Technological Forecasting & Social Change 209 (2024) 123779

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

journal homepage: www.elsevier.com/locate/techfore

Growing pains during scale-up hypergrowth: Integration and future research agenda

Kristel Moedt [a,*], Christian Lechner [b], Svetlana Khapova [a]

[a] Vrije Universiteit Amsterdam, The Netherlands
[b] LUISS Business School & University, Italy

ARTICLE INFO

Keywords:
Growing pains
Hypergrowth
Scale-ups
Organizational culture
Hiring
Leadership
Team composition

ABSTRACT

The hypergrowth of technological scale-ups is receiving growing research attention from TIM (Technology and Innovation Management) scholars. While much is researched and written about hypergrowth's strategic topics, scaling of technology, and physical assets, less attention is given to the internal challenges faced by rapidly and massively scaling firms. In this paper, we argue that if TIM scholars focusing on product development and new market entrance are to advance knowledge concerned with hypergrowth of scale-ups, they need to join the conversation with the general management scholars who focus on how to manage people in a rapidly developing context. We build our arguments by drawing on Penrose's theory of firm growth, which emphasizes that growth is a function of management capacity and possession of resources, and which suggests that massive scaling in one type of resource will lead to imbalances of other types of resources. We also draw on the cognitive theory of the firm, which suggests that a firm's priorities are the outcome of its top managers' mental models. Consequently, we put forward that technology-based firms, successful in technology scaling, will create issues and challenges on the human side of organizations. These challenges include HR issues, like hiring and turnover, leadership challenges, and organizational culture, which are often the focus of management research. To inspire new research, we review research evidence from technology and management literature integrating available evidence concerned with the "growing pains" of hyperscaling firms. We identify at least three important drivers of hypergrowth in technology scale-ups that affect the firm's internal processes: i) time pressure, ii) constant change, and iii) scarcity of resources. These context drivers put the workforce in a stressful situation due to a) expanding job demands, b) massive hiring, c) changing leadership requirements, and d) evolving organizational culture. We integrate our findings into an organizing framework that dynamically relates hypergrowth to effects in organizations. We conclude this paper with suggestions for how the growing pains can be addressed by future research on hypergrowth firms.

The number of scale-ups in the tech industry experiencing hypergrowth continues to rise (World Economic Forum, 2016). Rapid growth is often seen as an indication of technological scaling capacity (Gans and Quiggin, 2003; Mitra, 2005), market acceptance, and firm success (Feeser and Willard, 1990; Gjerløv-Juel and Guenther, 2012). For many technology-based firms, growth is not a goal in itself but a consequence of success, leading to scaling. However, for hypergrowth firms, massive and rapid scaling becomes the objective to increase their viability in the marketplace, stay ahead of competitors, and achieve sustainable market leadership (Chanut-Guieu et al., 2012; Headley et al., 2014; Lange et al., 2023; Picken, 2017). Failure to scale often means failure to survive (Sanasi et al., 2023).

Research in the technology and innovation management (TIM) domain has tended to focus on enablers of hypergrowth, like strategy, innovation, technology choices, manufacturing capacity, supply chain management, and other capabilities allowing for rapid and massive scaling (Chorev and Anderson, 2006; Guckenbiehl et al., 2021; Islam et al., 2020; Kakati, 2003; Lange et al., 2023; Maresch et al., 2023; Stanley et al., 1996; Venâncio et al., 2023; Vik et al., 2021; Walsh, 2004; Walsh et al., 2005). However, in Penrose's (1959) seminal work, she proposed that a firm's growth is a function of managerial capacity and the resources possessed by the firm. Those resources can be categorized as financial, human, and other productive resources (material and immaterial), including technology. For technology-based firms,

* Corresponding author at: Vrije Universiteit Amsterdam, Govert Flinckstraat 113h, 1072 EG Amsterdam, Netherlands.
E-mail addresses: k.m.moedt@student.vu.nl (K. Moedt), christian.lechner@luissbusinessschool.it (C. Lechner), s.n.khapova@vu.nl (S. Khapova).

https://doi.org/10.1016/j.techfore.2024.123779
Received 16 January 2023; Received in revised form 23 February 2024; Accepted 18 September 2024
Available online 30 September 2024

technology is a key asset alongside the organization's infrastructure (Stanley et al., 1996). We also presume that a firm's strategy, priorities of actions, and management attention are the outcome of the mental models of its top managers (Gavetti, 2012). However, this necessary attention focus, driven by bounded rationality (Ocasio, 1999), can lead to attention myopia concerning other and maybe more relevant issues (Lechner et al., 2020). Consequently, it is reasonable to assume that in technology-based firms, the top managers tend to be more focused on technology scaling, as well as technological, market, and organizational preparation for technological implementation (Vik et al., 2021).

Considering Penrose's theory of firm growth and taking a systematic perspective of hypergrowth enablers reveals that the system's bottlenecks, such as leadership, culture, and employee turnover, limit an organization's potential growth, especially in technology-based firms. We understand bottlenecks as the weakest elements within a system that determine the capacity limits of the entire system, in this case, the organization (Adner and Kapoor, 2010; Baldwin, 2015). While the lack of technological scaling would certainly limit an organization's growth (Gans and Quiggin, 2003; Vik et al., 2021), we argue that human-related issues within the organization of hypergrowth firms are the primary bottleneck during hypergrowth for technology-based firms. Enablers are not sufficient for understanding firms' hypergrowth if we do not understand potential barriers.

Specifically, we put forward that hypergrowth puts an organization and its employees under stress. Stress can be understood as a misfit between people and organizations related to competencies and new organizational and job requirements (French et al., 1974). Being part of a hypergrowth scale-up means engaging with high-paced talent acquisition, product development, market development, and internal restructuring (Chanut-Guieu et al., 2012; Kotter and Sathe, 1978; Piaskowska et al., 2021). It also means having an internal organization that is in a continuous state of chronic instability and stress as it needs to deal with turmoil, chaos, and significant inefficiencies while growing (Chanut-Guieu et al., 2012; Kotter and Sathe, 1978; Piaskowska et al., 2021). However, very few of these topics get published in the TIM journals.

In this paper, we argue that if scholars are to advance knowledge concerned with the hypergrowth of scale-ups in the TIM domain, they must be in dialogue with the general management researchers and focus on the study of not only, for instance, product development and new market entrance, but also how to manage people in a rapidly developing context. Considering our aim to serve technology and innovation management scholars and that we found little research concerned with the human side of hypergrowth in the TIM journals, this paper reviews what is known about the hypergrowth internal organization challenges faced by hypergrowth firms, referred to as 'growing pains', within the general management literature. We organize the findings into a framework that can serve as a starting point for new research and guide future investigations.

The hypergrowth growing pains can be characterized as challenges emerging due to insufficient organizational development at a particular growth stage, given the size and complexity of the business. Ironically, these challenges arise due to organizational success rather than failure. Going back to Penrose's (1959) notion, successfully scaling one type of resource, such as technology, would lead to issues for other types of resources and affect management capacity. In other words, growth in one phase leads to new bottlenecks in the next. The challenges to resolve new bottlenecks serve as indicators of organizational stress and signify the necessity for change if the organization aims to sustain its success (Flamholtz and Randle, 2016; Yeo and Park, 2018). In fact, the extent of growing pains experienced by an organization is associated with its future financial performance (Flamholtz and Randle, 2016).

The fundamental issue underlying growing pains is the insufficient development of the organization's infrastructure, encompassing its resources, systems, processes, structure, and culture. This inadequacy hampers the organization's ability to effectively support its size, complexity, and growth of business, resulting in the occurrence of growing pains (Flamholtz and Randle, 2016; Stanley et al., 1996). When an organization experiences a doubling in size across various dimensions, such as revenue, employee count, budget, production, or annual targets, it demands a different infrastructure. The faster the organization grows, the more challenging it becomes to align the infrastructure at the level required to support its growth. Failing to adjust the infrastructure accordingly will lead to an increased number and intensity of organizational growing pains (Flamholtz and Randle, 2016).

Consequently, in aiming to inspire new research, this paper integrates available evidence concerned with the "growing pains" of the firms' hypergrowth scaling and makes several valuable contributions. First, this paper is unique in offering a review of literature specifically focused on hypergrowth scale-ups. Unlike previous studies that predominantly examine antecedents, our research explores the consequences of hypergrowth and, more specifically, those related to the human side. By doing so, we shed light on the unique challenges of organizational development under time compression and uncertainty, contributing to developing a robust future research agenda in this domain. Second, by placing the growing pains within an organizing framework, we illuminate the sometimes complex interplay among these challenges and how resolving one growing pain can potentially trigger the emergence of subsequent ones. Third, by clarifying the consequences of hypergrowth, this review shows what specific growing pains companies are likely to experience and how these challenges can influence their (financial) performance. This contributes to a better understanding of the relationships between hypergrowth, organizational dynamics, and performance outcomes. Fourth, comprehending the existing findings allows us to understand whether and what entrepreneurial firms can learn from exceptional cases, such as hypergrowth firms (Aldrich and Ruef, 2018). It shows how entrepreneurial firms can leverage lessons from hypergrowth firms to inform their own growth strategies and practices.

We begin this paper with a brief introduction to hypergrowth firms. Next, we present the methodology used to derive the sample of the reviewed articles. We review studies and show that the literature can be organized into three indicators of firms' hypergrowth: time pressure, continuous change, and scarcity of (mainly human) resources. In turn, these hypergrowth characteristics trigger several growing pains, divided into four themes: changing job demands, extensive hiring, shifting leadership requirements, and development of organizational culture. We organize our findings into a theoretical framework of hypergrowth growing pains. This theoretical framework is the outcome of the conclusions of the literature review. Finally, we conclude this paper by offering a research agenda that connects the key constructs highlighted in our review and framework.

1. Hypergrowth scale-up firms: definition and conceptual boundaries

We begin this paper by clarifying the definition and conceptual boundaries of hypergrowth scale-ups, which comprise two sub-concepts: scale-up firms and hypergrowth. Scale-up firms occupy an intermediate stage of organizational development between the start-up and mature firm stages within the organizational life cycle. These firms pursue a high-growth strategy to achieve economies of scale (Piaskowska et al., 2021). A scale-up can be characterized as a relatively young and fast-growing firm that achieves accelerated growth and wealth creation based on the scalability of its business model (Williamson, 1991). Note that while every scale-up is a high-growth firm, not every high-growth firm can be classified as a scale-up (Monteiro, 2019). A high-growth firm undergoes an accelerated cycle of growth and wealth creation owing to factors such as market dominance and the realization of economies of scale. Conversely, a scale-up is a high-growth firm whose accelerated cycle of growth and wealth creation is fundamentally based on the scalability intrinsic to its business model (Williamson, 1991). In

some contexts, scale-ups or high-growth companies are also referred to as 'gazelles' or 'unicorns' (Aldrich and Ruef, 2018; Autio et al., 2000; Harnish, 2014; Moreno and Casillas, 2000; Senderovitz et al., 2016; St-Jean et al., 2008).

Despite existing research confirming the unique challenges faced by hypergrowth firms and their distinctive characteristics (Cassia and Minola, 2012; Markman and Gartner, 2002; Paleari et al., 2015; Senderovitz et al., 2016; Stanley et al., 1996), there is a lack of consensus regarding the definition and differentiation of hypergrowth from related concepts, such as high growth and rapid growth firms. For instance, Markman and Gartner (2002) define hypergrowth as organizations experiencing extraordinary growth patterns ranging from 500 to 30,000 % over five years. Other studies identify hypergrowth based on criteria such as sustained annual growth of 20 % for at least four consecutive years (Cassia et al., 2009; Cassia and Minola, 2012) or a minimum of 150 % growth in employment over four years (Halabisky et al., 2006). Flamholtz and Randle (2016) consider growth rates of 50 to 100 % per year as indicative of hypergrowth. Hambrick and Crozier (1985) refer to an accelerated growth phase, characterized by rapid progression through this phase typically driven by factors like technological breakthroughs, aggressive marketing, high market demand, limited competition, or a combination. Moreover, scholars and practitioners use the term 'blitzscaling' or 'massive rapid business scaling' to describe rapid, global growth with a focus on attaining a first-mover advantage and prioritizing speed over efficiency in an uncertain environment (Hoffman and Yeh, 2018; Lange et al., 2023; Sullivan, 2016).

The measurement of growth remains a topic of ongoing debate in numerous studies. Growth manifests in diverse forms and sizes, with indicators and formulas that consider different aspects. These aspects include inputs such as the number of employees, outputs such as sales, revenues, profits, and performance, and valuation measures like assets, book value, and market capitalization. Alternatively, a combination of these indicators can also be used to assess growth (Achtenhagen et al., 2010; Garnsey and Heffernan, 2005; Janssen, 2009; Josefy et al., 2015; Weinzimmer et al., 1998).

