It's about time! CEO temporal dispositions, CEO temporal leadership and corporate entrepreneurship

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We would like to thank John Wagner (associate editor) 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.

Abstract

With the intention of advancing research on executives' subjective view of time, we examine how two conceptually distinct CEO temporal dispositions--*time urgency* (feeling of being chronically hurried) and *pacing style* (pattern of effort distribution over time in working toward deadlines) -- differentially influence a key strategic behavior: corporate entrepreneurship (CE). We propose CEO *temporal leadership* as a mediator in the relationships between CEO temporal dispositions and CE. Using a sample of 129 small and medium sized Chinese firms, we found that CEO time urgency was positively related to CEO temporal leadership, which in turn was positively related to CE. Although the deadline-action style inhibited temporal leadership, CEO steady-action style does not confer any advantage over the early-action style in promoting temporal leadership. Moreover, CEO temporal leadership mediated the CEO dispositions-CE relationships. This study extends previous research by explicating the dispositional basis of executives' subjective view of time in shaping CE activities of firms and by demonstrating *how* CEO temporal dispositions shape firm behaviors.

Keywords: CEO dispositions, temporal leadership, corporate entrepreneurship

Accelerated changes in competition, technological advances and customer preferences have made consideration of time imperative for firms and have brought the issue of time to the forefront of research in strategic management (Bridoux, Smith, and Grimm, 2013; D'Aveni, Dagnino and Smith, 2010). Central to furthering the temporal agenda in strategy is the emerging literature on executives' subjective view of time, which suggests that an executive'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; Crossan et al., 2005). The "temporal dimension deserves comprehensive study because it constitutes a fundamental dimension of strategy making… decisions are made by individual decision makers, whose psychological view of time cannot be ignored" (Das, 2004: 58).

Despite its importance, research on the subjective perspective of time in strategy is still nascent and can benefit from the long tradition of temporal orientation in psychology. Research on temporal orientation in psychology, which dates back to Lewin's (1942) psychological view of time, has followed two distinct trajectories – situational and dispositional (Holman and Zimbardo, 2009; Wallace and Rabin, 1960). The situational perspective contends that temporal orientations are malleable and evolve 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., September 11 attacks) they encounter, and adapt their temporal orientations to suit their task and work environments (De Volder and Lens, 1982; Holman and Silver, 1998, 2005; Holman and Zimbardo, 2009; Shipp, Edwards, and Lambert, 2009; Trope and Liberman, 2003). In contrast, the dispositional perspective contends that temporal orientation constitutes innate and stable personality traits that, like fingerprints, are unique to each individual (Goldrich, 1967; Zimbardo and Boyd, 1999). Studies in this steam have made significant progress in identifying and validating specific temporal dispositions (e.g., time urgency and pacing style) that shape a wide range of individual behaviors and outcomes including goal-setting, decision-making, and learning behaviors (Bluedorn, 2002; Gevers, Rutte,

Comment [JC1]: **AE: Comment 1**: *Throughout the manuscript you refer to CEO temporal orientations as traits and dispositions, both of which connote innateness and permanence, but literatures on the psychology and social psychology of time often suggest that such orientations are learned and subject to change over time. I would like to see you go back to the relevant literatures and further explore this point, then give it due consideration in the manuscript's introduction and modify the remainder of the paper as necessary to account for this important theoretical consideration.*

and Van Eerde, 2006; Landy et al., 1991; Strathman et al., 1994).

Strategy research has predominantly adopted the situational perspective to examine a key aspect of temporal orientation -- temporal attention, which "is dependent more on the characteristics of situation rather than characteristics of the individual" (Das, 1987; Nadkarni and Chen, 2014; Nadkarni, Chen and Chen, 2015; Ocasio, 1997: 190; Yadav, Prabhu and Chandy, 2007). The paucity of research addressing the dispositional perspective in the strategy context is notable because the upper echelons theory has long advocated that the organizational goals, structures, processes and culture within which firm strategies are initiated and executed reflect the personality characteristics of its chief leader and the most power actor in the firm—the CEO, who enjoys disproportionate, at times almost dominating, influence on firm activities (Finkelstein, Hambrick, and Cannella, 2009; Hiller and Hambrick, 2005). Hambrick, Finkelstein, and Mooney (2005: 503) stressed that "we can imagine no more fertile terrain in the organizational sciences today than the study of executive personality" because CEOs are "finite flawed human beings who reside in jobs where the stakes associated with their humanness – both positive and negative – are enormous."

Building on the dispositional perspective of time in psychology, we examine the strategic implications of two temporal dispositions: *time urgency* (feeling of being chronically hurried) (Landy et al., 1991) and *pacing style* (pattern of effort distribution over time in working toward deadlines) (Gevers, Rutte, and Van Eerde, 2006). They are conceptually distinct time-related traits; each describes a unique aspect of how an individual thinks and feels about time (Mohammed and Nadkarni, 2011; Waller et al., 2001). 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 goal setting and prioritizing, planning behaviors and achievement striving (Claessens, 2004; Conte, Landy, and Mathieu, 1995; Gevers, Mohammed, and Baytalskaya, 2015; Gevers, Rutte, & Van Eerde, 2006; Landy et al., 1991). CEO time urgency and pacing style is especially pertinent in the context of strategy because scholars have long recognized that

speed (Eisenhardt, 1989; Katila and Chen, 2008; Rindova, Ferrier, and Wiltbank, 2010) and pacing (Eisenhardt and Brown, 1998; Gersick, 1994; Klarner and Raisch, 2013) are central to gaining and maintaining early-mover advantages through the sensing and seizing of yet-to-occur technological and market opportunities ahead of competitors. Thus, time urgency and pacing style allow explication of the potential micro-dispositional basis of these key strategic activities.

Accordingly, we pose the following research question: *How* do CEO temporal dispositions influence key strategic activities? Because extant research has mainly examined the direct effects of CEO temporal orientation, we know little about the intervening mechanisms through which CEO temporal orientation affects strategic behaviors (Das, 1987; Nadkarni and Chen, 2014; Nadkarni, Chen and Chen, 2015; Yadav, Prabhu and Chandy, 2007). Strategy scholars have lamented how 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 CEO disposition – firm strategy relationship (Hambrick, 2007). To overcome this blackbox and lend theoretical precision about explanations of *how* CEO temporal dispositions shape firm strategies, 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 firm strategies (outcomes) (Avolio, 2007; DeRue et al., 2011; Hogan and Kaiser, 2005; Johnson et al., 2012; Zaccaro, 2012). Thus, CEO dispositions influence how CEOs lead, motivate and interact with top executives, who in turn shape strategic formulation and implementation (Colbert, Barrick, and Bradley, 2014; Peterson, Galvin and Lange, 2012). We highlight *CEO temporal leadership* (behaviors pertaining to the management of the temporal aspects of top management team activities) as the central intervening mechanism in explaining how CEO time urgency and pacing style shape a key strategic activity of a firm – corporate entrepreneurship (CE) (Mohammed and Nadkarni, 2011).

