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Theoretical-empirical Article

Dynamic Ambidexterity: Proposal of a Theoretical and Hypothetical Model

Ambidestria Dinâmica: Proposta de um Modelo Teórico e Hipotético

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ABSTRACT

Context: ambidexterity is a dynamic capability that seeks to balance exploitation and exploration initiatives. The joint development of exploitation and exploration can be achieved through dynamic ambidexterity. Theoretical discussions involving the relationship between the concepts of ambidexterity and dynamic capabilities (DCs) have already been developed in literature. However, the way the three ambidextrous approaches (structural, contextual, and sequential) are based on DCs still needs to be observed by researchers. **Objective:** this study aims to propose a conceptual and theoretical hypothetical model that explains the influence of various types of organizational ambidexterity (structural, contextual, and sequential) on the development of DCs and their relation to organizational performance. **Methodology:** the study was developed through an extensive systematic literature review guided by an inductive logic, interpretive epistemology, and qualitative approach. **Results:** the analyses and discussions made it possible to present a theoretical hypothetical model of dynamic ambidexterity that involves nine constructs and eleven hypotheses. **Conclusion:** we believe that our study contributes theoretically to the field of organizational Strategies and can enable studies aligned with the concepts of dynamic ambidexterity and DCs.

Keywords: organizational ambidexterity; structural ambidexterity; contextual ambidexterity; sequential ambidexterity.

RESUMO

Contexto: a ambidestria é uma capacidade dinâmica que busca equilibrar iniciativas de *exploitation* e *exploration*. O desenvolvimento conjunto de *exploitation* e *exploration* pode ser alcançado por meio da ambidestria dinâmica. As discussões teóricas envolvendo a relação entre os conceitos de ambidestria e capacidades dinâmicas (CDs) já foram desenvolvidas na literatura. Entretanto, a forma como as três abordagens ambidestras (estrutural, contextual e sequencial) são baseadas em CDs ainda precisa ser observada pelos pesquisadores. **Objetivo:** o objetivo do estudo é propor um modelo teórico hipotético que explique a influência dos variados tipos de ambidestria organizacional (estrutural, contextual e sequencial) no desenvolvimento das CDs e sua relação com o desempenho organizacional. **Metodologia:** o estudo foi desenvolvido por meio de uma ampla revisão sistemática da literatura orientada por uma lógica indutiva, epistemologia interpretativa e abordagem qualitativa. **Resultados:** as análises e discussões possibilitaram a apresentação de um modelo teórico hipotético de ambidestria dinâmica que envolve nove construtos e onze hipóteses. **Conclusão:** acreditamos que o nosso estudo contribui teoricamente para o campo das estratégias organizacionais e pode possibilitar estudos alinhados com os conceitos de ambidestria dinâmica e CDs.

Palavras-chave: ambidestria organizacional; ambidestria estrutural; ambidestria contextual; ambidestria sequencial.

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INTRODUCTION

Ambidexterity's theory suggests that in a dynamic environment it is important for organizations to develop their exploitation and exploration capabilities in order to identify future opportunities and use existing resources to remain competitive in the market (March, 1991; Tushman & O'Reilly, 1996).

According to Gupta, Smith, and Shalley (2006), "ambidexterity refers to synchronous search for both exploitation and exploration through weakly coupled and differentiated subunits or individuals, each of whom specializes in both exploitation and exploration." (Gupta, Smith, & Shalley, 2006, p. 693) However, the concept of ambidexterity can be observed from other perspectives. Ambidexterity is also observed as a way to frame the challenges faced by organizations in managing exploitation and exploration (Birkinshaw & Gupta, 2013) or an organization's ability to explore and exploit (Carter, 2015).

Previous discussions suggest that ambidexterity is a multifaceted and complex construct (Junni, Sarala, Taras, & Tarba, 2013), and the firms can become ambidextrous in different ways (e.g., structural, contextual, and sequential/cyclical) (Birkinshaw, Zimmermann, & Raisch, 2016; Gibson & Birkinshaw, 2004; Tushman & O'Reilly, 1996). According to Chen (2017), the joint development of exploitation and exploration can be achieved through dynamic ambidexterity, a joint organization of contextual, sequential, and structural ambidexterity.

However, it should be considered that putting contextual, sequential, and structural ambidexterity together brings with it the limitations and 'side effects' of each one's forms of ambidexterity. Structural ambidexterity, for example, can lead to an imbalance in the organization. Innovative exploration ideas are usually viewed critically by the core business (Heracleous, Papachroni, Andriopoulos, & Gotsi, 2017). Political factors can develop with greater force; there is an increase in organizational complexity that can change into delays in the decision-making process, or there can be a loss of a clear allocation of responsibilities (Heracleous et al., 2017). Cultural tensions can develop in the organization (Tian, Deng, Zhang, & Salmador, 2018) resulting in two distinct companies that no longer have anything in common or can no longer find a basis for communication (Heracleous et al., 2017). The separation of business units into exploitation and exploration can promote isolation effects that make coordination between the parties more difficult (Gibson & Birkinshaw, 2004; Smith & Tushman, 2005).

Contextual ambidexterity can work well when exploration initiatives arise based on the existing organizational context (core business). However, when new initiatives are radically different from the organization's core business, contextual ambidexterity may not work (Chen, 2017). Furthermore, contextual ambidexterity requires a supportive organizational context and culture that reconciles seemingly contradictory elements (e.g., discipline, resilience, support, and trust) (Gibson & Birkinshaw, 2004; Ossenbrink, Hoppmann, & Hoffmann, 2019).

Sequential ambidexterity, while suggested at the project level, may not be effective at the organizational level (Chen, 2017). Sequential ambidexterity requires the organization to constantly switch between exploitation and exploration and necessitates continuous reconfigurations that can compromise organizational capabilities fundamental to its survival (Christensen, 1997; Christensen & Raynor, 2003).

The complexity of the ambidexterity construct and its ways of development within firms suggest dynamic strategic practices. Thus, O'Reilly and Tushman (2008) define ambidexterity as a dynamic capability (DC) on the basis that firms must reconfigure their competencies to maintain a balance between exploring new opportunities and exploiting the company's current routines to adapt to the demands of volatile environments. Teece, Pisano, and Shuen (1997) define dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments." (Teece, Pisano, & Shuen, 1997, p. 516) According to Teece (2007, p. 1319), DC can be disaggregated into three capabilities: sensing, seizing, and reconfiguring. The micro-foundations of DC correspond to the "distinct skills, processes, procedures, organizational structures, decision rules, and disciplines" that underpin the sensing, seizing, and reconfiguring capabilities.

The relationship between ambidexterity and DC can occur in the form of a process (Carter, 2015) when there is a need for dynamically shifting strategic content (exploitation and exploration) and the organizational context to support the new strategy (O'Reilly & Tushman, 2008). In Carter's (2015) view, ambidexterity occurs in levels (order). At level zero of ambidexterity, the organization develops mechanisms and capabilities (structural, contextual, and leadership) to create, manage, and sustain the state of ambidexterity. Level one, which links ambidexterity to DC, allows the organization to reconfigure the ambidexterity mechanisms of level zero as a response to changes in the environment. The relational view between ambidexterity and DC is corroborated by Popadiuk, Luz and Kretschmer (2018) when defining relationships between the micro-foundations of DC with the components of ambidexterity (exploitation, exploration, organizational structure, organizational context, and manager and employee roles).

