

# Review of Organizational Ambidexterity Research

SAGE Open  
January-March 2022: 1–22  
© The Author(s) 2022  
DOI: 10.1177/21582440221082127  
[journals.sagepub.com/home/sgo](https://journals.sagepub.com/home/sgo)

Olga Kassotaki<sup>1</sup>

## Abstract

The main objective of this research is to investigate how organizational ambidexterity can be achieved at a modern organization. A concise review of key studies conducted until today consolidates the state of academic research on the subject of organizational ambidexterity, as the ambidexterity concept has been gaining increased attention from scholars. The systematic search of the literature published since 1991, composed of 122 articles, has revealed various research perspectives with respect to organizational ambidexterity. The research tools that have been employed were the systematic data collection processes, qualitative data analysis techniques, and data synthesis of the selected research output. The results of this review have shown that researchers have been studying ambidexterity from various angles and in various literature streams. They have been focusing on multiple external and internal organizational factors that affect ambidexterity and have been analyzing these moderators in terms of performance metrics and degree of their influence on ambidexterity. This study concludes with future research directions and propositions on the subject of organizational ambidexterity.

## Keywords

systematic review, exploration, exploitation, organizational ambidexterity

## Introduction

For the last few years, the concept of ambidexterity has increasingly become the field of research for many scholars (Amjad & Md Nor, 2020; Wilden et al., 2018). Researchers have introduced the term of organizational ambidexterity to describe two contradictory and seemingly incompatible processes of exploration and exploitation that take place in organizations (Brix, 2019). Exploration refers to search, risk taking, experimentation, and innovation, whereas exploitation has to do with refinement, efficiency, implementation, and execution (Gianzina-Kassotaki, 2017; Levinthal & March, 1993; March, 1991). Most importantly, ambidexterity seems to be positively and significantly associated with firm performance (Fu et al., 2016; Zhang et al., 2016). The more efficient the management of explorative and exploitative activities by organizational actors, the highest the firm performance outcomes (Boumgarden et al., 2012; Hirst et al., 2018; Raisch & Birkinshaw, 2008).

Duncan (1976) was the first scholar to introduce the term of organizational ambidexterity (Gianzina-Kassotaki, 2017). Later, March (1991) inserted the concepts of exploration and exploitation and described them as independent activities that include inherent trade-offs between the two. Until today, March's (1991) work has accumulated high number of citations, a fact that shows that these concepts are worth pursuing and analyzing in research in order to conceive the full magnitude and essence of their influence (Wilden et al.,

2018). In line with his work, Tushman and O'Reilly (1996, 1997) further developed the term of organizational ambidexterity by introducing evolutionary and revolutionary change processes. They emphasized the structural separation between the two different types of activities. In the short run, managers must constantly increase the fitness of strategy, structure, and culture (evolutionary change), whereas in the long run, they may be required to destroy the alignment that made their companies successful (revolutionary change; Gianzina-Kassotaki, 2017). Tushman and O'Reilly's (1996, 1997) ideas were received positively in the business world, yet their contribution received little academic attention until the article of Gibson and Birkinshaw (2004) was published, which was describing the antecedents, consequences, and mediating role of organizational ambidexterity. The term gained widespread recognition from scholars, and since then, there has been a rapid increase in the number of studies on organizational ambidexterity (Gianzina-Kassotaki, 2017; Wilden et al., 2018).

Despite the increased number of studies that have been conducted on the subject of ambidexterity since the 1990s,

<sup>1</sup>University of Warwick, Coventry, UK

## Corresponding Author:

Olga Kassotaki, Strategy and International Business Group, Warwick Business School, University of Warwick, Scarman Road, Coventry CV4 7AL, UK.

Email: [o.gianzina-kassotaki@warwick.ac.uk](mailto:o.gianzina-kassotaki@warwick.ac.uk)



Creative Commons CC BY: This article is distributed under the terms of the Creative Commons Attribution 4.0 License (<https://creativecommons.org/licenses/by/4.0/>) which permits any use, reproduction and distribution of

the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

there has not been a significant effort to organize these findings systematically and compile them into a comprehensive review of current knowledge. It is believed that due to the complexity of issues involved, a more systematic review that explores all aspects of the existing literature as well as the empirical evidence is required. Therefore, we intend to fill this gap by enhancing our understanding of all aspects of organizational ambidexterity (Pittaway et al., 2004). In order to perform this review, we implemented a multi-stage review strategy (Pittaway et al., 2004; Turner et al., 2013), a detailed analysis of which can be found in Appendix. At the end of this manuscript, we propose new directions for future research of this concept, while emphasizing the limited number of studies conducted on ambidextrous leadership, especially at the CEO level, we stress the need for a more comprehensive and multilevel approach to ambidexterity, and we emphasize the importance of ambidexterity management in the high technology industry.

In conclusion, this study is highly relevant for scholars conducting research on ambidexterity as it offers a timely theoretical investigation of the ambidexterity concept and makes a concise review of the organizational ambidexterity research output. This study is also important from a practical perspective for multiple actors of any organization as they are encouraged to reflect on their behaviors in order to effectively confront the competing challenges firms are called upon to face in the light of the emerging global organizational challenges and the subsequent vast investment in resources and capital.

### Theoretical Foundations

With respect to the ambidexterity concept, March (1991) as well as Tushman and O'Reilly (1996) suggested that firms simultaneously pursuing both explorative and exploitative activities can achieve superior performance when compared to the firms focusing on one at the expense of the other. Firms that mainly pursue exploitation achieve returns that are predictable but not necessarily sustainable. They may enhance their short-term performance, but that may result in a competence trap, as they may not be able to respond adequately to environmental changes. On the contrary, scholars have long argued that firms' ability to compete successfully in the long run may be rooted in their ability to jointly pursue exploration and exploitation with ambidexterity being a key driver in their long-term performance. Therefore, firms must pursue an optimal mix of exploration and exploitation in order to remain competitive both in the short- and long-term (Gianzina-Kassotaki, 2017; Gibson & Birkinshaw, 2004; Junni et al., 2013; Luo et al., 2018).

In their attempt to resolve the apparent contradiction of exploration and exploitation, researchers have moved toward different directions, producing literature streams related to organizational ambidexterity (Gianzina-Kassotaki, 2017; Knight & Paroutis, 2017b; Lavie et al., 2010; Raisch & Birkinshaw, 2008). They have been attempting to explain

ambidexterity in the context of organizational learning (Kostopoulos & Bozionelos, 2011; Prieto-Pastor & Martin-Perez, 2015), technological innovation (O'Reilly & Tushman, 2004; Smith et al., 2017), organizational adaptation (Gupta et al., 2006; Markides & Charitou, 2004), strategic management (Kassotaki et al., 2019; Papachroni et al., 2015), and organizational design (Gibson & Birkinshaw, 2004; Markides & Charitou, 2004). Table 1 shows some seminal work on organizational ambidexterity produced in different streams (Raisch & Birkinshaw, 2008).

### A Framework of Organizational Ambidexterity

Despite the massive volume of research produced on different elements of organizational ambidexterity, less clarity on how organizations achieve ambidexterity still exists (Birkinshaw & Gupta, 2013; Gianzina-Kassotaki, 2017; Raisch & Birkinshaw, 2008). Over the past decade, researchers have stressed upon the factors that may affect organizational ambidexterity, such as environmental dynamics, organizational structures, behavioral contexts, and leadership characteristics that contribute to the successful implementation of ambidexterity (see Figure 1; Gianzina-Kassotaki, 2017; Lavie et al., 2010). All the above moderators were analyzed in relation to performance metrics and the degree of their influence on organizational ambidexterity (Gianzina-Kassotaki, 2017; Junni et al., 2013, 2015). In this regard, most of the studies are mainly focused on structural factors and on the effect of ambidexterity on firm performance whereas references to other factors and more complex relationships that address additional variables are rather scarce (Gianzina-Kassotaki, 2017; Raisch & Birkinshaw, 2008).

Taking into account the above context, research has shown that organizational ambidexterity reaps the greatest performance effects in dynamic environments (Jansen et al., 2006; Junni et al., 2013; Kortmann, 2014; Lin & Ho, 2016). Such environments include knowledge-intensive services (such as higher education organizations; Berraies & Zine El Abidine, 2019; Chang et al., 2016; Huang & Cummings, 2011; Junni et al., 2013), and high-technology sectors (e.g. research and biotech; Derbyshire, 2014; Junni et al., 2013; Kassotaki et al., 2019; Rothaermel & Deeds, 2004; Wang & Rafiq, 2014). In dynamic markets, firms continuously need to innovate while being effective in their organizational setup, because the duration of a competitive advantage is very uncertain. On the contrary, more stable markets, where firms may have long periods of exploitation and short bursts of exploration or vice versa (Gupta et al., 2006), may be more forgiving (Gianzina-Kassotaki, 2017; Junni et al., 2013).

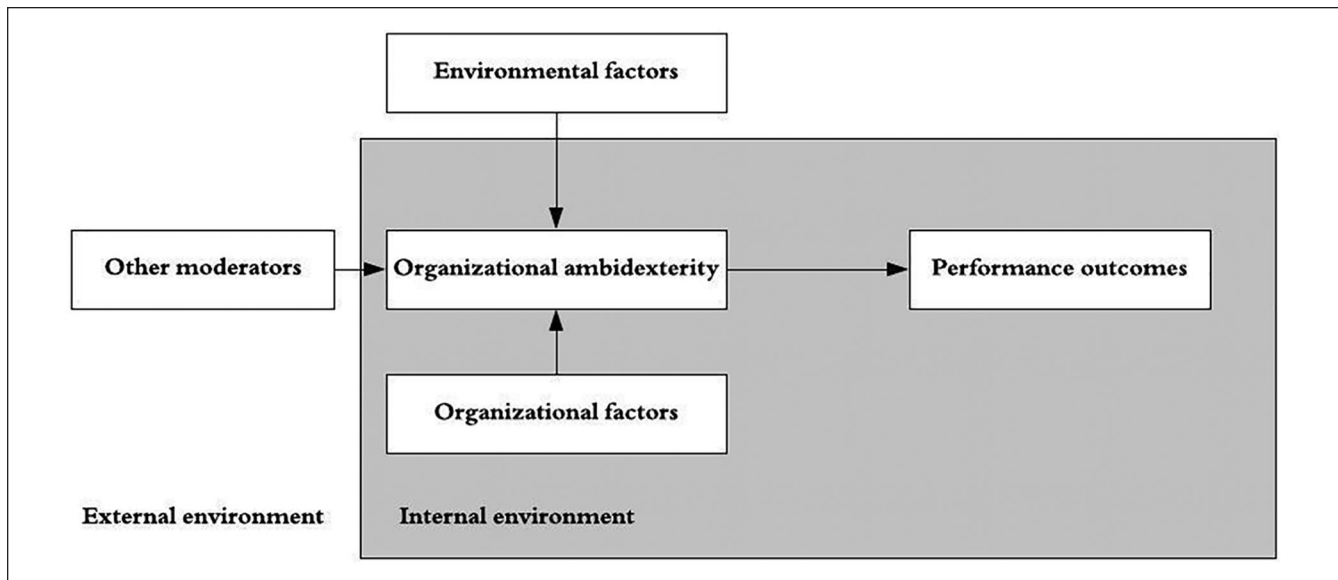
Furthermore, different suggestions have been made about how organizations should balance explorative and exploitative activities to resolve contradicting requirements (Gianzina-Kassotaki, 2017; Turner et al., 2013; Tushman & O'Reilly, 2013). The first approach is called *contextual* ambidexterity, and it has to do with the simultaneous balance of exploration