Additionally, some scholars have unconsciously investigated hypergrowth while using definitions that encompass rapid or high growth, often ranging from several hundred to thousands of percent (Cassia et al., 2009; Paleari et al., 2015). This can be observed in the works of Barringer and Jones (2004), Barringer et al. (2005), Feeser and Willard (1990), Fombrun and Wally (1989), Hambrick and Crozier (1985), and Markman and Gartner (2002).

In summary, previous literature has employed the term 'hypergrowth' somewhat freely within various theoretical debates, research domains, and empirical contexts. We can extract three defining elements from the literature. First, an intermediate organizational state; second, fast growth of resources; and third, time compression. Thus, in this paper, we define hypergrowth as *a phase in the organizational life cycle characterized by a rapid and massive scaling of organizational resources in an exceptionally short period of time*. In what follows, we present a literature review synthesizing evidence on the consequences of hypergrowth for the internal organization experienced by the firms as growing pains and can hinder organizational growth.

2. Review methodology

To ensure rigorous standards concerning quality, validity, and credibility, we conducted this review in an organized, transparent, and methodical fashion (Kunisch et al., 2023; Siddaway et al., 2019). Moreover, to execute and present the review of the existing literature with the utmost rigor, we followed a three-step protocol: data search, data analysis, and report (Siddaway et al., 2019; Tranfield et al., 2003).

The data search encompassed three steps. First, we used the Web of Science database to find articles related to firms' hypergrowth in TIM-related journals. We focused on the top ten TIM journals suggested by Linton and Thongpapanl (2004), such as Journal of Product Innovation Management, Research Policy, Research-Technology Management, R&D Management, IEEE Transactions on Engineering Management, Technological Forecasting and Social Change, International Journal of Technology Management, Technovation, Technology Analysis & Strategic Management, and Journal of Engineering and Technology Management. We searched these journals using a number of related search terms, such as high-growth firms, SMEs, rapid growth firms, scale-ups, firms scaling, massive rapid business scaling, gazelles, unicorns, blitzscaling, and new ventures.

We quickly made two observations. First, there are not many papers that focus specifically on hypergrowth. Instead, a frequent focus of the scale-up research is on high growth. Next, we observed that most of the research in high-growth scaling mainly focuses on enablers, like product development, strategy, technology scaling, and new market entry. Very few papers address internal organizational topics related to the hypergrowth of technology firms.

Consequently, we followed our plan to focus on learning about internal organizational topics related to the hypergrowth of technology firms from the management journals. Linton and Thongpapanl (2004) note that many management journals also publish research on technology and innovation management topics. Considering that management journals are more likely to publish papers on people and internal organizational issues, we continued our search through the Web of Science database by making word combinations. For example, we searched for articles that combined one of the above-mentioned search terms with terms like growing pains, challenges, problems, and tensions. In addition, we looked for the specific growing pains we address in this review, namely, those related to team composition, hiring, leadership, and organizational culture.

Finally, we decided to employ a backward snowballing approach (C. Parker et al., 2020) to retrieve relevant references used by other authors that could guide the knowledge creation on the topic of growing pains of hypergrowth firms. To do so, we checked references in the found articles to find more relevant papers. Additional articles were added to our sample when they matched one of the above-mentioned search terms. Some books were added when referred to by other scholars. Abstracts of the additional publications that were identified were also scanned, following the same selection criteria described above, to determine whether the publications were relevant for inclusion into the sample. The same snowballing procedure was applied to the added publications and was continued until no further relevant publications were identified. In total, 114 articles and 15 books were identified through snowballing and added to the sample.

To review papers, we established a review framework designed to capture the distinct attributes of each manuscript. These attributes included the article's aim or research question, title, abstract, year of publication, applied theoretical perspective, methodology (quantitative or qualitative), and levels or units of analysis, as well as the main findings. This framework served as a systematic repository, enabling us to store methodically, screen, analyze, and evaluate the documented literature throughout the subsequent stages. Additionally, it facilitated how we arrived at specific findings and conclusions (Siddaway et al., 2019).

In the final stage of our review, we synthesized the literature, presented our findings, and identified potential avenues for future research. A thorough analysis of the relevant articles allowed us to grasp the scope of the field and identify gaps in the existing literature. From this analysis, several overarching research themes related to the internal organizational challenges associated with firms' hypergrowth have emerged, which we present below.

3. Findings

If we acknowledge the existence of enablers of growth, such as technology scaling and infrastructure development, and take hypergrowth as a cause, the question arises, What issues are caused that

potentially could inhibit further growth? We identified three key characteristics of hypergrowth scale-ups frequently addressed by the literature: time pressure, continuous change, and scarcity of (mainly human) resources.

3.1. Indicators of firms' hypergrowth

3.1.1. Time pressure

The reviewed articles revealed two roles of time in the context of firms' hypergrowth: hypergrowth creates time pressure, and due to time pressure, hypergrowth must take place. Whereas for many firms growth is not a goal in itself but a consequence of success, hypergrowth firms make growth their primary objective to enhance their market viability, outpace competitors, and achieve sustainable market leadership (Chanut-Guieu et al., 2012; Headley et al., 2014; Kotter and Sathe, 1978; Lange et al., 2023; Picken, 2017). Failure to scale often means failure to survive (Sanasi et al., 2023). A significant portion of hypergrowth firms experience rapid growth for only a short period (Delmar et al., 2003), and critical tasks such as hiring and decision-making must be executed within this significantly compressed time frame. Unlike companies with more gradual growth, hypergrowth firms must rapidly mobilize and leverage various resources (e.g., financial, human, information, relational) in a very short period (Chanut-Guieu et al., 2012; Halabisky et al., 2006; Kotter and Sathe, 1978; Markman and Gartner, 2002). Furthermore, the rapid pace of transformation and the pace at which decisions must be made in fast-growing companies creates significant strain on the organization. This may overwhelm many individuals unaccustomed to such intensity (Chanut-Guieu et al., 2012; Hambrick and Crozier, 1985; Kotter and Sathe, 1978), leading to organizational stress. Organizational stress can be defined as a misfit between the resources available within an organization, including its workforce, and the demands necessary for optimal functioning (French et al., 1974). This stress arises from external factors, in this case, hypergrowth, and compels both the organization as a whole and individuals within it to adapt and deviate from their usual behaviors (Beehr and Newman, 1978). In their research, Kotter and Sathe (1978) highlight a CEO of a rapid-growth firm who had to make more critical business decisions in a month than a CEO of a steadily growing company would make in a year.

3.1.2. Continuous change

Research shows that hypergrowth acts as a stress factor that induces constant changes in employees, job demands, functions, structures, systems, products, and markets (Chanut-Guieu et al., 2012; Gjerløv-Juel and Guenther, 2012; Kotter and Sathe, 1978; Lange et al., 2023). Consequently, in this dynamic environment, activities like career planning become increasingly challenging. Establishing clear rules and policies to guide people also becomes more difficult, as does the development and implementation of stable organizational routines. Hypergrowth necessitates employees to continuously let go of the familiar routines and adapt to new situations, which can create stress and uncertainty. Additionally, the constant changes make it difficult to establish operational efficiency, as can be achieved in more stabilized companies (Chanut-Guieu et al., 2012; Gjerløv-Juel and Guenther, 2012; Kotter and Sathe, 1978). Furthermore, the process of change triggers the need for even more change to maintain organizational balance. An increase in revenues often necessitates hiring more employees, leading to intensified recruitment and training efforts. Subsequently, new employees or customers prompt the need for more sophisticated systems and processes, calling for recruiting specialized functions. All these activities must be done under significant time constraints and require additional resources (DeSantola and Gulati, 2017; Kotter and Sathe, 1978).

3.1.3. Scarcity of resources

Finally, the reviewed studies revealed that a third characteristic of hypergrowth is the scarcity of resources. This scarcity is twofold, involving both financial resources and the workforce. It arises due to the mismatch between existing resources and the fast-changing needs of the organization. Consequently, a hypergrowth firm often overstretches its current resources and must be cautious not to overextend itself (Bantel, 1998; Chanut-Guieu et al., 2012; Kotter and Sathe, 1978; Mohr et al., 2014). The staffing shortage results from the firm's rapid expansion, which often outpaces its ability to attract enough skilled employees and set up adequate day-to-day systems to support employees. Thus, firms grow faster than they can hire or effectively integrate new hires. As such, the people become a bottleneck: the existing workforce becomes overloaded and stressed by the increasing pace, while not enough appropriate people can be hired in time. Similarly, financial resource limitations are frequently encountered because hypergrowth demands envisioning on a larger scale than the current organizational size allows (Chanut-Guieu et al., 2012; DeSantola and Gulati, 2017; Kotter and Sathe, 1978). Therefore, growth requires firms to think, plan, and act for an expansion of hiring, systems, markets, and other resources beyond what their current financial resources can comfortably support and what the present organizational size would typically demand. Indeed, anticipating technology scaling leads to scarce human and financial resources. Hypergrowth firms are often cash-starved, and acquiring the necessary resources becomes crucial, requiring tapping into financial systems, such as banks or investors, even if it means incurring significant debt. This places them in a precarious position, as the pressure to grow may shift their focus more towards seeking and exploiting growth opportunities than efficiently managing their acquired financial resources (Baum et al., 2001; Stevenson and Jarillo, 1990).

3.2. Growing pains

Hypergrowth creates continuous, radical change under time pressure and uncertainty. It can give rise to dynamic issues and challenges that, in turn, restrain further growth, commonly known as the 'Penrose effects' (Lee, 2014; Penrose, 1959). Interestingly, these challenges tend to intensify the faster a firm grows, highlighting the fragility of high growth (S. C. Parker et al., 2010). As a result, it poses challenges for leadership and human resource practices (Church and McMahan, 1996) as well as organizational development and culture (Zellers and Wooley, 2022). However, our systematic analysis of the extant evidence showed that the emerging literature on the firms scaling has made limited efforts to integrate findings on the consequences of firms' hypergrowth for the internal organization, particularly regarding the organizational stress manifested as 'growing pains'.

Through the literature review, we identified four key themes, each associated with underlying growing pains caused by organizational stress: (a) the changing job demands, (b) extensive hiring, (c) the shifting leadership requirements, and (d) the development of the organizational culture as it evolves during this process. Table 1 provides an overview of the organizational hypergrowth indicators and with which growing pains they are associated.

3.3. Continuously expanding job demands

The first significant challenge identified in the hypergrowth context is the continuous evolution of job demands. This challenge encompasses the recruitment, selection, and onboarding of a large number of people within a short period of time, as well as the impact of these changes on team composition. Team composition refers to the background and experiences of the people occupying various roles within the organization (Beckman and Burton, 2008; Nadler and Tushman, 1980). Managing these dynamic job demands and ensuring a cohesive and effective team composition is a crucial area of focus during hypergrowth.

A growing body of research has examined how the experience and qualities of organizational members impact its growth and development (Florin et al., 2003). Simultaneously, team stability allows team members to gain a better understanding of each other's capabilities, having a

Table 1
Key growing pains during scale-up hypergrowth.