Theoretical discussions involving the relationship between the concepts of ambidexterity and dynamic capabilities have already been developed in literature (O'Reilly & Tushman, 2008; Popadiuk, Luz & Kretschmer, 2018). However, the way the three ambidextrous approaches (structural, contextual, and sequential) are based on dynamic capacities still needs to be observed by researchers. The existing literature provides detailed information on structural, contextual, and sequential ambidexterity individually (Assen, 2019; Chou, Yang, & Chiu, 2018; Heracleous et al., 2017; Lô & Fatien, 2018). However, we currently have few studies on when and how modes of ambidexterity are combined within change initiatives (Ossenbrink et al., 2019).

Furthermore, it is discussed that the development of ambidextrous capacities (exploitation and exploration) within organizations is subject to different contingency factors (Marín-Idárraga, Hurtado González, & Cabello Medina, 2016; Wilden, Hohberger, Devinney, & Lavie, 2018). Luger, Raisch, and Schimmer (2018) suggest that contexts characterized by incremental changes or discontinuous changes influence companies in different ways. Various authors discuss the influence of the CEO (Collins & Clark, 2003; Gibson & Birkinshaw, 2004; Lubatkin, Simsek, Ling, & Veiga, 2006) and the role of senior management managers as a background to exploitation and exploration strategies (Jansen, George, Bosch, & Volberda, 2008; Koryak, Lockett, Hayton, Nicolaou, & Mole, 2018; Smith & Tushman, 2005). Marín-Idárraga, Hurtado González, and Cabello Medina (2016) review the literature on the history of exploitation and exploration and identify three groups of antecedents of exploitation (physical, human, and organizational capital) and exploration (knowledge absorption, interorganizational relationships, and financial leverage and market exchange).

The authors of this study believe that a joint understanding of the antecedents of organizational ambidexterity, its contingent factors, and the combination of ambidextrous capabilities is critical to providing targeted recommendations to C-level decision-makers in organizations on when to use each mode of ambidexterity and how to take advantage of the synergies between them. Moreover, the study seeks to cover a gap in the organizational ambidexterity literature by suggesting a theoretical and hypothetical model that involves the themes of dynamic ambidexterity, DC, and organizational performance.

Thus, the following research question was defined: How the various types of organizational ambidexterity (structural, contextual, and sequential) can influence the development of dynamic capabilities and their relation to organizational performance? The aim of the study is to propose a conceptual and theoretical hypothetical model that explains the influence of various types of organizational ambidexterity (structural, contextual, and sequential) on the development of dynamic capabilities and their relation to organizational performance.

THEORETICAL BACKGROUND

Exploitation and exploration

The literature in the management field has looked at the distinction between exploitation and exploration in different areas (He & Wong, 2004). Research in organization theory has been discussing efficiency-oriented structures and those oriented toward innovation, or mechanistic versus organic structures (Burns & Stalker, 1961). In the field of organizational learning, single-loop versus dual-loop learning has been the focus (Argyris & Schön, 1978). Strategy area has observed pro-cyclical processes induced by reducing variation and autonomous processes that increase variation (Burgelman, 1991); and in managerial economics, static efficiency and dynamic efficiency (Ghemawat & Ricart Costa, 1993). March (1991) discusses exploitation and exploration from the viewpoint of adaptive process studies — the relationship between exploring new opportunities (exploration) or exploring old certainties (exploitation) —, a view that has fundamentals in Schumpeter (1934) and Holland (1975).

Previous studies suggest that the differences between the two concepts relate to whether learning/innovation occurs along the same trajectory as the old one or along a completely different trajectory (Gupta et al., 2006). This view is related to what Christensen (1997) called the 'dilemma of the innovator.' In exploitation there is a search for the guarantee of satisfactory results in the short term and establishment of a solid business — competitiveness is sought in the environment in which the organization is involved — while in exploration is observed a long-term horizon that may present possibilities of success not achievable by exploitation (Chen, 2017). The question that presents itself in the context of innovation is: How to avoid the loss of new opportunities (exploration) while existing opportunities (exploitation) need attention (dilemma of the innovator)?

In rational choice models, the balance between exploitation and exploration is discussed from the perspective of rational search theory (Radner & Rothschild, 1975). In this theory, it is assumed that there are many investment opportunities, each characterized by a probability of return that is unknown (March, 1991). The choice should be made between obtaining information about new alternatives and thus expanding future returns — this alternative suggests allocating part of the investments in the search for uncertain

alternatives — or using the information currently available to extend current returns — this alternative suggests concentrating investments on apparently better-known alternatives.

The logics of exploitation and exploration follow the principles of rational search theory (Radner & Rothschild, 1975) and are contradictory in that they represent different conceptions of business and require divergent management practices (Besharov & Smith, 2014). Exploitation is associated with the capabilities already known by the organization (March, 1991) and has distinct characteristics of exploration, as highlighted in Table 1.

On the other hand, exploration is associated with the unknown, the search for new businesses or new ways of doing businesses (Chen, 2017; March, 1991). Table 2 below presents the central characteristics of exploration.

Table 1. Characteristics of exploitation-driven organizations.

Feature	Reference
Exploitation companies work within well-established problem-solving structures, under which problems and solutions can be clearly defined (they have a low level of uncertainty).	Chen, 2017
They focus on existing businesses or existing ways of doing business and the use of the information and capabilities available to achieve short-term organizational objectives and market positions (gaining competitiveness).	Chen, 2017
Have high success rates.	Chen, 2017
Good management suggests companies with good exploitation capacity.	March, 1991
Short-term successes and predictable revenues/profits are sought.	Govindarajan & Trimble, 2010
Focus the organization's attention on improving reliability, efficiency, and control.	Chen, 2017

Note. Developed by the authors.

Table 2. Characteristics of exploration-oriented organizations.

Feature	Reference
Search for new business opportunities, new revenue fronts, or business models.	Chen, 2017; March, 1991
Exploration practices consume resources in the short term; their returns are uncertain and can take time.	Arend & Chen, 2012
Have high failure rates.	Chen, 2017
Successful organizations in exploitation may not have the same results with exploration.	Christensen & Raynor, 2003
It rarely creates immediate value, so there is a reason that less attention is devoted to it.	Chen, 2017
Generally, exploration practices begin with early failures and disappointments, and not all early failures will lead to a breakthrough.	Chen, 2017

Note. Developed by the authors.

The contradictory logics of exploitation and exploration can be accommodated through organizational ambidexterity (Chen, 2017; He & Wong, 2004; O'Reilly & Tushman, 2008). Organizational ambidexterity (OA) is based on different types of ambidexterity (contextual, structural, and sequential) that, from a dynamic perspective, are interrelated (Chen, 2017). There are different approaches to ambidexterity in the literature (Birkinshaw & Gupta, 2013; Carter, 2015; O'Reilly & Tushman, 2008), but the one that has drawn the most attention from researchers and that is adopted in this study is that ambidexterity is a dynamic capability. (O'Reilly & Tushman, 2008; Popadiuk et al., 2018).

Modes of ambidexterity

The contradictory nature of exploitation and exploration can make their adoption difficult and generate risks associated with the survival of the organization itself (Andriopoulos & Lewis, 2009; March, 1991). Thus, the specialized literature suggests that long-term success can only be achieved whether exploitation and exploration are applied simultaneously (March, 1991; Wilden et al., 2018). The ability of an organization to perform exploitation and exploration simultaneously is conceptualized as organizational ambidexterity (Tushman & O'Reilly, 1996). The challenge for organizations is to balance and organize the exploration of current knowledge (exploitation) without

overlooking new opportunities (exploration) (Christensen, 1997; O'Reilly & Tushman, 2008). In the search for solutions to organizational ambidexterity, three theoretical strands of ambidexterity have emerged from the literature, namely: structural, contextual, and sequential or cyclical (O'Reilly & Tushman, 2013).