**Table 1.** Seminal Research on Organizational Ambidexterity.

Type	Literature stream	Typology of ambidexterity	Ambidexterity concept	Key challenges for a successful ambidexterity management
Organizational ambidexterity: Initial contribution				
<ul style="list-style-type: none"> <li>Organizational learning ambidexterity</li> </ul>	Organizational learning	Simultaneous pursuit of ambidexterity	Ambidexterity perceived as two types of learning (exploration–exploitation/ single loop–double loop) balanced for long-term organizational success	The more a manager obtains top-down and bottom-up knowledge inflows, the higher the level of ambidexterity in which he engages.
Key author(s):				
1. Argyris and Schön (1978) 2. March (1991) 3. Gupta et al. (2006) 4. Mom et al. (2007)				
Evolution of organizational ambidexterity				
<ul style="list-style-type: none"> <li>Structural ambidexterity</li> </ul>	Technological innovation	Simultaneous pursuit of ambidexterity in interdependent units	Ambidexterity reflects the challenges of the simultaneous pursuit of incremental (exploitative) and radical (explorative) innovations in the organizational setup	Combined exploration–exploitation innovations reflect complex capabilities that provide additional corporate advantage beyond those provided by each innovation separately
Key author(s):				
1. Tushman and O'Reilly (1996) 2. Tushman and Smith (2002) 3. Benner and Tushman (2003) 4. O'Reilly and Tushman (2004)				
<ul style="list-style-type: none"> <li>Strategic ambidexterity</li> </ul>	Strategic management	Simultaneous pursuit of ambidexterity	Ambidexterity includes variation-reducing (induced) and variation-increasing (autonomous) strategic processes, with their combination being the most beneficial for organizations	Leaders must make successful trade-offs between two strategic processes that compete for scarce resources, whereas the combination of these processes could be the most beneficial to organizations
Key author(s):				
1. Markides and Oyon (2010)				
<ul style="list-style-type: none"> <li>Contextual ambidexterity</li> </ul>	Organizational design	Simultaneous pursuit of ambidexterity in independent units	Ambidexterity perceived as the challenge of the trade-off between efficiency (mechanistic/centralized/ hierarchical structure) and flexibility (organic/ decentralized/autonomous structure) in a complex organizational design for short-term efficiency and long-term innovation.	Mechanistic and organic structures are difficult to achieve within a single firm, however their combined flexible structures lead to the generation and better employment of innovations
Key author(s):				
1. Tushman and O'Reilly (1996) 2. Adler et al. (1999) 3. Gibson and Birkinshaw (2004) 4. Jansen et al. (2005)				
<ul style="list-style-type: none"> <li>Organizational ambidexterity or punctuated equilibrium</li> </ul>	Organizational adaption	Sequential pursuit of ambidexterity in independent units	Ambidexterity comprised of long periods of convergence (evolutionary change) punctuated by short periods of discontinuous (revolutionary) change for long-term organizational success	Too many change actions may lead to organizational chaos, whereas the opposite could cause inertia
Key author(s):				
1. Gupta et al. (2006)				

and exploitation through the alignment of two opposites within the same business unit (Gibson & Birkinshaw, 2004; Martini et al., 2015). The second approach is called *structural* ambidexterity, where companies can use simultaneously separate subunits, one for exploration and another for exploitation (Markides & Charitou, 2004; O'Reilly & Tushman, 2004).

The third approach is called *cyclical* ambidexterity, where organizations can temporarily cycle through periods of exploration and periods of exploitation within the same business unit (O'Reilly & Tushman, 2008). Finally, the fourth approach is called *reciprocal* ambidexterity, which includes the sequential pursuit of ambidexterity across separate units,



**Figure 1.** A framework of organizational ambidexterity.

where the output of exploration from one unit is the input for exploitation for the other unit (Simsek et al., 2009).

Beyond the environmental and structural factors, researchers have stressed their attention on other moderators that influence organizational ambidexterity, such as culture and social relationships (Junni et al., 2015; Mueller et al., 2013), as well as market orientation, resource endowment, and the firm's scope (Gianzina-Kassotaki, 2017; Raisch & Birkinshaw, 2008). For instance, market orientation increases the firm's capability to respond to current and future customers' needs (Kyriakopoulos & Moorman, 2004). Likewise, resource endowment relates to the amount of resources that a firm possesses, as limited resources can restrain organizations from pursuing as complex a strategy as organizational ambidexterity. In that respect, young firms may benefit more from a one-sided orientation than from an ambidextrous strategy (Cao et al., 2009; Lubatkin et al., 2006).

Finally, according to Junni et al. (2013), organizational ambidexterity is positively and significantly associated with organizational performance (see also Gibson & Birkinshaw, 2004; He & Wong, 2004; Lubatkin et al., 2006; Raisch et al., 2009). This is in line with Tushman and O'Reilly's (1996) suggestion that firms that simultaneously pursue exploration and exploitation achieve superior performance in contrast to firms that use one strategy at the expense of the other. Tushman and O'Reilly (2013) further support, in accordance with other researchers, that ambidexterity is positively associated with sales growth (Derbyshire, 2014; He & Wong, 2004), subjective ratings of performance (Cao et al., 2009; Lee & Meyer-Doyle, 2017; Lubatkin et al., 2006), innovation (He & Wong, 2004; Kortmann, 2014), market evaluation as measured by Tobin's Q factor (Uotila et al., 2009), and firm survival (Tushman & O'Reilly, 2013).

To sum up, the existing literature on ambidexterity has proposed and tested the relationships between the most important factors that may affect ambidexterity. There are, therefore, relationships between the antecedents, moderators, and outcomes of organizational ambidexterity (Raisch & Birkinshaw, 2008), as presented in Figure 1. However, Raisch and Birkinshaw (2008) have also mentioned in their study that at a first glance, ambidexterity antecedents, moderators, and environmental factors have been conceptualized as the most significant agents that have a major impact on ambidexterity. However, more in depth studies have revealed that there are also other important elements affecting the interrelations between the internal factors (Junni et al., 2015), such as the top team's strategic intent (Andriopoulos & Lewis, 2009), leadership vision and values (Koryak et al., 2018; O'Reilly & Tushman, 2008), and an aligned senior team with the ability to manage ambidexterity (Chandrasekaran et al., 2012; Garcia-Granero et al., 2018; Heyden et al., 2018; Van Doorn et al., 2020).

Recently, scholars have started to study the internal and external conditions of the effects of ambidexterity on performance (Gianzina-Kassotaki, 2017; Raisch & Birkinshaw, 2008; Raisch & Tushman, 2016). For example, Raisch et al. (2009) have emphasized the importance of inter-organizational activities in promoting ambidexterity and thus performance, such as customer relationships, corporate venturing, and strategic alliances (see also Bresciani et al., 2018; Lavie & Rosenkopf, 2006). Based on the conclusions of these studies, Raisch and Birkinshaw (2008) have noted that it is important to consider multiple performance dimensions, as studies using one-dimensional indicators may run the risk of producing biased estimations of ambidexterity on the firms' overall success. They have stressed, therefore, upon the

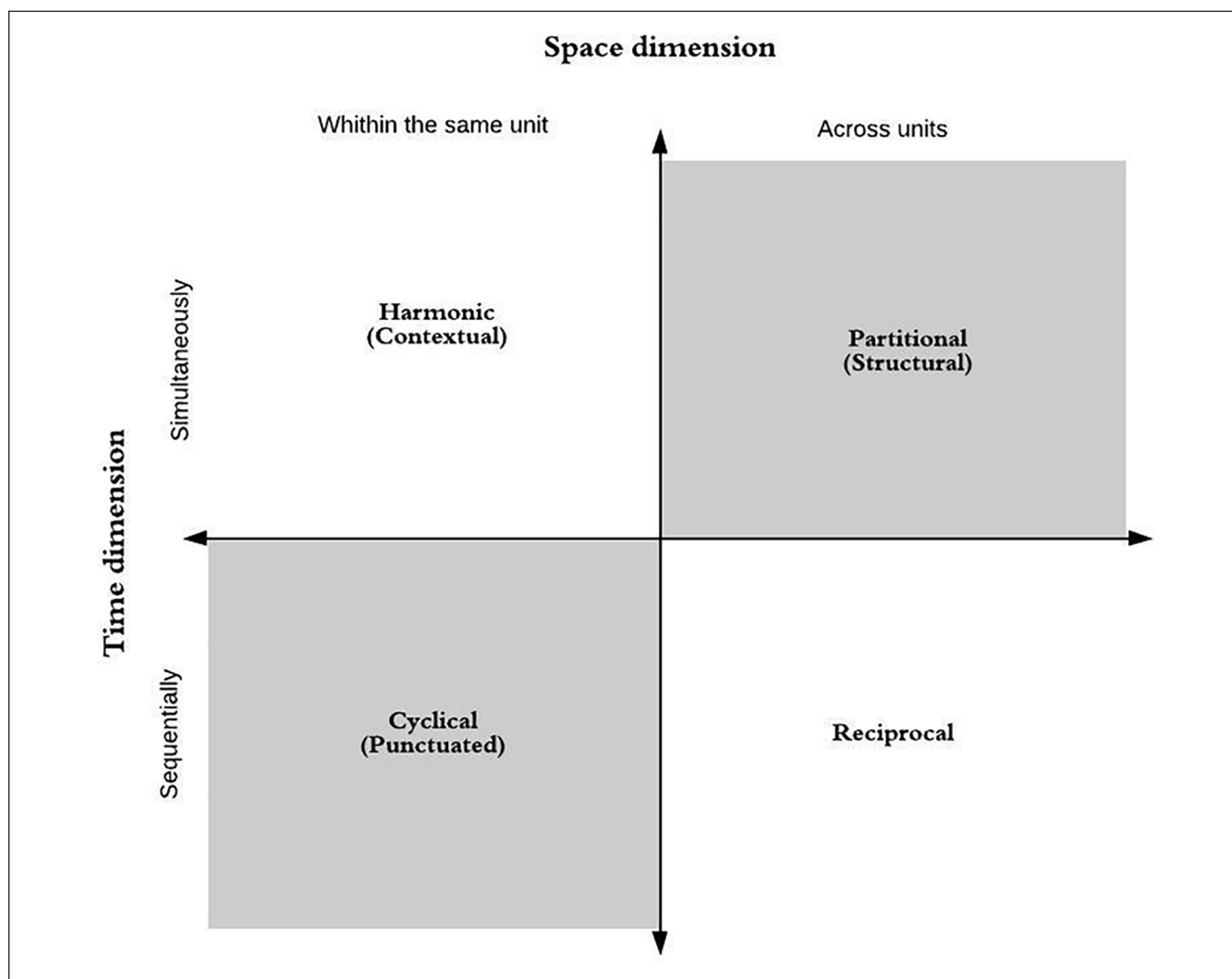
importance of considering ambidexterity's both short-term and long-term performance implications, as explorative activities become obvious in the long run whereas exploitative behaviors become apparent only in the short run (Jansen et al., 2006; Levinthal & March, 1993; March, 1991).

### *A Typology of Organizational Ambidexterity*

In this section, in order to explain how organizations balance explorative and exploitative activities, we use the following two dimensions: time and space. These dimensions form the basis for a better understanding of ambidexterity, while also giving us the opportunity to describe the internal structure of ambidextrous organizations and how their actors manage to balance ambidexterity. Time dimension captures the extent to which ambidexterity is pursued simultaneously or sequentially over time, whereas space dimension captures whether ambidexterity takes place within independent or

interdependent organizational units (Geerts et al., 2018; Gianzina-Kassotaki, 2017; Kang & Snell, 2009; Simsek et al., 2009). An illustration of the above concept is presented in Figure 2 below:

Contextual or harmonic ambidexterity is inherently challenging as it includes the simultaneous pursuit of exploration and exploitation within the same business unit (Gianzina-Kassotaki, 2017; Kang & Snell, 2009). This involves building a set of processes or systems, so that individuals could make their own judgments on how to divide their time between conflicting demands (Gibson & Birkinshaw, 2004). From a managerial perspective, it necessitates leaders to have complex, ambidextrous behaviors in the organizational roles that they encounter (Andriopoulos & Lewis, 2009; Raisch & Birkinshaw, 2008). From a resource-based view, contextual ambidexterity is a potential source of competitive advantage as it is valuable, rare, and costly to imitate. It is also positively associated with stakeholder satisfaction, middle and senior



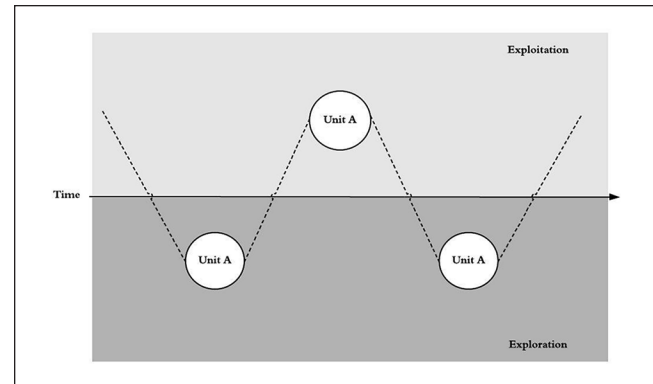
**Figure 2.** A typology of organizational ambidexterity.



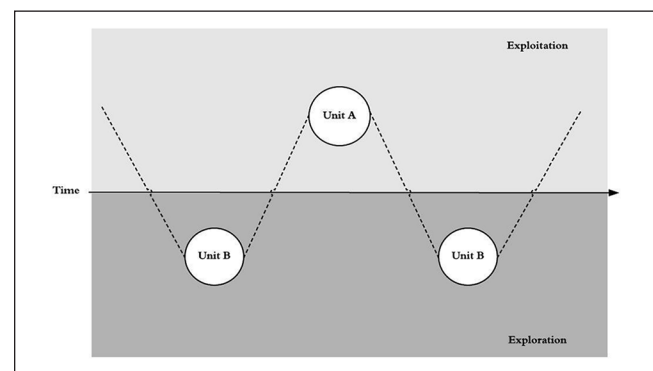
level managers' performance, as well as strategic performance. The difficulty, however, of such an approach lies in the fact that the implementation of ambidexterity in systems and processes is costly to achieve (Gibson & Birkinshaw, 2004; Simsek et al., 2009). This type of ambidexterity is used in corporate venture units (Hill & Birkinshaw, 2014; Raisch & Tushman, 2016). Such units capable to simultaneously build new capabilities, while using existing ones enjoy higher levels of unit performance (Simsek et al., 2009). Their organizational designs permit a fast knowledge transmission between exploratory and exploitative learning domains, necessary for the development of innovative and applicable solutions (Gutter & Konlechner, 2009).