CE, which is defined as the sum of a firm's innovation, corporate venturing, and strategic

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

This study advances the subjective temporal agenda in strategy in two ways. First, it explicates the *dispositional* basis of CEO temporal orientation in shaping firm behaviors. Distinct from the prevalent situational perspective, this study introduces an alternative dispositional conceptualization of CEO temporal orientation that is thoroughly grounded in the rich tradition of temporal traits in psychology. By demonstrating the nuances of how key strategic activities of the firm (CE) can stem from distinct and innate temporal dispositions (time urgency and pacing style) that CEOs bring to varied strategic situations, our study explicates the micro-dispositional sources of time in strategy that are distinct from the situationally constructed and malleable subjective temporal sources of CEOs examined in prior studies. As Hambrick (2007: 334) advocates, "…if we want to understand why organizations do the things they do, or why they perform the way they do, we must consider the *dispositions* of their most powerful

Comment [JC2]: **AE: Comment 2**: *I believe that the research question motivating your study currently appears on page 3 of the manuscript ("On the basis of this personality-leadership…). I would like to see this statement better embedded in the existing research literature to clarify and substantiate the theoretical contribution to be made by the manuscript. The current manuscript summarizes empirical expectations but does not do a good enough job in communicating theoretical contribution.*

actors." The promising evidence on the strategic implications of CEO temporal dispositions supports this contention.

Second, it contributes to temporal research in strategy by addressing the unsolved issue of *how* CEO temporal dispositions shapes a key strategic activity—CE. Prior research has examined the strategic implications of CEO temporal orientation without explicitly theorizing or testing the underlying mechanisms driving these relationships. We build on the personality-leadership behavior-outcome framework to specify *CEO temporal leadership* as a pivotal intervening mechanism in explaining the relationship between CEO temporal dispositions and strategic behaviors (CE). In doing so, this study opens the proverbial "black box" and lends theoretical clarity and precision on how CEO temporal orientations influence strategic behaviors and outcomes. As Carpenter (2011: 4) contends, research that "goes into the hard-to-access black box (can) help us better understand executive personality and their consequences."

THEORY DEVELOPMENT

CEO dispositions and strategic outcome: A process model

Comment [JC3]: ***AE: comment 4:*** *The proximal-distal distinction, first raised on page 6, does not work and should be deleted throughout the manuscript (for example, on page 19). The simpler, more direct explanation for the point you're trying to make is that the CEO's orientation directly affects planning and decision making within the TMT during strategic formulation and thus influences behaviors lower in the organization as strategic plans and decisions are implemented.*

The framework of personality-leadership behavior-outcome is increasingly considered a major theoretical perspective to explain *how* leader personality influences important outcomes (Avolio, 2007; DeRue et al., 2011; Hogan and Kaiser, 2005). This framework is premised on two prominent perspectives in the personality and leadership literatures. First, the trait theory of leadership contends that 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 (Judge et al., 2002; Lord, De Vader, and Alliger, 1986). Resick et al. (2009) and Peterson, Galvin and Lange (2012) showed that traits such as core self-evaluation and narcissism shape the contingent reward, transformational and servant leadership behaviors of CEOs.

Second, building on the behavioral paradigm of leadership (Judge and Piccolo, 2004; Judge, Piccolo, and Ilies, 2004), strategic leadership research has argued that CEO leadership

behaviors influence strategic activities by shaping how CEOs define and communicate strategic vision and goals, and how they mobilize and coordinate the activities of the TMT (Ling et al., 2008a; Peterson et al., 2003; Resick et al., 2009; Waldman and Yammarino, 1999). Because the TMT has been characterized as the dominant coalition and chief decision-making body charged with the primary responsibility to craft the strategies of the firm (Carpenter, Geletkanycz, and Sanders, 2004; Hambrick and Mason, 1984; Hambrick, 2007), how CEOs coordinate, communicate and influence activities within the TMT determines strategy formulation and implementation across the organization. CEO transformational, transactional and visionary leadership have been shown to shape key strategic outcomes such as CE and innovation (Ling et al., 2008a; Elenkov, Judge, and Wright, 2005).

By integrating the tenets of the trait theory and the behavioral paradigm, the personality-leadership behavior-outcome framework contends that the influence of leader personality on outcomes is transmitted through leadership behaviors (Avolio, 2007; DeRue et al., 2011; Hogan and Kaiser, 2005; Johnson et al., 2012; Zaccaro, 2012). Although sparse, empirical studies have shown that CEO leadership behaviors (e.g., transformational leadership and servant leadership) mediate the effects of CEO traits (e.g., emotional stability, consciousness, narcissism) on firm performance (Colbert, Barrick, and Bradley, 2014; Peterson, Galvin, and Lange, 2012). Drawing on this framework, we develop a process model to propose how *CEO (temporal) dispositions* influence key strategic activities (*CE*) through *CEO (temporal) leadership* behaviors. In what follows, we explain each component of this process model.

CEO 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 (Conte, Mathieu, and Landy, 1998). Time-urgent persons 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 in timely completion of team

tasks (Conte, Landy, and Mathieu, 1995; Landy et al., 1991). They regularly check work progress, increase others' awareness of the remaining time, and motivate others to accomplish commitments within the allotted time (Rastegar and Landy, 1993; Waller, Giambatista, and Zellmer-Bruhn, 1999). Because they strive for timely completion of all scheduled activities, time-urgent persons are efficient in the use of time, work very fast and serve as clock-setters to group activities. In contrast, non-time-urgent individuals, who feel less hurried and constrained by time resources, 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; Mohammed and Nadkarni, 2011; Waller et al., 2001). Test-retest results show that time urgency constitute a stable attribute of an individual (Landy et al., 1991).

Pacing style, a term first introduced by Blount and Janicik (2002), 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; Mohammed and Nadkarni, 2011). 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 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, in which the pacing is very close to the deadline and individuals start very late, intensifying their effect 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 moderating 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 sub-goals and monitor others' work progress over time (Mohammed and Nadkarni, 2011). The test-retest

reliability demonstrates that pacing style is a relatively stable behavioral tendency (Gevers, Rutte, and Van Eerde, 2006; Gevers, Mohammed, and Baytalskaya, 2015). Pacing style is related to varied behaviors and outcomes, such as goal setting and prioritizing, planning, preference for order, and preference for unpredictability and job performance (Claessens, 2004; Gevers, Mohammed, and Baytalskaya, 2015).

Time urgency and pacing style are conceptually distinct time-related constructs. Whereas time urgency captures *when* work is due, pacing style reflects *how* individuals allocate temporal resources 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 this chronic hurriedness about deadlines that time-urgent individuals do. Early-action people perform most activities in 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; Mohammed and Harrison, 2013). 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. Using eight samples from two countries, Gevers, Mohammed, and Baytalskaya (2015) demonstrated that pacing style and time urgency capture distinct time-related characteristics.

CEO temporal leadership

Temporal leadership has its origins in the time, interaction and performance (TIP) theory, which highlights the core activities (scheduling, temporal coordination, allocation of temporal resources) defining the temporal patterning of internal group interaction (McGrath and Rochford, 1983; McGrath and Kelly, 1986). These core temporal activities allow groups to adjust effectively to external temporal parameters and to enhance timeliness and performance (McGrath

and Kelly, 1986). Although the TIP theory does not specify who is charged with carrying out these temporal activities, leadership scholars have advocated 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 challenges faced by leaders, such as managing multiple time frames and deciding the speed and timing of team actions. Halbesleben et al. (2003) stressed that leadership behaviors should incorporate temporal activities such as managing time frames, adjusting to different tempos, recognizing time-related differences, and synchronizing working cycles of members. Mohammed and Nadkarni (2011) conceptualized, operationalized and validated the construct of temporal leadership in teams.

