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How and when does founder polychronicity affect new venture performance? The roles of entrepreneurial orientation and firm age

Accepted version

Abstract

This paper proposes a moderated mediation model to examine the relationship between polychronicity and venture performance. We argue that entrepreneurial orientation (EO) mediates the positive relationship between polychronicity and venture performance. The hypotheses were tested using time-lagged data from a sample of 249 ventures from Vietnam. Using structural equation modeling, our findings indicate that EO mediates the relationship between polychronicity and venture performance. Additionally, the results reveal the relationship between polychronicity and EO is moderated by firm age, and that this interaction effect is stronger for younger firms than older firms. Our theory-based arguments and findings help extend and provide evidentiary support to the polychronicity- venture performance relationship, which highlights the significance of the effect polychronicity has on venture performance through founders polychronic proclivities.

Keywords: *Polychronicity; entrepreneurial orientation; new ventures, performance; Vietnam*

1. Introduction

Time-based characteristics and skills are vital in today's business world (Mohammed & Nadkarni, 2014). As organizations become increasingly complex, it is expected that they acquire a philosophy that values multitasking to address the rapid changes and demands of the external environment (König & Waller, 2010). Faced with demands from complex and uncertain environments, new venture founders must be dutiful in the delegation of their time for efforts to perform well. However, less is known about how time-based constructs, such as polychronicity, impact the outcome of new ventures (Sirén et al., 2020).

Polychronicity represents a trait-like affinity for allocating time across multiple projects simultaneously (Hall, 1983) and is argued to have important effects for firms (Slocombe & Bluedorn, 1999), especially in dynamic work contexts (Arndt et al., 2006; Bluedorn, 2002), like those found in entrepreneurial ventures. Polychronic individuals are more likely to effectively problem-solve in multi-faceted, unpredictable, and turbulent environments because of their ability to allocate across multiple projects and decisions at a moment's notice (Ahmad et al., 2023). Polychronicity has also been linked to firm performance (Souitaris & Maestro, 2010), prompting a need to understand more about *how* and *when* polychronicity can be beneficial to entrepreneurial ventures. For instance, founders operate under immense time pressure and environmental changes. In line with this assertion, it reason to say that founders with higher levels of polychronicity will have an increased level of organizational capabilities that allow them to switch between tasks based on changes in the markets they are operating (Agnihotri & Bhattacharya, 2022). Therefore, our study presumes that founders who are more polychronic will have a stronger ability to handle multiple projects and shift focus more quickly when necessary to projects that may need a more immediate response, which may in turn, yield higher performance outcomes for their ventures (Yang et al., 2022). We expect this relationship

because expected outcomes have been attributed to dual-tasking or task-switching as influencing how polychronicity manifests over time to impact performance (Howard & Cogswell, 2022). We contribute to this stream of inquiry by providing further evidence for how and when polychronicity can positively affect performance in an entrepreneurial context.

In addition, the polychronicity-performance relationship remains a 'black box' and previous studies regarding this relationship have not examined mediators. As Chen (2022) points out, polychronicity is often examined with a positive lens, where focusing on several tasks simultaneously can foster innovation, creativity, and cognitive variety, many factors which are entrepreneurial in nature. Therefore, to understand polychronicity in the context of new ventures, this study examines how entrepreneurial orientation (EO) mediates the relationship between polychronicity and venture performance, while taking into consideration firm age. It is believed that entrepreneurial orientation will mediate this relationship because new ventures often operate in environments with high levels of uncertainty and require founder entrepreneurial orientation to balance the demands of the evolving tasks required to be successful (Souitaris & Maestro, 2010). Since polychronicity is considered a trait that influences creative behaviors, it is expected to drive entrepreneurial behaviors as well (Lindsay, 2008; Pidduck et al., 2023; Waheed, et al., 2021). It also encourages individuals to determine innovative ways to complete tasks outside the normal boundary of routines and standard behaviors, which is encouraged through EO (Hecht & Allen, 2005). Therefore, we posit entrepreneurial orientation is an important mechanism for understanding the link between polychronicity and new venture performance because EO represents a prelude to prominent entrepreneurial behaviors that drive firms toward performance (Pidduck et al., 2013; Rosenbusch et al., 2013). These behaviors are often undertaken concurrently, and, for new ventures especially, require simultaneous attention from the founder.

We presume that polychronicity is a needed dimension in new ventures to address the unstable environments new ventures often operate in (Souitaris & Maestro, 2010) and to address the temporal need of these characteristics (Sirén et al., 2020).

While EO is a well-researched construct that links to firm performance (Rauch et al., 2009), results have been inconclusive (Basco et al., 2020) and limited within the application of new venture performance (Donbesuur et al., 2020). Additionally, the role of EO in new ventures has been underexamined, somewhat due to the construct originally being conceived to determine strategic capabilities in established organizations (McGee & Peterson, 2019), highlighting the need to explore EO in different contexts (Covin & Miller, 2014) or as a connecting mechanism (Rosenbusch et al., 2013). Also, behavioral factors that complement EO need further investigation to understand effects on financial performance (Covin & Wales, 2019), because relying solely on EO does not guarantee performance (Gupta et al., 2021). Indeed, recent studies have highlighted the need to investigate the factors leading to EO behaviors (e.g., Adomako, 2021; Clark et al., 2023), such as innovation (Kyrgidou & Spyropoulou, 2013), and *how* these capabilities ultimately affect venture performance. Relatedly, scholars have shown the importance of clarifying *when* entrepreneurial orientation can help determine venture outcomes (Kearney et al., 2018). Understanding how organizations allocate their entrepreneurial behaviors from a temporal perspective is unclear, even more so how temporal allocation of resources affects performance (Sirén et al., 2020).

Coupling the inconsistent findings concerning the effects of EO with a need to help founders better understand how their influence contributes to venture orientation and outcomes, we investigated the primary research question: *How and when does founder polychronicity affects the performance of new ventures?* We suggest polychronicity affects venture

performance through EO as a mediator, and that this relationship is contingent upon the age of the venture that can help determine when polychronicity is effective. Additionally, we answer recent calls for further investigation of the relationship between polychronicity and venture performance (Bromiley & Rau, 2016), especially considering that research has supported polychronicity as having a positive influence on performance (König & Waller, 2010) and that individuals with more proclivity towards polychronicity thrive in dynamic, unstable and unanalyzable environments that require these preferences to switch between efforts (Adomako et al., 2016; Chen, 2022). Other recent calls in the literature highlight a need for additional research on new venture performance by examining individual and firm-level constructs (Covin & Wales, 2019; Pidduck et al., 2023). In these ways, we contribute to the budding discussions concerning how entrepreneurs manage their time resources (Mmbaga et al., 2023), and when doing so can be deemed effective (Sirén et al., 2020). A need which is only heightened due to the virtual, hybrid, and autonomous nature of the current workforce (Mmbaga et al., 2023; Puranik et al., 2020; Zhang et al., 2017).