Hypergrowth indicators	Description	Related growing pains	Example references
Time pressure, continuous change, and scarcity of resources	Hypergrowth occurs under high time pressure and is accompanied by constant changes in employees, job demands, structures, systems, products, and markets, along with a scarcity of financial resources and employees.	• Work pressure, uncertainty, and stress due to a lack of (right) people and an ever-changing environment. • Short-term focus, lower morale, dissatisfaction, physical problems, absenteeism, decreased productivity, increased turnover, high turnover, and replacement costs.	• Chanut-Guieu et al., 2012 • Kotter and Sathe, 1978 • Flamholtz and Randle, 2016 • French et al., 1974
Expanding job demands	During hypergrowth, jobs grow faster than people can keep up, and the organization requires different skills and experiences in each stage.	• Early hires unable to keep up with the organizational growth. • Need for more specialists instead of generalists. • Hiring experienced, functional specialists creates frustration among existing colleagues.	• Boeker and Wiltbank, 2005 • DeSantola and Gulati, 2017 • Gulati and DeSantola, 2016 • Hellmann and Puri, 2002 • Hofer and Charan, 1984 • Hoffman and Yeh, 2018 • Sofer, 1961
Massive hiring	Hypergrowth requires the recruitment, selection, and onboarding of a large number of people in a short period to fuel further growth.	• Difficulties in synchronized team building due to unexpected situations and the constant emergence of new positions. • Teams do not have time to wait for an ideal candidate. • Managers have insufficient time to assess candidate suitability. • Lack of seasoned employees for onboarding new hires leads to more mistakes and people feeling lost. • People do not know what others in the company are doing. • Lack of visibility into others' roles and responsibilities, leading to difficulties in getting things done. • Teams work in isolation.	• Brush et al., 2009 • Galbraith, 1982 • Lee, 2014 • Penrose, 1959 • Rich, 1999
Changing leadership requirements	Managing a team in hypergrowth requires a continually evolving set of leadership competencies	• Disagreements between top management and middle management regarding the suitability of the middle manager. • Managers feel they lack time to manage their team. • Difficulty in having management suitable for the right growth stage. • Rapidly changing required substantive expertise for managers. • Frustration among current managers when experience is brought in from outside. • Founders struggle to identify the right management talent.	• Barringer and Jones, 2004 • Church and McMahan, 1996 • Gulati and Sawhney, 2019 • Hambrick and Crozier, 1985 • Tansky and Heneman, 2003
Evolving organizational culture	Hypergrowth will lead to instability in the company's culture.	• Founders relinquish control over culture evolution. • Founders cannot be involved in selecting new employees and conveying culture. • Large number of new employees distort the original culture. • Clash between old and new culture. • Perceived differences between real and nominal culture.	• Baron and Hannan, 2002 • Donate and Guadamillas, 2010 • Gregory, 1983 • Harrison and Carroll, 1991 • Kuratko et al., 2020 • Peters and Waterman, 1982 • Lawrence and Lorsch, 1967 • Picken, 2017 • Schein, 1983, 2017 • Sutton and Rao, 2014

positive effect on task allocation, collaboration, and firms' ability to maintain their competitive advantage (Agrawal and Ljungqvist, 2014; Berk et al., 2014; Kogut and Zander, 1996; Nahapiet and Ghoshal, 1998). However, achieving and maintaining team stability becomes complex during hypergrowth due to the rapid changes and demands faced by the organization.

In situations of high growth, the first complexity is that the expansion of job roles often outpaces the individual's personal growth and development. Those recruited during the start-up phase have not grown at the same pace as the organization and lack the necessary skills and expertise required for the next phase (DeSantola and Gulati, 2017; Galbraith, 1982; Gulati and DeSantola, 2016; Hoffman and Yeh, 2018; Kotter and Sathe, 1978). Job titles assigned to early employees often exceed their experience, resulting in a rapid increase in the technical demands of their roles without sufficient time for skill acquisition (Galbraith, 1982). Most people have skills and experiences that optimize them for a particular stage, and not every person can effectively grow with each stage of the company (Hoffman and Yeh, 2018). Those who were instrumental in the organization's early stages may be severely unsuited to its later stages (Sofer, 1961). Consequently, hypergrowth can lead to a situation where the organization soon reaches the limits of its team members' capabilities.

Secondly, during rapid growth, organizations quickly undergo a shift in the skill set they require, favoring specialists over generalists. In the start-up phase, the organization needs versatile people and (technical)

generalists who can get many different things done in an uncertain and rapidly changing environment (Galbraith, 1982; Hoffman and Yeh, 2018). However, the scale-up phase demands functional specialists who possess expertise in areas crucial for further scaling the organization (Galbraith, 1982; Hofer and Charan, 1984; Hoffman and Yeh, 2018). This hiring and turnover process leads to a transformation from an old guard consisting of founders and early adopters to a new guard of seasoned professionals (Boeker and Wiltbank, 2005; Galbraith, 1982; Hellmann and Puri, 2002), often resulting in a different working style within the organization.

The third complexity is that in the start-up phase, people are often attracted to join a company due to the non-bureaucratic climate, the potential for equity, the ability to make a significant impact, the opportunity to acquire valuable experience rapidly, and the potential for leveraging the start-up experience as a springboard to enhance their labor market position (Coad et al., 2014; Galbraith, 1982). During this stage, there is still a high level of interaction among team members and little need for formal structures (Galbraith, 1982). Success is believed to be driven by the collective energy, commitment, confidence, and unity within the organization, facilitated by the absence of rigid structures. However, as the organization grows and transitions into the next phase, the need for increased structures becomes evident. New hires possess more specialized skills, and new functions are quickly introduced. Consequently, both managers and employees are required to hand over tasks they previously handled themselves, resulting in a narrowing of their roles, which can often be perceived as a loss of autonomy and a source of discontentment (Galbraith, 1982; Hoffman and Yeh, 2018).

Finally, the hiring of experienced, functional specialists often creates frustration and tension among existing colleagues, even when they themselves prefer to maintain a generalist role rather than a specialist position and find the scale-up process itself nerve-wracking (Gulati and Sawhney, 2019; Hoffman and Yeh, 2018; Kotter and Sathe, 1978). They may see the newcomers as intruders and opportunists because they did not contribute during the challenging initial period. Additionally, there may be a sense that the newcomers were hired under time pressure (Hambrick and Crozier, 1985) and may feel frustrated about the loss of authority (Gulati and Sawhney, 2019). The hiring of these new functional specialists is often accompanied by efforts to implement systems and create more structure within the organization. However, this can encounter significant resistance from the early joiners, who were attracted to the company because of its non-bureaucratic atmosphere (Galbraith, 1982; Hoffman and Yeh, 2018). The clash between the need for structure and the preference for a dynamic, entrepreneurial environment can create internal conflicts. As a result, this friction may result in employee turnover, with departing employees taking with them the critical tacit knowledge of the company, the culture, and potentially strong customer relationships established since the organization's inception (Gulati and Sawhney, 2019).

3.4. Massive hiring

During hypergrowth, team composition does not occur in a vacuum. It is a critical aspect highly influenced by the recruitment and assimilation of new team members. Rapid growth requires the recruitment, selection, and onboarding of a large number of people in a short period of time to sustain and propel further expansion (Hambrick and Crozier, 1985; Kotter and Sathe, 1978; Lee, 2014; Penrose, 1959), thereby creating a self-reinforcing cycle of growth (Garnsey et al., 2006). Moreover, it is argued that higher employment growth can enhance a firm's chances of survival (Almus, 2004; Phillips and Kirchhoff, 1989). However, this process poses significant challenges for high-growth companies, leading to complexities and considerations that need to be addressed (Hellmann and Puri, 2002; Tansky and Heneman, 2003).

First, it can be argued that contrary to the earlier statement, an initial phase of rapid employment growth eventually decreases the likelihood of survival and results in lower employment growth and higher employee turnover. Despite high-growth firms outperforming other companies in the short term, their rapid expansion of employment creates initial instability, which ultimately hampers their long-term efficiency (Gjerløv-Juel and Guenther, 2012).

Secondly, synchronized team building is often necessary for teams like Engineering, Sales, and Support. However, the reality is that it rarely unfolds as intended. In practice, one team may struggle to match the pace of growth and next the sales team's performance unexpectedly falls behind. Additionally, the constant creation of new functions within the organization further exacerbates the challenge, leading to a continuous shifting of the problem from one team to another (Galbraith, 1982). As a result, strategic workforce planning becomes nearly impossible as the dynamic nature of the organization makes it hard to predict and align team capabilities effectively.

Moreover, in gradually growing companies, there is often the luxury of waiting for the ideal candidate to step forward for a position. Experienced colleagues who have been with the organization for a while can then train this new hire. However, high-growth firms do not have this luxury. They must be able to recruit new employees very quickly, otherwise, the teams will collapse under the work pressure (Kotter and Sathe, 1978). One of the most prevalent organizational growing pains is the work overload and the excessive stress perceived by employees, especially when there is a shortage of people or the right people to get the job done (Flamholtz and Randle, 2016; Kotter and Sathe, 1978). Both employees and teams feel like they are constantly playing catch-up but never succeed in doing so (Flamholtz and Randle, 2016), resulting in a lack of attention to important long-term issues while focusing solely on short-term urgencies (Flamholtz and Randle, 2016; Kotter and Sathe, 1978). Consequently, morale may decline, dissatisfaction may increase, and physical health problems may arise due to heightened stress levels (Flamholtz and Randle, 2016; Schuler, 1980). This can lead to increased absenteeism and, therefore, decreased productivity or increased employee turnover, which, in turn, leads to significant turnover and replacement costs (Flamholtz and Randle, 2016).

Consequently, recruiting the right people for this scale-up phase becomes a critical, major management activity (Galbraith, 1982). However, the faster a firm grows, the less time managers have to thoroughly assess the suitability of candidates (Barringer and Jones, 2004; Flamholtz and Randle, 2016). When a company is able to attract and retain skilled and capable employees, it increases the likelihood that the company can effectively implement and maintain its growth-oriented strategy (Rich, 1999). Insufficient investments in recruiting the right people and making poor hiring choices can lead to misalignment between new employees and the organizational needs, resulting in increased organizational stress and a negative impact on overall morale (Faith et al., 1988).

The next significant hurdle hypergrowth firms need to take is the onboarding and effective training of new colleagues (Brush et al., 2009; Kotter and Sathe, 1978). When only a small percentage of the team consists of new members, it is not a major issue if they are not fully assimilated within a short period. However, when 20 to 50 % of the team is new, the speed of their onboarding becomes crucial. In many cases, these newcomers join a team without seasoned employees who can teach them the ropes and familiarize them with the culture, structure, and processes gradually. It is not unusual for the existing team members to have only recently joined. Additionally, due to limited time and the need to address only pressing issues, the onboarding process for new team members is often deprioritized. As a result, new colleagues may feel lost, and the risk of mistakes increases as they lack full training or close supervision (Kotter and Sathe, 1978).

Subsequently, amid tremendous team growth, a typical other growing pain arises: many colleagues are unaware of what others in the company are doing, and roles and responsibilities are not clearly defined. People struggle to grasp the exact nature of their own jobs and how their work relates to their colleagues' work. Moreover, the organizational structure, including both the implicit and explicit line of

authority, often becomes unclear (Flamholtz and Randle, 2016; Gjerløv-Juel and Guenther, 2012). This lack of clarity can lead to frustration, as individuals find it difficult to navigate the organization and may feel compelled to take matters into their own hands to get things done. Furthermore, it results in teams independently interpreting and delineating responsibilities, fostering team isolation and discussions within the organization (Flamholtz and Randle, 2016), and it hampers the development of efficient organizational routines (Gjerløv-Juel and Guenther, 2012). Also, Penrose (1959) argued that if a firm expands at a pace faster than individuals within the organization can build the necessary experience and familiarity with each other and the firm, it will result in reduced efficiency and hinder the firm's ability to compete effectively in the market, leading to a period of stagnation.

In conclusion, the organization must dedicate significant time to the recruitment, selection, training, and integration of new colleagues to cope with changing organizational requirements caused by hypergrowth. However, these efforts to mitigate organizational stress can inadvertently lead to organizational stress, which may impede further growth, a phenomenon known as the 'Penrose effect' (Penrose, 1959).

3.5. Changing leadership requirements

Previous research indicates the crucial role of founders in high-growth organizations (Barringer et al., 2005; Beckman and Burton, 2008; Hellmann and Puri, 2002). However, managing a rapidly growing firm requires a different set of leadership competencies, experience, and knowledge compared to starting and managing a new venture (Boeker and Karichalil, 2002; Boeker and Wiltbank, 2005; Green and Ashton, 1992; Hellmann and Puri, 2002; Lange et al., 2023; Shepherd and Patzelt, 2022). These competencies play a significant role in a firm's growth potential, as they put strong limits on the level of expansion a firm can handle when external growth barriers are absent (Penrose, 1959). Given the turbulence associated with rapid growth, it is vital for executives and managers, not just the founders, to be equipped to respond effectively to the external environment and the resulting internal changes (Church and McMahan, 1996; Gartner and Moro, 2024; Lange et al., 2023; Siepel et al., 2017; Zhu, 2020). It is a constant balancing act between fulfilling immediate needs and capitalizing on opportunities, within the constraints of limited resources (Ferguson et al., 2016) further compounding organizational stress.

The first complexity in this situation revolved around the divergent viewpoints among leaders. Top management and middle management often have differing perspectives on the suitability of the middle manager (Kotter and Sathe, 1978). Top management hesitates to delegate responsibilities, believing that middle management is not ready yet. On the other hand, middle managers often perceive a lack of delegation, where they are given responsibilities without sufficient authority, as top management still retains decision-making authority, reminiscent of when the company was smaller (Flamholtz and Randle, 2016; Kotter and Sathe, 1978). This dynamic is particularly prevalent during the transition to professional management and traces back to the days when the founder made all the decisions. However, the perception that only top management is authorized to make decisions reduces the effectiveness of lower-level managers (Flamholtz and Randle, 2016). Moreover, managers often struggle to find time to focus on team management as they are still engrossed in technical work. This issue arises due to either a lack of clearly defined manager's roles or insufficient training to equip managers with the necessary skills for their positions. Although high-growth firms recognize these challenges, they often lack the time and resources to invest in training and upskilling their managers (Tansky and Heneman, 2003). As a consequence, managers may feel uncertain about the expectations and ultimately prioritize their previous work tasks over managerial responsibilities (Flamholtz and Randle, 2016).

