars have lamented that extant research is ''limited by the simple fact that the majority of studies are too narrowly focused on one form of leadership'' and have stressed that ''leadership research may benefit from more theoretical integration'' (Peterson, Galvin, and Lange, 2012: 585; Avolio, 2007; DeRue et al., 2011). Originating in the time, interaction, and performance (TIP) theory, temporal leadership has strong theoretical foundations and has received growing academic attention (Mohammed and Nadkarni, 2011; Maruping et al., 2015). We integrated the temporal research in psychology, the TIP theory, and the personality–leadership behavior–outcome framework to propose that the effects of CEOs' temporal dispositions on strategic behaviors are channeled through their temporal leadership. Our findings suggest that temporal leadership should figure more prominently in the ongoing conversation surrounding CEOs' leadership and strategic outcomes. Future research could build on our work by exploring the mediating effects of temporal leadership in the relationship between CEOs' temporal dispositions and other

key strategic behaviors, such as mergers and acquisitions, joint ventures, and diversification.

Limitations and Directions for Future Research

This study has several limitations, which provide fruitful avenues for future research. First, the use of the Chinese high-tech SMEs sample limits the generalizability of the findings. Future researchers may want to replicate this study in another type of firm (e.g., large and established firms) or industry (e.g., stable industries). Second, although time urgency and pacing style capture important individual differences, researchers could examine the effects on corporate entrepreneurship activities of other temporal dispositions, such as temporal depth—how far people look into the future or the past (Bluedorn, 2002)—because adopting a long-term time horizon gives executives insights necessary for innovation and creativity, promoting entrepreneurial actions (Bluedorn and Martin, 2008). Finally, we build our research model on the basis of the trait theory of leadership, which contends that people inherit certain qualities and traits that predispose them toward specific types of leadership behaviors (Judge et al., 2002; Hogan and Kaiser, 2005). Although traits may explain certain corresponding leadership behaviors, traits alone may not completely explain the effectiveness of these behaviors (Kirkpatrick and Locke, 1991; Chen et al., 2000). Although leaders with the requisite traits have great potential for specific leadership behaviors, they need certain skills and must take certain actions to actualize this potential and be successful (Yukl, 2006; Zaccaro, 2007). Future studies could build on the results of this study by going beyond temporal traits and considering additional factors such as skills (e.g., problem-solving, decision-making, planning, and time-management skills) in predicting the effectiveness of temporal leadership. We believe that the dispositional perspective can be an important intellectual tool for creating new research opportunities to address a variety of temporal issues in the strategy area.

Acknowledgments

We thank Associate Editor John Wagner and three anonymous reviewers for their valuable feedback on earlier versions of the paper. We also gratefully acknowledge helpful suggestions from Ming-Jer Chen, Tianxu Chen, and Zeki Simsek.

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Authors' Biographies

Jianhong Chen is an assistant professor in the Department of Management at Peter T. Paul College of Business and Economics at the University of New Hampshire, Durham, NH 03824-9987 (e-mail: jianhong.chen@unh.edu). Her research interests include CEOs' temporal orientations, the personality composition of top management teams, competitive dynamics, and corporate entrepreneurship. She received her Ph.D. in strategic management at Drexel University.

Sucheta Nadkarni is the Sinyi Chaired Professor of Chinese Management in the Cambridge Judge Business School at the University of Cambridge, Trumpington Street, Cambridge CB21AG, United Kingdom (e-mail: s.nadkarni@jbs.cam.ac.uk). Her research interests include executive personality and temporal orientation, strategic cognition, and competitive dynamics. She received her Ph.D. in strategic management at the University of Kansas.