Crucially, according to upper echelon theory (UET), firm leaders impact venture performance (Hambrick, 2007; Hambrick & Mason, 1984). Drawing on UET, the foundation of our arguments rest on the idea that founders influence firm activities, strategic initiatives, decisions, and how entrepreneurial their firm will behave to affect performance (Hambrick, 2007; Van Doorn et al., 2017). Founders, as the primary—often sole—leaders of entrepreneurial firms, requisition attributes from their cognitive base to help develop and establish firm norms and strategies, such as EO (Boling et al., 2016; Miller, 1983; Wales et al., 2013). However, EO in entrepreneurship literature is often too focused on inputs of the founder or top managers

without considering mechanisms that drive the relationship (Klotz et al., 2014; Van Doorn et al., 2017), creating a gap in understanding.

In the context of entrepreneurship, founders' characteristics and attributes are extremely salient to the functionality of the venture (Chen, 2022; Unger et al., 2011). For example, Hmieleski and Sheppard (2019), examined differences in 303 founding CEOs, and observed that creativity and teamwork characteristics impacted new venture performance. Other studies on attributes such as self-efficacy (McGee & Peterson, 2019), coping with uncertainty (Lanivich, 2015), and risk-taking propensity (Tang & Tang, 2007) also showed that founder characteristics impacted venture performance. Despite the connections of these characteristics to new venture performance, the field of entrepreneurship is lacking in theory and evidence supporting the meaningful relationships between founders' individual-level attributes and firm-level outcomes (for recent reviews, see Clark et al., 2023; Pidduck et al., 2023). This is problematic because founders are often the primary source of capital and influence in early-stage ventures and knowing how and when founders influence their ventures can inform scholars and practitioners on how to take advantage of such influence. In this study, we attempt to address these issues and contributes to the current debate on the temporal context of founders' entrepreneurial orientation and how it answers recent calls in literature to examine the relationship between polychronicity and new venture performance (Sirén et al., 2019).

2. Background and Theory Development

2.1. Polychronicity

Polychronicity is a time-based construct that describes how many things a person can attend to simultaneously (Bluedorn et al., 1999; König & Waller, 2010). Unlike other resources, time is (generally) equally distributed on a daily basis. Hall (1983) developed the concepts of

monochronic and polychronic time, which provided an understanding of the complexities of time-based behaviors. It is important to note that some researchers have regarded the concepts of polychronicity and multitasking (simultaneously attempting more than one task) as synonyms (e.g., Bluedorn, 2002) given that polychronicity implies a certain level of multitasking. However, studies have shown major conceptual differences between polychronicity and multitasking (Kirchberg et al., 2015; König & Waller, 2010; Poposki & Oswald, 2010). For example, Kirchberg et al. (2015) suggested that polychronicity operates as an antecedent of multitasking. Most notably, researchers have claimed that polychronicity is a trait-like preference; unlike multitasking, which is a behavior that tends to alter with task demands, varying work conditions, and individuals' psychophysiological state (Kirchberg et al., 2015). Indeed, based on high test-retest reliability coefficients for relevant measures (e.g., Bluedorn, 2002), researchers note that polychronicity has been more indicative of a trait than a state (Conte & Jacobs, 2003).

Accordingly, polychronicity is recognized herein as an innate trait and conceptualized on a continuum from polychronic to monochronic (Bluedorn et al., 1992). Preference to engage in multiple tasks simultaneously and the ability to shift attention between tasks characterize a polychronic orientation, whereas a monochronic orientation focuses on the completion of one task before engaging in another (Poposki & Oswald, 2010). Shifting consists of simultaneous interspersing or the merging of numerous tasks as the individual transitions from one task to another (Bluedorn et al., 1992). Further, research on interrupting behaviors note that individuals who receive new demands managed to continue their ongoing task while processing the new demands, during which it was probable to shift their attention to the new demands before completing the task at hand (Kirchberg et al., 2015). Moreover, at other times, these individuals maintained their engagement with the task they had at hand until completion, before transferring

their focus and attention to a new demand. In either situation, the individuals had to process and work on both the ongoing task and new tasks simultaneously. In essence, the more shifting among tasks an individual tends to do, the more polychronic their behavior.

Polychronicity has also been studied as an important characteristic of CEOs and top management teams (Chen, 2022; Conte & Jacobs, 2003; Souitaris & Maestro, 2010). For instance, in dynamic environments, polychronicity in top-management teams (TMT) had a positive effect on performance in a study examining 305 new technology ventures (Souitaris & Maestro, 2010). Relatedly, in a study of 127 SMEs, researchers found that levels of polychronicity enhanced performance, by increasing the coordination of innovation activities in the firm (Sirén et al., 2020). For instance, Chen (2022) found CEO polychronicity was an antecedent of firm innovation and described that polychronicity can enhance or hinder innovation based on differing mechanisms that drive and/or alter the relationship, such as environmental dynamism and firm size.

2.2. Entrepreneurial orientation and venture performance

Entrepreneurial orientation characteristics reflect entrepreneurs' strategic initiatives, strategy-making processes, and decisions that enact venture purpose, vision, and competitive advantages that directly impact firm performance (Rauch et al., 2009). EO is defined by three prominent factors: innovativeness, proactiveness, and risk-taking (Covin & Slevin, 1989), which represent the dominant conceptualization of firm behaviors considered entrepreneurial in nature (George & Marino, 2011; Pidduck et al., 2023). Innovativeness is the predisposition to engage in creativity through introductions of new services or products that generate competitive advantage and performance (Miller, 1983). Proactiveness is acting in a forward-thinking manner and seeking

new opportunities ahead of competition while preparing for changes of future demands (Rauch et al., 2009). Risk-taking is committing time and resources to potential opportunities despite unstable and/or low probabilities regarding outcomes (Miller, 1983; Rauch et al., 2009). In this way, EO has been considered the 'driving force behind the organizational pursuit of entrepreneurial activities' (Covin & Wales, 2012, p. 677).

Over several decades, scholars have demonstrated a link between EO dimensions and entrepreneurial performance outcomes because firms exhibiting EO adapt to challenging demands and contingencies better than their rivals, take more risks, and have shorter product life cycles (Tang et al., 2018). For example, Wiklund and colleagues (2009) showed initiatives that spark innovation, and subsequently the introduction of new products, services, and technologies in the market, can generate economic performance. Zahra and Covin (1995) found proactiveness helps firms maintain competitive advantages that lead to long-term organizational success, and Lumpkin and Dess (1996) discovered companies more willing to aggressively take risks to exploit opportunities can achieve long-term financial growth. Relatedly, Hughes and Morgan (2007) found that EO dimensions of proactiveness and innovativeness had a positive effect on new venture performance. It is the multi-faceted outcomes of EO that strengthen venture performance (Kollmann & Stöckmann, 2014). While the link between EO and venture performance is established (Rauch et al., 2009; Wiklund & Shepherd, 2009), how it functions as a connective mechanism remains unclear.