Temporal leadership, a team-level concept, is defined as the set of a leader's behaviors pertaining to the management of the temporal aspects of the team's task at hand. It includes three interrelated team-level activities--*scheduling*, *temporal synchronization* and *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 completion of a set of sub-goals 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 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 continually adjust this temporal organizing framework to accommodate gaps, delays and deviations (Maruping et al., 2014). *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 team task goals, efficiently

allocate time to different sub-tasks, and create built-in blocks of time for unexpected contingencies (Maruping et al., 2014). These three activities are closely intertwined and together compose the temporal structure for team-level activities (Halbesleben et al., 2003; McGrath and Rotchford, 1983). For example, creating built-in times for contingencies and sequencing team members' activities are crucial for setting detailed schedules and interim milestones. Similarly, temporally 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., 2014).

Temporal leadership behaviors have been shown to enhance team outcomes (Mohammed and Nadkarni, 2011; Maruping et al., 2014); they help team leaders better communicate complex time frames, facilitate within-group temporal coordination, and create coherent internal temporal structures so that the team can better adjust 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). Mohammed and Nadkarni (2011) demonstrated the pivotal role of temporal leadership in maximizing team performance. Maruping et al. (2014) found that temporal leadership determined how effectively teams respond to time pressure.

Corporate entrepreneurship (CE)

CE (also referred to as intrapreneurship) is a broad multi-dimensional concept that lies at the intersection of entrepreneurship and strategic management (Dess et al., 2003; Hitt et al., 2001). It is defined as a set of firm activities encompassing three dimensions: *innovation*, *corporate venturing* and *strategic renewal* (Zahra, 1996)[1]. *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 (Narayanan, Yang,

[1] Distinct from entrepreneurial orientation that reflects a firm's dispositional style of strategy making or its commitment to entrepreneurial practices, CE captures concrete entrepreneurial behaviors and activities of a firm (Ling et al., 2008a; Simsek, Veiga, and Lubatkin, 2007; Zahra, 1996).

and Zahra, 2009; 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 Heavy, 2011). Thus, CE is a coherent and unitary construct (Ling et al., 2008a). Because innovation, corporate venturing and strategic renewal have all been considered major strategic initiatives, CE has strong prescriptive value and is characterized as an effective means of achieving superior financial performance (Zahra and Covin, 1995). Studies have found that CE relates positively to varied firm performance measures (Simsek and Heavy, 2011; Yiu and Lau, 2008; Zahra, 1993; 1995).

The extant research has examined two broad sets of antecedents—environmental and organizational. Environmental facets such as dynamism, complexity, and munificence have been shown to influence CE (Simsek Veiga, and Lubatkin, 2007; Zahra, 1993), as have organizational factors such as technological and management capabilities (Yiu, Lau, and Bruton, 2007), corporate governance (Zahra, 1996), resources (Hornsby, et al., 2009; Kelly, Peters, and O'Conner, 2009; Simsek, Veiga, and Lubatkin, 2007; Yiu and Lau, 2008), 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 CE activities of the firm. CEOs occupy unique positions at the apex of their organizations and control core and complementary assets essential to CE activities (Dess et al., 2003; Phan et al., 2009; Zahra, Filatotchev, and Wright, 2009). Therefore, they shoulder significant responsibility for promoting CE (Ireland, Covin, and Kuratko, 2009). However, studies examining the role of CEOs in shaping CE activities are sparse. An exception is Ling et al. (2008a), who found that CEO transformational leadership influenced TMT characteristics, which in turn impacted CE.

In this study, we focus on the relationship between CEO temporal disposition, temporal

leadership and CE. We chose CE as the key intermediate outcome for several reasons. First, the entrepreneurship literature increasingly regards CE behaviors as prerequisites for improving a firm's financial performance (Zahra, 1996; Ling et al., 2008). Researchers have advocated the use of CE 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 also contend that the performance of CEOs can best be represented by intermediate outcomes (such as CE), because executives typically exert influence on the ultimate firm performance through behaviors such as adaptation to environmental changes and innovation (Waldman and Yammarino, 1999). On the basis of this premise, several studies have used CE or its components (innovation) as a dependent variable in examining the strategic effects of CEO traits and leadership styles (Elenkov, Judge, and Wright, 2005; Ling et al., 2008a; Simsek, Heavey, and Veiga, 2010).

Finally, CE is particularly susceptible to CEO temporal dispositions, because CE 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 temporal window in which to recognize and capture fleeting technological and market opportunities. A delay of opportunity recognition may foreclose a firm's chance of 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 (Burgers et al., 2009; Floyd and Lane, 2000; Katila and Ahuja, 2002). Under tight time pressure, these temporal demands may conflict with each other, creating significant temporal challenges for top executives. Acute focus on and sensitivity to time, temporal sequencing of key activities, and determination of time-sensitive priorities are all pivotal to successful recognition and execution of CE activities (Bird and West, 1998).

HYPOTHESES

CEO Time urgency

We expect that CEO time urgency will foster the core temporal leadership activities of *scheduling, synchronization* and *efficient allocation of temporal resources*. Because time-urgent people are acutely aware of time (Landy et al., 1991), time-urgent leaders chalk out a clear timeline for task completion, create internal deadlines, and regularly check the work progress of the team and of each member against set deadlines in order to ensure timely completion of group activities (Mohammed and Harrison, 2013; Rastegary and Landy, 1993). Conte, Landy, and Mathieu (1995) found that time urgency related positively to *scheduling.* This research suggests that time urgency of CEOs 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 (Harrison, 1991; Schreyogg and Steinmann, 1987).

Second, by bringing the topic of time to the forefront of team activities, time-urgent individuals serve as clock setters for group activities and motivate team members to move forward in their task completion (Waller et al., 2001). Time-urgent leaders expend effort in temporally sequencing various sub-activities in the correct order and in accurately mapping the times when each task activity is expected to be accomplished (Mohammed and Harrison, 2013). Such clarity in the temporal sequencing of group activities will foster *temporal synchronization*, which is important in strategic decision-making. Strategy research suggests that one of the main challenges facing CEOs 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 internal pace within the TMT so that temporal conflicts are dramatically reduced, time lags are shortened, and environmental changes are detected earlier (Ancona and Chong, 1996; Crossan et al., 2005; Gersick, 1994). Time-urgent CEOs will 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 and treat it as such, time-urgent leaders prioritize group tasks (Mohammed and Harrison, 2013; Rastegary and Landy, 1993). 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, Landy, and Mathieu, 1995; Conte, Mathieu, and Landy, 1998). By such means, time-urgent leaders faced with unforeseen contingencies achieve *efficient allocation of temporal resources* in team activities. Such efficient time allocation is especially important in the strategic context, since 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 a decision on key urgent strategic issues, and create build-in time for unexpected environmental changes, all of which will result in strong temporal leadership.

H1: CEO time urgency will be positively related to CEO temporal leadership.

CEO pacing style

We expect that CEO pacing style will have an inverted U-relationship with temporal leadership such that steady-action CEOs (moderate score on pacing style) will better promote temporal leadership activities (*scheduling, synchronization and efficient allocation of temporal resources*) than early-action (low score on pacing style) and deadline-action CEOs (high score on pacing style).