'Structural ambidexterity' is based on exploitation and exploration in structurally distinct business units, which in a second moment are coordinated by high-level managers (Chen, 2017; Tushman & O'Reilly, 1996). The exploitation and exploration business units in the structural environment use different strategies, structures, and processes (Úbeda-García, Claver-Cortés, Marco-Lajara, & Zaragoza-Sáez, 2019). While structural ambidexterity seems the best alternative (Chen, 2017), it is observed that this type of ambidexterity directs the requirements of organization and coordination of different business units (exploitation and exploration) by senior executives. Senior executives are required to have different skills and competences (Cao, Simsek, & Zhang, 2010; Heavey & Simsek, 2014; Nemanich, Keller, & Vera, 2007) to structurally organize and decide on exploration and exploitation practices (Li, 2013).

'Contextual ambidexterity' is characterized by the search for exploitation and exploration in an organizational context in which employees can freely choose, without restrictions, the exploitation business units; exploration is sought in a natural and unintentional way (Günsel, Altındağ, Kılıç Keçeli, Kitapçı, & Hızıroğlu, 2018; Raisch, Birkinshaw, Probst, & Tushman, 2009). In contextual ambidexterity, it is assumed that a single organizational context can allow both exploitation and exploration. However, exploitation and exploration can develop in completely different organizational contexts (Fourné, Rosenbusch, Heyden, & Jansen, 2019; Lô & Fatien, 2018).

'Sequential ambidexterity' can be understood as a temporal exchange between exploitation and exploration to maintain a balance between the two conflicting practices (Chou et al., 2018; Gupta et al., 2006). Sequential ambidexterity differs from structural and contextual ambidexterity approaches in that it does not require a permanent balance between exploitation and exploration. The sequential approach focuses on optimizing performance over the long term (Siggelkow & Levinthal, 2003). According to Boumgarden, Nickerson, and Zenger (2012), while static and sustained equilibrium is the goal of ambidexterity (structural and contextual), sequential indecision emphasizes the dynamic achievement of high levels of exploitation and exploration by temporarily and sequentially altering the relationships between organizational structures that promote exploitation or exploration. The ability to temporally switch between exploitation and exploration is observed to be positively related to new product development (Chou et al., 2018).

The three theoretical strands of ambidexterity have developed in the literature through individual (e.g., Assen, 2019; Clercq, Thongpapanl, & Dimov, 2013; Heracleous et al., 2017) or hybrid approaches (e.g., Fourné et al., 2019; Ossenbrink et al., 2019). However, recent studies have sought to look at all three strands of ambidexterity in an interrelated manner (e.g., Chen, 2017).

Dynamic capabilities

Understanding the concept of dynamic ambidexterity is necessary to know the theoretical principles involving the dynamic capabilities and how thematic ambidexterity and DC are related.

Theoretical approaches concerning dynamic capabilities are diverse in the literature (Teece, 2007; Teece et al., 1997; Winter, 2003; Zollo & Winter, 2002). However, the perspective suggested by Teece (2007) and Teece et al. (1997) has been applied to explain dynamic capabilities as an enabling element for sustainable organizational performance.

According to Teece (2007), the "dynamic capabilities enable business enterprises to create, deploy, and protect the intangible assets that support superior long-run business performance." (Teece, 2007, p. 1319) DCs are formed by micro-foundations (sensing, seizing, and reconfiguring) that are difficult to deploy and develop (Teece, 2007).

The micro-foundation 'sensing' is associated with the organization's ability to identify and reconfigure opportunities and threats. The micro-foundation 'seizing' refers to taking advantage of the opportunities identified in the micro-foundation 'sensing.' Finally, the micro-foundation 'reconfiguring' refers to the organization's ability to reconfigure specialized and co-specialized resources to meet customer demands, and to sustain and expand the evolutionary aptitude (Teece, 2007).

Through the DC micro-foundations (Teece, 2007), Popadiuk et al. (2018) propose a relationship between DC and ambidexterity. Ambidexterity component 'exploitation' is associated with DC seizing (internal movements of the company, resulting in economies of scale, efficiency in the orchestration of assets and resources, and others) and the 'exploration' component is associated with DC sensing (company capability in using local and nonlocal resources, assets, sources of knowledge, and innovation). The 'organizational structure' component is associated with the DCs sensing and seizing (company's capability to organize itself to integrate and allocate new resources, assets, knowledge, and innovation) and reconfiguring (company's

capability to organize itself to meet the improvements required by exploitation). The organizational context, in the view of Popadiuk et al. (2018), develops the micro-foundation 'sensing' of dynamic capabilities through "company's capability to build a context that fosters the awareness of environmental opportunities and threats, as well as to perceive the need for exploration and exploitation" (Popadiuk et al., 2018, p. 652) and the micro-foundation 'seizing' through the "company's capability to absorb needed change" (Popadiuk et al., 2018, p. 652). Finally, the micro-foundation reconfiguring is associated with the "company's capability to constantly be attentive to the changes in the context required by new resources, assets, knowledge acquisition, and improvements" (Popadiuk et al., 2018, p. 652).

The results of Popadiuk et al. (2018) denote close alignment with previous discussions about the concept of Dynamic Ambidexterity (Chen, 2017), failing to observe sequential ambidexterity — only contextual and structural level ambidexterities are observed in Popadiuk et al. (2018). We believe that sequential ambidexterity is aligned to DC micro-foundation 'reconfiguring,' as it is applied at the project level (Chen, 2017) or even can involve the whole organization (Boumgarden, Nickerson, & Zenger, 2012) and tends to be more 'volatile' — possibility to quickly switch from exploitation to exploration or vice versa.

From static to dynamic ambidexterity

The different modes of ambidexterity (structural, contextual, and sequential) have come to look not only at reconciling the contradictory forces of exploitation and exploration, but also at how organizations experience and deal with paradoxical tensions. In this sense, Raisch and Zimmermann (2017) suggest that at an early stage organizations identify paradoxical tensions and develop a plan to address them (organizational ambidexterity). In a second moment, organizational structures, cultures, and processes are adequate to deal with the paradox (contextual ambidexterity). In the next moment, organizational actors manage the paradoxical tensions in their daily activities (sequential and contextual ambidexterity) (Raisch & Zimmermann, 2017).

The work of Raisch and Zimmermann (2017) suggests that ambidexterity modes are complementary and operate at distinct organizational levels. This assumption is reinforced by the hierarchical ambidexterity framework presented by Carter (2015) and Chen's (2017) proposed dynamic ambidexterity. However, dynamic ambidexterity is also conceptualized as an organization's ability to balance exploitation and exploration over time (Luger, Raisch, & Schimmer, 2013). In this view, dynamic ambidexterity leads to higher organizational performance than the static forms of ambidexterity described in previous studies (Luger et al., 2013).

In this study, we follow the dynamic ambidexterity view suggested by Chen (2017) — dynamic ambidexterity involves contextual, structural, and sequential ambidexterity with dynamic capabilities characteristics (Chen, 2017; O'Reilly & Tushman, 2008).

'Structural ambidexterity' is suggested at the corporate level in order to have business units that explore existing opportunities (exploitation), but also new opportunities (exploration). These exploitation and exploration units must have different strategies, structures, and processes (Chen, 2017). 'Contextual ambidexterity' should be applied at the business unit level. The organization must enable an organizational environment in the business units that allows the fluidity of new ideas and new initiatives to emerge unintentionally. This organization of contextual ambidexterity is sought to minimize the limitations of structural ambidexterity at the organization level (Chen, 2017). Finally, 'sequential ambidexterity' is applied at the project level. New projects are incubated by dedicated exploration units, while the same practice can be carried out in exploitation units. Exploitation projects can both enhance the existing business and become a new exploration unit. 'Sequential ambidexterity' is sought to complement the limitations of structural ambidexterity at the organization level (Chen, 2017). For Chen (2017), a sequential ambidexterity may be effective at project level, but not be efficient at the organizational level. Switching between exploitation and exploration at the organization level requires constant reconfigurations of strategies, structures, and processes, which can consume organizational capabilities essential to their survival (Chen, 2017).