2.3. Polychronicity and entrepreneurial orientation

Polychronicity represents how and when individuals dedicate their time to activities (Bluedorn et al., 1999) and is considered a stable personality attribute (Szameitat & Hayati, 2019) which enhances the ability to seek and transform information, manage interruptions, manipulate

different resource combinations and knowledge, and focus on innovation activities (Arndt et al., 2006; Sirén et al., 2020; Vizcaíno et al., 2021). Considering polychronicity has also been associated with idea generation, better decision-making, and effective problem-solving (Nutt, 2002), we anticipate that it will relate to different dimensions of entrepreneurial orientation. First, with the challenging and unstable environments plaguing the modern workforce, it has become ever-increasingly important that founders and top-management teams (TMTs) continually adapt and create fit within the environments they are working (Asghar et al., 2020; Hecht & Allen, 2005). Making polychronic activities a necessary characteristic a founder exhibits to address competing demands in rapidly changing and competitive environments (Ferraris et al., 2021). Founders with polychronicity ability can change focus to more urgent tasks and relevant issues on an at-need basis (Poposki & Oswald, 2010). That is, polychronic individuals have preference for switching between tasks (Arndt et al., 2006; Bluedorn et al., 1999) and believe in managing the most relevant task during a specific timeframe (Conte & Gintoft, 2005) and in relation to their working environment (Howard & Cogswell, 2022).

To address the importance of polychronicity for founders, we present a connection between polychronicity and entrepreneurial orientation: innovativeness, proactiveness, and risk-taking (Covin & Slevin, 1989). Following tenets of UET, the founder often has characteristics that lead to important implications for strategic decision-making and firm performance (Hambrick & Mason, 1984; Jayaraman et al., 2000). As primary developers and directors of early firm orientation and strategy, founders can utilize their preference for undertaking multiple tasks or projects and their ability to switch between multiple, simultaneously occurring tasks as foundation for entrepreneurial behaviors (Chen, 2022) and allocating their attention across

multiple tasks (Yi et al., 2021). In this way, the polychronicity of new venture founders enhances EO by allowing for several proactive searches for new, risky innovations to occur at once. For instance, since innovativeness involves the introduction of new products and services via creative channels, we hypothesize that polychronicity creates awareness for multiple paths and alternatives for innovation and creativity (Halbesleben et al., 2003; McKay & Gutworth, 2021). Relatedly, scholars have shown polychronic organizational leaders can better adapt to changes and integrate different activities when necessary to address those changes (Chen, 2022; Volk et al., 2017). Furthermore, a recent study suggested that when polychronicity traits were prevalent, it was advantageous for innovation in an organization (Rapp et al., 2020). Polychronicity strengthens organization innovation climate (Mullins et al., 2020) encouraging the likelihood that organizations exhibit this dimension of EO.

Additionally, proactiveness involves future forward pursuits and anticipation of changes in the marketplace and environment by introducing new products and services before competitors (Lumpkin & Dess, 2001; Rauch et al., 2009). This means that organizations that embody and exhibit proactiveness have founders that continually focus on tasks and allocate multiple resources in order to meet the demands of the changing environment before competitors do (De Massis et al., 2014). This also means that they are more responsive in uncertain environments making them more likely to take actions to reduce the uncertainty in the environment (Leunbach et al., 2020). We anticipate polychronic founders to flourish in these environments because polychronic founders will be more likely to proactively heed change and implement decisions which will ultimately create organizations that willingly support and accept proactiveness (Kaufman-Scarborough & Lindquist, 1999). Ultimately, acting in these uncertain

environments and committing resources and time to opportunities despite the outcomes is also enforcing the risk-taking dimension of EO.

In sum, we anticipate that polychronic founders can endure pressures of their changing environment and have a strong ability to deal with interruptions (Bluedorn & Martin, 2008). As a supporting characteristic of proactive and risky behaviors, founders' polychronicity has an impact on how their venture conducts business (Lin et al., 2022; Souitaris & Maestro, 2010). Therefore, we hypothesize that polychronicity is positively associated with a venture's EO.

Hypothesis 1. Polychronicity is positively associated with entrepreneurial orientation.

2.4. Moderating role of firm age

Although firm age is often controlled for in management and entrepreneurship studies, it should be included in polychronicity and EO research in a theoretically meaningful way (Anderson & Eshima, 2013). For several reasons, our theorizing suggests that firm age will alter the polychronicity and EO relationship due to the differences we anticipate in founder involvement over time, as well as the EO demands of newer versus more mature organizations.

Foremost, new ventures generally require high founder involvement due to high demands from urgent tasks (Jayaraman et al., 2000; Souitaris & Maestro, 2010). Additionally, considering the nature of launching a venture, new firms traditionally operate with high levels of entrepreneurial orientation (Miller, 2011), and must respond to the threats and opportunities from their external environment (Markman et al., 2005) to overcome liabilities of newness and smallness (Rutherford et al., 2009; Su et al., 2011). The liability of newness increases failure rates of smaller firms if they cannot access resources and adequately leverage those resources appropriately (Freeman et al., 1983), which could motivate founders of young firms to do as much as they can all at once to gain legitimacy. To survive such demands and liabilities, new

firms need to quickly adapt, respond to external contingencies, and solve complex problems (Schein, 1996). Accordingly, new ventures require dynamic capabilities for survival (Zahra et al., 2006) and founders must work diligently to establish effective strategies (Thornhill & Amit, 2003); they must cultivate current capabilities while simultaneously developing new products and discovering new markets (Teece et al., 1997).

Generally, when given a firm's lifecycle, newer organizations will have priorities that focus on survival, innovation, proactiveness, as well as risk-taking, given the dynamic nature of the environment (Sharma & Salvato, 2011, 2014). As organizations age, their standard operating procedures and systems start to become routinized, limiting the required involvement of the founder (Jayaraman et al., 2000). Mature organizations are often more concerned about maintaining the status quo than seeking out new opportunities (Bluedorn et al., 1999; Eisenhardt, 1989; Schein, 1996). Furthermore, as firms become established, structural inertia and decreased organizational adaptability can deter entrepreneurial behaviors (Zahra & George, 2002). For example, Souder and colleagues (2012) found that mid-tenure founders were less likely to continue market expansion. Also, mature organizations are more likely to resist exploring new technologies and technological changes (Benner, 2010). Due to accumulated capabilities and knowledge, it is more difficult for older firms to make radical strategic changes (Tushman & Anderson, 1986) and adjust to new innovation processes (Hill & Rothaermel, 2003). Managers often have outdated or clouded attitudes about innovation and change (Tripsas & Gavetti, 2000). For instance, a study examining 267 small business owners showed a negative relationship between EO and performance in organizations greater than 10 years old (Runyan et al., 2008). Relatedly, new firms find it easier to adapt and transform than mature firms because there are fewer internal processes, procedures, and assets to re-engineer (Teece, 2018). Additionally, new

venture founders accept interruptions and multiple tasks as behavioral manifestations of polychronicity (Bluedorn et al., 1992; Souitaris & Maestro, 2010) and embrace their polychronic actions more than leaders of mature organizations (Bluedorn et al., 1999; Schein, 1996).

However, despite the rationale that younger ventures may have more agility when responding to the environment, founding entrepreneurs have challenges addressing the growth and life cycle of new ventures that are different from established firms (Slevin & Covin, 1997). Traditionally, new ventures are considered to have a wayward approach to strategic decision making (Eisenhardt, 1989) and their underdeveloped processes, unclear norms, and market knowledge, make it more difficult to link strategy to performance (Slevin & Covin, 1997). Although younger firms may have better flexibility due to the lack of structural inertia, it can hinder their ability to exploit opportunities effectively (McGee & Peterson, 2019).