Structural or partitional ambidexterity includes a dual structure composition where exploration and exploitation are pursued in structurally independent units (Huang & Kim, 2013; Kang & Snell, 2009), with each one having its own strategies, structures, cultures, and incentive systems (Gianzina-Kassotaki, 2017; Tushman et al., 2010). It is an interdependent, simultaneous phenomenon that involves ambidexterity within different structural units or divisions of one or more organizations. Each unit houses its own distinct management team, organization structure, culture, control systems, and incentive structures that have an independent or organizationally interdependent operation coordinated by actions of a senior management team (Geerts et al., 2018; Tushman et al., 2010; Tushman & O'Reilly, 1996). Structural ambidexterity is used in financial services firms or firms with strategic alliances and inter-firm networks. The integration of exploration and exploitation across separate domains constitutes a major challenge that can be addressed through a shared vision (Jansen et al., 2008; O'Reilly & Tushman, 2004), senior management team coordination (Lubatkin et al., 2006), and systems for knowledge integration. It can, then, be closely associated with increased innovation and high financial performance (Simsek et al., 2009).

Cyclical ambidexterity or punctuated equilibrium (Lant & Mezias, 1992; Papachroni et al., 2015; Smith et al., 2017; Wang & Rafiq, 2014) includes long periods of exploitation (relative stability) interrupted by short bursts of exploration within the same business unit (see Figure 3; Cantarello et al., 2012; Gersick, 1991; Gupta et al., 2006; Kang & Snell, 2009; Romanelli & Tushman, 1994; Siggelkow & Levinthal, 2003; Tushman & O'Reilly, 1996). As a result, it requires changes in the formal structure and routines, practices and procedures of reward and control, and resource allocation. For this reason, mechanisms for management conflict, effective interpersonal relations, flexibility, and switching rules constitute the primary feature of this ambidexterity. It is mostly used in firms with strong technological and R&D orientation, such as biotechnology or software firms (Ardito et al., 2021; Simsek et al., 2009; Uotila, 2018). These firms follow an S-shaped curve, where they first engage in an exploration to discover new knowledge, and then, they focus on exploitation to



**Figure 3.** Cyclical ambidexterity or punctuated equilibrium.



**Figure 4.** Reciprocal ambidexterity.

develop and commercialize that knowledge. Hence, they are strongly associated with innovative outcomes and increased performance through innovation (Simsek et al., 2009).

Reciprocal ambidexterity includes the sequential pursuit of ambidexterity across separate units (Gianzina-Kassotaki, 2017). In this type, the outputs of exploration from unit B become the inputs for exploitation by unit A, and the outputs from unit A cycle back to become the inputs of unit B (see Figure 4; Simsek et al., 2009). This type of ambidexterity requires an ongoing information exchange, collaborative problem solving, joint decision-making, and resource flows between managers of different units. Reciprocal ambidexterity is used between organizations that engage in formal strategic alliances or processes of internationalization as they operate in complex environments that require proper knowledge integration among the alliance partners. Most importantly, a proper exploratory and exploitative knowledge sharing in long-term inter-organizational relationship could be positively associated with increased relationship performance (Simsek et al., 2009).

All the above approaches are not seen strictly as alternatives (Gianzina-Kassotaki, 2017; Kauppila, 2010; Papachroni et al., 2015). Firms are expected to utilize various combinations, while seeking to better employ ambidexterity in their

organizational context (Hill & Birkinshaw, 2014; Raisch, 2008; Turner et al., 2013). They are, therefore, expected to pursue *hybrid* forms of organizational ambidexterity or hybrid strategies (Raisch & Birkinshaw, 2008). Still, firms are mostly expected to focus on the simultaneous use of exploration and exploitation or on the contextual ambidexterity that results in supreme corporate performance. As an example of the above strategies, we could use high-tech companies, which are anticipated to pursue contextual ambidexterity in the same unit, as well as structural ambidexterity in different units. At the same time, as the external environment changes, it is possible that these companies may pursue reciprocal ambidexterity or try to manage exploration initially in one unit and then use the output to achieve exploitation in another unit. Thus, a few or all the four types of organizational ambidexterity are likely to occur both in high-tech oriented firms and in non-technologically oriented organizations (Boumgarden et al., 2012; Nickerson & Zenger, 2002).

### **Organizational Ambidexterity and Environmental Dynamism**

A key characteristic of organizational ambidexterity is that it is positively and significantly associated with environmental dynamism (Boumgarden et al., 2012; Davis et al., 2009; Junni et al., 2013; Katou et al., 2021; Pertusa-Ortega & Molina-Azorín, 2018). Ambidexterity is found to be more important for firms that operate in dynamic environments (Halevi et al., 2015; Lin & Ho, 2016), such as high-tech and knowledge-intensive service firms, rather than in manufacturing industries (Junni et al., 2013). In dynamic markets, firms need to continuously search for new opportunities while carefully exploiting the scarce financial and human resources, as the competition is intense (Katou et al., 2021). In contrast, in more stable markets, firms could use longer periods of stability followed by shorter bursts of change. Thus, they may focus on exploitation for longer periods before paying attention to exploration (Jansen et al., 2005, 2006; Junni et al., 2013; Lavie et al., 2010).

Moreover, difficulties arise not only when firms encounter scarce human and/or financial resources (Swift, 2016), but also when organizations exhibit different organizational and/or environmental conditions, such as recession, turnaround, or firm mergers (Marquis & Tilcsik, 2013). Organizations may experience multiple such periods over time. For instance, a firm may go public, merge with another firm, or have a massive reorientation, and thus suddenly face new environmental demands. As a result, the organization must define or adjust exploration and exploitation activities in order to remain confined to the scope delineated by its organizational form (Birkinshaw et al., 2016; Boumgarden et al., 2012; Brix, 2020; Havermans et al., 2015).

Ambidexterity can also be approached in terms of environmental munificence in order to describe industrial

opportunities and dynamism (Gianzina-Kassotaki, 2017; Raisch & Birkinshaw, 2008; Raisch & Hotz, 2010). In times of low environmental munificence, ambidexterity fails to significantly affect firm performance. However, in times of increasing environmental munificence (with scarcity of critical resources), firms might benefit from organizational ambidexterity, resulting in superior short-term performance (Auh & Menguc, 2005; Lavie et al., 2010). Thus, as the complexity, plurality, and competitiveness of the environment grows, organizations experience increased pressures to simultaneously deal with multiple competing demands in their organizational environment (Smith, 2014).

### **Ambidexterity and Organizational Performance**

*Ambidexterity–performance relationship.* Researchers have expressed opposing views about ambidexterity and its impact on organizational performance (Gianzina-Kassotaki, 2017). On the one hand, Porter (1996) suggested that firms must pursue either differentiation or low cost strategy, whereas their simultaneous pursuit compromises their potential value and results in them being “stuck in the middle” (Papachroni et al., 2015). In the same vein, earlier research has suggested that firms need to make choices that favor exploration over exploitation (Raisch & Birkinshaw, 2008). On the other hand, March (1991) believes that firms that pursue exploration and exploitation simultaneously are more likely to achieve superior performance. This is in line with Tushman and O'Reilly's (1996) opinion that firms that pursue exploration at the expense of exploitation run the risk of ending up having low organizational performance.

The above arguments have led to the “ambidexterity premise” (Raisch & Birkinshaw, 2008), according to which an organization that uses only exploration will normally suffer from the fact that it never gains the returns on its knowledge. On the contrary, an organization that uses only exploitation will normally suffer from obsolescence (Bonesso et al., 2014; Gianzina-Kassotaki, 2017; Lavie et al., 2010; Levinthal & March, 1993).

In order to resolve the above discrepancy, a research of the ambidexterity–performance relationship has been tested in different contexts, such as in mergers and acquisitions (M&A; Bauer et al., 2018; Choi & McNamara, 2018), manufacturing firms (Chen et al., 2016), high-tech firms (Aoki & Wilhelm, 2017; He & Wong, 2004), multinational enterprises (Han, 2007), small and medium-sized firms (Dezi et al., 2021; Garaus et al., 2016; Lubatkin et al., 2006; Patel et al., 2013), and corporate ventures (Raisch & Tushman, 2016). It has also been tested on different levels (Chang et al., 2016), such as on the firm level and business unit level (Gibson & Birkinshaw, 2004; Jansen et al., 2012), in projects and teams (Cao et al., 2009; Hirst et al., 2018; Huang & Cummings, 2011; Rosenkopf & Nerkar, 2001; Venugopal et al., 2020), and on the individual level

(Lee & Meyer-Doyle, 2017; Mom et al., 2009). Most of the studies showed a positive relationship of organizational ambidexterity with sales growth (Derbyshire, 2014; He & Wong, 2004), transition to scale (Raisch & Tushman, 2016), profitability (Fiss, 2011), return on investment and market share (Hambrick, 1983), and short-term and long-term firm performance (Dolz et al., 2019; Luger et al., 2018; Mahr, 2010; Pertusa-Ortega & Molina-Azorín, 2018; Schmitt & Raisch, 2013; Zimmermann et al., 2015).

More recently, Junni et al. (2013) used a meta-analysis to define the organizational ambidexterity–performance relationship. They found that ambidexterity is important for performance in non-manufacturing firms and at the higher levels of analysis. They also found that the performance effects are stronger when the study uses a cross-sectional or multi-method research design (Gianzina-Kassotaki, 2017). In Table 2 below, some key studies are presented, where scholars define the positive relationship between ambidexterity and performance.

In this table, researchers use different levels of analysis, which include small- to medium-sized firms (SMEs), multinationals, different industries, such as manufacturing and high-tech firms, publicly traded firms, among others. The types of research, which may involve qualitative, quantitative, or meta-analysis studies, also vary. All these studies show positive influence of ambidexterity on performance. Most importantly, scholars examine internal and external conditions, which they suggest have positive effects through their relationship with ambidexterity on firm performance (Gianzina-Kassotaki, 2017).

**Measurement of ambidexterity and performance.** In relation to the measurement of organizational ambidexterity, the measures of ambidexterity differ considerably across studies (Costanzo, 2019; Lavie et al., 2010; Luger et al., 2018; Pertusa-Ortega & Molina-Azorín, 2018; Turner et al., 2013). Ambidexterity instruments are constructed according to how scholars perceive ambidexterity as balanced or combined (Cao et al., 2009; Knight & Paroutis, 2017a; Miron-Spektor et al., 2018; Smith et al., 2017).

The balanced dimension refers to the firm's orientation toward exploratory or exploitative activities, while the combined dimension has to do with their combined magnitude (Cao et al., 2009; Chanda & McKelvey, 2020; Raisch et al., 2009; Venugopal et al., 2020). In the balanced perspective, organizational ambidexterity can be described as a midpoint, or an optimal point on a continuum, with exploration and exploitation lying at the two ends. In the combined perspective, exploration and exploitation are considered independent activities, where their maximized level can produce a high level of organizational ambidexterity (see Figure 5; Junni et al., 2013). Within both categories, researchers use different mathematical variations to measure ambidexterity (e.g.,  $|A - B|$  and continuous measures within the balanced perspective,  $A + B$  and  $A \times B$  within the combined perspective;

Birkinshaw & Gupta, 2013; Cao et al., 2009; Junni et al., 2013). Most of the ambidexterity scholars have a specific preference toward ambidexterity measurement, but there is no conclusive evidence whether these different measures produce consistent results (Almahendra & Ambos, 2015; Junni et al., 2013; Lavie et al., 2010).

The performance measures in ambidexterity studies are classified into objective and perceptual (Gianzina-Kassotaki, 2017). The objective measures correspond to the growth and profitability of organizations under examination, whereas the perceptual measures have to do with whether performance is considered absolute or relative as compared to that of competitors (Junni et al., 2013). For example, Gibson and Birkinshaw (2004), in their study, measured the perceptual performance of one business unit, while Lubatkin et al., (2006), in their research, measured the perceptual performance as compared to that of industry competitors.

**Classification of ambidextrous organizations based on their performance.** Finally, even though ambidexterity literature is extremely vague about how two different objectives should be balanced, traded off against one another, reconciled, or just managed (Ahammad et al., 2015; Cao et al., 2009; Uotila, 2018). Birkinshaw and Gupta (2013) propose that some firms are likely to be more ambidextrous than others, while it seems improbable for a firm to deliver the highest level of achievement simultaneously on both dimensions (Gianzina-Kassotaki, 2017). Figure 6 below illustrates the classification of ambidextrous organizations, as developed by Birkinshaw and Gupta (2013).