Finally, the pursuit of exploitation and exploration and organizational ambidexterity are subject to different contingent factors that can influence their application in organizations (Gibson & Birkinshaw, 2004; Jansen et al., 2008; Luger, Raisch, & Schimmer, 2018; Marín-Idárraga et al., 2016; Wilden et al., 2018).

Antecedents of exploitation and exploration, and organizational ambidexterity influencing factors

The literature review proposed by Marín-Idárraga et al. (2016) can provide a relevant theoretical basis for understanding the 'antecedents of exploitation and exploration'. Marín-Idárraga et al. (2016) observed that exploitation has as its main antecedent the physical, human, and organizational capital. The three antecedents of exploitation can be briefly explained as follows: physical capital — refers to current technology resources, R&D

budget, financial resources, raw materials and inputs, products, and information systems in the organization; human capital — refers to the managers' leadership skills, employee knowledge, teamwork, and technical capacity of employees; and organizational capital — refers to ongoing processes, internal value chain, quality system, input/product relationship, current management practices, current organizational structure, control and monitoring, and organizational routines. However, the composition of the construct 'organizational capital' in the view of Marín-Idárraga et al. (2016) is limited and does not consider fundamental elements for exploitation and exploration.

Organizational capital can also be understood as the knowledge embedded in the organization such as databases, processes, and the organizational culture that enables knowledge transfer between individuals and groups within the organization (Fu & Morris, 2014). In this view, organizational capital can have an influence on both exploitation and exploration (Fu, Flood, & Morris, 2016; Fu & Morris, 2014), especially the culture that can be different for exploitation or exploration (Gibson & Birkinshaw, 2004; March, 1991).

Marín-Idárraga et al. (2016) suggest that the antecedents for exploration are formed by the capacity of knowledge absorption, interorganizational relationships, and financial leverage and market exchange. The capacity to absorb knowledge refers to the ability of technological transfer, absorption of external knowledge, sharing of know-how, external consultation services (consulting); interorganizational relations refer to new suppliers, strategic alliances, distribution of systems and external logistics, franchises and licenses, exchange of resources with competitors, joint projects with institutions, agreements with distributors, exchange of information with customers, and interinstitutional agreements; and financial leverage and market exchange refer to the financing of external research, financial leverage, government policies and programs, marketing campaigns, market research, and promotion of new companies.

In addition to the discussions associated with the antecedents of exploitation and exploration, the literature presents different issues that can influence organizational ambidexterity (Table 3).

We believe that the background of exploitation and exploration together with the factors that influence organizational ambidexterity are important elements to understand and discuss the dynamic ambidexterity topic.

In the same way that we have elements that precede organizational ambidexterity, we must also observe the consequent elements of ambidexterity. In this sense, the literature has discussed the effect of ambidexterity on organizational performance (Junni et al., 2013; Popadić, Černe, & Milohnić, 2015; Solís-Molina, Hernández-Espallardo, & Rodríguez-Orejuela, 2018; Wei, Zhao, & Zhang, 2014).

Ambidexterity and organizational performance

A large number of studies suggest that ambidexterity is positively associated with the performance of organizations (Gibson & Birkinshaw, 2004), especially in increasing sales (Auh & Menguc, 2005; Han & Celly, 2008; O'Reilly & Tushman, 2013). However, the effect of organizational ambidexterity on performance is not a consensus, and this is moderated by different factors (Junni et al., 2013). Due to trade-offs between exploitation and exploration at the organization level, in some situations, ambidexterity may not be feasible or may be ineffective (Solís-Molina et al., 2018).

Popadić, Černe and Milohnić (2015) suggest a positive relationship between exploitation and exploration and the organization's innovation performance, reinforcing the assumption that the conflicting optics of ambidexterity when they occur together can lead to superior results in terms of innovation performance. According to Solís-Molina, Hernández-Espallardo and Rodríguez-Orejuela (2018), absorptive capacity moderates the effect of ambidexterity on organizational performance. Results of Solís-Molina, et al. (2018) suggest that ambidexterity has a greater effect on organization performance at high levels of absorptive capacity, while specialization in exploitation or exploration is more effective at low levels of absorptive capacity.

Jansen, Bosch, and Volberda's (2006) findings suggest that exploration pursuit is more effective in dynamic environments, while exploitation pursuit is more beneficial to a unit's financial performance in more competitive environments. Wei, Zhao and Zhang (2014) suggest that "the interaction of exploitation and exploration has a negative effect on firm performance in a firm with responsive market orientation whereas it has a positive effect in a firm with proactive market orientation." (Wei, Zhao, & Zhang, 2014, p. 134) Other studies suggest that the impact of organizational ambidexterity on organizational performance is highly industry sensitive and depends on the methods used in the empirical assessment (Dranev, Izosimova, & Meissner, 2020), or can have negative effects by being duplicative and inefficient (Ebben & Johnson, 2005).

Table 3. Themes that influence organizational ambidexterity.

Theme	Main discussions	References
Leadership of managers and sharing an integrated vision with the CEO of the organization	… capacity of the CEO of the organization to have access to timely, valuable and diversified information is the key to avoid polarized management attention for both exploitation and exploration. … CEO develops this capacity through its networks of connections that act as a channel of valuable information and resources through the actors involved.	Collins and Clark (2003); Gibson and Birkinshaw (2004); Lubatkin et al. (2006).
Integration between the team of the organization's senior management and the CEO	… organizations with senior management teams that share the same vision and have "contingency rewards"[1] to the members of these teams are associated with high levels of innovation through exploitation and exploration. … a contradictory view of exploitation and exploration within senior management teams may involve paradoxical cognitive processes both with the CEO and in actions among the entire senior management team, evidencing the need for connection networks.	Gibson and Birkinshaw (2004); Jansen, George, Bosch and Volberda (2008); Lubatkin et al. (2006); Smith and Tushman (2005).
Transformational leadership by the CEO	Transformational leadership was observed as one of the main factors for innovation in organizations. Transformational leadership aims to engage individuals in search of bonds that increase the level of motivation of those led. Leadership's empowerment[2] and the leader's commitment to continuous improvement (CI) and innovation are associated with contextual ambidexterity at the organizational unit level.	Avolio, Bass and Jung (1999); Jung, Chow and Wu (2003); Masood, Dani, Burns and Backhouse (2006); Assen (2019).
Role of CEO cognition	CEO goals orientation is conceptualized as motivations that shape what individuals generally seek to accomplish when engaging in challenging tasks. … "goal orientations describe CEOs' deeper motivation, cognition, and values, through which they evaluate the external environment and take specific decisions and actions when leading their firms to adopt complex strategic orientations such as an ambidextrous orientation" (Mammassis & Kostopoulos, 2019, pp. 577-578).	Mammassis and Kostopoulos (2019); Porac and Thomas (2002); Pryor, Holmes, Webb and Liguori (2019); Wilms, Winnen and Lanwehr (2019).
Dynamism of the environment	... different types of CEO objective guidelines (learning, approach, and prevention) can facilitate or hinder ambidexterity, and that these effects are conditioned by the level of dynamism[3] of the environment to which the organization is situated. The moderating effect of the dynamics of the environment was observed as a condition of the effectiveness of the top management team (TMT — including CEO and senior executives) in promoting the balance between exploitation and exploration. … Environmental munificence can represent the opportunities and availability of resources that organizations are subject to, resources that both exploitation and exploration require.	Fourné, Rosenbusch, Heyden and Jansen (2019); Gupta et al. (2006); Halevi, Carmeli and Brueller (2015); Mammassis and Kostopoulos (2019); Nadkarni and Chen (2014).