Given the equivocal outcomes we see within organizations and their varied levels of EO at differing lifecycles, this study is concerned with how firm age impacts the polychronicity and EO relationship. We project that firm age will moderate the relationship between founder polychronicity and EO, whereas the relationship is expected to be stronger in younger firms. While we know that EO will differ based on firm age, we presume that the founders decrease in involvement over time, and priorities that relate to polychronic tasks will decrease as well, given the reduced urgency needed to tackle the fast-evolving demands of the environment (Sharma & Salvato, 2011; Zellweger & Sieger, 2012), thus, reducing prevalence of polychronicity exhibited in founders. Given this logic, we believe young firms may need to explore more opportunities than older firms, and that they have polychronic preferences in order to act on the multiple timely demands needed to succeed. Further exemplifying why founders' polychronicity can have a bigger impact on EO and seen more beneficial in younger, rather than older, ventures.

Hypothesis 2. Firm age moderates the relationship between polychronicity and EO such that the positive relationship is stronger for younger rather than older firms.

2.5. EO as mediator

Founders often have social, behavioral, and cognitive characteristics that have implications for strategic decision-making and venture performance by directly or indirectly influencing their actions and behaviors (Bromiley & Rau, 2016; Hambrick, 2007; Hambrick & Mason, 1984). UET suggests that there are varying aspects of how observable, psychological, or interactional characteristics of firm leaders' influence venture outcomes (Bromiley & Rau, 2016; Hambrick & Mason, 1984) by impacting their strategic choices (Tang et al., 2018). We draw on UET to understand how founders polychronicity operates through EO to enhance venture performance. UET posits that organizational processes, structure, culture, and goals are all reflected in the strategies set forth by organizations' leaders (Hambrick, 2007), like venture founders. Thus, founders are an important factor concerning how the venture will perform (Barringer et al., 2005). For instance, examining founder-specific experiences of the TMT, Patzelt and colleagues (2008) linked founder characteristics to venture performance. They concluded that the cognitive base of founders that comprised the TMT influenced how they interpret and act on information, which predicted their strategic preferences (Patzelt et al., 2008). Also, cognitive and behavioral attributes can relate to attention and multitasking characteristics, such as polychronicity (Souitaris & Maestro, 2010). For instance, polychronicity helps decision makers allocate their time and energies based on their entrepreneurial needs (Chen, 2022). Relatedly, Eisenhardt (1989) found that firms considering multiple alternatives simultaneously made fast strategic decisions and increased performance.

Consequently, EO is an ideal mediator between polychronicity and venture performance because it reflects a propensity to seek opportunities and take risks (Zhang et al., 2016) that require simultaneous tasks including future-oriented thinking, creativity, and innovation that could lead to competitive advantages (Lumpkin & Dess, 1996). Thus, polychronic founders affect the entrepreneurial posture of their ventures with their capability to handle multiple tasks and processes simultaneously which, in turn, enhances their ventures' EO and related capabilities to achieve better performance (Dess et al., 2011) by allowing for multiple entrepreneurially oriented tasks to occur concurrently.

Generally, while EO positively influences firm performance (Wales et al., 2013), extant research supports our argument for polychronicity working through EO to enact performance. For instance, findings suggest that performance improves when top managers and decision makers consider multiple alternatives simultaneously (Eisenhardt, 1989), particularly in dynamic and uncertain environments (Judge & Miller, 1991), which is relatable to EO's proactiveness facet. Brown and Eisenhardt's (1997) research in the computer industry, examining multiple product innovation, showed the process of how organizations successfully manage multiple product development projects simultaneously and how that leads to firm performance. They found that firms can switch between exploration and exploitation when faced with rapid changes and coordinate activities that ultimately lead to enhanced performance. Recently, Sirén and colleagues (2020) suggested that polychronicity leads to better firm performance because it aids creativity and complex problem solving, which relate to EO's innovativeness facet. Regarding the EO facet of risk-taking, Schell and Conte (2008) posited polychronicity and error orientation (where risk-taking is a dimension) are related because they both impact behaviors that are associated with goals and how work gets done. In sum, founders' polychronicity complements

the proactiveness, innovativeness and risk-taking dimensions of EO (Lumpkin & Pidduck, 2021) by enabling the development, exploitation, and implementation of multiple ideas at once (Wales et al., 2013) which exemplifies how founders' characteristics can impact venture performance (Rauch et al., 2009).

Hypothesis 3. The relationship between founders' polychronicity and venture performance is mediated by entrepreneurial orientation.

[INSERT FIGURE 1 HERE]

3. Research Methods

3.1. Context, sample, and data collection

We collected data from Vietnam, a developing country in Southeast Asia to test our hypotheses. We considered Vietnam as our study context because the country's entrepreneurship ecosystem has seen steady improvements in recent years. For example, the country's business ownership rate is high (19.6%) compared to many countries in the Asian-Pacific context (GEM, 2022). Despite this, only about one in five businesses survive past their first three years (GEM, 2022). Thus, it is important to explore how founders' time-based characteristics (e.g., polychronicity) help the growth and performance of small ventures in Vietnam.

To collect the appropriate data for testing our hypotheses, we drew a nationally stratified sample of 780 ventures consisting of young ventures less than five years old with four or more employees from the Vietnamese National Business Register. We then drew a sample of ventures that were more than five years old to represent older ventures. The National Business Register is a comprehensive database of new ventures founded in Vietnam.

We conducted our study in three waves with responses from three different venture representatives to minimize common method bias (Podsakoff et al., 2003). In Wave 1 (May

2018), we sent a personalized packet with a letter, survey instrument, and a prepared returned envelope to the founders of the sampled ventures to solicit information about founder polychronicity. Of the 780 surveys, 17 ventures could not be reached, and their surveys were returned as non-deliverable, hence we received 276 completed surveys.

To attenuate common method bias associated with cross-sectional data, we contacted top managers (e.g., heads of human resources, operations, marketing, production) to capture EO in Wave 2. Founders who responded to Wave 1 provided contact details for a top manager that could take our Wave 2 survey. Accordingly, we emailed one top manager in each of the 276 firms with our questionnaire from which we received 256 matched and completed responses from the top managers in Wave 2.

Wave 3 of the survey was undertaken approximately 12 months after Wave 1. Accordingly, we contacted the finance managers (or chief accountants) of each firm with a questionnaire via email to capture the dependent variable (i.e., venture performance). The Wave 3 survey generated 252 responses, of which three were discarded due to missing information, resulting in 249 complete responses across all the three waves. Sample characteristics appear in Table 1.

[INSERT TABLE 1 HERE]

3.2. Measures

The constructs in this study were measured using seven-point, Likert-type scales with anchors ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Founders provided answers to the independent variable (i.e., polychronicity), moderating variable (i.e., venture age), and the control variables in Wave 1. Top managers who were not the founder or financial executive (e.g., marketing executive, operations executive) answered questions related to the mediating variable

(i.e., EO) in Wave 2, and finance managers (orchief accountants) responded to the venture performance measure in Wave 3. Table 2 displays the items, reliability and validity metrics, and the factor loadings of the multi-item measures.

[INSERT TABLE 2 HERE]

Polychronicity. The five items measuring entrepreneurs' polychronicity were taken from Bluedorn *et al.*, (1999). Recent studies show the validity and reliability of the polychronicity scale (Chen, 2022; Mohammed & Nadkarni, 2014).

Firm age. We measured firm age as the number of years since the venture was founded.