This figure shows the efficiency frontier of multiple ambidextrous organizations, according to which they must perform at the ideal frontier of their sector if they want to remain successful. They must also be able to perfectly balance the tensions between the explorative and exploitative activities. By combining the above two elements, they will succeed to manage ambidexterity effectively and thus achieve high performance outcomes.

Accordingly, Boumgarden et al. (2012) also argue in their study that ambidexterity theory is unclear in explicitly defining the relationships among exploration, exploitation, and firm performance (Gianzina-Kassotaki, 2017). Still, they propose a three-dimensional representation of the relationship among these three variables according to which ambidextrous organizations may have high performance outcomes, provided that they produce an approximate balance of exploration and exploitation activities (see also Junni et al., 2013). On the contrary, if ambidextrous companies are comprised of inconsistent design elements, the greater the distance from a balanced ambidextrous structure, the lower the level of their performance (Gieske et al., 2019; Kassotaki et al., 2019). In fact, organizations seem to appear in optimal exploration–exploitation clusters, and any organization that adopts an organizational form deviating from these clusters presents lower performance and a diminished probability of



**Table 2.** Key Studies About the Positive Relationship Between Ambidexterity-Performance.

References	Level of analysis	Type of research	Measurement of performance	Key findings
He and Wong (2004)	Manufacturing and high-tech firms	Quantitative	Sales growth	<ul style="list-style-type: none"> <li>The interaction between explorative and exploitative innovation strategies is positively related to sales growth rate</li> <li>The relative imbalance between explorative and exploitative innovation strategies is negatively related to sales growth rate</li> </ul>
Lubatkin et al. (2006)	Small- to medium-sized enterprises (SMEs)	Quantitative	Top management team (TMT) behavioral integration	<ul style="list-style-type: none"> <li>No other group, including the board of directors, has as great a potential for affecting the form and fate of an organization as the small group of senior executives residing at the apex of the organization</li> </ul>
Han and Celly (2008)	Multinational enterprises (INVs)	Quantitative	<ul style="list-style-type: none"> <li>Profit (ROI)</li> <li>Growth (market share)</li> </ul>	<ul style="list-style-type: none"> <li>Firms that looked at the long-term, profit-growth strategy enjoyed better performance than firms that adopted only one or none of the strategies</li> </ul>
Cao et al. (2009)	Small- to medium-sized enterprises (SMEs)	Quantitative	<ul style="list-style-type: none"> <li>Growth (sales, profit, market share)</li> <li>Operational efficiency</li> <li>Cash flow</li> <li>Market reputation</li> </ul>	<ul style="list-style-type: none"> <li>The concurrent high levels of the balance dimension of ambidexterity (BD) and the combined dimension of ambidexterity (CD) yield synergetic benefits and are over and above their independent effects</li> <li>BD is more beneficial to resource-constrained firms, whereas CD is more beneficial to firms having great access to internal and/or external resources</li> </ul>
Sarkees and Hulland (2009)	Publicly traded firms	Quantitative	<ul style="list-style-type: none"> <li>Revenues</li> <li>Profits</li> <li>Customer satisfaction</li> <li>New product introductions</li> </ul>	<ul style="list-style-type: none"> <li>Firms that successfully employ an ambidextrous strategy outperform those, which overemphasize either efficiency or innovation.</li> </ul>
Blarr (2012)	Small- to medium-sized firms (SMEs)	Quantitative	<ul style="list-style-type: none"> <li>ROA</li> <li>ROE</li> <li>Perceptual performance as compared to competitors, and compared to the industry average</li> </ul>	<ul style="list-style-type: none"> <li>The higher the level of organizational ambidexterity, the better the firm performance</li> </ul>
Boumgarden et al. (2012)	Firm (or multi-business level) and business unit level	Qualitative (dual case study analysis)	Expected economic profitability	<ul style="list-style-type: none"> <li>Vacillation may offer higher long run performance than ambidexterity, while ambidexterity enhances performance on the margin when utilized within larger epochs of vacillation</li> <li>Ambidexterity and vacillation are complements with respect to performance</li> </ul>
Jansen et al. (2012)	Multiple units of different organizations	Quantitative	<ul style="list-style-type: none"> <li>Average profitability for two consecutive years</li> <li>Objective and subjective (perceptual) measures of net growth and overall business performance</li> </ul>	<ul style="list-style-type: none"> <li>Unit ambidexterity boosts unit performance when the organization is decentralized, more resource munificent, or less resource independent</li> <li>Structural differentiation does not condition the relationship between unit ambidexterity and its performance.</li> </ul>

(continued)

**Table 2.** (continued)

References	Level of analysis	Type of research	Measurement of performance	Key findings
Junni et al. (2013)	–	Quantitative (meta-analysis)	–	<ul style="list-style-type: none"> <li>• Cross-sectional surveys and multi-method studies showed stronger performance effects</li> <li>• Subjective performance measures had stronger performance effects than objective ones</li> <li>• Weaker performance impact in manufacturing industries</li> </ul>
Derbyshire (2014)	Multiple sectors from different countries	Quantitative	Growth in sales turnover	<ul style="list-style-type: none"> <li>• Strong effect of ambidexterity on performance in the manufacturing, scientific, and technical services sectors.</li> </ul>
Chang et al. (2016)	Universities (departmental and individual levels)	Quantitative	Commercial performance	<ul style="list-style-type: none"> <li>• Research ambidexterity (RA) facilitates departmental and individual commercial performance</li> </ul>
Luger et al. (2018)	Global insurance firms	Quantitative	<ul style="list-style-type: none"> <li>• ROE</li> <li>• Total shareholder return (TSR)</li> </ul>	<ul style="list-style-type: none"> <li>• In contexts characterized by incremental change, firms benefit more from the learning effects of maintaining ambidexterity, which leads to superior performance</li> <li>• In contexts of discontinuous change, firms suffer more from misalignment that reinforcement creates, which affects their performance negatively.</li> </ul>
Venugopal et al. (2020)	Small- to medium-sized firms (SMEs)	Quantitative	Perceptual measures compared to that of competitors	<ul style="list-style-type: none"> <li>• Combined ambidexterity mediates the effect of TMT behavioral integration on firm financial performance</li> <li>• Balanced ambidexterity does not produce enhanced firm financial performance in the specific context of SMEs</li> </ul>
Dezi et al. (2021)	Small- to medium-sized firms (SMEs)	Quantitative	Perceptual measures compared to that of competitors	<ul style="list-style-type: none"> <li>• Knowledge management plays a significant role in mediating the effects of the external embeddedness on the firm's ambidexterity that in turn enhances firm performance</li> </ul>

survival. In the same vein, Riccaboni and Moliterni (2009) argue that organizations able to effectively combine exploration and exploitation occupy a stable position at the core of the network structure and enjoy a competitive advantage (see also Hahn et al., 2016; Junni et al., 2013; Turner et al., 2013).

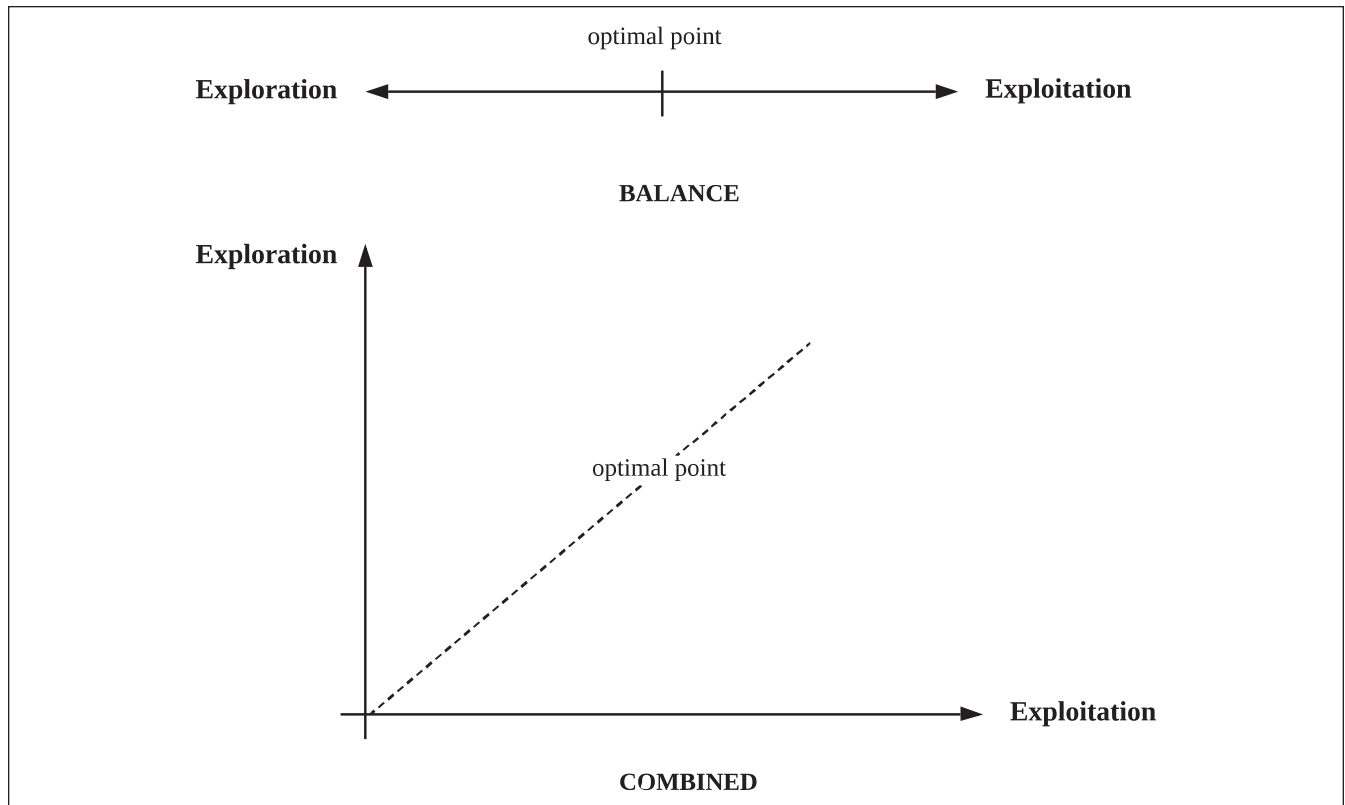
## Future Research Directions

Research has shown that March's (1991) work has an increasing dispersion of influence in multiple fields (Amjad & Md Nor, 2020; Nosella et al., 2012). Until recently, his work influence spread over more than 11 research areas, with no single field accounting for more than 20% of the citing articles. The most recent publications are on organizational structure, ambidexterity, and performance, and technological search, innovation, and networks (Wilden et al., 2018). Some important recent debates are also those focusing on ambidexterity as a paradox (Farjoun, 2010; Smith & Lewis, 2011), on the dynamics of ambidexterity (Luger et al., 2018; Raisch & Tushman, 2016),

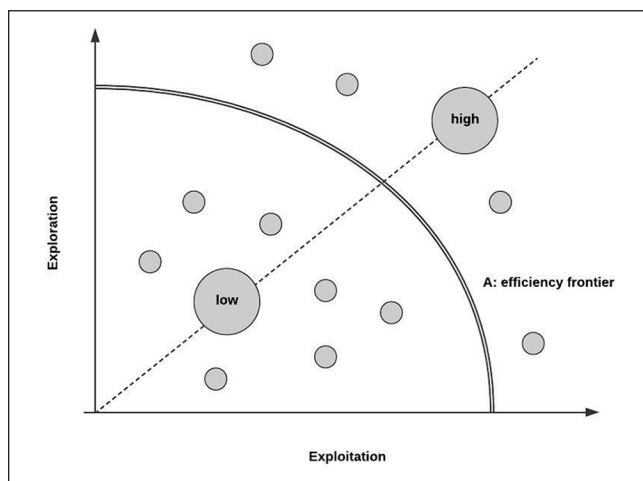
and on the micro-foundations of ambidexterity (Christofi et al., 2021; Kiss et al., 2020; Tempelaar & Rosenkranz, 2019; Zhang et al., 2020; Zimmermann et al., 2018).

In general, there is an immense increase of research on ambidexterity, especially from 2015 and onwards with more than 40 articles published on an annual basis. Organizational ambidexterity studies mostly focus on large organizations, and less on small to medium sized firms, which constitute the major contributor in any national and local economy. The largest research output on organizational ambidexterity is produced in North America, Europe, and China, whose organizational culture is mostly highlighted as a consequence (Amjad & Md Nor, 2020).

Despite the above volume of work on organizational ambidexterity, there are still unexplored areas, especially for researchers who employ a multi-level approach to ambidexterity (Burgess et al., 2015; Kassotaki et al., 2019; Turner et al., 2013), for those who work on ambidextrous leadership, as research on TMT members managing



**Figure 5.** Measurement of organizational ambidexterity.



**Figure 6.** Classification of ambidextrous organizations.

explorative and exploitative activities is rather scarce (Kassotaki, 2019a; Koryak et al., 2018; Venugopal et al., 2020), and for those who are studying ambidexterity in the high technology industry, and especially in scale-up firms (Coutu, 2014; Ferraris et al., 2019; Ferraris et al., 2018; Isenberg & Onyemah, 2017).