Secondly, finding suitable management for the right growth stage becomes challenging as job requirements rapidly change during hypergrowth. The same management position in companies of vastly different sizes imposes entirely different demands on the persons occupying those roles (Kotter and Sathe, 1978). Hambrick and Crozier (1985) highlight that the management skills required in a 1000-person company greatly differ from those needed in a 100-person company. Therefore, strong managerial skills tend to be scarce when the company has reached that size quickly. In addition, when companies experience rapid growth, the required substantive expertise for managers rapidly evolves. "The financial vice-president who was adept at establishing controls and reports may not be well-suited to the new tasks of cultivating the financial community, managing currency fluctuations, or dealing with complex tax problems" (Hambrick and Crozier, 1985, p. 36). Leaders tend promote loyal employees who came on board in the early stages as managers. While this may initially seem effective in shifting from individual contributors to managers, rapid growth quickly reveals their inadequacy for the position (Hambrick and Crozier, 1985; Kotter and Sathe, 1978). Scaling an organization soon requires establishing an executive layer to facilitate effective functioning. In the start-up phase, the manager and executive roles are often fulfilled by the same person, but these are distinct positions. The transition from manager to executive is considerably more challenging than the transition from individual contributor to manager, and organizations often require experienced executives from outside (Hoffman and Yeh, 2018). Addressing the challenge of a manager no longer right for the job is something many founders find very painful (Hambrick and Crozier, 1985), but it is essential to address for organizational growth, as executives themselves must be capable of driving further expansion (Hoffman and Yeh, 2018). Therefore, successful companies tend to hire new officers or directors with experience in larger organizations proactively, as "preparation for the next phase of growth" and recognizing that it is easier to prevent chaos than to correct it (Hambrick and Crozier, 1985; Siepel et al., 2017). Nonetheless, this transition poses its own set of challenges.

Existing managers, often promised career advancement, may feel discontented when experienced leaders are brought in from outside (Galbraith, 1982; Hoffman and Yeh, 2018). The new executives and managers often gain considerable influence, potentially leading to an adversarial relationship with the original managers who are used to collegial, personalized problem-solving among members of the 'family' (Hambrick and Crozier, 1985). Additionally, bringing in experienced leaders can sometimes result in the layoff of current managers. It can cause great uncertainty among employees who may not understand the underlying reasons. This can negatively impact morale and increase turnover (Flamholtz and Randle, 2016). Moreover, while these new leaders are hired for their experience, there is a risk that they will introduce their own corporate ideas, personnel philosophies, and ways of doing things, which may significantly differ from the organization's established practices, requiring some unlearning for the new leaders (Kotter and Sathe, 1978). Even highly experienced individuals need time to integrate into the organization's culture (Barringer and Jones, 2004). An open mindset is crucial, according to Hoffman and Yeh (2018), as current managers must be receptive to ideas from the new executives, while newcomers must be willing to learn from what happened before they arrived.

In this regard, founders also grapple with whether to hire individuals who have previously scaled a company or those who possess the capabilities to. Identifying the right talent can be challenging due to their limited experience (Gulati and Sawhney, 2019). Companies tend to hire experienced managers from larger organizations under the assumption that these individuals know how things should be done and that their experience will prove beneficial in later stages (Hoffman and Yeh, 2018). However, there is some indication that individuals in leadership positions enter with a specific level of competencies that hardly develops (Gaddis, 2018). Besides, hiring someone who has managed on a much larger scale can actually be counterproductive, as the skills needed at each growth phase differ significantly. Therefore, it is crucial to hire individuals who are well-suited to the current growth stage and possess

relevant experience for that specific phase (Hoffman and Yeh, 2018), otherwise, even leadership might become an organizational bottleneck.

3.6. Evolving organizational culture

The fourth theme revolves around the dynamic nature of organizational culture during hypergrowth. While many scholars view organizational culture as a sustainable concept (Baron and Hannan, 2002; Dobrev and Barnett, 2005; Peters and Waterman, 1982; Quinn and Cameron, 1983; Schein, 1983, 2017), others refer to the evolving nature of organizational culture in the context of rapid growth (DeSantola and Gulati, 2017; Gulati and DeSantola, 2016; Gulati and Sawhney, 2019; Hoffman and Yeh, 2018).

Organizational culture can be defined as "a set of rules, values, and beliefs that are shared by a firm's members and which conditions their behaviors, along with the configuration of the firm's image and identity in relation to its environment" (Donate and Guadamillas, 2010). While scholars acknowledge that culture can be a major strategic asset - as it is difficult to replicate - and a significant predictor of organizational success or problems (Flamholtz and Randle, 2016), not many studies examine organizational culture within hypergrowth organizations. Culture is typically critical in this context, as it impacts how individuals behave in the absence of explicit policies and rules or when existing ones reach their breaking point (Hoffman and Yeh, 2018), which constantly occurs during rapid growth. Culture can even serve as a substitute for rules. According to Hoffman and Yeh (2018), as a culture becomes stronger, the need for stringent rules to manage behavior diminishes.

It is evident from research on organizational culture that founders and early executives play a decisive role in shaping the culture of an organization (Baron and Hannan, 2002; Dobrev and Barnett, 2005; Peters and Waterman, 1982; Quinn and Cameron, 1983; Schein, 1983, 2017). Founders, in particular, have the unique opportunity to shape a culture that reflects the values, beliefs, and norms to support and reinforce the organization's purpose and strategy (Schein, 1983). Failing to pay attention to this aspect can result in the development of a dysfunctional culture that undermines the success of the organization (Picken, 2017). Scholars widely believe that once a culture is established, it is sustained through the selection of new employees, socialization and role modeling, organizational rituals, and the way people are promoted and rewarded (Deal and Kennedy, 1982; Donaldson and Lorsch, 1983; Geertz and Darnton, 2017; Kotter and Sathe, 1978; Smircich, 1983). Critical determinants in shaping culture include the areas where founders direct their attention, how they respond to critical organizational incidents, their role modeling and coaching behaviors, what they reward and recognize, and their decisions regarding hiring, selection, promotion, and dismissal. While visible aspects of organizational culture, such as rituals and symbols, and formal statements, like written values, are important, they must be aligned with the founders' behavior to avoid cultural conflicts (Schein, 1983, 2017). Schein (1983, 2017) underlines that organizational culture is adaptive and dynamic but also emphasizes that certain aspects of culture endure over time if they are deeply embedded into the organization.

In contrast to the belief that organizational culture is self-sustaining, scaling fast poses exceptional challenges to maintaining a stable culture (Hoffman and Yeh, 2018), often resulting in cultural instability within the company. One of the reasons is that founders may let culture evolve on its own, rather than being deliberate about its development (Gulati and Sawhney, 2019). When a firm begins to scale, founders are often preoccupied with more immediate and pressing issues, causing culture to take a back seat (Gulati and Sawhney, 2019). Companies experiencing rapid growth are sometimes compelled to compromise on cultural and ethical considerations to meet their ambitious growth plans (Kuratko et al., 2020). Once the culture moves in an undesirable direction, it can lead to major strategic and employee-related issues that are difficult to reverse (Gulati and Sawhney, 2019). Examples of companies that have faced such challenges include Uber (Isaac, 2017; Partington and Pratty, 2021; Witteman, 2019).

Second, the organic transfer of culture requires time and personal interaction with the founders (Hoffman and Yeh, 2018). However, as the pressure to rapidly double in size mounts, founders and early leaders can no longer be directly involved in selecting all new hires (Harrison and Carroll, 1991). When the firm reaches a particular size, founders also become less able to play a central role in conveying the organizational culture (DeSantola and Gulati, 2017; Hoffman and Yeh, 2018; Sutton and Rao, 2014). Some leaders may also be limited in their ability to use cultural management tools, which further dilutes the culture (DeSantola and Gulati, 2017). Moreover, during rapid expansion, there are often insufficient settled employees available to effectively transfer cultural meanings to the large influx of new colleagues (Kotter and Sathe, 1978).

Third, there is a risk that the influx of many newcomers can distort the original organizational culture. While founders play a critical role in defining the culture, it evolves over time through the presence and actions of many people. Individuals tend to interpret the culture in ways that meet their own needs and preferences. Additionally, new coworkers bring their own expectations shaped by their professional training and previous work experiences, which may cause further differentiation of cultural meanings inside the organization (Baker and Aldrich, 1994). As a result, cultural meanings may no longer be uniformly applied, and the emergence of subgroups resulting from growth can, therefore, interpret organizational culture, including attitudes and behaviors, in different ways (DeSantola and Gulati, 2017; Gregory, 1983; Lawrence and Lorsch, 1967).

The aforementioned three challenges may contribute to the discrepancy between the real culture and the nominal culture in growing firms. The real culture refers to the actual behaviors and norms that employees observe and experience within the organization, while the nominal culture represents the culture that the organization has formally defined on paper. Employees may express discontent when leaders attempt to formally codify and manage the culture because they perceive inconsistencies between their actual experiences and the stated company culture (Turco, 2016). When culture is not managed effectively, a clash may arise between the old and the new culture, which, in turn, can hinder the successful implementation of strategies and affect the overall success of the entire company (Hoffman and Yeh, 2018).

Prior research understands that culture should evolve over time to support organizational growth. However, this should be managed rather than uncontrolled change, and firms must transition from organic cultural transmissions to deliberate cultural shaping (Hoffman and Yeh, 2018). As the Dutch historian Johan Huizinga said: "If we are to preserve culture, we must continue to create it."

4. Synthesis and an organizing framework

To synthesize our literature review findings, we developed Fig. 1. The figure shows that positioned between the start-up and mature stages of the organizational life cycle, scale-ups are characterized by their high-growth strategy aimed at achieving economies of scale (Piaskowska et al., 2021). This high growth can turn into hypergrowth, presenting numerous challenges. Despite limited research on hypergrowth firms, theoretical streams agree that hypergrowth is accompanied by time constraints. Firstly, hypergrowth is needed to rapidly achieve market leadership (Chanut-Guieu et al., 2012; Headley et al., 2014; Picken, 2017). Secondly, hypergrowth places intensive time pressure on many tasks and decision-making processes (Chanut-Guieu et al., 2012; Hambrick and Crozier, 1985; Kotter and Sathe, 1978). Consequently, organizations operating in a stage of hypergrowth experience continuous stress as their resources are stretched thin and they face a permanent lack of resources (Chanut-Guieu et al., 2012; Kotter and Sathe, 1978). To overcome the resource misfit, firms must actively realign their resources to meet organizational needs, which leads to continuous change at both individual and organizational levels. This continuous change further amplifies organizational stress and presents challenges in effectively

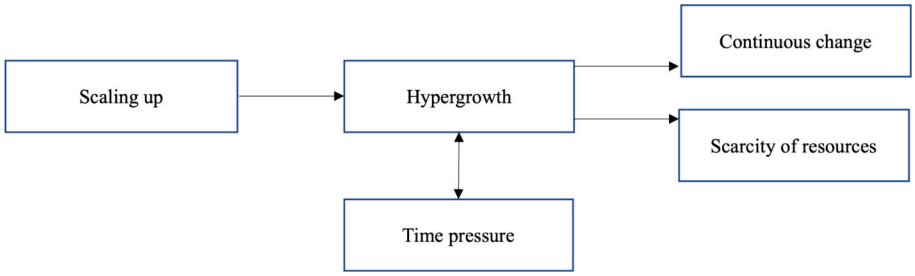

Fig. 1. Interplay of hypergrowth and its direct consequences.

managing and adapting to it.

The framework highlights the cyclical nature of hypergrowth, wherein the pursuit of rapid growth creates stress and the need for change, which, in turn, generates additional stress. This iterative process emphasizes the dynamic and demanding nature of hypergrowth and underscores the criticality of effectively managing change and organizational stress to navigate the challenges associated with hypergrowth. An unbalanced scaling of resources will lead to bottlenecks due to scarcity of other resources. Especially, technology scaling up (as input) will lead to an unbalance of the workforce as hiring can hardly keep up with the pace of growth.

To help make sense of the various themes, organizational stress, growing pains, and their relationships, we developed a second, coherent framework depicted in Fig. 2, which both summarizes and generalizes the main findings. As human resources appear to be the bottleneck, scarcity of qualified staff leads to a series of effects. This organizing framework illustrates our view that the various growing pains are not sequential but interconnected and that the resolution of one growing pain leads to the emergence of the next. Each growing pain represents a significant challenge on its own, and if unaware of their interrelation, they may interact and create a downward spiral.