Entrepreneurial orientation. The items measuring EO were taken from previous research (e.g., Covin & Slevin, 1989; Miller, 1983). This scale represents three EO dimensions entailing innovativeness, proactiveness, and risk-taking.

Venture performance. We used lagged (one-year) performance data reported from heads of finance or accounting of the firms with complete surveys from Waves 1 and 2. We asked respondents in Wave 3 to compare their performance to their competition based on seven metrics: profitability, profit margins, return on investments, market share, return on assets, sales growth, and employee growth (Sheng et al., 2011). Following previous studies (e.g., Hmieleski & Baron, 2008; Hmieleski et al., 2012), we created an overall venture performance score by standardizing and then summing the comparative performance metrics.

Control variables. The following variables were controlled for because they may influence our research model (Adomako, 2021). The number of full-time employees was used to capture firm size. Entrepreneurial experience was measured using the number of previous firms founded by the entrepreneur (Hmieleski et al., 2012). Founders' age was measured as the number of years since the founder was born. Founders' education was assessed categorically (1 = high

school, 2 = higher national diploma, 3 = bachelor's degree, 4 = master's degree, 5 = doctoral degree). Finally, we controlled for industry type (0 = manufacturing, 1 = services).

[INSERT TABLE 3 HERE]

4. Results

4.1. Estimation approach and results

We estimated a confirmatory factor analysis in LISREL 8.80 (Jöreskog & Sörbom, 2006) to assess the measurement model of the multi-item constructs. The hypothesized five-factor model including polychronicity, innovativeness, proactiveness, risk-taking, and firm performance provided an acceptable fit (χ^2 [df = 179, N = 249] = 328.64, χ^2/df = 1.84, RMSEA = 0.06, NNFI = 0.93, CFI = 0.94, SRMR = 0.04). The five-factor model was superior to the alternative (1) three-factor model (innovativeness, proactiveness, and risk-taking combined) ($\Delta\chi^2$ = 96.43; Δdf = 7, p < 0.01), (2) two-factor model (polychronicity combined with EO) ($\Delta\chi^2$ = 192.37, Δdf = 9, p < 0.01) and (3) one-factor model (all latent constructs combined) ($\Delta\chi^2$ = 664.46, Δdf = 10, p < 0.01), which shows the distinctiveness of our multi-item constructs. As such, the assumption of discriminant validity is supported.

We also assessed the convergent validity of our indicators by assessing the factor loadings which were all greater than 0.50 and significant at (p < 0.01). Also, the Cronbach alpha, CR, and AVE were above their recommended threshold of 0.70, 0.60, and 0.50, respectively (Hair et al., 2019). This evidence lends support to our assumption of convergent validity. The descriptive statistics and correlations are reported in Table 4.

[INSERT TABLE 4 HERE]

4.2. Hypotheses testing

To test our hypotheses, we estimated six separate and nested structural models. For Models 1-3, the outcome variable was entrepreneurial orientation. For Models 4-6, venture performance was the outcome variable. First, we estimated the direct effect of polychronicity on EO ($\gamma = 0.56$, $p < 0.001$) and found support for Hypothesis 1. We then tested our moderation effect hypothesis with Model 3 (Table 5). The effect of the interaction between polychronicity and firm age on entrepreneurial orientation (Figure 2) was positive and significant ($\gamma = 0.12$, $p < 0.05$), which did not support Hypothesis 2 in the direction we proposed. To test Hypothesis 3, we estimated EO as a mediator between polychronicity and venture performance. Using a bootstrap sample of 10,000 with bias-corrected confidence interval in Hayes (2022) PROCESS macro 4.0, we found support for EO as a mediator of the relationship between polychronicity and venture performance (indirect effect = 0.25, 95% CI = [0.15, 0.35]). Results of the indirect effect are reported at the bottom of Table 5.

[INSERT TABLE 5 HERE]

[INSERT FIGURE 2 HERE]

4.3. Supplementary analysis

To check the robustness of our mediation and moderation analyses, we conducted a moderated mediation analysis. Using Model 7 in Hayes (2022) PROCESS macro 4.0, the results of the conditional indirect effect are shown in Table 6. The bias-corrected confidence interval estimate was based on 10,000 bootstrap samples. Specifically, we argued a first stage conditional indirect effect in which polychronicity influenced venture performance through EO and the intervening effect was moderated by firm age. The indirect effect at +1 SD above the mean and -1 SD below

the mean of firm age are reported in Table 6. The conditional indirect effect at the two levels of firm age was significant, albeit stronger for older firms ($\beta = 0.30$, $p < 0.05$; 95% CI = [0.18, 0.43]) than for younger firms ($\beta = 0.21$, $p < 0.05$; 95% CI = [0.12, 0.31]). This result shows that firm age moderated the indirect effect of polychronicity on venture performance through EO such that the indirect effect was stronger for older firms than for younger firms.

[INSERT TABLE 6 HERE]

5. Discussion

To our knowledge, there are no studies that examine how polychronicity impacts venture performance through EO. While extant literature has established a strong relationship between EO and performance (Rauch et al., 2009; Wales et al., 2013; Wiklund et al., 2009), there are few studies that link individual-level characteristics (e.g., polychronicity) to firm-level EO and venture performance (Donbesuur et al., 2020). This study addressed the questions of *how* and *when* founder polychronicity affects the performance of new ventures via a moderated mediation model. We argued that entrepreneurial orientation – as the strategic posture of the new venture – mediates the relationship between polychronicity and venture performance and proposed that the relationship between polychronicity and EO is moderated by firm age. Our results indicate that founder polychronicity operates through firm-level EO to positively affect venture performance, providing support for Hypothesis 1 and 3. We also found firm age moderates the relationship between polychronicity and firm-level EO, but differently than how we proposed; the effect was stronger for older firms instead of younger firms. We discuss the implications of these findings in detail below.

5.1. Theoretical contributions

Our study exhibits theoretical contributions regarding polychronicity phenomena to entrepreneurship and UET literature. First, our study adds insight for understanding polychronicity and how time is managed by founders of entrepreneurial firms (Souitaris & Maestro, 2010). Polychronicity is an important time-based characteristic that can add to the understanding of how EO functions in firms. Our findings contribute to the literature on polychronicity by providing evidence for how and when individual-level polychronicity impacts firm-level EO (Madjar & Oldham, 2006; Souitaris & Maestro, 2010) and, indirectly, venture performance. Our findings also build on the budding area of research regarding time in entrepreneurship and time-based resources (Sirén et al., 2019, 2020; Wadhwani et al., 2020). Time, as a finite and constantly fleeting resource, needs to be managed to give structure to work tasks. Thus, differences in the way time is managed can manifest advantages for those that coordinate their use of time in ways that complement their entrepreneurial venture's needs.

However, studies traditionally focus on static constructs of switching behaviors, which does not account for entrepreneurs need to address the back and forth of exploration and exploitation (Klonek et al., 2021). We showed that founder polychronicity helps strengthen EO and, subsequently, firm performance by enabling simultaneous and fast-switching behaviors – adding to the literature regarding how different elements of human capital can influence entrepreneurial activities (Miao et al., 2017) and how individual-level factors contribute to firm outcomes (Ward, 2004). This is important because founders have limited time resources and must dictate how their time is best used. Often, they maintain several roles in an entrepreneurial venture and must possess the ability to switch between these roles and/or perform their tasks simultaneously. This can affect the way their firm approaches opportunities, as shown herein. We find that founder polychronicity can be an advantage for entrepreneurial firms, and that this

advantage may manifest differently depending on firm age. In this way, we link founders' delegation of their time resources to their venture's performance and open the door for exploration of the nuances that surround such phenomena.