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 the task early so that they can relax close to the deadline. Early-action leaders are less receptive to feedback and are

Comment [JC4]: **AE: Comment 7**: *I would like to see you sharpen the argument leading to H2. This was a major concern of Reviewer #3's and I still see some need for further work in simplifying, clarifying, tying to relevant literatures. Especially since the test of this model fails, you need to do a very good job at this point to be able to discuss what you've learned from failure in the manuscript's discussion section*.

Sucheta's comments: 1) add more strategy linking literature: clarifying and tying to relevant literature 2) use more general arguments to discuss the downside of early pacing style, rather than the situational arguments: clarifying and 3) change the structure to maintain consistency with the previous hypothesis: simplifying

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 that advanced planning without receptivity to feedback and regular re-evaluation of strategic situations (prompted by CEOs with early-action style) can result in strategic activities being forced along "fixed time scales" that prematurely end strategic activities and preclude further refining and improvement essential in smooth and timely implementation (Brown and Eisenhardt, 1997; Grant, 2003). In contrast, receptivity to feedback and proactivity in re-evaluating goals and circumstances at regular intervals (typical of steady-action CEOs), are central to fostering responsiveness and adaptability in strategic decision-making within the TMT (Barringer and Bluedorn, 1999; Gersick, 1994). 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 towards task completion only when the deadline is close (Gevers, Mohammed, and Baytalskaya, 2015). As a result, they tend to underestimate time requirements needed 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 for CEOs to plan ahead and leave enough time for TMTs to comprehensively screen alternatives and select best way of solutions (Fredrickson, 1984; 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 activities of team members so that they complete the work well ahead of time. This preference to complete the team task well ahead of time makes early-action leaders prone to considerably reducing the team coordination and sequencing efforts close to the deadline. The laxity of early-action leaders

in continuously assessing gaps between planned and actual work progress, misalignment of team members' activities and unforeseen delays undermines their efficiency in temporal sequencing close to the deadline (Mohammed and Nadkarni, 2011). Contrary to early-action leaders, steady-action leaders strive to maintain consistency and clarity in temporal sequencing structures of work activities from the beginning right until the deadline (Gevers, Rutte, and Van Eerde, 2006). Strategy scholars suggest that such uniform and clear sequencing of team activities, rather than 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 them to discover the optimal temporal synchronization of various processes (Brown and Eisenhardt, 1997; Gersick, 1994; Okhuysen and Waller, 2002).

In contrast, deadline-action style inhibits temporal synchronization. The intense time pressure triggered by the deadline-action style imposes strong time pressure on team members to meet the stringent time requirement (Mohammed and Harrison, 2013). This time-crunch will leave little room for the CEOs 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 CEO temporal leadership (Ancona et al., 2001).

Finally, steady-action leaders will be the most efficient in *allocating temporal resources* than early-action and dead-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, regularly reviewing and reprioritizing team 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 close to 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 instill flexibility (Vermeulen and Barkeman, 2002). Recently, Klarner and Raisch (2013) demonstrated that a steady-paced, regular rhythm of strategic activities fosters better environmental adaptation.

Contrary to the steady-action leaders, deadline-action leaders are likely to cut things too close and offer no temporal safeguard for completing the task as per schedule (Gevers et al., 2006). Strategy scholars have emphasized that CEOs need to prioritize goals for the TMT members ahead of time and create build-in blocks of time for TMTs to deal with unforeseen contingencies and adversities (Ancona et al., 2001; Crossan et al., 2005). However, deadline-action CEOs cannot provide the TMTs with enough leeway, resulting in inefficient *allocation of resources*.

Taken together, we expect that CEO steady-action style will maximize CEO temporal leadership more than early-action and deadline-action style.

H2: CEO pacing style will have an inverted-U relationship to CEO temporal leadership.

CEO temporal leadership and CE

Comment [JC5]: AE: Comment 4: *The proximal-distal distinction, first raised on page 6, does not work and should be deleted throughout the manuscript (for example, on page 19). The simpler, more direct explanation for the point you're trying to make is that the CEO's orientation directly affects planning and decision making within the TMT during strategic formulation and thus influences behaviors lower in the organization as strategic plans and decisions are implemented.*

We expect that CEO temporal leadership will be positively related to CE. First, research suggests that CE involves multiple complex sub-activities with different, sometimes competing timelines (Dess et al., 2003; Morris, Kuratko and Colvin, 2011). Thus, it is important for CEO to help the TMT set clear goals and specific time frames for CE activities so that TMT members in turn can empower other citizens in the organization whom they oversee to design course of actions and execute strategies in a timely manner (Harvey and Griffith, 2007; Ireland and Hitt, 1999). Laying out clear *schedules* and creating long-term strategic goals and sets of interim milestones and sub-goals can allow the TMT to provide a clear road map for organizational members in charge of individual CE activities as well as to balance different time requirements across different CE activities being simultaneously initiated across the organization. Thus, clear

and adaptive scheduling of strategic activities within the TMT can ensure a coherent and integrated plan of action in formulating and implementing CE activities across the organization. Moreover, the establishment of temporal milestones can help TMTs track and monitor the progress of each strategic activity and facilitate timely execution of CE initiatives. Lerner, Zahra, and Kohavi (2007) have shown that the mapping of clear temporal trajectories of future strategic goals and plans-of-actions are central to undertaking CE activities.

Second, CE activities are highly uncertain and time-pressured (Shepherd, Williams, and Patzelt, 2015). To capture fleeting CE opportunities, TMTs need to temporally synchronize CE activities internally within the organization as well as externally with the environment 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 temporally sequence the timing of varied interconnected strategic activities undertaken by different work units so as to ensure smooth implementation of CE. Externally, top executives need to synchronize innovative activities with customer, competitor and technological demands in the targeted market segments (Halbesleben et al., 2003; Harvey and Griffith, 2007). By temporally synchronizing the internal organizational pace with external environmental changes, CEOs, together with other TMT members, can provide a coherent temporal organizing framework for the firm as a whole, better determine the transitioning point, receive and incorporate updated feedback, and adapt quickly to environmental changes, all of which are central to enhancing CE (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, it takes considerable time and commitment of a firm's top executives to formulate and implement them (Dess et al., 2003; Hornsby et al., 2009; Zahra, 1995). *Efficient allocation of temporal resources* prioritizes innovative ideas and new strategic initiatives above other demands to ensure that TMTs devote significant managerial

time and effort to overseeing CE initiatives. To efficiently allocate temporal resources, TMTs need to sift through the fog of uncertainty and ambiguity and identify the emergent errors, pauses and gaps in pursuing CE activities (Shimizu, 2012). As Garvin and Levesque (2006: 107) state, "failures are common in new-business creation, and corporations need to be clear on *when* they will decide to pull the plug… but most critical is senior managers' willingness to make timely go or no-go decisions." The creation of built-in extra time for unexpected contingencies and errors gives the TMT enough time to make adjustments on strategic directions based on the feedback and promotes smooth implementation of CE activities (Halbesleben et al., 2003).

H3: CEO temporal leadership will be positively related to CE.

The mediating role of CEO temporal leadership

The personality-leadership behavior-outcome framework contends that the primary way in which leader dispositions affect outcomes is through leadership behaviors (Avolio, 2007; DeRue et al., 2011; Hogan and Kaiser, 2005; Johnson et al., 2012; Zaccaro, 2012). In this sense, dispositional attributes of leaders serve as indirect predictors of outcomes, whereas leadership behaviors constitute direct predictors of outcomes (Van Iddekinge, Ferris and Heffner, 2009). Supporting this framework, studies have shown that CEO leadership behaviors mediate the relationship between CEO dispositions (e.g., big five personality, narcissism) and strategic outcomes (Colbert, Barrick, and Bradley, 2014; Peterson, Galvin and Lange, 2012). Accordingly, we propose that CEO temporal leadership behaviors will mediate the relationship of CEO temporal dispositions to CE activities.