The continuous changes and resource constraints lead to stress at the individual and organizational levels. Employees often feel overwhelmed by the lack of time and find themselves focusing solely on the most pressing, short-term issues (Kotter and Sathe, 1978). This intense work environment can also lead to various mental health complaints, including stress, uncertainty, frustration, dissatisfaction, lower morale, and burnout, as well as physical health issues (Galbraith, 1982; Gulati and Sawhney, 2019; Hambrick and Crozier, 1985; Hoffman and Yeh, 2018; Kotter and Sathe, 1978). From the organization's perspective, these stress-related challenges can result in increased absenteeism, decreased productivity, and a higher employee turnover, exacerbating the existing resource shortage and ultimately affecting overall firm performance (Gulati and Sawhney, 2019).

The continuous changes due to the hypergrowth result in shifting job demands for both employees and leaders. Early hires cannot keep up with the organization's growth and often lack the necessary skills and expertise for the next phase of expansion (DeSantola and Gulati, 2017; Galbraith, 1982; Gulati and DeSantola, 2016; Hoffman and Yeh, 2018; Kotter and Sathe, 1978). The organization begins to need more functional specialists than generalists to support further scalability (Galbraith, 1982; Hofer and Charan, 1984; Hoffman and Yeh, 2018). The demands placed on managers and their required expertise also evolve, and discussions emerge between top management and middle management regarding leadership approaches (Hambrick and Crozier, 1985; Kotter and Sathe, 1978; Tansky and Heneman, 2003). Founders face challenges in hiring people who are the right fit for the specific growth phase, particularly considering their own lack of experience (Gulati and Sawhney, 2019; Hoffman and Yeh, 2018). These changing job demands for employees and leaders contribute to physical and mental complaints, including the harmful effects on the entire organization.

To cope with the changing job demands and alleviate individual and organizational stress, hypergrowth firms often resort to recruiting large numbers of new employees. It is already a challenge in itself to synchronize the recruitment process across all teams (Galbraith, 1982) and prioritize the quality of hires over quantity (Barringer and Jones, 2004; Faith et al., 1988; Galbraith, 1982; Kotter and Sathe, 1978). At the same time, however, this also creates a new wave of growing pains. Recruitment becomes one of the major activities for management (Galbraith, 1982), further adding to their time constraints and work pressures (Tansky and Heneman, 2003). Furthermore, the onboarding process for the large influx of new employees becomes challenging in an environment characterized by constant change, resource scarcity, and time constraints. This creates a weak onboarding process (Brush et al., 2009; Kotter and Sathe, 1978) and a lack of clarity regarding role divisions and responsibilities among teams and employees, causing siloed working practices (Flamholtz and Randle, 2016). When recruitment, selection, and onboarding processes are not properly executed, it directly impacts firm performance (Kuratko et al., 2020; Penrose, 1959).

Rapid growth creates instability in the organizational culture of hypergrowth firms (Kuratko et al., 2020). The combined factors of organizational and individual stress, as well as the influx of new employees, contribute to this instability. Founders have limited time and attention to devote to culture as they focus on more pressing issues related to rapid growth (Gulati and Sawhney, 2019). Additionally,

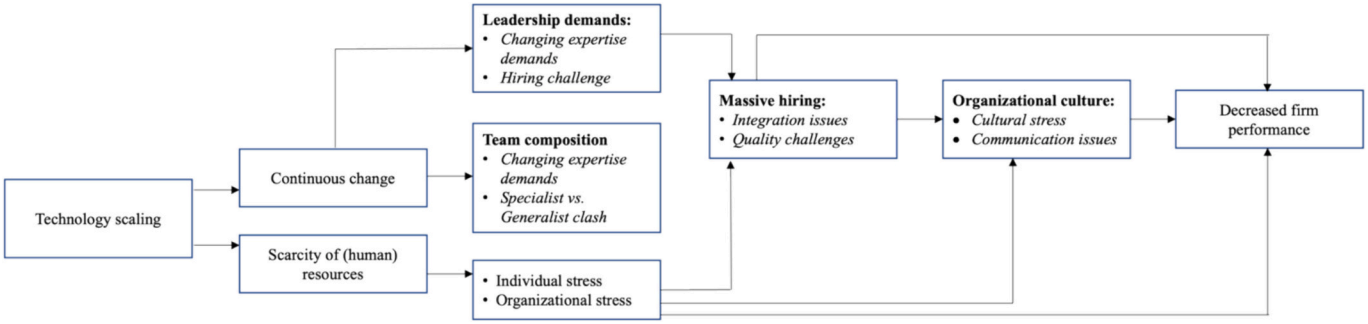

Fig. 2. An organizing framework of growing pains focused on human resources.

founders are no longer able to be involved in the selection process for all new employees and conveying organizational culture to them (DeSantola and Gulati, 2017; Hoffman and Yeh, 2018; Sutton and Rao, 2014). As a result, there is a risk of culture dilution (DeSantola and Gulati, 2017) and a potential clash between the old and new cultures within the organization (DeSantola and Gulati, 2017; Gregory, 1983; Hoffman and Yeh, 2018; Lawrence and Lorsch, 1967). This can lead to discrepancies between the real, perceived, and intended cultures as defined by the organization (Turco, 2016), which can affect the success of the entire company.

Going through hypergrowth is accompanied by a range of growing pains that can significantly impact the future financial performance of the organization. Coping with growing pains is complicated because they are interconnected, and addressing one can lead to the emergence of the next growing pain. Where, for example, recruitment of a large number of people may be seen as a solution to combat other symptoms, it creates a new flood of challenges. It is, therefore, crucial to pay attention to the organization's infrastructure, i.e., the organization's resources, systems, processes, structure, and culture, to support the size, complexity, and growth of the organization. Neglecting or insufficiently addressing this can exacerbate growing pains and lead to a downward spiral for the organization.

5. Discussion and implications for future research

Hypergrowth is a function of a firm's management capacity and the resources possessed by the firm at a given point in time (Penrose, 1959). A firm's strategic focus and attention because of bounded rationality is then driven by the mental models of its top managers (Bueters, 2023; Gavetti, 2012; Ocasio, 1999). In technology-based firms, issues of technology scaling, manufacturing capacity, and market readiness (Nick et al., 2021) might drive a firm's attention and the resulting growth. This realized growth could be threatened by the resulting bottleneck, namely the lack of qualified staff. This paper aimed to address firms' growing pains associated with hypergrowth, leading to rapid and massive scaling. If we take technology scaling as a given, what happens to a fast-growing technology-based organization? Considering the limited availability of studies addressing the consequences on the human side of hypergrowth, this paper relied on the review of a broader pool of research on firms' hypergrowth in TIM and management journals. We identified at least three important characteristics of the technological firms' hypergrowth that affect the firm's internal processes: i) time pressure, ii) constant change, and iii) scarcity of resources. The consequence of hypergrowth in one stage is the generation of bottlenecks in the subsequent stage, commonly understood as growing pains. We identified four key themes, each with related growing pains, for the firms' internal organizational processes that need to be addressed by the hypergrowth firms' literature: a) expanding job demands and massive hiring, b) changing leadership requirements, and c) evolving organizational culture. We integrated our findings into an organizing framework. Below, we discuss the opportunities our findings offer for future research on hypergrowth firms.

5.1. Hypergrowth

The first opportunity concerns future research on the technological firms' hypergrowth. There has been a notable increase in scholarly attention on high-growth firms and, to a lesser extent, on hypergrowth firms. However, this attention has primarily focused on understanding the drivers of rapid growth. We argue that there is a significant need for more research that connects hypergrowth to its consequences. Hypergrowth not only creates organizational stress but also necessitates rapid and substantial organizational change. To delve deeper into the effects of hypergrowth and how they evolve, it would be valuable to gain a better understanding of how and why hypergrowth influences organizations. Longitudinal data and case study research can offer valuable insights in this domain. Furthermore, it is essential to explore effective strategies for managing these effects to ensure that hypergrowth organizations are not disadvantaged by their own growth. Current theories are unlikely to apply directly, requiring, instead, theory extension or the development of new theories.

There is also an opportunity to differentiate between high-growth and hypergrowth firms, particularly their internal dynamics. Often, high-growth and hypergrowth are merged, or their differences are overlooked, obstructing knowledge creation. As a result, it has been challenging to draw a comprehensive distinction in this review. Therefore, there is considerable opportunity for exploring how the internal organization is impacted during periods of high growth and hypergrowth. Although some consequences may remain consistent irrespective of the exact rate of growth, hypergrowth firms are likely to experience them with greater intensity, and there may be distinct differences that require unique management approaches for hypergrowth. Differentiating between high-growth and hypergrowth can contribute significantly to the TIM and entrepreneurship literature and provide an important bridge to the management literature.

5.2. Technological interplay

The next opportunity concerns the impact of hypergrowth on technology. This review primarily focuses on human-related issues in hypergrowth firms, which might be caused by anticipated technology scaling. However, it is important to acknowledge that hypergrowth can present many other challenges deserving attention. For instance, there may arise issues related to product development and supply chain management as a consequence of hypergrowth, such as VanMoof, a Dutch bicycle manufacturer, which encountered technology and service problems during hypergrowth, leading them to file for bankruptcy (Nick et al., 2021). For certain human-related problems, technology can serve as a facilitator or provide solutions, such as automating some service functions, highlighting the interplay between technology and human issues during hypergrowth. The framework derived from the literature review would also allow for a reverse relationship. If one considers a people-intensive and not technology-driven industry, such as services, we see that workforce growth leads to technology bottlenecks and that, subsequently, technology scaling is necessary. However, for technology-based firms, this direction appears less likely. To gain a comprehensive understanding of hypergrowth, it would be valuable to explore the role of technology in driving rapid growth and the influence on technology-related and human-related topics as a consequence of hypergrowth.

Furthermore, exploring the interplay between technology and human-related aspects is crucial in understanding how firms scale during hypergrowth. The assumption is that industries with high levels of technological development and automation are less likely to experience rapid employment growth for firms operating within them (Belitski et al., 2022). Hence, conducting research on the interconnectedness of hypergrowth firms that focus on different technologies, and their employment acceleration can provide valuable insights into the dynamics of these rapidly growing organizations.

Lastly, we have argued that technology scaling leads to a bottleneck on the human side. Historically, technology has partially replaced human labor in production through the advent of machines and robots. There are indications that AI may similarly reduce the need for human involvement in administrative and managerial tasks in fast-scaling ventures, potentially alleviating stress on the human side. Future research could explore the interaction between AI and rapid scaling.

5.3. Team composition

While we are gaining a deeper understanding of changing job demands and team composition during hypergrowth, current research has only scratched the surface of this research topic. While research has broadened our understanding of founders and top management of new

ventures (Beckman and Burton, 2008; Boeker and Karichalil, 2002; Boeker and Wiltbank, 2005; Ferguson et al., 2016; Gartner and Moro, 2024), much remains unknown about employees' experiences in the rest of the organization. Future research should explore whether employees can sustainably work in hypergrowth scale-ups for extended periods or if they are more likely to succumb to individual stress factors or the lack of knowledge and experience needed for subsequent growth phases. Understanding how hypergrowth scale-ups can influence the development of early joiners is crucial, as the experience and qualities of organizational members directly correlate with the firm's growth and development (Florin et al., 2003). It may prove valuable to commit them to the organization for a longer period of time and not let them leave prematurely with all the knowledge, cultural understanding, and strong customer relationships they have.

Moreover, there is more to learn about the ideal balance between early-hired generalists and later-joined specialists within hypergrowth scale-ups. Given the wide range of challenges in such organizations, finding ways to optimize collaboration between generalists and specialists becomes crucial. Although selecting specialists has been shown to be important for high growth, research suggests that retaining and leveraging the expertise of generalists is equally valuable for sustaining growth, due, in particular, to their valuable culture and organizational knowledge, as well as their adaptability in tackling new and pressing challenges (Coad et al., 2014; Hoffman and Yeh, 2018).

5.4. Hiring

In addition to research on changing job demands and team composition, there is ample room to explore the topic of talent acquisition and onboarding during hypergrowth. It is not merely about hiring quickly; it is also about hiring right. Understanding how hypergrowth scale-ups can effectively attract, assimilate, and retain high-quality employees, even under significant time constraints, will be critical to ensuring the organization's long-term success.