Note. Developed by the authors. [1] The concept of contingency rewards is associated with the degree to which the benefits for individual team members depend on the outcome of their team, and can foster collaboration, create a commitment to organizational goals, and direct team members' attention to interdependent and non-individual activities (Jansen et al., 2008). [2] Empowerment leads to proactive guidance for work and related processes; employees with decision-making power actively create, shape, and alter their work environment and have an open attitude toward mistakes, seeing them not as failures, but as opportunities for learning, improvement, and innovation (Assen, 2019). [3] The rate or degree of environmental change.

Ambidexterity is contradictory by its nature and it should be considered that it is a strategy that evolves in different times and conditions (Carnahan, Agarwal, & Campbell, 2010). Organizational performance can be observed in the literature from different perspectives and according to the context that the organization is involved in. From the perspective of Kaplan and Norton (1997), organizational performance is identified by three types, namely: (a) financial return (the degree to which the organization's performance is better than its competitors in terms of conventional financial measures); (b) customer perspective (the degree to which the organization's performance is better than its competitors from a customer perspective); and (c) operational excellence (the degree to which the organization's performance is better than its competitors in its responsiveness and generation of productivity improvements).

In the study by Úbeda-García, Claver-Cortés, Marco-Lajara and Zaragoza-Sáez (2019), performance through organizational ambidexterity was measured by growth in market share, brand recognition, company image in the market, sales growth, and other performance variables aligned with the business branch of the companies observed in the research.

Thus, Úbeda-García et al. (2019) propose an integrated view of organizational ambidexterity and suggest a model that, under the dynamic capabilities approach, observes ambidexterity as a result of the combination of structural differentiation, organizational context, and interorganizational relationships. Figure 1 presents the theoretical and hypothetical model proposed by Úbeda-García et al. (2019).

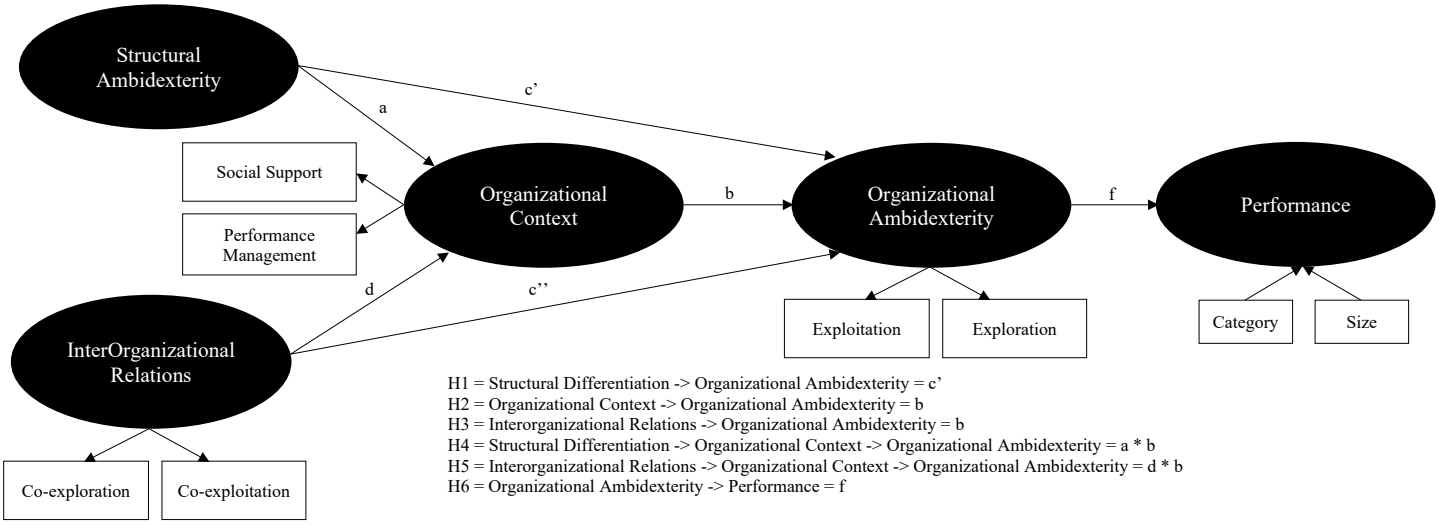
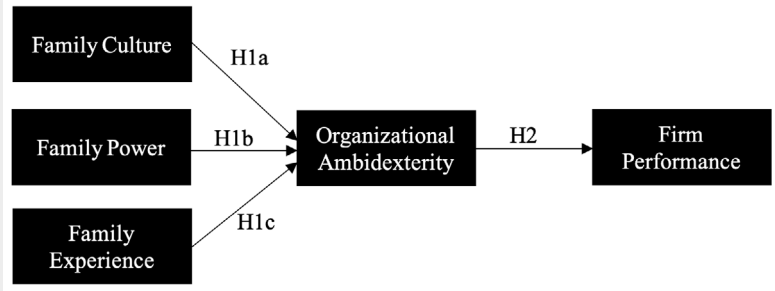
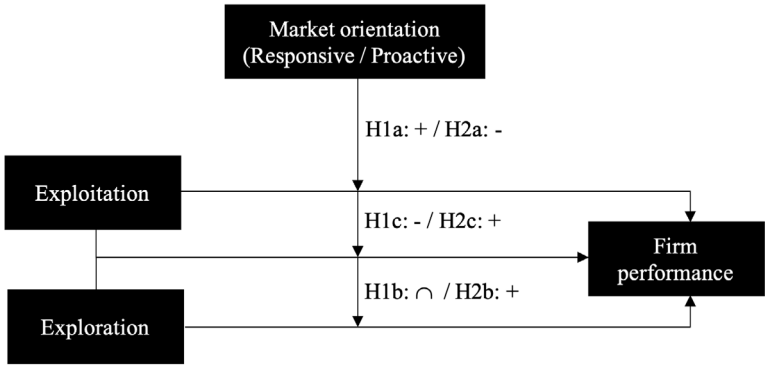


Figure 1. Theoretical and hypothetical model proposed by Úbeda-García et al. (2019).
Source: Reprinted from Úbeda-García et al. (2019, p. 4). Copyright © 2019 by Elsevier, with permission from Elsevier.

Úbeda-García et al. (2019) results suggest that organizational context, in addition to impacting directly on the achievement of ambidexterity, also appears as a mediating variable between the other two antecedents and ambidexterity. Thus, according to Úbeda-García et al. (2019), the context is what allows organizations to perform the integration of the various sources of knowledge (internal or external). In this scenario, ambidexterity showed positive results in organizational performance.