H4a: CEO temporal leadership will mediate the relationship between CEO time urgency and CE.

H4b: CEO temporal leadership will mediate the relationship between CEO pacing style and CE.

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 national GDP, entrepreneurship is an integral part of China's economy (Bloomberg Businessweek, 2010). Moreover, high-tech industries are especially suitable contexts for examining CE activities (Kelley, Peters, and O'Connor, 2009; Srivastava and Lee, 2005). 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). CE offers a useful path to gaining competitive advantage and superior firm performance in such environments (Phan et al., 2009; Shimizu, 2012). Finally, because SMEs have few intervening levels of management and external influences (e.g., boards, capital markets) (Ling et al., 2008a), CEOs play a more pivotal role in formulating and implementing strategies in SMEs than in large public firms (Herrmann and Nadkarni, 2014; 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 Statistic yearbook, 2012*) and which host the largest clusters of SMEs spanning a wide range of high-tech industries (*China's SME's yearbook, 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 instruments from English into Chinese and another two raters translated it back to English (Boyd et al., 2013). To further improve face validity, we pilot-tested the survey on 10 Chinese senior managers (not included in the main sample) and changed the survey as necessary.

We obtained a list of all firms with fewer than 500 employees (e.g., Arend, 2006) located

in the three high-tech industrial parks. One of the authors set up face-to-face meetings with the CEOs of the SMEs in the three 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 the top management team (TMT) members and send them a memo to encourage their participation. Prior studies also suggest that local assistants from industrial park administrative offices in China know the firm management within their parks in person and that such personal relationships could increase the response rate (Cao, Simsek, and Jansen, 2015; Qian, Cao, and Takeuchi, 2013). Therefore, we hired three administrative assistants, one from each of the three industrial parks. We hand-delivered the questionnaires to these administrative assistants, who distributed and collected responses from the CEO and the TMT members. To ensure privacy and confidentiality of responses, we instructed the CEO 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 non-respondents via phone calls or in-person visits.

Of the 348 SMEs, 158 CEOs agreed to participate in the study. We collected data at three different time periods 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 CE activities. Such a multiple key informants approach and the temporal separation allowed us to avoid common method bias and strengthen the inference of directionality in the CEO temporal disposition-CE relationship (Podsakoff et al., 2003). Moreover, our use of the six-month time lag is consistent

with previous studies, which have argued that six months is a reasonable time period for CEO traits to be reflected in firms' strategic behaviors and outcomes (e.g., Nadkarni and Herrmann, 2010; Peterson et al., 2012).

Consistent with prior studies (Colbert et al., 2008), we retained firms with a CEO and at least three TMT member responses. 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%) reported in prior survey studies of TMTs (Hambrick, Geletkanycz and Fredrickson, 1993). Consistent with upper echelons studies, an average of 3.58 TMT members (56% of total TMTs) from each firm participated in the study (Ensley, Pearson, and Amason, 2002; Smith, Collins, and Clark, 2005). 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

CEO time urgency. We assessed time urgency by use of 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 include "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) ($\alpha = 0.72$).

CEO pacing style. Consistent with previous research (Gevers, Rutte, and Van Eerde, 2006; Mohammed and Nadkarni, 2011), we measured pacing styles by use of five graphs, each with a written description below it. Examples of descriptions below graphs include "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*); "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 non-BARS (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.

CEO temporal leadership. We adapted Mohammed and Nadkarni (2011)'s 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"; therefore, 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. Such modification of established scales to improve their face validity is common in studies of executives (Carpenter and Westphal, 2001; 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 0.78 at the individual level and 0.80 at the team level. Checks for aggregation of the CEO temporal leadership scale revealed acceptable values (ICC(1) = 0.56; ICC(2) = 0.83; mean $r_{wg\,(j)}$ = 0.96; F = 5.74, $p < 0.001$). We averaged the responses of TMT members to derive the CEO temporal leadership scores.

Corporate entrepreneurship. We measured CE by an established 16-item scale, which broadly measures a firm's actual (rather than preferred) entrepreneurial activities on innovation (5 items), corporate venturing (5 items) and strategic renewal (6 items) (Ling et al., 2008a;

Simsek and Heavey, 2011; Zahra, 1996). 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 changed its competitive strategy for each business unit". At least three TMT members (including CEOs) filled out the CE scale (individual-level α: 0.90, team-level α: 0.92).

Given that the scale was designed to reflect three manifestations (innovation, business venturing and strategic renewal) of CE, we expected to confirm a three-factor structure underlying the CE construct. Therefore, we hypothesized the full CE measurement model, which represents CE as a second-order factor indicated by three first-order factors (innovation, corporate venturing and strategic renewal). We analyzed the full CE measurement model by using both individual-level data and team-level data (individual-level data: $\chi 2 = 433.87$, 101 df; CFI: 0.95; NFI: 0.94; IFI: 0.95; RMSEA: 0.09; team-level data: $\chi 2 = 178.43$, 101 df; CFI: 0.97; NFI: 0.93; IFI: 0.97; RMSEA: 0.08). These results confirm a three-dimensional structure underlying the CE construct.

Checks for within-group agreement of the CE scales revealed acceptable values (ICC(1) = 0.54; ICC(2) = 0.79; mean $r_{wg\,(j)} = 0.97$; $F = 4.77$, $p < 0.001$). Therefore, we computed an aggregated CE 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 CE opportunities (Zahra, 1993). Following previous studies (Miller and Friesen, 1983; Simsek, Heavey, and Veiga, 2010), we used established perceptual measures of environmental dynamism (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 CE 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 about the necessity for renewal and innovation (Greve, 2003). We asked TMT members to rate (1-to-5 Likert scale) their previous year's sales growth, which is a more reliable dimension of SME performance than other objective income-based measures, because SMEs have high motivation to minimize taxable income but no motivation to minimize reported sales (Brouthers, Brouthers, and Werner, 2003; Schulze et al., 2001; Ling et al., 2008b). Because CE activities are costly and require financial resources, availability of *unabsorbed slack* (excess, uncommitted liquid and easy-to-recover resources) is key to pursuing CE activities (Zahra, 1996). We measured unabsorbed slack by the four-item scale developed by Ling et al. (2008a). Examples of items include "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. Therefore, 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 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 complete consensus among the three consultants. None of our sampled firms produced both commodity and consumer products. Therefore, 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 CE activities (Qian, Cao, and Takeuchi, 2013; Herrmann and Datta, 2002). We created a composite measure of TMT heterogeneity on the basis of educational background heterogeneity (Herfindal-Hirschman index; high school, bachelor, master, PhD), functional background heterogeneity (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 heterogeneity (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, CEO demographics influence their skills and abilities in precipitating innovation and change (Wiersema and Bantel, 1992). We controlled for CEO age, education (number of years of schooling completed after high school) and tenure (composite of CEO firm and position tenure) (Herrmann and Datta, 2002).

ANALYSIS AND 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 CEO time urgency and pacing style on CEO 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.