One key area of exploration is identifying the specific qualities, competencies, and mindset that individuals need in order to not only survive but thrive in a hypergrowth environment. This goes beyond the standard job descriptions and qualifications. What character traits, such as adaptability, resilience, and a growth-oriented mindset, are essential for employees to weather the rapid changes and high-pressure situations accompanying hypergrowth?

Furthermore, exploring innovative and efficient hiring processes that balance speed with quality is essential. It is crucial to set up hiring processes that enable organizations to rapidly onboard new talent while ensuring the right fit for the roles. Striking this balance is vital to prevent hasty hiring decisions driven solely by the immediate need for staff, which could potentially lead to mismatches and increased work pressure on existing teams. Again, there is some evidence of a wave of new startups (Sifted, 2022) focused on partially automating the hiring process, indicating how the technology and human sides can interact.

Additionally, strategies for onboarding and integrating new employees quickly and effectively into the existing team and company culture warrant in-depth examination. By extending research to the employee level of the organization and examining these multifaceted aspects of talent acquisition, we can shed light on key issues related to managing teams during scale-up hypergrowth and contribute to the development of best practices in attracting, selecting, and nurturing the right talent for sustainable success.

5.5. Leadership

Considerable scholarly attention has been paid to the role of the founder and top management teams in new ventures (Beckman and Burton, 2008; Boeker and Karichalil, 2002; Boeker and Wiltbank, 2005; Ferguson et al., 2016; Gartner and Moro, 2024). However, there is a need for research to go beyond the upper echelons of the organization and understand the role of middle managers during hypergrowth. Early employees transitioning into managerial roles often face new challenges and expectations as the organization rapidly expands. The pressure to perform and adapt to their new responsibilities can lead to difficulties in meeting job expectations. Subsequently, more experienced individuals may be hired to oversee these early managers, potentially causing negative emotions and prompting some to leave the organization. Exploring how we can effectively train, mentor, and upskill first-time managers during hypergrowth is crucial to ensure their success in evolving roles. Additionally, understanding how to maintain them when they eventually have to cede their positions or job titles to new hires is important in retaining valuable talent and organizational knowledge. It is essential to examine leadership at all levels of the organization during hypergrowth. As Hambrick and Crozier (1985) pointed out, high-growth companies are strong enough to survive many challenges except one: mismanagement.

5.6. Organizational culture

Although we are beginning to understand how organizational culture is influenced during high growth and hypergrowth, there is still much to uncover regarding the impact of hypergrowth on organizational culture and to which extent culture survives during this period of explosive growth. Current research has highlighted the challenges of sustaining organizational culture as many new people join scale-ups, the lack of personal interaction with founders to transfer culture, and the potential disruptions caused by newcomers, policies, and processes or simply a lack of attention to culture. However, it seems we are only starting to gain an understanding of organizational culture in this context and how it evolves. The field has made some important steps along this path by exploring the stability of cultural systems over time versus the potential dilution because of growth in entrepreneurial ventures (DeSantola and Gulati, 2017). Although hypergrowth scale-ups are entrepreneurial ventures, extending this research to other hypergrowth scale-ups and considering factors like the high influx of new colleagues and intense time pressure under which hypergrowth scale-ups operate will be meaningful to determine whether important aspects are different and consequential.

Consequently, it would be beneficial to gather a deeper understanding of what the right organizational culture looks like during hypergrowth. A potential angle to further explore this may be through the lens of individual and organizational resilience to cope with stress. Resilience refers to "the process by which an actor (i.e., individual, organization, or community) builds and uses its capability endowments to interact with the environment in a way that positively adjusts and maintains functioning prior to, during, and following adversity" (Williams et al., 2017). Resilient entrepreneurs, able to quickly adapt to the ever-changing business needs and who can deal with uncertainties, have been shown to be better equipped to succeed (Ayala and Manzano, 2014). This concept could equally apply to individuals, teams, and organizations as a whole during hypergrowth.

To conclude, the present review exposes many unanswered questions related to how founders and leaders of hypergrowth scale-ups can spread, reinforce, and evolve the culture. Longitudinal studies and case studies can significantly contribute to understanding cultural developments during hypergrowth and could increase our understanding of the underlying processes that either support or undermine the organizational culture.

5.7. People practices

There are research opportunities to extend and develop new theories on the relationship between hypergrowth and people ("HRM") practices. Such research can build on management research on HRM practices to explore how hypergrowth scale-ups can weather disruptive growth with the support of robust people, policies, and practices.

The nature of entrepreneurial firms is distinct from that of established companies, and traditional theories, methods, and frameworks cannot be transferred to the former (Barber et al., 1999; Cardon and Stevens, 2004; Heneman et al., 2000; Zott and Amit, 2007). Drawing on this research, we expect that people practices should be deployed differently in hypergrowth scale-ups. This raises questions about which policies and practices are most effective at the organizational level, how they can support the founder and leadership team, and what benefits they bring to employees during hypergrowth. Existing research has already indicated a positive correlation between HR practices and high growth in organizations (Lopez-Garcia and Puente, 2012). Future research can explore both the direct and indirect impact of people practices in a hypergrowth context. There might be instances when people practices have a positive or negative relationship with hypergrowth. Therefore, it is crucial to understand how these practices influence growth and how these impact the organization, including all employees.

6. Limitations

While conducting this literature review, it is important to acknowledge several limitations that may have influenced the outcomes of our research. First, a notable limitation arises from the lack of articles addressing the concept of hypergrowth. This scarcity led us to broaden our inclusion criteria to encompass articles related to high-growth firms, which may not entirely align with the unique characteristics and challenges associated with hypergrowth. Consequently, including high-growth literature may have introduced some variability in the findings, potentially affecting the specificity of our conclusions. Second, our review primarily focused on four key themes: team composition, hiring practices, leadership dynamics, and organizational culture. While these themes represent essential internal aspects of hypergrowth, we recognize that there are additional dimensions and consequences of hypergrowth, internal as well as external, that we have not extensively explored. For example, building upon research centered around the role of network communities in hypergrowth firms (Iurkov et al., 2023). Limiting our focus to these four themes may have resulted in an incomplete representation of the full spectrum of challenges and implications associated with hypergrowth. Third, we took technology scaling as an enabler of growth, leading to a bottleneck in staffing. This does not mean that technology, market, and manufacturing readiness are not critical, but their inclusion would be beyond the scope of this literature review, which is more focused on the consequences of hypergrowth in technology-based firms. Moreover, a systematic literature review does not allow for theory testing or development of theory, but its conclusions can show future avenues for research. In conclusion, the limitations mentioned above underscore the need for future research to look deeper into the unique aspects of hypergrowth and explore a more comprehensive range of its consequences.

7. Conclusion

Hypergrowth scale-ups inevitably encounter growing pains that arise from time constraints, organizational changes, and the scarcity and misfit of resources. While growth is often perceived as a sign of success, it also comes with downsides. Exploring the phenomenon of growing pains as stress symptoms resulting from hypergrowth can provide valuable insights for researchers and practitioners seeking to understand the underlying processes crucial for a firm's long-term survival.

The increasing number of high-growth firms has turned this area into a vibrant field of study in recent years. While previous research has made valuable contributions to our understanding of factors driving high growth, our review highlights the need for further conceptual work to fully grasp the impact of hypergrowth. Specifically, we invite future research to focus on examining the growing pains of firms' hypergrowth. Through the review of extant research, we identified four areas that require more research: a) expanding job demands, b) massive hiring, c) changing leadership requirements, and d) evolving organizational culture. We believe that continued research on hypergrowth will contribute to an even richer, more complete, and, ultimately, more accurate understanding of how hypergrowth firms can align their internal organization to ensure long-term prosperity.

CRediT authorship contribution statement

Kristel Moedt: Writing – original draft. **Christian Lechner:** Writing – original draft. **Svetlana Khapova:** Writing – original draft.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT in order to improve language. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Declaration of competing interest

We have no conflict of interest to disclose.

Data availability

No data was used for the research described in the article.

References

Achtenhagen, L., Naldi, L., Melin, L., 2010. "Business growth"—do practitioners and scholars really talk about the same thing? Entrep. Theory Pract. 34 (2), 289–316. https://doi.org/10.1111/j.1540-6520.2010.00376.x.

Adner, R., Kapoor, R., 2010. Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations. Strateg. Manag. J. 31 (3), 306–333. https://doi.org/10.1002/smj.821.

Agrawal, A.K., Ljungqvist, A., 2014. Managerial labor market frictions and corporate investment. SSRN Electron. J. https://doi.org/10.2139/ssrn.2456758.

Aldrich, H.E., Ruef, M., 2018. Unicorns, gazelles, and other distractions on the way to understanding real entrepreneurship in the United States. Acad. Manag. Perspect. 32 (4), 458–472. https://doi.org/10.5465/amp.2017.0123.

Almus, M., 2004. The shadow of death – an empirical analysis of the pre-exit performance of new German firms. Small Bus. Econ. 23 (3), 189–201. https://doi.org/10.1023/B:SBEJ.0000032033.00519.00.

Autio, E., Arenius, P., Wallenius, H., 2000. Economic Impact of Gazelle Firms in Finland. Helsinki University of Technology, Department of Industrial Engineering and Management, p. 18. https://www.researchgate.net/publication/266471628_economic_impact_of_gazelle_firms_in_finland.

Ayala, J.-C., Manzano, G., 2014. The resilience of the entrepreneur. Influence on the success of the business. A longitudinal analysis. J. Econ. Psychol. 42, 126–135. https://doi.org/10.1016/j.joep.2014.02.004.

Baker, T., Aldrich, H.E., 1994. Friends and strangers: early hiring practices and idiosyncratic jobs. In: Bygrave, W. (Ed.), Frontiers of Entrepreneurship Research. Babson College, pp. 75–87.

Baldwin, C.Y., 2015. Bottlenecks, modules and dynamic architectural capabilities. https://ssrn.com/abstract=2512209.

Bantel, K.A., 1998. Technology-based, "Adolescent" firm configurations: strategy, identification, context, and performance. J. Bus. Ventur. 13, 205–230.

Barber, A.E., Wesson, M.J., Roberson, Q.M., Taylor, M.S., 1999. A tale of two job markets: organizational size and its effects on hiring practices and job search behavior. Pers. Psychol. 52 (4), 841–868. https://doi.org/10.1111/j.1744-6570.1999.tb00182.x.

Baron, J.N., Hannan, M.T., 2002. Organizational blueprints for success in high-tech start-ups. Calif. Manag. Rev. 44 (3), 8–37. https://doi.org/10.2307/41166130.

Barringer, B.R., Jones, F.F., 2004. Achieving rapid growth: revisiting the managerial capacity problem. J. Dev. Entrep. 9 (1), 73–86. https://web-p-ebscohost-com.vu-nl.idm.oclc.org/ehost/pdfviewer/pdfviewer?vid=1&sid=b35c9582-e82d-403f-b2c2-f42b57992695%40redis.

Barringer, B.R., Jones, F.F., Neubaum, D.O., 2005. A quantitative content analysis of the characteristics of rapid-growth firms and their founders. J. Bus. Ventur. 20 (5), 663–687. https://doi.org/10.1016/j.jbusvent.2004.03.004.

Baum, R.J., Locke, E.A., Smith, K.G., 2001. A multidimensional model of venture growth. Acad. Manag. J. 44 (2), 292–303.

Beckman, C.M., Burton, M.D., 2008. Founding the future: path dependence in the evolution of top management teams from founding to IPO. Organ. Sci. 19 (1), 3–24. https://doi.org/10.1287/orsc.1070.0311.