### *Ambidextrous Leadership Direction*

In the context of ambidextrous leadership, Rogan & Mors (2014) have recently expressed the view that studies on individual-level ambidexterity are scarce due to two basic difficulties—the one is empirical and the other one is theoretical. First, although individual behaviors are important for the management of ambidexterity, it is difficult to empirically observe the processes of how leaders promote ambidexterity in their organizational setting. Second, studies that describe ambidextrous leadership behaviors are restricted to cognitive processes required to balance exploration and exploitation.

In their seminal work on strategic leadership for exploration and exploitation, Jansen et al. (2009) stressed that strategic leaders or TMT members, promote explorative and exploitative activities in their organizational setting through transformational and transactional leadership styles (see also Halevi et al., 2015). In their research, they linked transformational leadership style with explorative innovation, while transactional leadership was associated with exploitative innovation (Diesel & Scheepers, 2019; Jansen et al., 2008; Luo et al., 2018; Nemanich & Vera, 2009; Tushman et al., 2010). On the contrary, Rosing et al. (2011) expressed the opinion that transformational and transactional leadership styles are too broad in nature, as they include a large number

of behaviors that can actually promote or hinder innovation (see also Berraies & Zine El Abidine, 2019). They instead proposed that teams and individuals can use opening and closing leadership behaviors during the innovation process that specifically match the requirements they face, and the possibility to switch between those behaviors, as dictated by the situations (Alghamdi, 2018; Kassotaki, 2019a). More recently, Koryak et al. (2018) used the attention-based theory, while focusing on two aspects of TMT members attention—attentional perspective and attentional engagement. Attentional perspective includes the top-down cognitive structures that produce increased awareness and focus over time to specific stimuli and responses, while attentional engagement involves the focus of resources such as time and energy on a selected set of stimuli and responses. They stressed that maintaining an optimal combination of exploration and exploitation at any moment is one of the most significant requirements on a manager's attention (see also Smith and Tushman, 2005).

The above studies indicate that leadership is a complex issue. There are so many significant variables of what constitutes a good leadership that it becomes almost impossible to develop an experiment that will provide conclusive evidence on the subject. Currently, leadership scholars focus their attention not only on the leader but also on the followers, peers, supervisors, work setting/context, and culture, as well as on a wide range of variables including the public, private, and non-profit organizations from countries all over the world. Leadership is no longer perceived as an individual characteristic, but is described in different models as dyadic, shared, relational, global, strategic, and a complex social dynamic (Avolio et al., 2009; Kassotaki, 2019a). With respect to ambidextrous leadership, only some studies to date describe leadership behaviors and leadership styles specific to ambidexterity management on the CEO level (Cao et al., 2010; Kiss et al., 2020). Comprehensive models on the individual level, holistic approaches on the strategic level and longitudinal studies are still needed to examine the impact of leadership on exploration and exploitation (Chen & Liu, 2020; Kassotaki, 2019b; Kiss et al., 2020; Koryak et al., 2018; Luo et al., 2018; Yukl, 2009).

### *A Multi-Level Approach to Ambidexterity Direction*

In the context of a multi-level approach to ambidexterity, researchers stress that it is important to focus on many different variables when studying ambidexterity, as studies that use only few indicators may produce biased estimations of how ambidexterity affects firms' overall success (Raisch & Birkinshaw, 2008).

In his review article, Simsek (2009) proposed that a multi-level approach to ambidexterity should include the organizational level (dual structure, behavioral context, and TMT

behavioral integration), the inter-firm level (centrality, diversity of ties), and the environment (dynamism, complexity). At the same time, in their empirical study, Andriopoulos and Lewis (2009) made a multi-level analysis of ambidexterity, while describing tensions in organizations at the three organizational levels—at the firm level, within projects, and at the employee level. At the firm level, senior executives pursue two important aims that relate to each other—stable revenues to increase cost efficiency, and innovative ideas to promote high performance (Zimmermann et al., 2015). Within projects, middle managers try to develop high quality customer relationships by using innovative ideas in the context of clearly defined goals (Burgess et al., 2015; Hirst et al., 2018). At the employee level, individuals face constant challenges, such as discipline and creativity (Hirst et al., 2018; Kassotaki et al., 2019). Recently, Kassotaki et al. (2019) attempted to construct a more holistic approach to ambidexterity management at multiple levels, while introducing the term ambidexterity penetration. In their research, they explained that exploration–exploitation tensions can be managed within organizations at the same level (horizontal ambidexterity), across levels (vertical ambidexterity), and through the entire organization (organizational ambidexterity).

Despite the above studies examining ambidexterity from multiple levels, more research is still needed for a closer examination of ambidexterity between the levels, where scholars should clarify if it is possible to compare the different levels in terms of their ambidexterity management. Future studies should also use more specialized approaches to describe how ambidexterity is managed at multiple levels, while using cluster analysis or qualitative comparative analysis (QCA) of organizations grouped in clusters (Kassotaki et al., 2019). Finally, future research should focus on the dynamic balancing of explorative and exploitative activities in organizations in different industries. Through longitudinal approaches, scholars will be able to capture the full complexity of the ambidexterity management, while at the same time explain how the exploration–exploitation allocations of the firms evolve and what is the impact on their long term performance outcomes (Luger et al., 2018; Rao & Thakur, 2019; Tushman et al., 2010).

### *High Technology Industry Direction*

Finally, according to OECD classification, high technology industry is considered to have one of the highest R&D intensities (OECD, 2011). This industry includes aircraft and spacecraft corporations, pharmaceuticals, and computing developers, among others. Technological effort is considered to be a critical determinant of productivity growth and international competitiveness (OECD, 2011), and for this reason, organizational ambidexterity is particularly important for this industry (Wang & Rafiq, 2014). Companies of this sector must constantly invest in innovative technologies, while



effectively managing explorative activities. At the same time, they are expected to operate in a lean organizational environment with controlled expenses, and thus effectively manage exploitative activities (Ardito et al., 2021; Bresciani et al., 2018; Ferraris et al., 2019; Kassotaki, 2019a).

Recently, scholars have started to examine more closely the business environment of the scale-up companies in the high-tech industry (Davis, 2014; Isenberg & Onyemah, 2017). A scale-up is an enterprise with average annual growth in employees or turnover greater than 20% per annum over a 3-year period, and with more than 10 employees at the beginning of the period (Coutu, 2014; OECD, 2007). Due to its nature, a scale-up firm is a particular case of the broader class of high-growth firms (HGF). Scale-up firms are mostly seen as high-tech start-ups but they are also present in service and manufacturing industries (Coad et al., 2014). Researchers have started to propose that the main problem for entrepreneurs is not just to start business (Aldrich & Ruef, 2018; Colombelli et al., 2016), but rather to make it grow in terms of number of users, funds raised, or physical capacity (Josefy et al., 2015).

The growth of scale-up firms has been discussed in terms of two key mechanisms—scalability and efficiency. Scalability has been described as the ability of the firm to grow quickly without being affected by the restrictions of its structure and resources. The idea of scalability has become important in recent years, as technological advances have made it easier to attract consumers and gain scale quickly. Efficiency, on the other hand, is a key component of scale-up firms, as without efficiency the firm is unable to maintain or improve its actual or latent economic performance, as growth occurs rapidly in a context of absence of market power. Without a minimum degree of efficiency, a firm that grows rapidly may collapse in the weight of its own growth. Scholars emphasize that the combination of scalability and efficiency leads to high growth rates in a way that are consistent with superior performance, two key and inseparable dimensions in the strategy of the scale-up firms (Monteiro, 2019).

As research on scale-up firms is a new and vibrant field (European Commission, 2018), future studies should examine more closely how the effective management of two types of capabilities (dynamic and efficiency) can exert influence on the entrepreneurial environment and bolster the foundation of the scale-up firms (Fu et al., 2020; Monteiro, 2019). Another important element is to understand how the external environment, such as institutional differences, economic policy variables, and trade specialization patterns affect the organizational dilemmas of the scale-up firms, as research has shown that the share of the scale-up organizations differs significantly across countries (Coad et al., 2014; Davis, 2014; European Commission, 2018). Finally, future research should also focus on the description of how more complex determinants, such as the role of the entrepreneur, team composition, organizational design, organizational innovation during high growth, firm strategies, and industry characteristics affect the

scalability and efficiency of the scale-ups firms (Coad et al., 2014; DeSantola & Gulati, 2017; Tushman et al., 2010).

## Limitations

This study is not without limitations. While a systematic review is regarded as the strongest form of evidence, it may constantly needs updating especially in a dynamic field of ambidexterity where new research is continuously emerging. In addition, as the thematic analysis is an inherently interpretive technique, which includes judgments and biases, it may have affected the reliability of the data presentation. Finally, limitations may also exist particularly in areas such as selection of methodologically flawed data, and issues resulting from data abstraction, which may have affected the quality, rigor, and reproducibility of this research.

## Conclusion

In recent years the concept of ambidexterity has gained an increased attention from researchers. Scholars have been studying ambidexterity in various literature streams, such as organizational learning, technological innovation, organizational adaption, strategic management, and organizational design. They have also been focusing on different external and internal organizational factors, such as environmental dynamism, organizational structures, behavioral contexts, and leadership characteristics. All these moderators have been analyzed in terms of performance metrics and the degree of their influence on ambidexterity. Despite the existing volume of work, there is still space for future research on ambidexterity in different directions. There are still unexplored areas for researchers who work on ambidextrous leadership, for those who employ a multi-level approach to ambidexterity, and for those who are studying ambidexterity in high technology organizations.

## Appendix

### *A Multi-Level Review Strategy*

In order to perform our review on ambidexterity research, we implemented a multi-level review strategy in our study (Pittaway et al., 2004; Tranfield et al., 2003; Turner et al., 2013). We followed the work of Tranfield et al. (2003), with the key points as summarized by Denyer and Neely (2005). The key points include “the development of clear and precise aims and objectives, the use of pre-planned methods, a comprehensive search of all potentially relevant articles, the use of explicit, reproducible criteria in the selection of articles, an appraisal of the quality of the research and the strength of the findings, a synthesis of individual studies using an explicit analytic framework, and a balanced, impartial and comprehensible presentation of the results” (Turner et al., 201, p. 319).

The main objective of this research was to investigate how organizational ambidexterity can be achieved at a modern

organization. In order to meet the requirement of developing clear and precise aims and objectives, an initial scoping review of the literature was carried out. We identified the research output of the ambidexterity concept published in top journals. Then, we selected milestone articles from the retrieved papers. We carefully read those articles and then created the most important themes in order to provide a comprehensive overview of the ambidexterity concept (Nosella et al., 2012; Wilden et al., 2018). After creating the main themes, we included other articles from top journals to these themes.

When identifying the articles, we were using journal databases, such as Business Source Complete (EBSCO), JSTOR Journals, and ScienceDirect. Our initial search term was «ambidex\*». Specific tools were applied to evaluate the papers identified, such as specific inclusion criteria (only peer-reviewed, academic journals, and reviews were included), theoretical and empirical paper evaluation criteria (only articles from top journals were included), a quality assessment tool (articles were selected according to theory robustness, generalizability, etc.), a relevance assessment tool (articles were assessed and selected only if relevant to the subject under study), and a common data extraction format (the same keywords and criteria were applied in the journal databases; Pittaway et al., 2004; Turner et al., 2013).

Based on our search, we identified 384 articles, from which we used 6 milestone articles in order to create the main themes (see Table A1). These milestone articles were chosen as they are review articles with a high number of citations. Review articles were chosen to build on them, as they have already attempted to capture the magnitude of ambidexterity research (Crossan & Apaydin, 2010), while their high number of citations reflected aspects related to scientific impact and relevance, as well as to research quality of the

field (Aksnes et al., 2019). After creating the themes, 122 articles in total were included in our study, while 262 were excluded due to unfit title, abstract, or full text.

When retrieving the articles, we identified two specific criteria. All the accessed articles were published after the main March's (1991) work. Therefore, our age of material included the last 30 years. We were also interested in articles mostly published in A-rank journals. These journals appear in the Financial Times 50 list. Based on multiple indicators, this list is believed to select the best management journals (Crossan & Apaydin, 2010; Fassin, 2021). Except from top journals, a very small number of highly cited articles published in B-rank journals (academic or practitioner), such as the work of Riccaboni and Moliterni (2009) and Tushman et al. (2010) were also included in our review.