'Please insert table 1 and table 2 about here'

CEO temporal dispositions, temporal leadership and CE

As shown in Model 2, Table 2, CEO time urgency related positively to CEO temporal leadership ($\beta = 0.23$, $p < 0.05$), supporting H1. However, the linear effect of CEO pacing style on

CEO temporal leadership was insignificant (β = -0.10, *ns*). In Model 3, CEO pacing style squared had a significant negative effect on temporal leadership (β = -0.20, $p < 0.05$). Figure 1 graphically depicts this nonlinear relationship between CEO pacing style and CEO 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 CEO 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 (score = 1), steady-action (score = 3) and deadline-action styles (score = 5). 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, $p < 0.05$) and steady-action subgroups (mean = 3.99, $p < 0.05$). However, 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 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-relationship proposed in H2.

Comment [SN6]: Can we give the exact p-value here rather than p <? This will allow us to give the exact p-value for the insignificant difference between early-action and deadline action as well.

Comment [JC7]: **AE: Comment 10**: *On page 28 you indicate that your study's results "partially supported" H2. However, since H2 proposed an inverted u relationship, they did/do not, i.e., the hypothesis test failed. You need to report this failure on page 28 and explore the implications of this failure for the remainder of your model in the manuscript's discussion section. As part of this discussion, you need to recharacterize (post hoc) the likely shape of this relationship (for the benefit of future researchers).*

As shown in Model 7 in Table 2, CEO temporal leadership (β = 0.22, $p < 0.01$) was positively related to CE after controlling the effects of CEO time urgency and pacing style. Thus, H3 was supported.

Mediation effects of CEO 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 (CEO time urgency, CEO pacing style squared) should relate to the dependent variable (CE), 2) the independent variables (CEO time urgency, CEO pacing style squared) should be associated with the mediator (CEO temporal leadership), and 3) the effects of the independent variables (CEO time urgency, CEO

pacing style squared) on the dependent variable (CE) should be diminished once the mediator (CEO temporal leadership) is entered. In Model 5 and Model 6, Table 2, CEO time urgency (β = 0.18, $p < 0.05$) related positively to CE. The linear effect of CEO pacing style on CE was insignificant (β = - 0.11), but the effect of CEO pacing style-squared on CE (β = -0.21, $p < 0.05$) was significant and negative. In Model 7, once CEO temporal leadership was entered, the effects of CEO time urgency (β = 0.15, $p < 0.10$) and pacing style-squared-term (β = -0.17, $p < 0.05$) on CE were diminished. These results suggest that CEO temporal leadership partially mediates the positive relationship between CEO time urgency and CE and CEO temporal leadership partially mediates the nonlinear relationship between CEO pacing style and CE.

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 CEO temporal dispositions on CE for time urgency and pacing style. CEO time urgency exerted strong indirect effects on CE through CEO temporal leadership (Z = 1.97, $p < 0.05$) and the indirect effect of CEO pacing style-squared was marginally significant (Z = -1.69, $p < 0.10$).

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 the complex nonlinear relationships (Hayes and Preacher, 2010; MacKinnon et al., 2002; Shrout and Bolger, 2002). As Preacher and Hayes (2004: 718) state, "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 the sampling distribution of products is skewed, with nonzero kurtosis, and the assumption of normal distribution is difficult to justify (Preacher and Hayes, 2008). 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 & 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. It provides evidence of mediation if the bias-corrected 95% confidence interval 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 & 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, Knippenberg, and Ginkel, 2014). We adopted Hayes' (2013) SPSS macro "PROCESS" to assess the indirect effects of CEO time urgency on CE through CEO temporal leadership. The result shows that the indirect effect of CEO time urgency on CE is positive and significant ($\beta = 0.052$, 95% CI = 0.013, 0.124).

Because the effect of CEO pacing style on CEO 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 relationship and has been used in 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), moderator (mean), and high levels of the predictor (mean plus one standard deviation). The 95% bootstrap CIs for the instantaneous indirect effect of CEO pacing style on CE through CEO temporal leadership were

for relatively low (1.072, 95% CI = -0.007, 0.092), moderate (2.364, 95% CI = -0.023, 0.011) and relatively high CEO pacing style (3.657, 95% CI = -0.089, -0.008). It shows that the instantaneous indirect effects of CEO early-action style and CEO 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 CEO early-action style to steady-action style do not seem to exert any discernible effect on CE through changes in CEO temporal leadership. However, at relatively high levels of CEO pacing style depicting deadline-action style, the indirect effect is negative and statistically different zero, meaning that increasing score for CEO deadline-action style would lower CE through changes in CEO 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. These results were consistent with those of the main analyses.

Second, CEOs, on average, may have higher scores of 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 CEO temporal dispositions on industry dummies, firms' geographic locations (0= Guangdong, 1= Shandong) and CEO 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 industry infrastructure, labor markets, proximity to suppliers and buyers, government policies and economic conditions (Ellison, Glaeser, and Kerr, 2010). Because 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 the upper echelons and leadership theories to examine the strategic implications of CEO temporal dispositions. The objectives of this study were twofold. The first was to explicate the *dispositional* basis of CEO temporal orientation by examining conceptually rigorous and methodologically valid temporal dispositional constructs from psychology—time urgency and pacing style. The second and equally important objective was to open the black box and explain *how* CEO temporal dispositions influence a key strategic behavior—CE. Building on the personality – leadership behavior – outcome framework, we proposed CEO temporal leadership as the intervening mechanism in the influence of CEO temporal dispositions on CE.

The study yielded three sets of results. First, CEO time urgency related positively to CEO temporal leadership but our hypothesized inverted-U relationship for CEO pacing style was not supported. Specifically, the negative effect of CEO deadline-action style (negative squared-term) on temporal leadership and in turn CE was in line with our prediction. However, our

Comment [CJ8]: **AE: Comment 13**: *Your discussion section should review your findings in light of the theoretical motivation offered in the manuscript's introduction. So, you first need to sharpen your manuscript's theoretical motivation, as noted above, then use it to frame your results and in so doing show what your study adds to existing theory. The current discussion section wanders well beyond this outline, engaging in speculation that has little or nothing to do with your study and the study's place within the framework of what we already know. Why does your study matter? Why should anyone care?*

hypothesized stronger positive effect of CEO steady-action style than early-action style on promoting temporal leadership and CE activities did not pan out as indicated by the insignificant linear effect of CEO pacing style and the insignificant mean temporal leadership and CE differences between early-action and steady-action CEO subgroups. Thus, CEO steady-action style did not offer any additional benefits beyond early-action style in fostering temporal leadership and in turn CE activities. Second, CEO temporal leadership related positively to CE. Finally, CEO time urgency and pacing style exerted indirect effects on CE through CEO temporal leadership, supporting the proposed mediation effect. In what follows, we discuss these results.

Theoretical implications

Dispositional perspective of CEO temporal orientation. Distinct from the dominant situational perspective, which defines CEO temporal orientation as malleable and situationally constructed (Das, 1987, Nadkarni and Chen, 2014; Nadkarni, Chen and Chen, 2015; Yadav, Prabhu and Chandy, 2007), this study informs that the deeply ingrained and stable temporal tendencies (time urgency and pacing style) of CEOs shape their temporal leadership behaviors, which in turn influences key strategic initiatives (CE). The dispositional perspective advocated in this study is especially notable because temporal traits are deeply ingrained and 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, which CEOs carry with them (often unconsciously) across a myriad of strategic situations, permeate how CEOs communicate and interact with top executives and in turn influence a wide range of strategic behaviors and outcomes. Failure to identify the underlying dispositional temporal source of strategic choices and behaviors has hindered our understanding of how time manifests in strategy making. By illustrating the influence of CEO time urgency and pacing style on a key strategic behavior (CE), this study brings temporal dispositions of CEOs to the forefront of CEO temporal orientation research.