Contributing to the UET perspective, our findings point to a specific advantage for those founders with polychronic tendencies as part of their cognitive base attributes. As such, founders' decisions to utilize polychronic time delegation advantages, according to UET, can affect firm-level phenomena, like the way ventures manifest EO, as we show here. This is important for UET scholarship because it exemplifies how an individual at the top level of management can sway their venture's outcomes. Moreover, we add polychronicity and the way founders think about using and dividing their time to the known individual-level cognitive base attributes that affect firm performance.

Additionally, we demonstrate firm age as important when examining the link between polychronicity and EO. Founders are anticipated to make decisions influenced by contextual factors, including where the venture is in its life cycle (Lester et al., 2003; Mathias et al., 2018). Since entrepreneurial firms rarely make it to old age (Coad, 2018), investigating the age-difference effects of entrepreneurial firms can shed light on the characteristics of surviving ventures. Yet, most entrepreneurship research relegates firm age as control variable or ignores the construct altogether (Anderson & Eshima, 2013; McGee & Peterson, 2019). Interestingly, our sample of Vietnamese entrepreneurs and their firms provided results regarding firm age differences that contradict theory and evidence from extant research. For instance, new ventures generally require intense founder involvement due to high demands from urgent tasks (Jayaraman et al., 2000; Souitaris & Maestro, 2010) and must respond quickly to threats and opportunities from their external environment (Markman *et al.*, 2005) to overcome liabilities of

newness and smallness (Su et al., 2011). Additionally, scholars argue that younger firms are more flexible (Nadkarni & Herrmann, 2010) and have greater strategic leeway (Barker & Barr, 2002) than older firms. This evidence suggests founders of young firms would need to possess a strong ability to work on projects simultaneously and often shift between tasks as operations demand.

However, our results suggest this is not always the case. While our findings may be due to cultural or other institutional differences unique to the Vietnamese context, we ponder more generalizable rationale for our found effects. For instance, older firms may have an advantage (over younger firms) of having better research and development capabilities (Sánchez & Perez, 2002) and greater ability to effectively deploy slack resources (George, 2005), allowing them to accommodate more projects (Chen, 2022), which provides opportunities for polychronicity to be effective. Younger firms struggle with resource acquisition and possess fewer resources (Knockaert & Ucbasaran, 2013) due to the liabilities of newness and smallness (Rutherford et al., 2009), which could affect the number of projects and tasks available, limiting the applicability of founders' polychronicity. Additionally, mature organizations can leverage their experiences and expertise by honing their capabilities with a stronger sense of what affects performance. Younger firms can struggle with strategic development (Herhausen et al., 2021) because they do not always have the skills or knowledge needed for EO (Wiklund & Shepherd, 2003) and their exploitative learning may overshadow EO benefits (Hughes et al., 2007, 2018) as they struggle to integrate knowledge from one project to the next (Yi et al., 2021). Finally, established organizations can retain knowledge over long time spans, increasing organizational effectiveness (Leonard & Sensiper, 1998). Indeed, the cumulative experience in older firms has been shown to positively influence innovation and product development (Qian et al., 2013). Thus, older firms

may show a stronger relationship between polychronicity and EO because new ventures can lack the ability and discipline needed to fully support EO (McGee & Peterson, 2019) or the simultaneous tasks associated with proactively taking risks to explore and exploit potential innovations.

5.2. Practical considerations

Our study has several practical implications. First, we highlight the importance of polychronicity that can be used to influence strategic behaviors of a firm (Chen, 2022). Polychronic environments facilitate more collaboration, ability to handle multiple projects simultaneously, and quicker reactions to challenges that arise (Vizcaíno et al., 2021). This suggests that founder polychronicity might help establish norms that benefit firm strategies wherein speed and flexibility are paramount. An organization that supports polychronicity from the top down might hold advantages for performing multiple activities at once, like engaging with multiple stakeholders for continuous information flow, which could give an edge when adapting to unstable conditions (Slocombe & Bluedorn, 1999). Importantly, because external environments can change rapidly (e.g., Covid-19 pandemic), understanding and exploiting founder polychronicity may allow an organization to adjust more quickly than rivals and create advantages that ultimately lead to better performance (Sirén et al., 2020). For instance, polychronic activities influence key strategic behaviors and strategic flexibility in their employees (Picken, 2017) such that employees might adopt behavioral tendencies and preferences to work on tasks simultaneously (Souitaris & Maestro, 2010). Determining how to successfully divide their attention can help founders clarify roles and behaviors regarding how decisions get made and what behaviors facilitate stronger EO (Kearney et al., 2018).

Second, founders are likely to initiate EO strategies and take the necessary steps to encourage EO (Mousa & Wales, 2012). Our study suggests that founders who are polychronic can facilitate higher EO, which, in turn, impacts overall venture performance. Our findings support the need of founders to create an environment that supports their polychronic working style. By creating a constructive working environment (Bluedorn & Martin, 2008) and cultivating polychronicity support among organizational members (Bluedorn, 2002; Bluedorn et al., 1999), founders may further enhance the effects of their polychronic abilities.

Third, this study can provide insights for ventures at both incumbent and more mature stages of their lifecycles. For one, our study suggests that younger firms should be more engaged in polychronic-supported EO for increased performance. Generally, firms that are more entrepreneurial will perform better in the short and long-term and be able to sustain stronger performance benefits than those firms who do not embrace EO (Gupta & Gupta, 2015). While there seems to be a long withstanding assumption that older firms become less adaptable and entrepreneurial, our study highlights older ventures with active founders that embrace polychronicity can leverage their resources to be more effective with their EO. This finding can help founders and managers alike support entrepreneurial initiatives to match structural initiatives of the lifecycle stage the venture is in (Grégoire et al., 2011). Founders should choose the pace at which their tasks require attention rather than consistently succumb to the interest of the external environment or stakeholders (Sirén et al., 2019).

Our findings suggest that polychronic behavior within the firm should be nurtured and not seen negatively as inability to concentrate on the job at hand. In practical terms, this implies less importance being placed on sequential task completion and more emphasis being placed on the ability to multitask and work on several projects at once. On average, it is suggested that

individuals with higher preferences for polychronicity also have higher performance due to the heightened ability to multitask and meet the demands of complex working demands (Howard & Cogswell, 2022). Employers could create training programs or encourage more agile project methodologies and ways of working that would encourage multitasking rather than sequential task completion and create techniques to improve multitasking abilities (Piercy & Underhill, 2021). Polychronic individuals are also more likely to feel fewer negative consequences (like stress) of demanding environments (Finuf et al., 2022; Pachler et al., 2018) This could encourage managers and founders alike to place an emphasis on polychronicity as a tool for employee satisfaction and well-being ways to reduce exhaustion (Berger & Bruch, 2021). Polychronicity should also be encouraged by placing less emphasis on task specialization and time constraints considering the links to improved venture performance (Fournier et al., 2013) and improving stakeholder relationships (Vizcaíno et al., 2021).