Beehr, T.A., Newman, J.E., 1978. Job stress, employee health, and organizational effectiveness: a facet analysis, model, and literature review. Pers. Psychol. 31 (4), 665–699. https://doi.org/10.1111/j.1744-6570.1978.tb02118.x.
Belitski, M., Stettler, T., Wales, W., Martin, J., 2022. Speed and scaling: an investigation of accelerated firm growth. J. Manag. Stud. https://doi.org/10.1111/joms.12869 (joms.12869).
Berk, J.B., van Binsbergen, J.H., Liu, B., 2014. Matching capital and labor. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2409915.
Boeker, W., Karichalil, R., 2002. Entrepreneurial transitions: factors influencing founder departure. Acad. Manag. J. 45 (4), 818–826. https://doi.org/10.2307/3069314.
Boeker, W., Wiltbank, R., 2005. New venture evolution and managerial capabilities. Organ. Sci. 16 (2), 123–133. https://doi.org/10.1287/orsc.1050.0115.
Brush, C.G., Ceru, D.J., Blackburn, R., 2009. Pathways to entrepreneurial growth: the influence of management, marketing, and money. Bus. Horiz. 52 (5), 481–491. https://doi.org/10.1016/j.bushor.2009.05.003.
Bueters, P., 2023. Het unicornspel van VanMoof werkte niet voor (haperende) fietsen. https://mtsprout.nl/groei/vanmoof-unicorn-mislukt.
Cardon, M.S., Stevens, C.E., 2004. Managing human resources in small organizations: what do we know? Hum. Resour. Manag. Rev. 14 (3), 295–323. https://doi.org/10.1016/j.hrmr.2004.06.001.
Cassia, L., Minola, T., 2012. Hyper-growth of SMEs: toward a reconciliation of entrepreneurial orientation and strategic resources. Int. J. Entrep. Behav. Res. 18 (2), 179–197. https://doi.org/10.1108/13552551211204210.
Cassia, L., Cogliati, G.M., Paleari, S., 2009. Hyper-growth among European SMEs: an explorative study. SSRN Electron. J. https://doi.org/10.2139/ssrn.1389521.
Chanut-Guieu, C., Guieu, G., Tannery, F., Dana, L.-P., 2012. Hyper-growth and sustainability in SMEs. The key figure of the strategic entrepreneur for balancing dominant logic and strategic paradoxes. https://www.kmu-hsg.ch/rencontres2012/resources/Topic_C/Rencontres_2012_Topic_C_Chanut-Guieu_Guieu_Tannery_Dana.pdf.
Chorev, S., Anderson, A.R., 2006. Success in Israeli high-tech start-ups. critical factors and process. Technovation 26 (2), 162–174. https://doi.org/10.1016/j.technovation.2005.06.014.
Church, A.H., McMahan, G.C., 1996. The practice of organization and human resource development in the USA's fastest growing firms. Leadersh. Org. Dev. J. 17 (2), 17–33. https://doi.org/10.1108/01437739610111204.
Coad, A., Daunfeldt, S.-O., Johansson, D., Wennberg, K., 2014. Whom do high-growth firms hire? Ind. Corp. Chang. 23 (1), 293–327. https://doi.org/10.1093/icc/dtt051.
Deal, T.E., Kennedy, A.A., 1982. Corporate Cultures: The Rites and Rituals of Corporate Life. Addison-Wesley Pub. Co.
Delmar, F., Davidsson, P., Gartner, W.B., 2003. Arriving at the high-growth firm. J. Bus. Ventur. 18 (2), 189–216. https://doi.org/10.1016/S0883-9026(02)00080-0.
DeSantola, A., Gulati, R., 2017. Scaling: organizing and growth in entrepreneurial ventures. Acad. Manag. Ann. 11 (2), 640–668. https://doi.org/10.5465/annals.2015.0125.
Dobrev, D.D., Barnett, W.P., 2005. Organizational roles and transition to entrepreneurship. Acad. Manag. J. 48 (3), 433–449. https://doi.org/10.5465/AMJ.2005.17407910.
Donaldson, G., Lorsch, J.W., 1983. Decision Making at the Top: The Shaping of Strategic Direction. Basic Books.
Donate, M.J., Guadamillas, F., 2010. The effect of organizational culture on knowledge management practices and innovation. Knowl. Process. Manag. 17 (2), 82–94. https://doi.org/10.1002/kpm.344.
Faith, R.L., Higgins, R.S., Tollison, R.D., 1988. Managerial rents and outside recruitment in the Coasian firm. In: Rowley, C.K., Tollison, R.D., Tullock, G. (Eds.), The Political Economy of Rent-seeking. Springer US, pp. 315–335. https://doi.org/10.1007/978-1-4757-1963-5_23.
Feeser, H.R., Willard, G.E., 1990. Founding strategy and performance: a comparison of high and low growth high tech firms. Strateg. Manag. J. 11 (2), 87–98. https://doi.org/10.1002/smj.4250110202.
Ferguson, A.J., Cohen, L.E., Burton, M.D., Beckman, C.M., 2016. Misfit and milestones: structural elaboration and capability reinforcement in the evolution of entrepreneurial top management teams. Acad. Manag. J. 59 (4), 1430–1450. https://doi.org/10.5465/amj.2014.0526.
Flamholtz, E.G., Randle, Y., 2016. Growing Pains: Building Sustainably Successful Organizations, Fifth edition. John Wiley & Sons, Inc.
Florin, J., Lubatkin, M., Schulze, W., 2003. A social capital model of high-growth ventures. Acad. Manag. J. 46 (3), 374–384. https://doi.org/10.2307/30040630.
Fombrun, C.J., Wally, S., 1989. Structuring small firms for rapid growth. J. Bus. Ventur. 4 (2), 107–122. https://doi.org/10.1016/0883-9026(89)90025-6.
French, J.R.P., Rogers, W., Cobb, S., 1974. Adjustment as a person-environment fit. In: Coelho, D., Hamburg, A., Adams, J.F. (Eds.), Coping and Adaptation: Interdisciplinary Perspectives. Basic Books.
Gaddis, J.L., 2018. On Grand Strategy. Penguin Press.
Galbraith, J., 1982. The stages of growth. J. Bus. Strateg. 3 (1), 70–79. https://doi.org/10.1108/eb038958.
Gans, J.S., Quiggin, J., 2003. A technological and organisational explanation for the size distribution of firms. Small Bus. Econ. 21, 243–256.
Garnsey, E., Heffernan, P., 2005. Growth setbacks in new firms. Futures 37 (7), 675–697. https://doi.org/10.1016/j.futures.2004.11.011.
Garnsey, E., Stam, E., Heffernan, P., 2006. New firm growth: exploring processes and paths. Ind. Innov. 13 (1), 1–20. https://doi.org/10.1080/13662710500513367.
Gartner, J., Moro, A., 2024. C-level managers and born-digitals' scaling: the case of Initial Coin Offerings (ICOs). Technol. Forecast. Soc. Chang. 198, 122943. https://doi.org/10.1016/j.techfore.2023.122943.
Gavetti, G., 2012. PERSPECTIVE—toward a behavioral theory of strategy. Organ. Sci. 23 (1), 267–285. https://doi.org/10.1287/orsc.1110.0644.
Geertz, C., Darnton, R., 2017. The Interpretation of Cultures: Selected Essays, Third edition. Basic Books.
Gjerløv-Juel, P., Guenther, C., 2012. Heroes today—but what about tomorrow?. In: Annual Meeting of the Academy of Management https://vbn.aau.dk/da/publications/heroes-today–but-what-about-tomorrow(f1ef61f1-f232-4939-a5ff-d3dc61d3e134).html.
Green, F., Ashton, D., 1992. Skill shortage and skill deficiency: a critique. Work Employ. Soc. 6 (2), 287–301.
Gregory, K.L., 1983. Native-view paradigms: multiple cultures and culture conflicts in organizations. Adm. Sci. Q. 28 (3), 359–376. https://doi.org/10.2307/2392247.
Guckenbiehl, P., Corral De Zubielqui, G., Lindsay, N., 2021. Knowledge and innovation in start-up ventures: a systematic literature review and research agenda. Technol. Forecast. Soc. Chang. 172, 121026. https://doi.org/10.1016/j.techfore.2021.121026.
Gulati, R., DeSantola, A., 2016. Start-ups that last. Harv. Bus. Rev. 94 (3), 14. https://hbr.org/2016/03/start-ups-that-last.
Gulati, R., Sawhney, V., 2019. Why your startup won't last. Harv. Bus. Rev. https://hbr.org/2019/12/why-your-startup-wont-last.
Halabisky, D., Dreessen, E., Parsley, C., 2006. Growth in firms in Canada, 1985–1999. J. Small Bus. Entrep. 19 (3), 255–267. https://doi.org/10.1080/08276331.2006.10593370.
Hambrick, D.C., Crozier, L.M., 1985. Stumblers and stars in the management of rapid growth. J. Bus. Ventur. 1 (1), 31–45. https://doi.org/10.1016/0883-9026(85)90005-9.
Harnish, V., 2014. Scaling Up: How a Few Companies Make It… And Why the Rest Don't; Mastering the Rockefeller Habits 2.0; People, Strategy, Execution, Cash, 1st ed. Gazelles.
Harrison, J.R., Carroll, G.R., 1991. Keeping the faith: a model of cultural transmission in formal organizations. Adm. Sci. Q. 36 (4), 552–582. https://doi.org/10.2307/2393274.
Headley, W.C., Dacal, R., Straub, D., 2014. The Effects of Empowerment and Cultural Orientation on High Growth Firms: A Field Experiment in Augmenting Managerial Capacity. Georgia State University. https://doi.org/10.2139/ssrn.2553351 (Unpublished manuscript).
Hellmann, T., Puri, M., 2002. Venture capital and the professionalization of start-up firms: empirical evidence. J. Financ. 57 (1), 169–197.
Heneman, R.L., Tansky, J.W., Camp, S.M., 2000. Human resource management practices in small and medium-sized enterprises: unanswered questions and future research perspectives. Entrep. Theory Pract. 25 (1), 11–26. https://doi.org/10.1177/104225870002500103.
Hofer, C.W., Charan, R., 1984. The transition to professional management: mission impossible? American Journal of Small Business 9 (1), 1–11. https://doi.org/10.1177/104225878400900101.
Hoffman, R., Yeh, C., 2018. Blitzscaling: The Lightning-fast Path to Building Massively Valuable Companies. HarperCollins Publishers.
Isaac, M., 2017. Inside Uber's aggressive, unrestrained workplace culture, The New York Times. https://www.nytimes.com/2017/02/22/technology/uber-workplace-culture.html.
Islam, N., Marinakis, Y., Majadillas, M.A., Fink, M., Walsh, S.T., 2020. Here there be dragons, a pre-roadmap construct for IoT service infrastructure. Technological Forecasting and Social Change 155, 119073. https://doi.org/10.1016/j.techfore.2017.09.016.
Iurkov, V., Koval, M., Zakaryan, A., 2023. The role of network community characteristics for firms' rapid business scaling. Technol. Forecast. Soc. Chang. 196, 122838. https://doi.org/10.1016/j.techfore.2023.122838.
Janssen, F., 2009. The conceptualisation of growth: are employment and turnover interchangeable criteria? J. Entrep. 18 (1), 21–45. https://doi.org/10.1177/097135570801800102.
Josefy, M., Kuban, S., Ireland, R.D., Hitt, M.A., 2015. All things great and small: organizational size, boundaries of the firm, and a changing environment. Acad. Manag. Ann. 9 (1), 715–802. https://doi.org/10.5465/19416520.2015.1027086.
Kakati, M., 2003. Success criteria in high-tech new ventures. Technovation 23 (5), 447–457. https://doi.org/10.1016/S0166-4972(02)00014-7.
Kogut, B., Zander, U., 1996. What firms do? Coordination, identity, and learning. Organ. Sci. 7 (5), 502–518. https://doi.org/10.1287/orsc.7.5.502.
Kotter, Sathe, V., 1978. Problems of Human Resource Management in rapidly growing companies. Calif. Manag. Rev. 21 (2), 29–36.
Kunisch, S., Denyer, D., Bartunek, J.M., Menz, M., Cardinal, L.B., 2023. Review research as scientific inquiry. Organ. Res. Methods 26 (1), 3–45. https://doi.org/10.1177/10944281221127292.
Kuratko, D.F., Holt, H.L., Neubert, E., 2020. Blitzscaling: the good, the bad, and the ugly. Bus. Horiz. 63 (1), 109–119. https://doi.org/10.1016/j.bushor.2019.10.002.
Lange, F., Tomini, N., Brinkmann, F., Kanbach, D.K., Kraus, S., 2023. Demystifying massive and rapid business scaling – an explorative study on driving factors in digital start-ups. Technol. Forecast. Soc. Chang. 196, 122841. https://doi.org/10.1016/j.techfore.2023.122841.
Lawrence, P.R., Lorsch, J.W., 1967. Differentiation and integration in complex organizations. Adm. Sci. Q. 12 (1), 1. https://doi.org/10.2307/2391211.
Lechner, C., Lorenzoni, G., Guercini, S., Gueguen, G., 2020. Supplier evolution in global value chains and the new brand game from an attention-based view. Glob. Strateg. J. 10 (3), 520–555. https://doi.org/10.1002/gsj.1381.
Lee, N., 2014. What holds back high-growth firms? Evidence from UK SMEs. Small Bus. Econ. 43 (1), 183–195. https://doi.org/10.1007/s11187-013-9525-5.