The conceptually rigorous and methodologically valid temporal dispositions examined in the study lend fine-grained theorization of the strategic implications of CEO temporal dispositions. *Time urgency* and *pacing style* constitute conceptually distinct temporal dispositions that have received wide recognition in the psychology literature (Blount and Janicik, 2002; Mohammed and Nadkarni, 2011; Waller et al., 2001). The distinct patterns of relationships of CEO time urgency and pacing style to CEO temporal leadership and in turn to CE activities underscores the unique strategic implications of each. CEO time urgency related positively to temporal leadership and in turn CE, whereas CEO pacing style had a non-linear relationship. There was no significant effect on temporal leadership and in turn CE activities at lower levels of CEO pacing style, suggesting that there were no significant differences in the effects of CEO early-action and steady-action style. However, there was a strong negative effect at high levels of CEO pacing style, confirming the dysfunctionality of deadline-action pacing style for temporal leadership and in turn CE. Taken together, these results demonstrate how distinct CEO temporal dispositions are central in the manifestation of time in key strategic behaviors such as CE.

The positive effects of CEO time urgency on CEO temporal leadership and in turn CE were in line with our predictions. Interestingly, we did not find support for the hypothesized inverted U-shaped effect of CEO pacing style on CEO temporal leadership. The strong negative effect of CEO deadline-action style (CEO pacing style squared) on temporal leadership and in turn CE activities was in line with the prediction in H2. However, the insignificant difference in mean temporal leadership between early-action and steady-action CEO subgroups did not support our prediction in H2 that steady-action style will be advantageous over the early-action style in promoting temporal leadership and in turn CE. These surprising results on CEO pacing style could be attributed to the firm and industrial contexts surrounding the Chinese high-tech SMEs. Because SMEs are typically structurally simple, have streamlined operations, and targeted innovation and market entries, they are agile, flexible and fast in moving new strategic ideas into behaviors (Chen and Hambrick, 1995; Hitt, Hoskisson, and Harrison, 1991). Due to

Comment [CJ9]: **AE: Comment 7**: *I would like to see you sharpen the argument leading to H2. This was a major concern of Reviewer #3's and I still see some need for further work in simplifying, clarifying, tying to relevant literatures. Especially since the test of this model fails, you need to do a very good job at this point to be able to discuss what you've learned from failure in the manuscript's discussion section*.

AE: Comment 10: *On page 28 you indicate that your study's results "partially supported" H2. However, since H2 proposed an inverted u relationship, they did/do not, i.e., the hypothesis test failed. You need to report this failure on page 28 and explore the implications of this failure for the remainder of your model in the manuscript's discussion section. As part of this discussion, you need to recharacterize (post hoc) the likely shape of this relationship (for the benefit of future researchers).*

this structural and operational flexibility and simplicity, SMEs adopt new ideas early without any significant integration and coordination costs (Dean, 1998). Because the costs of integrating new ideas into existing structures are minimal and SMEs derive their competitive advantage predominantly from consistently staying ahead of competition through early timing, receptivity to feedback and continuous adjustment associated with steady-action style may not provide any additional benefits beyond CEO early action style in promoting temporal leadership and CE activities in SMEs.

Conversely, because large organizations are structural complex with disparate activities and well-established processes, they possess 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 that are nimble and structurally flexible, large firms face structural inertia and high costs in integrating new ideas into existing systems and processes (Ahuja and Lampert, 2001; Katila, 2002). Launching new innovation, venturing and renewal activities requires considerable changes to the existing infrastructure and development of common interfaces (Leiponen & Helfat, 2010). Pushing new ideas and initiatives early without incorporating feedback and substantial continuous refinement to existing structures may usurp established advantages and disrupt existing infrastructure in large firms (Helfat, 1997). Thus, the feedback and continuous refinement associated with CEO steady-action style are essential to successfully and smoothly integrating CE initiatives within existing established structures and systems in large companies. Accordingly, CEO steady-action style is likely to foster temporal leadership and CE activities for large firms better than the early-action style. Klarner and Raisch (2013) found that steady pacing of strategic activities was most beneficial for large (revenues > €100 million) European insurance companies.

The lack of support for the hypothesized inverted-U effect of CEO pacing style could also be explained by the high-tech industrial environments, which are turbulent and in a constant state of flux where opportunities are ample but transient (D'Aveni, Dagnino, and Smith, 2010;

Qian, Cao, and Takeuchi, 2013). In these environments, TMTs can capture market and technological opportunities free of competition and foreclose rivals' chances to enter that market through early-mover timing even though the first finished attempt is relatively rough without any adjustments and refinement (Lee, Simith, Grimm, and Schomburg, 2000; Lieberman and Montgomery, 1988; 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 early-action style CEOs who tend to pace TMT schedules, coordination, and resource allocation early and far ahead of the deadline.

However, the differential effects of CEO steady-action style and early-action style may be more apparent in the slow changing low-tech industries where opportunities are rare and the potential for feedback-learning is high (Nadkarni and Narayanan, 2007). In such environment, continuous refinement and acute sensitivity to feedback, rather than early-timing, are essential to successfully realizing opportunities in such environments. Available CE opportunities are relatively sparse and failure to realize them can create huge set-backs in furthering CE initiatives (Kelley, Peters, and O'Connor, 2009; Srivastava and Lee, 2005). Therefore, in stable industries, the continuous adjustments and receptivity to feedback associated with CEO steady-action style may lead to higher levels of temporal leadership and CE activities than the purely early-timing focus in CEO early-action style. Exploring the effects CEO pacing styles in such stable and mature contexts may highlight the inverted-U effects of CEO pacing style by informing the increased benefits of CEO steady-action pacing style over early-action style in fostering temporal leadership and in turn CE.

Opening the black box of CEO temporal orientation. Our study by sheds light on *how* CEO temporal dispositions influence strategic activities. Previous research has examined the direct relationship of CEO temporal orientations with strategic behaviors such as innovation and competitive aggressiveness without directly theorizing and measuring the intervening

mechanisms (Das, 1987, Nadkarni and Chen, 2014; Nadkarni, Chen and Chen, 2015; Yadav, Prabhu and Chandy, 2007). This "black box" has inhibited our understanding of why and how CEO temporal orientation is consequential for key strategic behaviors. To open this black box, we built on personality-leadership behavior-outcome framework (Avolio, 2007; DeRue et al., 2011; Hogan and Kaiser, 2005; Johnson et al., 2012; Zaccaro, 2012) to explicitly theorize and empirically test CEO temporal leadership as the core intervening mechanism through which CEO temporal dispositions (time urgency) influence strategic behaviors (CE). The mediation results confirmed that CEO temporal leadership accounts for the effects of CEO time urgency and pacing style on CE. As one of the first studies to open the black box, this study lends theoretical precision in understanding the mechanisms through which CEO temporal dispositions influence strategic behaviors such as CE.