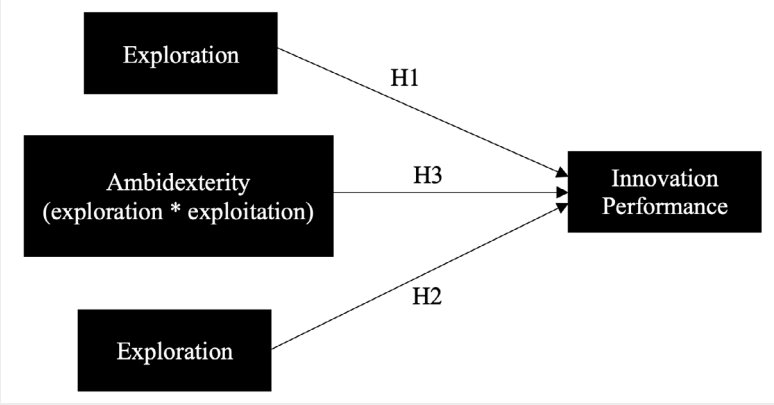
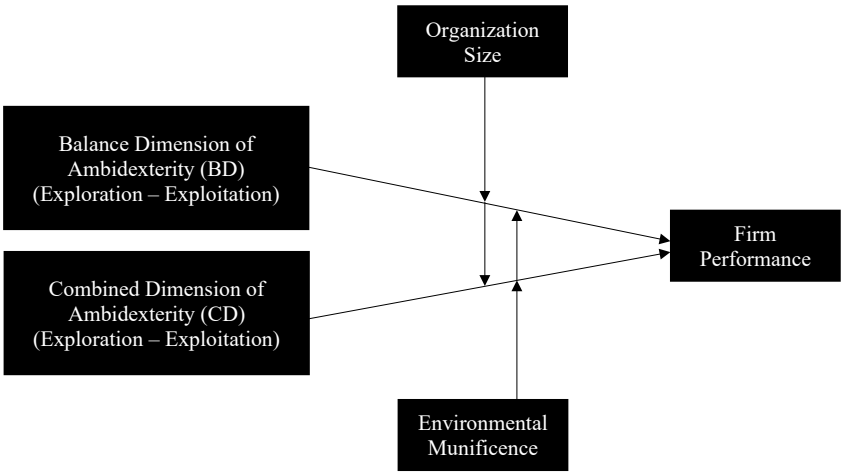
Several other studies present hypothetical models that evaluate the influence of organizational ambidexterity on firms performance (Cao, Gedajlovic, & Zhang, 2001; Lubatkin et al., 2006; Peng, Lin, Peng, & Chen, 2019; Popadić et al., 2015; Stubner, Blarr, Brands, & Wulf, 2012; Tamayo-Torres, Roehrich, & Lewis, 2017; Wei et al., 2014). Table 4 shows some hypothetical models from the literature.

Table 4. Hypothetical models between organizational ambidexterity and firms performance.

Hypothetical model	Reference
	Adapted from Stubner, Blarr, Brands and Wulf (2012, p. 220). Copyright © 2012, Taylor & Francis. Acknowledgments to Taylor & Francis.
	Adapted from Wei, Zhao, and Zhang (2014, p. 138). Copyright © 2019, Elsevier Inc. Acknowledgments to Elsevier B.V.

Continues

Table 4. Hypothetical models between organizational ambidexterity and firms performance (Continued).

Hypothetical model	Reference
	Adapted from Popadić et al. (2015, p. 115). Copyright © 2015, Sciendo. Acknowledgments to Sciendo.
	Cao, Gedajlovic and Zhang (2001, p. 38). Copyright © 2009, Informs. Acknowledgments to Informs.

The four models presented in Table 4 denote that, in general, studies that analyze the influence of organizational ambidexterity on firm performance reduce the phenomenon to these constructs with the application of some control variables (e.g., environment munificence, firm size, market orientation). The authors of this study had difficulty finding studies in the literature that presented theoretical or hypothetical models of organizational ambidexterity that jointly presented the themes of organizational ambidexterity, DC, and firm performance.

However, the theoretical model suggested by Birkinshaw, Zimmermann and Raisch (2016) — Figure 2 — is the one that came closest to this proposal.

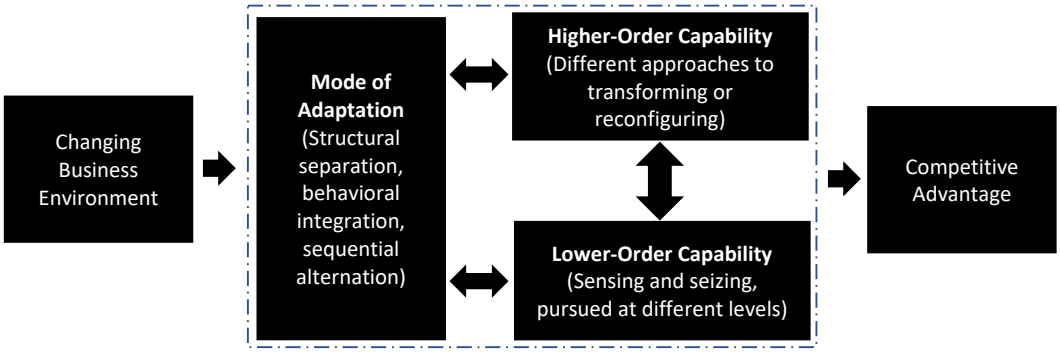


Figure 2. Theoretical framework proposed by Birkinshaw et al. (2016).
Source: Birkinshaw, et al. (2016, p. 40).

Birkinshaw et al. (2016) theoretical framework suggests that changes in the environment influence modes of adaptation in the organization at the structural, behavioral, and sequential levels (alluding to the forms of ambidexterity) that in conjunction with higher-order (reconfiguring) and lower-order (sensing and seizing) capabilities can lead the firm to gain a competitive advantage. Even though Birkinshaw et al.'s (2016) theoretical framework suggests that the alignment between the forms of ambidexterity and the micro-foundations of dynamic capabilities influence the firm's competitive advantage rather than organizational performance, this model presents close alignment with the proposal of this study.

METHODOLOGY

In this study, we intend to apply an interdisciplinary and qualitative approach, under an inductive logic and interpretive epistemology. Interdisciplinarity occurs when two or more disciplines intentionally establish links or bonds with each other to achieve a broader and diversified knowledge about a given phenomenon (Bernstein, 2014). Qualitative studies are characterized by the non-use, in principle, of statistical means in the analysis of data (Myers, 2013). The qualitative study is based on the analysis of theoretical-empirical knowledge and allows an approximation between subject and object researched (Minayo & Sanches, 1993). The qualitative approach should describe, understand, and explain the phenomenon under study opening perspectives and variables to be subsequently used in statistical surveys (Minayo, 2012). Inductive logic is suggested in the literature when the aim of the study is to construct theories or models (Eisenhardt, 1989; Eisenhardt & Graebner, 2007).

Webster and Watson (2002) consider that there are two types of literature review: (a) one that deals with a mature subject where there is an accumulated body of research that needs analysis and synthesis; (b) and another type where the authors address an emerging theme that would benefit from exposure to potential theoretical foundations. This study has characteristics of both approaches because it involves literatures that have a body of knowledge already well-developed (dynamic capacities) and another group of works more incipient (dynamic ambidexterity). Webster and Watson (2002) suggest that a literature review paper should conduct a thorough literature review and then propose a conceptual model that synthesizes and extends existing research. The author's contribution would arise from the fresh theoretical foundations proposed in developing a conceptual model. Interpretive epistemology was adopted in the study with the objective of understanding the dynamics between the dynamic capacities and dynamic ambidexterity in its three different approaches (contextual, structural, and sequential).

For a reliable systematic literature review, Webster and Watson (2002) suggest that the main contributions in the literature are probably in the major scientific journals. Thus, this study was initially developed based on Chen's (2017) work for presenting theoretical and empirical foundations that could help in the development of a dynamic ambidexterity model. Subsequently, studies were sought that could complement Chen's (2017) work and provide an integrative interdisciplinary perspective of a theoretical model of dynamic ambidexterity. We used the Rayyan application (https://rayyan.qcri.org/ retrieved on January 30, 2021) and the Connected Papers platform (https://www.connectedpapers.com/ retrieved on February 03, 2021) to analyze both selected and related papers. Connected Papers is a unique visual tool to help researchers and scientists find and explore papers relevant to their field of work (Eitan, Smolyansky, & Harpaz, 2021). Rayyan "is a free, online application to assist researchers with systematic review methodology and meta-analysis projects" (Johnson & Phillips, 2018, p. 46).