5.3. Limitations and future research directions

This study has several limitations that can provide avenues for future research. For example, when examining firm age, younger firms may ultimately have lower performance during their critical years of growth (Littunen et al., 1998). Similarly, the understanding of what actual age constitutes new or established organizations is muddied in the literature, and EO may take several years to manifest and show benefits (McGee & Peterson, 2019; Zahra & Covin, 1995). Also, considering the cross-sectional design with a sample from Vietnam, causality claims and generalizability across environments is limited, making it increasingly important for more studies, with alternate methods, across different cultures (Barreto et al., 2022). While our study was conducted in the specific context of Vietnam, a Southeast Asian country and findings relate to a Vietnamese business context, many of the building theories in our research model were built

on Western theories highlighting the need to explore the generalizability of these concepts in context of other developing economies (Nguyen et al., 2015). For instance, Vietnam is one of the fastest growing Southeast Asian economies and has transitioned to a more open-market economy. This places emphasis on entrepreneurship and more participation in the world market (Roxas, 2021). This sample can be generalizable to similar emerging economies placing emphasis on the necessity of how polychronicity can help new venture survival given the resource constraints often inherent in new ventures in these complex developing economies. This also points to a future research opportunity to test whether the findings can be repeated in other contexts of more developed and established cultures, such as Western economies, or different stages of venture lifecycles. Also, bias may exist when examining subjective and perceptual data. Our sample was collected via surveying upper echelon individuals (i.e., TMT) and their perceptions may be different than the objective reality of outcomes that exist in the firm (Real et al., 2014).

Our results provide insight for the direct link between polychronicity and EO, and we contribute to understanding how polychronicity is beneficial in entrepreneurial settings (Kaplan, 2008; Leunbach et al., 2020). Yet, we did not directly account for the potential support of founders' abilities by their employees. For example, founders can influence how others get work done in the organization (Palmer et al., 2020; Shepherd et al., 2021). Since polychronicity was originally conceptualized as a facet of organizational culture and identity (Bluedorn et al., 1992), it is reasonable to wonder if founder polychronicity might contribute to the development of how other individuals in their venture operate and respond to organizational demands (Poposki & Oswald, 2010). According to organizational culture theory, polychronicity could influence how employees are expected to behave and act (Hogan & Coote, 2014; Wang et al., 2021). Indeed,

founders' values, norms, and beliefs in a firm influence the behaviors of their employees (Gutermann et al., 2017; Mouton et al., 2012; Ogbonna & Harris, 2001; Schein, 1995, 2010).

Additionally, although we examined one variable (i.e., firm age) that was theoretically derived to have a significant moderating effect on the linkage between polychronicity and venture performance through EO, it is possible that additional moderating variables exist. For example, entrepreneurs' self-efficacy (Chen et al., 1998; McGee et al., 2009) may heighten the odds polychronicity results in greater EO. Also, entrepreneurs' optimism (Dushnitsky, 2010) may enhance its ability to convert polychronicity into improved EO. Thus, we encourage future studies to consider these variables as potential moderators.

Finally, given the positive nature of our variables, one could argue for the possibility of having "too much of a good thing" (Pierce & Aguinis, 2013). Although we did not investigate curvilinear effects for polychronicity in this study, it is logical to argue that too much founders' polychronicity could cause new ventures to become overrun with task-switching costs that could distort the ventures effort to improve performance. Thus, it will be interesting for futures studies to investigate a curvilinear effect of polychronicity on venture performance through EO. Future studies may examine this relationship in a different context such as new ventures operating in developing countries such as those in sub-Saharan Africa.

6. Conclusion

This study examined *how* and *when* founder polychronicity affects firm performance of new ventures. By drawing on UET and examining firm age as a boundary condition, we provide evidence that founder polychronicity affects venture performance through EO. Our work is important in the discussion of founder-related effects on firm-level outcomes, like performance, and contributes evidence for the inclusion of specific founder traits, like polychronicity, for the

calculus of venture orientation. We hope our work inspires further research into these relationships that can provide important insights into how entrepreneurial ventures perform.

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Table 1. Demographic characteristics of the sample distribution

Variables	Sub-category	Frequent (*n*)	Percent (%)
Venture age	Younger	133	53.4
	Older	116	46.6
Venture size	0 – 9 employees	141	56.6
	10 – 20 employees	65	26.1
	21 – 30 employees	24	9.6
	> 30 employees	19	7.6
Entrepreneurial experience	< 1 year	124	49.8
	1 – 5 years	107	43.0
	6 – 10 years	8	3.2
	> 10 years	10	4.0
Industry	Manufacturing	168	67.5
	Service	81	32.5
Education	High school	89	35.7
	Higher national diploma	53	21.3
	Bachelor's degree	58	23.3
	Master's degree	42	16.9
	Doctoral degree	7	2.8

Note: *n* = 249. Venture age and industry are dummy variables

Table 2. Reliability and validity assessment

Constructs, details of measures, and reliability and validity results	λ (t-value)
Polychronicity (Bluedorn et al., 1999): CR = 0.78; AVE = 0.54; α = 0.78	
I like to juggle several projects at the same time.	0.65(Fixed)
I would rather complete an entire project every day than complete parts of several projects (r).	0.71(9.05)
I believe people should try to do many things at once	0.65(8.44)
I believe it is best to complete one project before beginning another (r)	0.64(8.32)
I believe it is best for people to be given several projects to perform	0.57(7.63)
Innovativeness (Covin and Slevin, 1989): CR = 0.82; AVE = 0.61; α = 0.82	
In our firm, we have a strong emphasis on R&D, technological leadership, and innovations	0.67(Fixed)
In our firm changes in product or service lines have usually been quite dramatic to achieve competitive advantage	0.82(10.83)
In our firm, one of the main goals is to launch many new lines of products/services in the next three years	0.85(11.7)
Proactiveness (Covin and Slevin, 1989): CR = 0.77; AVE = 0.52; α = 0.77	
In our firm, we tend to be ahead of competitors regarding the introduction of products and ideas	0.73(Fixed)
In our firm, we typically initiate actions which competitors then respond to	0.71(10.49)
In our firm, we are often the first to introduce new products and services, new ways to produce these, or new administrative methods	0.73(10.69)
Risk-taking (Covin and Slevin, 1989): CR = 0.80; AVE = 0.57; α = 0.80	
In our firm, we see bold, wide-ranging acts are necessary to achieve the firm's objectives	0.76 (Fixed)
In our firm, we have a strong aptitude for high-risk projects (with chances of high returns)	0.74(10.83)
In our firm my firm typically adopts a bold posture when confronted with decisions involving uncertainty, to maximize the exploitation of opportunities	0.76(10.69)
Firm performance (Sheng et al., 2011): CR = 0.89; AVE = 0.54; α = 0.89	
Profitability	0.71(Fixed)
Profit margins	0.76(11.11)
Return on investment	0.79(11.53)
Market share	0.73(10.73)
Return on asset	0.76(11.24)
Sales growth	0.75(10.98)
Employment	0.64(9.52)
Model Fit Statistics	
χ^2(df)	328.64(179)
χ^2/df	1.84
RMSEA	0.06
SRMR	0.04
NNFI	0.93
CFI	0.94

Table 3. Confirmatory factor analysis

Model	Description	χ^2	*df*	CFI	NNFI	RMSEA	SRMR	Δ from hypothesized model	
								$\Delta\chi^2$	Δdf
Hypothesized model	Five-factor model[a]	324.99	179	0.94	0.93	0.06	0.04	--	--
Model 1	Three-factor model[b]	421.42	186	0.91	0.90	0.07	0.05	96.43**	7
Model 2	Two-factor model[c]	517.36	188	0.88	0.86	0.08	0.06	192.37**	9
Model 3	One-factor model[d]	989.45	189	0.78	0.75	0.13	0.08	664.46**	10

Note*:* $^{**}p < 0.01$. χ^2 = chi-square; df = degrees of freedom; CFI = comparative fit index; NNFI = non-normed fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean squared residual.