The *behavioral* explanation for the relationship between CEO temporal orientation and strategic behaviors introduced in this study is conceptually distinct from the attention-based explanation implied in CEO temporal orientation research (Nadkarni and Chen, 2014; Yadav, Prabhu and Chandy, 2007). Drawing on the attention based view (Ocasio, 1997), these studies rest on the assumption, without explicit theorization and testing, that CEO temporal orientations will serve as attentional filters which shape how CEOs selectively perceive strategic stimuli, interpret noticed cues and evaluate strategic options. Whereas attentional mechanism emphasizes individual CEOs' perception and interpretation, the behavioral leadership framework describes how CEOs foster synchronization of joint actions of TMTs, share key strategic information, interact, and communicate with TMT members. Strategy leadership scholars increasingly stress that such CEO-TMT interface is central to explaining the effects of CEO attributes on firm-level strategies (Ling, Simsek, Lubatkin, and Veiga, 2008; Peterson et al., 2003). Indeed, 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 of the CEO. Rather, TMT interactions,

processes and choices can be trace to CEO leadership styles and dispositions. By demonstrating that CEO temporal dispositions exert indirect influence on CE through CEOs' temporal leadership behaviors, this study introduces a new behaviorally-rooted explanation of the strategic implications of CEO 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) in enriching our understanding of the underlying mechanisms driving the strategic implications of CEO 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 within strategy settings, this study goes beyond previous empirical work that has focused on transformational and servant leadership as the main mechanisms to transmit the effect of CEO traits to strategic behaviors and outcomes (e.g., Colbert, Barrick, and Bradley, 2014; Peterson, Galvin, and Lange, 2012). 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" (Avolio, 2007; DeRue et al., 2011; Peterson, Galvin, and Lange, 2012: 585). Originated in the TIP theory, temporal leadership has strong theoretical foundation and has received growing academic attention (Mohammed and Nadkarni, 2011; Murping et al., 2014). We integrated the temporal research in psychology, the TIP theory and the personality-leadership behavior-outcome framework to propose the effects of CEO temporal dispositions on strategic behaviors are channeled through CEO temporal leadership. Our findings suggest that temporal leadership should be considered more prominently in the ongoing conversation surrounding CEO leadership and strategic outcomes. Future research could build on our work by exploring the mediating effects of temporal leadership in the relationship between CEO temporal dispositions on other key strategic behaviors, such as mergers and acquisitions,

joint ventures and diversification.

Limitations, directions for future research and conclusion

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 studies may want to replicate this study in another firm (e.g., large and established firms), industry (e.g., stable industries). Second, although time urgency and pacing style capture important individual differences, researchers could examine the effects on CE activities of other temporal dispositions, such as temporal depth (how far people look into the future or the past) (Bluedorn, 2002). Adopting a long-term time horizon provides executives insights necessary for innovation and creativity, promoting entrepreneurial actions (Bluedorn and Martin, 2008). Finally, we build our research model based on the trait theory of leadership, which contends that people inherit certain qualities and traits that predispose them towards specific types of leadership behaviors (Hogan and Kaiser, 2005; Judge et al., 2002). Although traits may explain corresponding leadership behaviors, traits alone may not completely explain the effectiveness of these behaviors (Chen, Gully, Whiteman, Kilcullen, 2000; Kirkpatrick and Locke, 1991). Although leaders who possess 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 skills, decision making, planning skills and time management skills) in predicting the effectiveness of temporal leadership.

In conclusion, taking the temporal lens in strategic leadership offers critical insights for a wide range of research topics and business practices. Our study highlights essential CEO temporal dispositions and temporal leadership behaviors that are vital for a key strategic intermediate outcome -- CE.

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Table 1. Means, standard deviations, and correlations [a]

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1	CEO age	43.05	7.72	1.00												
2	CEO education	2.87	0.81	0.06	1.00											
3	CEO tenure	6.09	4.05	0.36	0.00	1.00										
4	TMT size	6.33	3.77	0.26	0.01	0.32	1.00									
5	TMT demographic diversity	-0.09	1.81	0.08	0.06	0.40	0.00	1.00								
6	Firm size b	4.00	1.46	0.27	0.15	0.51	0.67	0.18	1.00							
7	Slack	3.58	0.57	-0.04	-0.07	0.04	0.23	-0.04	0.18	1.00						
8	Past performance	3.28	0.73	-0.05	0.04	0.20	0.34	-0.03	0.35	0.29	1.00					
9	Firm product portfolio	0.22	0.41	0.08	0.09	0.02	0.02	-0.07	0.08	-0.12	0.05	1.00				
10	Environmental dynamism	2.79	0.69	0.01	-0.14	0.02	-0.02	-0.12	-0.16	-0.08	-0.07	-0.07	1.00			
11	CEO time urgency	3.77	0.55	-0.07	-0.07	-0.01	-0.04	0.08	-0.01	0.26	0.10	0.01	0.23	1.00		
12	CEO pacing style	2.36	1.29	0.07	0.05	0.06	0.01	-0.12	0.07	-0.25	-0.08	-0.01	0.11	-0.11	1.00	
13	CEO temporal leadership	3.94	0.50	0.01	-0.14	0.02	0.03	-0.09	0.00	0.31	0.13	-0.18	0.10	0.30	-0.16	1.00
14	Corporate entrepreneurship	3.46	0.45	-0.19	-0.04	0.14	0.07	-0.09	0.14	0.38	0.27	0.03	0.06	0.29	-0.17	0.38

[a] N=129, Correlations greater than 0.17 are significant at $p < 0.05$; greater than 0.23 are significant at $p < 0.01$

[b] Natural logarithm

Table 2. Results of CEO temporal dispositions, CEO temporal leadership and corporate entrepreneurship [a]

Variables	CEO temporal leadership			Corporate entrepreneurship			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Controls							
CEO age	0.06	0.07	0.07	-0.25**	-0.24**	-0.24**	-0.26**
CEO education	-0.10	-0.09	-0.09	-0.01	0.01	0.01	0.02
CEO tenure	0.04	0.07	0.02	0.24*	0.27**	0.21*	0.21*
TMT size	-0.08	-0.06	-0.06	-0.14	-0.12	-0.13	-0.11
TMT demographic diversity	-0.08	-0.14	-0.10	-0.15^{+}	-0.21*	-0.17^{+}	-0.14
Firm size b	-0.02	-0.02	0.01	0.11	0.12	0.15	0.15
Slack	0.29***	0.20*	0.19*	0.34***	0.26**	0.26**	0.21*
Past performance	0.09	0.07	0.07	0.12	0.10	0.10	0.08
Firm product portfolio	-0.13	-0.15^{+}	-0.14^{+}	0.07	0.05	0.07	0.10
Environmental dynamism	0.09	0.03	0.06	0.09	0.04	0.08	0.07
Main effects							
CEO time urgency		0.23**	0.25**		0.18*	0.21*	0.15^{+}
CEO pacing style		-0.10	-0.02		-0.11	-0.03	-0.02
CEO pacing style square			-0.20*			-0.21*	-0.17*
CEO temporal leadership							0.22**
F	2.19	2.61	2.85	4.46	4.46	4.79	5.18
R square	0.16	0.21	0.24	0.27	0.31	0.35	0.39
Adjusted R square	0.08	0.13	0.16	0.21	0.24	0.28	0.31

[a] N=129

Figure 1. CEO pacing style to CEO temporal leadership