Our systematic literature review occurred in three distinct moments that complement each other. The first moment occurred by using the Connected Papers platform to identify seminal studies based on the work of Chen (2017) and applying the snowball technique to the findings. The second stage of the literature review occurred by searching for studies in major academic databases. Finally, in a third step, we used the Connected Papers platform for the joint analysis of the studies selected in this research.

Systematic literature review using Connected Papers applications

Next, Figure 3 shows the chart of most relevant studies according to Chen's (2017) study generated by the Connected Papers application.

Sixty references were identified by the platform. Next, the articles most cited by the chart articles are suggested by the Connected Papers platform as important and seminal works for the field under research (Table 5).

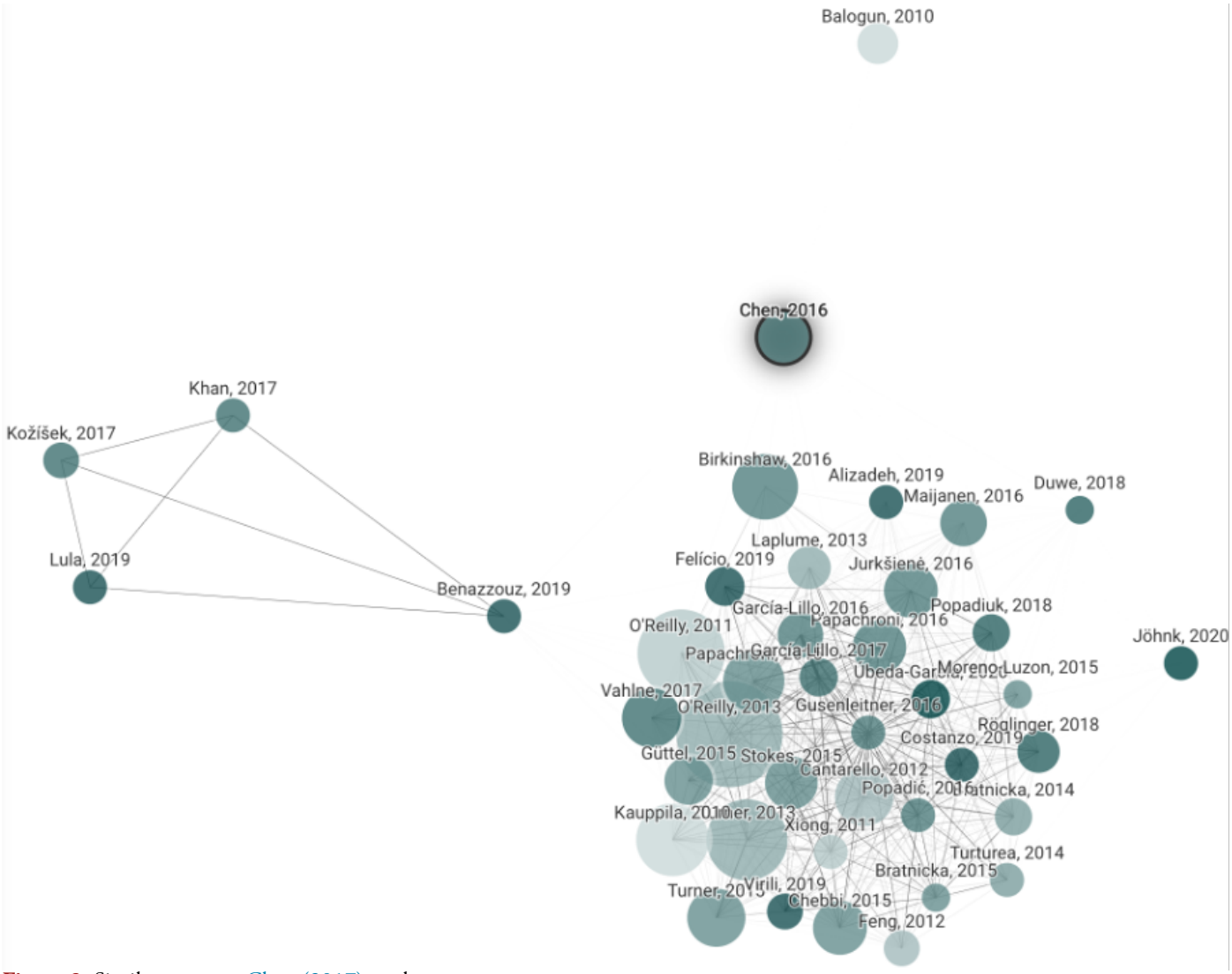


Figure 3. Similar paper to Chen (2017) study.
Developed by the authors by Connected Papers platform.

Table 5. Important seminal works for the thematic researched.

Title	Last author	Year	Citations	Graph citations
Ambidextrous organizations: managing evolutionary and revolutionary change	Charles A. O'Reilly	1996	3,487	34
The antecedents, consequences, and mediating role of organizational ambidexterity	Cristina B. Gibson	2004	2,303	32
Organizational ambidexterity: balancing exploitation and exploration for sustained performance	Michael L. Tushman	2009	1,569	31
Exploration vs. exploitation: an empirical test of the ambidexterity hypothesis	Poh-Kam Wong	2004	2,581	31
Organizational ambidexterity: antecedents, outcomes, and moderators	Julian Birkinshaw	2008	1,751	30
Ambidexterity and performance in small- to medium-sized firms: the pivotal role of top management team behavioral integration	John F. Veiga	2006	1,373	30
The ambidextrous organization	Michael L. Tushman	2004	1,888	28
Managing strategic contradictions: a top management model for managing innovation streams	Michael L. Tushman	2005	1,481	26
Unpacking organizational ambidexterity: dimensions, contingencies, and synergistic effects	Hongping Zhang	2009	830	25
The interplay between exploration and exploitation.	Christina E. Shalley	2006	2,358	25

Note. Developed by the authors by Connected Papers platform in 2021.

The seminal studies identified in Table 5 were used to apply the snowball technique (Greenhalgh & Peacock, 2005). The similarity metric of Connected Papers platform "is based on the concepts of co-citation and bibliographic coupling. According to this measure, two papers that have highly overlapping citations and references are presumed to have a higher chance of treating a related subject matter" (Eitan, Smolyansky, & Harpaz, 2021, p. 1). The related subject in the case of this study is Chen's (2017) work and its citations that have dynamic ambidexterity and related approaches to ambidexterity as their central theme. The Connected Papers platform also suggests derivative studies (10) published after Chen (2017), which were used to compose the literature review. Thus, we selected 31 studies: 10 studies from Table 5, 11 derivative studies of Chen's (2017) work, and 10 studies identified via the snowball technique.

Systematic literature review and Rayyan application

Subsequently, papers that discussed the DC and dynamic ambidexterity were consulted in the main academic databases (Scopus, Web of Science, ieeeXplore, EBSCOhost). Searches were performed by the following fields: title, summary, and keywords. The search criteria involved the terms 'dynamic ambidexterity,' 'organizational ambidexterity,' and 'dynamic capabilities.' No temporal filter was applied. The exclusion criteria adopted were as follows: (a) scientific article type publications; (b) peer-reviewed scientific articles; (c) studies already identified in other databases; (d) studies identified via the Connected Papers application (step 1). Searches were conducted in March 2021. Table 6 presents the results of searches performed in academic databases.

Table 6. Results of searches in academic databases.