More specifically, when constructing the main themes of this review, we were interested in including the most important elements of organizational ambidexterity research. These include: (1) the streams of the work produced on ambidexterity, (2) the internal and external organizational factors that influence ambidexterity, (3) the approaches/forms that comprise ambidexterity, (4) the environmental dynamism that influences ambidexterity, (5.1) the ambidexterity-performance relationship, (5.2) the ambidexterity-performance measurement, and (5.3) the classification of ambidextrous organizations. The above elements were deemed important, as the study of multiple dimensions of ambidexterity allows for a more holistic approach to ambidexterity analysis that results in more accurate estimations of ambidexterity on the firms' overall success (Raisch & Birkinshaw, 2008). In Table A1, we present the six milestone articles used in our study, while in Table A2, we present the thematic analysis of the papers reviewed.

**Table A1.** Overview of the Milestone Articles Used in This Study.

References	Sections	Coding	Description of sections	Title of the article	Journal	Number of citations until end of 2021 (from Google Scholar)
Raisch and Birkinshaw (2008)	Theoretical foundations	1	This section include different literature streams	Organizational ambidexterity: Antecedents, outcomes, and moderators	Journal of Management	3010
	A framework of organizational ambidexterity	2	This section includes multiple factors that affect ambidexterity			
Simsek et al. (2009)	A typology of organizational ambidexterity	3	This section describes the four approaches to ambidexterity	A typology for aligning organizational ambidexterity's conceptualizations, antecedents, and outcomes	Journal of Management	836

(continued)

**Table A1.** (continued)

References	Sections	Coding	Description of sections	Title of the article	Journal	Number of citations until end of 2021 (from Google Scholar)
Boumgarden et al. (2012)	Classification of ambidextrous organizations	5.3	This sub-section describes how ambidextrous organizations are classified	Sailing into the wind: Exploring the relationships among ambidexterity, vacillation, and organizational performance	Strategic Management Journal	449
Junni et al. (2013)	Organizational ambidexterity and environmental dynamism Ambidexterity-performance relationship Measurement of ambidexterity and performance	4 5.1 5.2	This section describes how environmental dynamism influences ambidexterity This sub-section describes how ambidexterity affects performance This sub-section describes how ambidexterity and performance are measured	Organizational ambidexterity and performance: A meta-analysis	Academy of Management Perspectives	795
Birkinshaw and Gupta (2013)	Classification of ambidextrous organizations	5.3	This sub-section describes how ambidextrous organizations are classified	Clarifying the distinctive contribution of ambidexterity to the field of organization studies	Academy of Management Perspectives	699
Tushman and O'Reilly (2013)	A framework of organizational ambidexterity	2	This section includes multiple factors that affect ambidexterity	Organizational ambidexterity: Past, present, and future	Academy of Management Perspectives	2057

**Table A2.** Thematic Analysis of the Papers Reviewed.

Coding	Themes	Sections	Description of sections	No. of papers	Journals
I	What are the literature streams of the work produced on ambidexterity	Theoretical foundations	This section include different literature streams	27	Academy of Management Annals Academy of Management Executive Academy of Management Journal Academy of Management Review Academy of Management Perspectives Administrative Science Quarterly California Management Review Group and Organization Management Harvard Business Review Journal of Management Journal of Management Studies Long Range Planning MIT Sloan Management Review Organization Science Organization Studies Schmalenbach Business Review The International Journal of Human Resource Management The Journal of Applied Behavioral Science

(continued)

**Table A2.** (continued)

Coding	Themes	Sections	Description of sections	No. of papers	Journals
2	What are the internal and external organizational factors that influence ambidexterity	A framework of organizational ambidexterity	This section includes multiple factors that affect ambidexterity	45	Academy of Management Annals Academy of Management Executive Academy of Management Journal Academy of Management Perspectives California Management Review Harvard Business Review Human Resource Management International Journal of Management Reviews International Journal of Research in Marketing Journal of Management Journal of Operations Management Journal of Product Innovation Management Long Range Planning Managerial Science Organization Science Research in Organizational Behavior Research Policy Strategic Management Journal Strategic Organization Technovation
3	How many approaches/forms comprise ambidexterity	A typology of organizational ambidexterity	This section describes the four approaches to ambidexterity	31	Academy of Management Journal Academy of Management Review British Journal of Management California Management Review Harvard Business Review Industrial and Corporate Change International Journal of Management Reviews Journal of Management Journal of Management Studies Journal of Product Innovation Management Long Range Planning Organization Science Strategic Management Journal Strategic Organization The International Journal of Human Resource Management The Journal of Applied Behavioral Science
4	How environmental dynamism influences ambidexterity	Organizational ambidexterity and environmental dynamism	This section describes how environmental dynamism influences ambidexterity	19	Academy of Management Annals Academy of Management Journal Academy of Management Perspectives Administrative Science Quarterly BRQ Business Research Quarterly California Management Review Human Resource Management Journal of Business Research Journal of Management Long Range Planning Managerial Science Organization Science Schmalenbach Business Review Strategic Management Journal
5.1	How ambidexterity relates to firm performance	Ambidexterity-performance relationship	This sub-section describes how ambidexterity affects performance	42	Academy of Management Annals Academy of Management Journal Academy of Management Perspectives Business Horizons BRQ Business Research Quarterly California Management Review Canadian Journal of Administrative Sciences European Management Journal Harvard Business Review

(continued)



**Table A2.** (continued)

Coding	Themes	Sections	Description of sections	No. of papers	Journals
					Human Resource Management International Journal of Human Resource Management Journal of Enterprising Culture Journal of Management Journal of Management Studies Long Range Planning Organization Science Small Group Research Strategic Management Journal Technovation The Journal of Applied Behavioral Science
5.2	How ambidexterity and performance are measured	Measurement of ambidexterity and performance	This sub-section describes how ambidexterity and performance are measured	17	Academy of Management Annals Academy of Management Journal Academy of Management Perspectives BRQ Business Research Quarterly International Journal of Innovation Management International Journal of Management Reviews Journal of Management Organization Science Organization Studies
5.3	How different ambidextrous organizations are classified	Classification of ambidextrous organizations	This sub-section describes how ambidextrous organizations are classified	11	Academy of Management Perspectives Human Resource Management Industrial and Corporate Change International Journal of Management Reviews Long Range Planning Organization Science Organization Studies R&D Management Strategic Management Journal
<b>Total number of non-duplicate articles included in this review</b>				122	

### Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author received no financial support for the research, authorship, and/or publication of this article.

### ORCID iD

Olga Kassotaki  <https://orcid.org/0000-0002-8534-7251>

### References

- Adler, P. S., Goldoftas, B., & Levine, D. I. (1999). Flexibility versus efficiency? A case study of model changeovers in the Toyota production system. *Organization Science*, 10(1), 43–68.
- Ahammad, M., Lee, M., Malul, M., & Shoham, A. (2015). Behavioral ambidexterity: The impact of incentive schemes on productivity, motivation, and performance of employees in commercial banks. *Human Resource Management*, 54(S1), 45–62.
- Aksnes, D. W., Langfeldt, L., & Wouters, P. (2019). Citations, citation indicators, and research Quality: An overview of basic concepts and theories. *SAGE Open*, 9(1), 1–17. <https://doi.org/10.1177/2158244019829575>
- Aldrich, H., & Ruef, M. (2018). Unicorns, gazelles, and other distractions on the way to understanding real entrepreneurship in America. *Academy of Management Perspectives*, 32(4), 458–472.
- Alghamdi, F. (2018). Ambidextrous leadership, ambidextrous employee, and the interaction between ambidextrous leadership and employee innovative performance. *Journal of Innovation and Entrepreneurship*, 7(1), 1–14.
- Almahendra, R., & Ambos, B. (2015). Exploration and exploitation: A 20-year review of evolution and reconceptualisation. *International Journal of Innovation Management*, 19(01), 1550008.
- Amjad, A., & Md Nor, K. (2020). Organizational ambidexterity: The state of global research using bibliometric analysis on Scopus database. *Journal of Xi'an University of Architecture & Technology*, 12(5), 1522–1540.
- Andriopoulos, C., & Lewis, M. (2009). Exploitation-exploration tensions and organizational ambidexterity: Managing paradoxes of innovation. *Organization Science*, 20(4), 696–717.
- Aoki, K., & Wilhelm, M. (2017). The role of ambidexterity in managing buyer–supplier relationships: The Toyota case. *Organization Science*, 28(6), 1080–1097.
- Ardito, L., Petruzzelli, A. M., & Albino, V. (2021). The influence of alliance ambidexterity on innovation performance and the moderating role of firm age. *IEEE Transactions on Engineering Management*, 68(2), 370–377.

- Argyris, C., & Schön, D. A. (1978). Organizational learning: A theory of action perspective. *The Journal of Applied Behavioral Science*, 15(4), 542–548.
- Auh, S., & Menguc, B. (2005). Balancing exploration and exploitation: The moderating role of competitive intensity. *Journal of Business Research*, 58(12), 1652–1661.
- Avolio, B. J., Walumbwa, F. O., & Weber, T. J. (2009). Leadership: Current theories, research, and future directions. *Annual Review of Psychology*, 60(1), 421–449.
- Bauer, F., Strobl, A., Dao, M. A., Matzler, K., & Rudolf, N. (2018). Examining links between pre and post M&A value creation mechanisms—Exploitation, exploration and ambidexterity in central european SMEs. *Long Range Planning*, 51(2), 185–203.
- Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review*, 28(2), 238–256.
- Berraies, S., Zine, El., & Abidine, S. (2019). Do leadership styles promote ambidextrous innovation? Case of knowledge-intensive firms. *Journal of Knowledge Management*, 23(5), 836–859.
- Birkinshaw, J., & Gupta, K. (2013). Clarifying the distinctive contribution of ambidexterity to the field of organization studies. *Academy of Management Perspectives*, 27(4), 287–298.
- Birkinshaw, J., Zimmermann, A., & Raisch, S. (2016). How do firms adapt to discontinuous change? Bridging the dynamic capabilities and ambidexterity perspectives. *California Management Review*, 58(4), 36–58.
- Blarr, W. H. (2012). *Organizational ambidexterity: Implications for strategy performance linkage*. Gabler Verlag.
- Bonesso, S., Gerli, F., & Scapolan, A. (2014). The individual side of ambidexterity: Do individuals' perceptions match actual behaviors in reconciling the exploration and exploitation trade-off? *European Management Journal*, 32(3), 392–405.
- Boumgarden, P., Nickerson, J., & Zenger, T. R. (2012). Sailing into the wind: Exploring the relationships among ambidexterity, vacillation and organizational performance. *Strategic Management Journal*, 33(6), 587–610.
- Bresciani, S., Ferraris, A., & Del Giudice, M. (2018). The management of organizational ambidexterity through alliances in a new context of analysis: Internet of Things (IoT) smart city projects. *Technological Forecasting and Social Change*, 136, 331–338.
- Brix, J. (2019). Ambidexterity and organizational learning: revisiting and reconnecting the literatures. *Learning Organization*, 26(4), 337–351.
- Brix, J. (2020). Building capacity for sustainable innovation: A field study of the transition from exploitation to exploration and back again. *Journal of Cleaner Production*, 268, 122381.
- Burgess, N., Strauss, K., Currie, G., & Wood, G. (2015). Organizational ambidexterity and the hybrid middle manager: The case of patient safety in UK hospitals. *Human Resource Management*, 54(S1), S87–S109.
- Cantarello, S., Martini, A., & Nosella, A. (2012). A multi-level model for organizational ambidexterity in the search phase of the innovation process. *Creativity and Innovation Management*, 21(1), 28–48.
- Cao, Q., Gedajlovic, E., & Zhang, H. (2009). Unpacking organizational ambidexterity: Dimensions, contingencies and synergistic effects. *Organization Science*, 20(4), 781–796.
- Cao, Q., Simsek, Z., & Zhang, H. (2010). Modelling the joint impact of the CEO and the TMT on organizational ambidexterity. *Journal of Management Studies*, 47(7), 1272–1296.
- Chanda, S. S., & McKelvey, B. (2020). Back to the basics: Reconciling the continuum and orthogonal conceptions of exploration and exploitation. *Computational and Mathematical Organization Theory*, 26(2), 175–206.
- Chandrasekaran, A., Linderman, K., & Schroeder, R. (2012). Antecedents to ambidexterity competency in high technology organizations. *Journal of Operations Management*, 30(1–2), 134–151.
- Chang, Y.-C., Yihsing, P., Martin, B. R., Chi, H.-R., & Tsai-Lin, T.-F. (2016). Entrepreneurial universities and research ambidexterity: A multilevel analysis. *Technovation*, 54(August), 7–9.
- Chen, J., & Liu, L. (2020). Reconciling temporal conflicts in innovation ambidexterity: The role of TMT temporal leadership. *Journal of Knowledge Management*, 24(8), 1899–1920.
- Chen, Y., Tang, G., Cooke, F. L., & Jin, J. (2016). How does executive strategic human resources management link to organizational ambidexterity? An empirical examination of manufacturing firms in China. *Human Resource Management*, 55(5), 919–943.
- Choi, S., & McNamara, G. (2018). Repeating a familiar pattern in a new way: The effect of exploitation and exploration on knowledge leverage behaviors in technology acquisitions. *Strategic Management Journal*, 39(2), 356–378.
- Christofi, M., Vrontis, D., & Cadogan, J. W. (2021). Micro-foundational ambidexterity and multinational enterprises: A systematic review and a conceptual framework. *International Business Review*, 30(1), 101625.
- Coad, A., Daunfeldt, S. O., Hözl, W., Johansson, D., & Nightingale, P. (2014). High-growth firms: Introduction to the special section. *Industrial and Corporate Change*, 23(1), 91–112.
- Colombelli, A., Krafft, J., & Vivarelli, M. (2016). To be born is not enough: The key role of innovative start-ups. *Small Business Economics*, 47(2), 277–291.
- Costanzo, L. A. (2019). Organisational Ambidexterity in the UK financial services: A corporate level perspective. *European Management Review*, 16(4), 105–1041.
- Coutu, S. (2014). *The scale-up report: On UK economic growth*. CBE.
- Crossan, M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47(6), 1154–1191.
- Davis, J. P., Eisenhardt, K. M., & Bingham, C. B. (2009). Optimal structure, market dynamism and the strategy of simple rules. *Administrative Science Quarterly*, 54(3), 413–452.
- Davis, N. (2014). *Enhancing Europe's competitiveness: Fostering innovation-driven entrepreneurship in Europe*. World Economic Forum.
- Denyer, D., & Neely, A. (2005). Introduction to special issue: Innovation and productivity performance in the UK. *International Journal of Management Reviews*, 5–6(3–4), 131–135.
- Derbyshire, J. (2014). The impact of ambidexterity on enterprise performance: Evidence from 15 countries and 14 sectors. *Technovation*, 34(10), 574–581.