[a]Five factors: Polychronicity; innovativeness; proactiveness; risk-taking; venture performance

[b]Three factors: Polychronicity; innovativeness, proactiveness, and risk-taking combined; venture performance

[c]Two factors: Polychronicity, innovativeness, proactiveness and risk-taking combined; venture performance

[d]One factors: Polychronicity, innovativeness, proactiveness, risk-taking and venture performance combined

Table 4. Descriptive statistics and correlations

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Polychronicity	4.82	0.86	1.00										
2. Entrepreneurial orientation	4.88	0.82	0.65^{***}	1.00									
3. Innovativeness	4.77	0.95	0.59^{***}	0.86^{***}	1.00								
4. Proactiveness	4.93	0.90	0.55^{***}	0.89^{***}	0.67^{***}	1.00							
5. Risk taking	4.93	0.95	0.57^{***}	0.87^{***}	0.58^{***}	0.69^{***}	1.00						
6. Venture performance	4.78	0.91	0.62^{***}	0.61^{***}	0.55^{***}	0.52^{***}	0.52^{***}	1.00					
7. Venture age	7.95	5.23	-0.06	-0.09	-0.02	-0.10	-0.12†	$-0.11^{\dagger}$	1.00				
8. Venture size	12.73	15.81	-0.35^{***}	-0.31^{***}	-0.21^{***}	-0.28^{***}	-0.31^{***}	-0.18^{**}	0.17^{**}	1.00			
9. Entrepreneurial experience	1.96	3.74	-0.04	-0.08	-0.03	-0.08	-0.09	$-0.11^{\dagger}$	0.25^{***}	0.16^{*}	1.00		
10. Industry‡	0.33	0.47	-0.14^{*}	-0.10	$-0.12^{\dagger}$	$-0.11^{\dagger}$	-0.03	-0.17^{**}	-0.05	-0.07	-0.16^{**}	1.00	
11. Education level[a]	2.30	1.20	-0.31^{***}	-0.34^{***}	-0.28^{***}	-0.30^{***}	-0.31^{***}	-0.24^{***}	$0.10^{\dagger}$	0.36^{***}	-0.01	-0.09	1.00

Note. $n = 249$, $^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. ‡Dummy variable: 0 = manufacturing; 1 = service.

[a]Education level: 1 = high school; 2 = higher national diploma; 3 = bachelor's degree; 4 = master's degree; 5 = doctoral degree.

Table 5. Structural model estimation

Variables	Model 1-3: Entrepreneurial orientation			Model 4-6: Venture performance		
Control variables						
Firm size⁂	-0.44(-5.93)***	-0.19(-2.90)**	-0.19(-2.79)**	-0.31(-4.10)**	-0.04(-0.58)	0.02(0.38)
Entrepreneurial experience⁂	0.01(0.21)	-0.02(-0.34)	-0.02(-0.39)	-0.02(-0.27)	-0.06(-0.99)	-0.05(-0.96)
Industry‡	-0.19(-3.03)***	-0.08(-1.41)	-0.10(-1.78)	-0.24(-3.69)**	-0.12(-2.21)*	-0.10(-1.88)
Education[a]	-0.19(-2.78)**	-0.11(-1.95)	-0.11(-1.94)	-0.13(-1.90)	-0.05(-0.86)	-0.01(-0.22)
Direct effects						
Polychronicity		0.56(8.39)***	0.58(8.59)***		0.60(8.26)***	0.40(5.57)***
Entrepreneurial orientation			0.02(0.30)			0.40(5.25)***
Firm age						
Two-way interaction effect						
Polychronicity × firm age			0.12(2.17)*			
Model fit indices						
χ^2/df	7.45/8	17.20/10***	19.87/14***	80.06/38***	84.288/44***	88.40/50***
R^2	0.30	0.53	0.55	0.18	0.44	0.52
ΔR^2	-	0.23	0.02	-	0.26	0.08
RMSEA	0.00	0.05	0.04	0.07	0.06	0.06
SRMR	0.02	0.02	0.02	0.04	0.03	0.03
NNFI	1.00	0.97	0.97	0.94	0.95	0.96
CFI	1.00	0.99	0.99	0.96	0.97	0.97
Indirect effect	Estimate	BootSE	BCCI(LL)	BCCI(UL)		
POLY→EO→VPER	0.245	0.051	0.146	0.349		

Note**:** n = 249. *p < 0.05; ** p < 0.01; ***p < 0.001; standardized coefficients are reported with t-values in parenthesis. ⁂natural logarithm of original values; ‡ dummy variables; [a] categorical control variable. POLY = polychronicity; EO = entrepreneurial orientation; VPER = venture performance. BCCI = Bias-corrected confidence interval; LL = lower limit; UL = upper limit

Table 6. Moderated mediation results for venture performance across levels of firm age

		Venture performance			
Moderator	Level	Indirect effect	Boot SE	BLL 95% CI	BUL 95% CI
Firm age	Younger firm (-1 SD)	0.21	0.05	0.12	0.31
	Older firm (+1 SD)	0.30	0.06	0.18	0.43

Note**:** n = 249. Bootstrap sample size = 10,000. LL = lower limit; CI = confidence interval; UL = upper limit.

Figure 1. Conceptual model

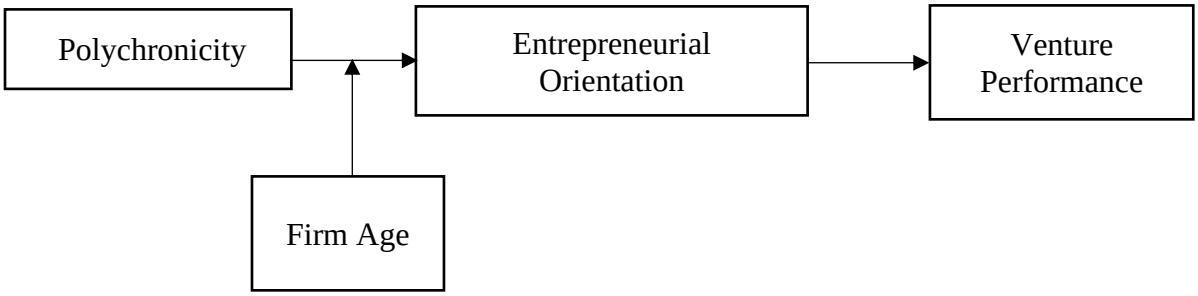


Figure 2. Interaction of polychronicity and firm age on enterpeneurial orientation