Linton, J.D., Thongpapanl, N., 2004. Perspective: ranking the technology innovation management journals. J. Prod. Innov. Manag. 21 (2), 123–139. https://doi.org/10.1111/j.0737-6782.2004.00062.x.
Lopez-Garcia, P., Puente, S., 2012. What makes a high-growth firm? A dynamic probit analysis using Spanish firm-level data. Small Bus. Econ. 39 (4), 1029–1041. https://doi.org/10.1007/s11187-011-9321-z.
Maresch, D., Leo, H., Walsh, S.T., 2023. Hotspurs in, sober bores out: a call and an agenda for entrepreneurship and innovation policies that foster rapidly scaling ventures. Technol. Forecast. Soc. Chang. 196, 122846. https://doi.org/10.1016/j.techfore.2023.122846.
Markman, G.D., Gartner, W.B., 2002. The effects of hyper growth on firm profitability. The Journal of Private Equity 5 (4), 58–65. https://doi.org/10.3905/jpe.2002.320025.
Mitra, S., 2005. Information technology as an enabler of growth in firms: an empirical assessment. J. Manag. Inf. Syst. 22 (2), 279–300. https://doi.org/10.1080/07421222.2005.11045847.
Mohr, V., Garnsey, E., Theyel, G., 2014. The role of alliances in the early development of high-growth firms. Ind. Corp. Chang. 23 (1), 233–259. https://doi.org/10.1093/icc/dtt056.
Monteiro, G.F.A., 2019. High-growth firms and scale-ups: a review and research agenda. RAUSP Management Journal 54 (1), 96–111. https://doi.org/10.1108/RAUSP-03-2018-0004.
Moreno, A.M., Casillas, J.C., 2000. High-growth Enterprises (Gazelles): A Conceptual Framework (unpublished manuscript).
Nadler, D.A., Tushman, M.L., 1980. A model for diagnosing organizational behavior. Organ. Dyn. 9 (2), 35–51. https://doi.org/10.1016/0090-2616(80)90039-X.
Nahapiet, J., Ghoshal, S., 1998. Social capital, intellectual capital, and the organizational advantage. Acad. Manag. Rev. 23 (2), 242. https://doi.org/10.2307/259373.
Nick, G., Kovács, T., Kő, A., Kádár, B., 2021. Industry 4.0 readiness in manufacturing: Company Compass 2.0, a renewed framework and solution for Industry 4.0 maturity assessment. Procedia Manufacturing 54, 39–44. https://doi.org/10.1016/j.promfg.2021.07.007.
Ocasio, W., 1999. Institutionalized action and corporate governance: the reliance on rules of CEO succession. Adm. Sci. Q. 44 (2), 384–416. https://doi.org/10.2307/2667000.
Paleari, S., Cassia, L., Minola, T., Cogliati, G., 2015. Are hyper-growth firms inherently different? Preliminary evidence from a sample of fast-growing European SMEs. Int. J. Entrep. Ventur. 1 (1), 1. https://doi.org/10.1504/IJEV.2015.10001824.
Parker, S.C., Storey, D.J., van Witteloostuijn, A., 2010. What happens to gazelles? The importance of dynamic management strategy. Small Bus. Econ. 35 (2), 203–226. https://doi.org/10.1007/s11187-009-9250-2.
Parker, C., Scott, S., Geddes, A., 2020. Snowball sampling, SAGE Research Methods Foundations. http://methods.sagepub.com/foundations/.
Partington, M., Pratty, F., 2021. Gorillas: the new WeWork?, Sifted. https://sifted.eu/articles/gorillas-wework/ (August 2).
Penrose, E.T., 1959. The Theory of the Growth of the Firm, 4th ed., Rev. ed. Oxford University Press.
Peters, T.J., Waterman, R.H., 1982. In Search of Excellence: Lessons From America's Best-run Companies (1st ed). Harper & Row.
Phillips, B.D., Kirchhoff, B.A., 1989. Formation, growth and survival; small firm dynamics in the U.S. economy. Small Business Economics 1 (1), 65–74. https://doi.org/10.1007/BF00389917.
Piaskowska, D., Tippmann, E., Monaghan, S., 2021. Scale-up modes: profiling activity configurations in scaling strategies. Long Range Planning, Elsevier Ltd 54 (6), 102101. https://doi.org/10.1016/j.lrp.2021.102101.
Picken, J.C., 2017. From startup to scalable enterprise: laying the foundation. Bus. Horiz. 60 (5), 587–595. https://doi.org/10.1016/j.bushor.2017.05.002.
Quinn, R.E., Cameron, K., 1983. Organizational life cycles and shifting criteria of effectiveness: some preliminary evidence. Manag. Sci. 29 (1), 33–51. https://doi.org/10.1287/mnsc.29.1.33.
Rich, J.T., 1999. The growth imperative. J. Bus. Strateg. 20 (2), 27–31. https://doi.org/10.1108/eb039992.
Sanasi, S., Ghezzi, A., Cavallo, A., 2023. What happens after market validation? Experimentation for scaling in technology-based startups. Technol. Forecast. Soc. Chang. 196, 122839. https://doi.org/10.1016/j.techfore.2023.122839.
Schein, E.H., 1983. The role of the founder in creating organizational culture. Organ. Dyn. 12 (1), 13–28. https://doi.org/10.1016/0090-2616(83)90023-2.
Schein, E.H., 2017. Organizational Culture and Leadership (5th Edition). Wiley.
Schuler, R.S., 1980. Definition and conceptualization of stress in organizations. Organ. Behav. Hum. Perform. 25 (2), 184–215. https://doi.org/10.1016/0030-5073(80)90063-X.
Senderovitz, M., Klyver, K., Steffens, P., 2016. Four years on: are the gazelles still running? A longitudinal study of firm performance after a period of rapid growth. International Small Business Journal: Researching Entrepreneurship 34 (4), 391–411. https://doi.org/10.1177/0266242614567483.
Shepherd, D.A., Patzelt, H., 2022. A call for research on the scaling of organizations and the scaling of social impact. Entrep. Theory Pract. 46 (2), 255–268. https://doi.org/10.1177/1042258720950599.
Siddaway, A.P., Wood, A.M., Hedges, L.V., 2019. How to do a systematic review: a best practice guide for conducting and reporting narrative reviews, meta-analyses, and meta-syntheses. Annu. Rev. Psychol. 70 (1), 747–770. https://doi.org/10.1146/annurev-psych-010418-102803.
Siepel, J., Cowling, M., Coad, A., 2017. Non-founder human capital and the long-run growth and survival of high-tech ventures. Technovation 59, 34–43. https://doi.org/10.1016/j.technovation.2016.09.001.
Sifted, 2022. HR tech: people managers' not-so-secret weapon, Sifted. https://sifted.eu/pro/briefings/hr-tech?pass25sif8X.
Smircich, L., 1983. Concepts of culture and organizational analysis. Adm. Sci. Q. 28 (3), 339–358. https://doi.org/10.2307/2392246.
Sofer, C., 1961. The Organization From Within: A Comparative Study of Social Institutions Based on a Sociotherapeutic Approach. Routledge.
Stanley, M.H.R., Amaral, L.A.N., Buldyrev, S.V., Havlin, S., Leschhorn, H., Maass, P., Salinger, M.A., Stanley, H.E., 1996. Scaling behaviour in the growth of companies. Nature 379 (6568), 804–806. https://doi.org/10.1038/379804a0.
Stevenson, H.H., Jarillo, J.C., 1990. A paradigm of entrepreneurship: entrepreneurial management. Strateg. Manag. J. 11, 17–27.
St-Jean, E., Julien, P.-A., & Audet, J. (2008). Factors associated with growth changes in "Gazelles." Journal of Enterprising Culture, 16(2), 161–188. doi:https://doi.org/10.1142/S0218495808000089.
Sullivan, T., 2016. Blitzscaling, Harvard Business Review. https://hbr.org/2016/04/blitzscaling (April).
Sutton, R.I., Rao, H., 2014. Scaling Up Excellence: Getting to More Without Settling for Less, First edition. Crown Business.
Tansky, J.W., Heneman, R., 2003. Guest editor's note: introduction to the special issue on human resource management in SMEs: a call for more research. Hum. Resour. Manag. 42 (4), 299–302. https://doi.org/10.1002/hrm.10091.
Tranfield, D., Denyer, D., Smart, P., 2003. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. Br. J. Manag. 14 (3), 207–222. https://doi.org/10.1111/1467-8551.00375.
Turco, C.J., 2016. The Conversational Firm: Rethinking Bureaucracy in the Age of Social Media. Columbia University Press. https://doi.org/10.7312/turc17898.
Venâncio, A., Picoto, W., Pinto, I., 2023. Time-to-unicorn and digital entrepreneurial ecosystems. Technol. Forecast. Soc. Chang. 190, 122425. https://doi.org/10.1016/j.techfore.2023.122425.
Vik, J., Melås, A.M., Stræte, E.P., Søraa, R.A., 2021. Balanced readiness level assessment (BRLa): a tool for exploring new and emerging technologies. Technol. Forecast. Soc. Chang. 169, 120854. https://doi.org/10.1016/j.techfore.2021.120854.
Walsh, S.T., 2004. Roadmapping a disruptive technology: a case study. Technol. Forecast. Soc. Chang. 71 (1–2), 161–185. https://doi.org/10.1016/j.techfore.2003.10.003.
Walsh, S.T., Boylan, R.L., McDermott, C., Paulson, A., 2005. The semiconductor silicon industry roadmap: epochs driven by the dynamics between disruptive technologies and core competencies. Technol. Forecast. Soc. Chang. 72 (2), 213–236. https://doi.org/10.1016/S0040-1625(03)00066-0.
Weinzimmer, L.G., Nystrom, P.C., Freeman, S.J., 1998. Measuring organizational growth: issues, consequences and guidelines. J. Manag. 24 (2), 235–262. https://doi.org/10.1177/014920639802400205.
Williams, T.A., Gruber, D.A., Sutcliffe, K.M., Shepherd, D.A., Zhao, E.Y., 2017. Organizational response to adversity: fusing crisis management and resilience research streams. Acad. Manag. Ann. 11 (2), 733–769. https://doi.org/10.5465/annals.2015.0134.
Williamson, O.E., 1991. Strategizing, economizing, and economic organization. Strateg. Manag. J. 12 (S2), 75–94. https://doi.org/10.1002/smj.4250121007.
Witteman, J., 2019. Oud-werknemers over Booking.com: "Het is één grote chaos", De Volkskrant. https://www.volkskrant.nl/kijkverder/v/2019/oud-werknemers-over-booking.com-het-is-een-grote-chaos/?referrer=https%3A%2F%2Fwww.google.com%2F (August 9).
World Economic Forum, 2016. Mastering Hypergrowth. https://www.weforum.org/reports/mastering-hypergrowth/.
Yeo, Y., Park, C., 2018. Managing growing pains for the sustainable growth of organizations: evidence from the growth pathways and strategic choices of Korean firms. Sustainability 10 (10), 1–24. https://doi.org/10.3390/su10103824.
Zellers, G.B., Wooley, G.L., 2022. Developing and retaining organizational culture during hyper-growth. http://hdl.handle.net/1803/17694.
Zhu, Y., 2020. An interactive perspective of managers' functional experience and managerial ties of new ventures in transition economies. Tech. Anal. Strat. Manag. 32 (3), 292–305. https://doi.org/10.1080/09537325.2019.1655536.
Zott, C., Amit, R., 2007. Business model design and the performance of entrepreneurial firms. Organ. Sci. 18 (2), 181–199. https://doi.org/10.1287/orsc.1060.0232.

Kristel Moedt is PhD student at the School of Business and Economics. She earned a master's degree in Business Administration from Tilburg University and owns an HR consultancy firm for international scale-ups. Her research interests center around consequences of growth, organizational culture, leadership and team composition.

Svetlana Khapova is Professor of Organisational Behaviour at the Vrije Universiteit Amsterdam. She is Past Division Chair of the Careers Division of the Academy of Management. Her research focuses on strategic leadership topics, including leadership development, career mobility, emotions in organizations and board dynamics. Her research has been published in various top-tier journals. She is author (together with M. B. Arthur and J. Richardson) of the book "An Intelligent Career: Taking Ownership of Your Work and Your Life" published by Oxford University Press in 2017.

Christian Lechner is Full Professor of Entrepreneurship. Before joining Luiss, he held faculty positions at the Free university of Bolzano and Toulouse Business School in France. He earned a bachelor and master's degree in Business Administration from the LMU University of Munich (Ludwig-Maximilians-Universität Munich), an MBA from the University of Georgia, USA and a PhD in Business Administration from the University of Regensburg.

His research interests center around drivers of entrepreneurship and growth,

entrepreneurial teams, heuristics, outliers and the interface between organizational design and performance. His research has been has been published in journals such as Journal of Business Venturing, Entrepreneurship Theory & Practice, Journal of Product Innovation Management, Entrepreneurship and Regional Development and International Small Business Journal. He is Consulting Editor and Editorial Board Member International Small Business Journal.