- DeSantola, A., & Gulati, R. (2017). Scaling: organizing and growth in entrepreneurial ventures. *Academy of Management Annals*, 11(2), 640–668.
- Dezi, L., Ferraris, A., Papa, A., & Vrontis, D. (2021). The role of external embeddedness and knowledge management as antecedents of ambidexterity and performances in Italian SMEs. *IEEE Transactions on Engineering Management*, 68(2), 360–369.
- Diesel, R., & Scheepers, C. B. (2019). Innovation climate mediating complexity leadership and ambidexterity. *Personnel Review*, 48(7), 1782–1808.
- Dolz, C., Iborra, M., & Safón, V. (2019). Improving the likelihood of SME survival during financial and economic crises: The importance of TMTs and family ownership for ambidexterity. *BRQ Business Research Quarterly*, 22(2), 119–136.
- Duncan, R. B. (1976). The ambidextrous organization: Designing dual structures for innovation. In R. H. Kilmann, L. R. Pondy & D. Slevin (Eds.), *The management of organization design: Strategies and implementation* (pp. 167–188). North-Holland.
- European Commission. (2018). Scale-up companies—Is a new policy agenda needed? *ec.europa.eu*. <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=26381&no=1>
- Farjoun, M. (2010). Beyond dualism: Stability and change as a duality. *Academy of Management Review*, 35(2), 202–225.
- Fassin, Y. (2021). Does the financial times FT50 journal list select the best management and economics journals? *Scientometrics*, 126(7), 5911–5943.
- Ferraris, A., Erhardt, N., & Bresciani, S. (2019). Ambidextrous work in smart city project alliances: unpacking the role of human resource management systems. *International Journal of Human Resource Management*, 30(4), 680–701.
- Ferraris, A., Monge, F., & Mueller, J. (2018). Ambidextrous IT capabilities and business process performance: an empirical analysis. *Business Process Management Journal*, 24(5), 1077–1090.
- Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54(2), 393–420.
- Fu, H., Chen, W., Huang, X., Li, M., & Köseoglu, M. (2020). Entrepreneurial bricolage, ambidexterity structure, and new venture growth: Evidence from the hospitality and tourism sector. *International Journal of Hospitality Management*, 85, 102355.
- Fu, N., Flood, P. C., Morris, T., & Read, M. (2016). Organizational ambidexterity and professional firm performance: The moderating role of organizational capital. *Journal of Professions and Organization*, 3(1), 1–16.
- Garaus, C., Guttel, W., Konlechner, S., & Koprax, I. (2016). Bridging knowledge in ambidextrous HRM systems: Empirical evidence from hidden champions. *The International Journal of Human Resource Management*, 27(3), 355–381.
- Garcia-Granero, A., Fernandez-Mesa, A., Jansen, J., & Vega-Jurado, J. (2018). Top management team diversity and ambidexterity: The contingent role of shared responsibility and CEO cognitive trust. *Long Range Planning*, 51(6), 881–893.
- Geerts, A., Leten, B., Belderbos, R., & Van Looy, B. (2018). Does spatial ambidexterity pay off? On the benefits of geographic proximity between technology exploitation and exploration. *Journal of Product Innovation Management*, 35(2), 151–163.
- Gersick, C. I. G. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Academy of Management Review*, 16(1), 10–36.
- Gianzina-Kassotaki, O. (2017). *Leadership and ambidexterity: A multilevel analysis of the aerospace and defense organizations* [Dissertation]. Warwick Business School. [http://wrap.warwick.ac.uk/95904/1/WRAP\\_Theses\\_Gianzina-Kassotaki\\_2017.pdf](http://wrap.warwick.ac.uk/95904/1/WRAP_Theses_Gianzina-Kassotaki_2017.pdf) (26 September 2017)
- Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), 209–226.
- Gieske, H., Duijn, M., & van Buuren, A. (2019). Ambidextrous practices in public service organizations: Innovation and optimization tensions in Dutch water authorities. *Public Management Review*, 22(3), 341–346.
- Gupta, K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal*, 49(4), 693–706.
- Gutter, W., & Konlechner, S. (2009). Continuously hanging by a thread: Managing contextually ambidextrous organizations. *Schmalenbach Business Review*, 61, 150–172.
- Hahn, T., Pinkse, J., Preuss, L., & Figge, F. (2016). Ambidexterity for corporate social performance. *Organization Studies*, 37(2), 213–235.
- Halevi, M., Carmeli, A., & Brueller, N. (2015). The ambidexterity in SBUs: TMT behavioral intergration and environmental dynamism. *Human Resource Management*, 54(S1), 223–238.
- Hambrick, D. (1983). Some tests of the effectiveness and functional attributes of Miles and Snow's strategic types. *Academy of Management Journal*, 26(1), 5–26.
- Han, M. (2007). Achieving superior internationalization through strategic ambidexterity. *Journal of Enterprising Culture*, 15(1), 43–77.
- Han, M., & Celly, N. (2008). Strategic ambidexterity and performance in international new ventures. *Canadian Journal of Administrative Sciences*, 28(4), 335–349.
- Havermans, L., Den Hartog, D., Keegan, A., & Uhl-Bien, M. (2015). Exploring the role of leadership in enabling contextual ambidexterity. *Human Resource Management*, 54(S1), 179–200.
- He, Z.-L., & Wong, P.-K. (2004). Exploration vs exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science*, 15(4), 481–494.
- Heyden, M. L. M., Sidhu, J., & Volberda, H. (2018). The conjoint influence of top and middle management characteristics on management innovation. *Journal of Management*, 44(4), 1505–1529.
- Hill, S. A., & Birkinshaw, J. (2014). Ambidexterity and survival in corporate venture units. *Journal of Management*, 40(7), 1899–1931.
- Hirst, G., van Knippenberg, D., Zhou, Q., Zhu, C. J., & Tsai, P. C.-F. (2018). Exploitation and exploration climates' influence on performance and creativity: Diminishing returns as function of self-efficacy. *Journal of Management*, 44(3), 870–891.
- Huang, J., & Kim, H. J. (2013). Conceptualizing structural ambidexterity into the innovation of human resource management

- architecture: The case of LG Electronics. *The International Journal of Human Resource Management*, 24(5), 922–943.
- Huang, S., & Cummings, J. (2011). When critical knowledge is most critical: Centralization in knowledge-intensive teams. *Small Group Research*, 42(6), 669–699.
- Isenberg, D., & Onyemah, V. (2017). *Start-ups won't save the economy. But "scale-ups" could*. Retrieved September 1, 2018, from <https://www.weforum.org/agenda/2017/03/start-ups-entrepreneurship-scale-ups-latin-america/>
- Jansen, J., George, G., Van Den Bosch, F., & Volberda, H. (2008). Senior team attributes and organizational ambidexterity: The moderating role of transformational leadership. *Journal of Management Studies*, 45(5), 982–1007.
- Jansen, J., Simsek, Z., & Cao, Q. (2012). Ambidexterity and performance in multiunit contexts: Cross-level moderating effects of structural and resource attributes. *Strategic Management Journal*, 33(11), 1286–1303.
- Jansen, J., Van Den Bosch, F., & Volberda, H. (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. *Management Science*, 52(11), 1661–1674.
- Jansen, J., Vera, D., & Crossan, M. (2009). Strategic leadership for exploration and exploitation: The moderating role of environmental dynamism. *The Leadership Quarterly*, 20(1), 5–18.
- Jansen, J., Volberda, H., & Van Den Bosch, F. (2005). Exploratory innovation, exploitative innovation and ambidexterity: The impact of environmental antecedents. *Schmalenbach Business Review*, 57(October), 351–363.
- Josefy, M., Kuban, S., Ireland, R. D., & Hitt, M. A. (2015). Dynamic balancing of exploration and exploitation: The contingent benefits of ambidexterity. *Academy of Management Annals*, 9(1), 715–802.
- Junni, P., Sarala, R., Taras, V., & Tarba, S. (2013). Organizational ambidexterity and performance: A meta-analysis. *Academy of Management Perspectives*, 27(4), 299–312.
- Junni, P., Sarala, R., Tarba, S., Liu, Y., & Cooper, C. (2015). Guest editors' introduction: The role of human resources and organizational factors in ambidexterity. *Human Resource Management*, 54(S1), S1–S28.
- Kang, S., & Snell, S. (2009). Intellectual capital architectures and ambidextrous learning: A framework for human resource management. *Journal of Management Studies*, 46(1), 65–92.
- Kassotaki, O. (2019a). Ambidextrous leadership in the high technology organizations. *Organizational Dynamics*, 48(2), 37–43.
- Kassotaki, O. (2019b). Explaining ambidextrous leadership in the aerospace and defense organizations. *European Management Journal*, 37(5), 552–563.
- Kassotaki, O., Paroutis, S., & Morrell, K. (2019). Ambidexterity penetration across organizational levels in an aerospace and defense organization. *Long Range Planning*, 52(3), 366–385.
- Katou, A. A., Budhwar, P. S., & Patel, C. (2021). A trilogy of organizational ambidexterity: Leader's social intelligence, employee work engagement and environmental changes. *Journal of Business Research*, 128, 688–700.
- Kaupila, O. (2010). Creating ambidexterity by integrating and balancing structurally separate interorganizational partnerships. *Strategic Organization*, 8(4), 283–312.
- Kiss, A. N., Libaers, D., Barr, P. S., Wang, T., & Zachary, M. A. (2020). CEO cognitive flexibility, information search, and organizational ambidexterity. *Strategic Management Journal*, 41(12), 2200–2233. <https://doi.org/10.1002/sm>. <https://doi.org/10.1002/smj.3192>
- Knight, E., & Paroutis, S. (2017a). Becoming salient: The TMT leader's role in shaping the interpretive context of paradoxical tensions. *Organization Studies*, 38(3–4), 403–432.
- Knight, E., & Paroutis, S. (2017b). Paradoxes of learning and education. In M. Lewis, W. Smith, P. Jarzabkowski, & A. Langley (Eds.), *Oxford handbook of organizational paradox: Approaches to plurality, tensions and contradictions* (p. forthcoming). Open University Press.
- Kortmann, S. (2014). The mediating role of strategic orientations on the relationship between ambidexterity-oriented decisions and innovative ambidexterity. *Journal of Product Innovation Management*, 32(5), 666–684.
- Koryak, O., Lockett, A., Hayton, J., Nicolaou, N., & Mole, K. (2018). Disentangling the antecedents of ambidexterity: Exploration and exploitation. *Research Policy*, 47(2), 413–427.
- Kostopoulos, K. C., & Bozionelos, N. (2011). Team exploratory and exploitative learning: Psychological safety, task conflict, and team performance. *Group & Organization Management*, 36(3), 385–415.
- Kyriakopoulos, K., & Moorman, C. (2004). Tradeoffs in marketing exploitation and exploration strategies: The overlooked role of market orientation. *International Journal of Research in Marketing*, 21(3), 219–240.
- Lant, T., & Mezias, S. (1992). An organizational learning model of convergence and reorientation. *Organization Science*, 3(1), 47–71.
- Lavie, D., & Rosenkopf, L. (2006). Balancing exploration and exploitation in alliance formation. *Academy of Management Journal*, 49(4), 797–818.
- Lavie, D., Stettner, U., & Tushman, M. L. (2010). Exploration and exploitation within and across organizations. *Academy of Management Annals*, 4(1), 109–155.
- Lee, S., & Meyer-Doyle, P. (2017). How performance incentives shape individual exploration and exploitation: Evidence from Microdata. *Organization Science*, 28(1), 1–18.
- Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic Management Journal*, 14(S2), 95–112.
- Lin, L.-H., & Ho, Y.-L. (2016). Institutional pressures and environmental performance in the global automotive industry: The mediating role of organizational ambidexterity. *Long Range Planning*, 49(6), 764–775.
- Lubatkin, M. H., Simsek, Z., Ling, Y., & Veiga, J. (2006). Ambidexterity and performance in small- to medium-sized firms: The pivotal role of top management team behavioral integration. *Journal of Management*, 32(5), 646–672.
- Luger, J., Raisch, S., & Schimmer, M. (2018). Dynamic balancing of exploration and exploitation: The contingent benefits of ambidexterity. *Organization Science*, 28(3), 449–470.
- Luo, B., Zheng, S., Ji, H., & Liang, L. (2018). Ambidextrous leadership and TMT-member ambidextrous behavior: The role of TMT behavioral integration and TMT risk propensity. *The International Journal of Human Resource Management*, 29(2), 338–359.
- Mahr, F. (2010). *Hybrid strategy and firm performance: The moderating role of individual and technological ambidexterity* (No. 2010–4). Institute for Communication Economics. Munich School of Management. University of Munich. Retrieved January 17, 2017, from [https://epub.ub.uni-muenchen.de/11504/1/Mahr\\_2010\\_LMU.pdf](https://epub.ub.uni-muenchen.de/11504/1/Mahr_2010_LMU.pdf).



- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87.
- Markides, C. C., & Oyon, D. (2010). What to do against disruptive business models (When and how to play two games at once). *MIT Sloan Management Review*, 51(4), 27–32.
- Markides, C., & Charitou, C. D. (2004). Competing with dual business models: A contingency approach. *Academy of Management Executive*, 18(3), 22–36.
- Marquis, C., & Tilcsik, A. (2013). Imprinting: Toward a multilevel theory. *Academy of Management Annals*, 7(1), 193–243.
- Martini, A., Neirotti, P., & Aloini, D. (2015). Finding the way to ambidexterity: Exploring the relationships among organizational design, knowledge creation and innovation. *International Journal of Innovation Management*, 19(4), 32.
- Miron-Spektor, E., Ingram, A., Keller, J., Smith, W., & Lewis, M. (2018). Microfoundations of organizational paradox: The problem is how we think about the problem. *Academy of Management Journal*, 61(1), 26–45.
- Mom, T., Van Den Bosch, F., & Volberda, H. (2007). Investigating managers' exploration and exploitation activities: The influence of top-down, bottom-up and horizontal knowledge inflows. *Journal of Management Studies*, 44(6), 910–931.
- Mom, T., Van Den Bosch, F., & Volberda, H. (2009). Understanding variation in managers' ambidexterity: Investigating direct and interaction effects of formal structural and personal coordination mechanisms. *Organization Science*, 20(4), 812–828.
- Monteiro, G. F. (2019). High-growth firms and scale-ups: A review and research agenda. *RAUSP Management Journal*, 54(1), 96–111.
- Mueller, V., Rosenbusch, N., & Bausch, A. (2013). Success patterns of exploratory and exploitative innovation: A meta-analysis of the influence of institutional factors. *Journal of Management*, 39(6), 1606–1636.
- Nemanich, L. A., & Vera, D. (2009). Transformational leadership and ambidexterity in the context of an acquisition. *The Leadership Quarterly*, 20(1), 19–33.
- Nickerson, J. A., & Zenger, T. R. (2002). Being efficiently fickle: A dynamic theory of organizational choice. *Organization Science*, 13(5), 547–566.
- Nosella, A., Cantarello, S., & Filippini, R. (2012). The intellectual structure of organizational ambidexterity: A bibliographic investigation into the state of the art. *Strategic Organization*, 10(4), 450–465.
- O'Reilly, C. A., & Tushman, M. L. (2004). The ambidextrous organization. *Harvard Business Review*, 82(4), 74–81.
- O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, 28, 185–206.
- OECD. (2007). *Eurostat-OECD manual on business demography statistics*. OECD-Eurostat.
- OECD. (2011). *ISIC REV.3 Technology intensity definition*. Retrieved January 17, 2017, from <https://www.oecd.org/sti/ind/48350231.pdf>
- Papachroni, A., Heracleous, L., & Paroutis, S. (2015). Organizational ambidexterity through the lens of paradox theory: Building a novel research agenda. *The Journal of Applied Behavioral Science*, 51(1), 71–93.
- Patel, P., Messersmith, J., & Lepak, D. (2013). Walking the tightrope: An assessment of the relationship between high performance work systems and organizational ambidexterity. *Academy of Management Journal*, 56(5), 1420–1442.
- Pertusa-Ortega, E. M., & Molina-Azorín, J. F. (2018). A joint analysis of determinants and performance consequences of ambidexterity. *BRQ Business Research Quarterly*, 21(2), 84–98.
- Pittaway, L., Robertson, M., Munir, K., Denyer, D., & Neely, A. (2004). Networking and innovation: A systematic review of the evidence. *International Journal of Management Reviews*, 5/6(3–4), 137–168.
- Porter, M. (1996). What is strategy? *Harvard Business Review*, 74(6), 61–78.
- Prieto-Pastor, I., & Martin-Perez, V. (2015). Does HRM generate ambidextrous employees for ambidextrous learning? The moderating role of management support. *The International Journal of Human Resource Management*, 26(5), 589–615.
- Raisch, S. (2008). Balanced structures: Designing organizations for profitable growth. *Long Range Planning*, 41(5), 483–508.
- Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes and moderators. *Journal of Management*, 34(3), 375–409.
- Raisch, S., Birkinshaw, J., Probst, G., & Tushman, M. (2009). Organizational ambidexterity: Balancing exploitation and exploration for sustained performance. *Organization Science*, 20(4), 685–695.
- Raisch, S., & Hotz, F. (2010). Shaping the context for learning: Corporate alignment initiatives, environmental munificence and firm performance. In S. Wall, C. Zimmermann, R. Klingebiel & D. Lange (Eds.), *Strategic reconfigurations: Building dynamic capabilities in rapid innovation-based industries* (pp. 62–85). Edward Elgar Publishing Limited.
- Raisch, S., & Tushman, M. (2016). Growing new corporate businesses: From initiation to graduation. *Organization Science*, 27(5), 1237–1257.
- Rao, I., & Thakur, P. (2019). Knowledge workers, organisational ambidexterity and sustainability: A conceptual framework. *International Journal of Business Excellence*, 19(3), 415–428.
- Riccaboni, M., & Moliterni, R. (2009). Managing technological transitions through R&D alliances. *R&D Management*, 39(2), 124–135.
- Rogan, M., & Mors, M. L. (2014). A network perspective on individual-level ambidexterity in organizations. *Organization Science*, 25(6), 1860–1877.
- Romanelli, E., & Tushman, M. L. (1994). Organizational transformation as punctuated equilibrium: An empirical test. *Academy of Management Journal*, 37(5), 1141–1166.
- Rosenkopf, L., & Nerkar, A. (2001). Beyond local search: Boundary-spanning, exploration, and impact in the optical disk industry. *Strategic Management Journal*, 22(4), 287–306.
- Rosing, K., Frese, M., & Bausch, A. (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership. *The Leadership Quarterly*, 22(5), 956–974.
- Rothaermel, F. T., & Deeds, D. L. (2004). Exploration and exploitation alliances in biotechnology: A system of new product development. *Strategic Management Journal*, 25(3), 201–221.
- Sarkees, M., & Hulland, J. (2009). Innovation and efficiency: It is possible to have it all. *Business Horizons*, 52(1), 45–55.
- Schmitt, A., & Raisch, S. (2013). Corporate turnarounds: The duality of retrenchment and recovery. *Journal of Management Studies*, 50(7), 1216–1244.

- Siggelkow, N., & Levinthal, D. (2003). Temporarily divide to conquer: Centralized, decentralized, and reintegrated organizational approaches to exploration and adaptation. *Organization Science*, 14(6), 650–669.
- Simsek, Z. (2009). Organizational ambidexterity: Towards a multilevel understanding. *Journal of Management Studies*, 46(4), 597–624.
- Simsek, Z., Heavey, C., Veiga, J., & Souder, D. (2009). A typology for aligning organizational ambidexterity's conceptualizations, antecedents and outcomes. *Journal of Management*, 46(5), 865–894.
- Smith, W. (2014). Dynamic decision making: A model of senior leaders managing strategic paradoxes. *Academy of Management Journal*, 57(6), 1592–1623.
- Smith, W., Erez, M., Jarvenpaa, S., Lewis, M., & Tracey, P. (2017). Adding complexity to theories of paradox, tensions, and dualities of innovation and change: Introduction to organization studies special issue on paradox, tensions, and dualities of innovation and change. *Organization Studies*, 38(3–4), 303–317.
- Smith, W., & Lewis, M. (2011). Toward a theory of paradox: A dynamic equilibrium model of organizing. *Academy of Management Review*, 36(2), 381–403.
- Smith, W., & Tushman, M. (2005). Managing strategic contradictions: A top management model for managing innovation streams. *Organization Science*, 16(5), 522–536.
- Swift, T. (2016). The perilous leap between exploration and exploitation. *Strategic Management Journal*, 37, 1688–1698.
- Tempelaar, M. P., & Rosenkranz, N. A. (2019). Switching hats: The effect of role transition on individual ambidexterity. *Journal of Management*, 45(4), 1517–1539.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207–222.
- Turner, N., Swart, J., & Maylor, H. (2013). Mechanisms for managing ambidexterity: A review and research agenda. *International Journal of Management Reviews*, 15(3), 317–332.
- Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38(4), 8–30.
- Tushman, M. L., & O'Reilly, C. A. (1997). *Winning through innovation: A practical guide to leading organizational change and renewal*. Harvard Business Press.
- Tushman, M. L., & O'Reilly, C. A. (2013). Organizational ambidexterity: Past, present and future. *Academy of Management Perspectives*, 27(4), 324–338.
- Tushman, M. L., & Smith, W. (2002). *Organizational technology. Blackwell Companion to Organizations*. Blackwell.
- Tushman, M., Smith, W. K., Wood, R. C., Westerman, G., & O'Reilly, C. (2010). Organizational designs and innovation streams. *Industrial and Corporate Change*, 19(5), 1331–1366.
- Uotila, J. (2018). Punctuated equilibrium or ambidexterity: Dynamics of incremental and radical organizational change over time. *Industrial and Corporate Change*, 27(1), 131–148.
- Uotila, J., Maula, M., Keil, T., & Zahra, S. A. (2009). Exploration, exploitation and financial performance: Analysis of S&P 500 corporations. *Strategic Management Journal*, 30(2), 221–231.
- Van Doorn, S., Tretbar, T., Reimer, M., & Heyden, M. (2020). Ambidexterity in family firms: The interplay between family influences within and beyond the executive suite. *Long Range Planning*. Advance online publication. <https://doi.org/10.1016/j.lrp.2020.101998>
- Venugopal, A., Krishnan, T. N., Upadhyayula, R. S., & Kumar, M. (2020). Finding the microfoundations of organizational ambidexterity—Demystifying the role of top management behavioural integration. *Journal of Business Research*, 106(August), 1–11.
- Wang, C. L., & Rafiq, M. (2014). Ambidextrous organizational culture, contextual ambidexterity and new product innovation: A comparative study of UK and Chinese high-tech firms. *British Journal of Management*, 25(1), 58–76.
- Wilden, R., Hohberger, J., Devinney, T. M., & Lavie, D. (2018). Revisiting James March (1991): Whither exploration and exploitation? *Strategic Organization*, 16(4), 352–369.
- Yukl, G. (2009). Leading organizational learning: Reflections on theory and research. *The Leadership Quarterly*, 20(1), 49–53.
- Zhang, J., Edgar, F., Geare, A., & Kane, C. (2016). The interactive effects of entrepreneurial orientation and capability-based HRM on firm performance: The mediating role of innovation ambidexterity. *Industrial Marketing Management*, 59, 131–143.
- Zhang, X., Liu, Y., Tarba, S. Y., & Giudice, M. D. (2020). The micro-foundations of strategic ambidexterity: Chinese cross-border M&As, Mid-View thinking and integration management. *International Business Review*, 29(6), 101710.
- Zimmermann, A., Raisch, S., & Birkinshaw, J. (2015). How is ambidexterity initiated? The emergent charter definition process. *Organization Science*, 26(4), 1119–1139.
- Zimmermann, A., Raisch, S., & Cardinal, L. (2018). Managing persistent tensions on the frontline: A configurational perspective on ambidexterity. *Journal of Management Studies*, 55(5), 739–769.