Database	Search string	Results	Included
Web of Science	TOPIC: ("dynamic ambidexterity") OR TOPIC: ("organizational ambidexterity") AND TOPIC: ("dynamic capabilities") Stipulated time: Every year. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI.	135	46
Scopus	(TITLE-ABS-KEY ("dynamic ambidexterity") OR TITLE-ABS-KEY ("organizational ambidexterity") AND TITLE-ABS-KEY ("dynamic capabilities"))	42	12
ieeeXplore	("All Metadata":dynamic ambidexterity) OR ("All Metadata":organizational ambidexterity) AND ("All Metadata":dynamic capabilities)	20	1
EBSCOhost	TI "dynamic ambidexterity" OR SU "dynamic ambidexterity" OR TI "organizational ambidexterity" OR SU "organizational ambidexterity" AND SU "dynamic capabilities"	15	2
ScienceDirect	Title, abstract, keywords: (("dynamic ambidexterity" OR "organizational ambidexterity") AND "dynamic capabilities")	10	0
Grand total:		222	61

Note. Developed by the authors.

The results of step 1 of the literature review (31 studies) added to the papers identified in the academic databases (Table 6 — 61), totaled 92 scientific papers that were considered to support this study. The selected studies were read in their entirety.

According to Webster and Watson (2002), the main contributions in the literature are probably in the major scientific journals. Thus, through the Rayyan application, we identified 31 scientific journals with publications associated with the research conducted. Seven journals had more than one study published, namely: *European Management Journal* (8), *Organization Science* (7), *Journal of Management* (6), *Academy of Management Journal*, *Strategic Management Journal and Business*, *California Management Review* (4), and *Academy of Management Review* (3).

The authors with the highest number of publications were also identified through the Rayyan application, namely: Agarwal, Rajshree (5), Carnahan, Seth (5), Simsek, Zeki (5), Campbell, Benjamin (5), Tushman, Michael L. (4), Birkinshaw, Julian (4), Raisch, Sebastian (4), Jansen, Justin J.P. (3), Heavey, Ciaran (3), Fourné, Sebastian P.L. (3), O'Reilly, Charles A. (2), Chen, Yan (2), Christensen, Clayton M. (2), Xiang, Shuting (2), O'Kane, Conor (2), Wang, Jingyi (2), Chen, Guoquan (2), Smith, Wendy K. (2), Teece, David J. (2), Zhang, Jing A. (2). Regarding the number of publications identified per year (92), Figure 4 was created.

The data in Figure 4 denote a greater number of publications associated with the researched themes in the year 2019, suggesting interest from researchers in recent years.

Finally, based on the previous systematic literature review, we seek to develop a conceptual and theoretical hypothetical model that can represent the relationship between the themes dynamic capabilities and dynamic ambidexterity.

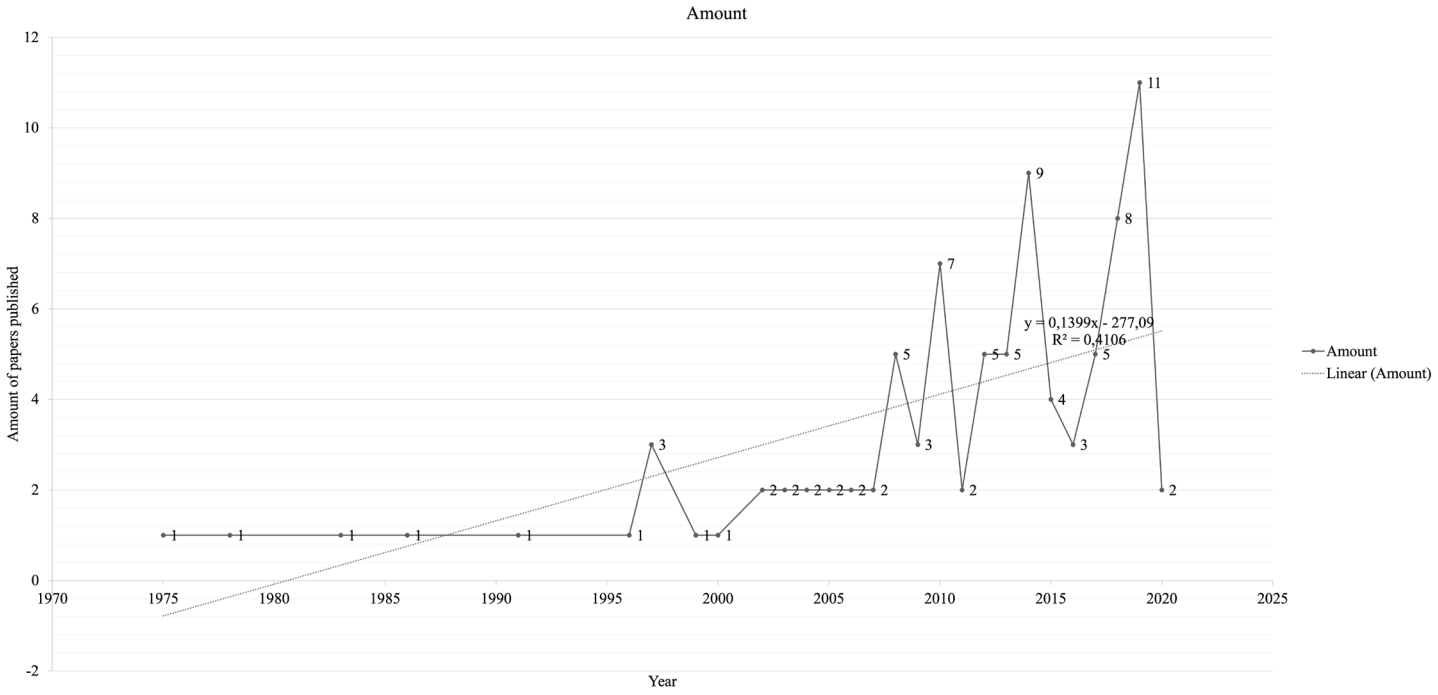


Figure 4. Number of publications identified per year.
Developed by the authors.

Theoretical and hypothetical model proposal

The studies listed by the literature review provided support for a unique theoretical lens of the elements that make up the dynamic ambidexterity (contextual, sequential, and structural ambidexterity), dynamic capacities, and exploration and exploitation practices, and their antecedents could be plotted. Thus, Figure 5 presents the theoretical model of dynamic ambidexterity (TMDA) suggested in this study.

Figure 5 shows, at the top, the antecedents for the development of exploitation and exploration opportunities. The history of exploitation, formed by physical, human, and organizational capital, suggests that organizations with the following characteristics tend to develop greater exploration opportunities: machinery, equipment, and technical conditions for the manufacture of products, provision of services, and exchange of goods; financial resources for R&D activities and processes of products; cash flow to leverage the organization's current business activity; current products and services with potential for development and software and hardware capabilities that support information flows in the enterprise (Marín-Idárraga et al., 2016). Similarly, the human capital of these organizations, associated with the leadership capacity of top managers to guide employees in achieving the organization's objectives, higher level of employee training, teamwork (synergy), and skills of employees in the activities they perform within the company are antecedents of exploitation opportunities (Marín-Idárraga et al., 2016). Organizations with a solid organizational capital, with well-established and monitored internal processes, quality assurance, and effective management complete the construct 'antecedent of exploitation opportunities' proposed in the model.

Otherwise, the 'construct 'antecedent of exploration opportunities" is formed by the organization's ability to absorb knowledge, interorganizational relationships, financial leverage and market projection, and also organizational capital. Some of the practices and characteristics that can expand exploration opportunities in environmental organizations are: organizations with a greater capacity to acquire, assimilate, transform, and exploit knowledge from external sources, alliances with other companies to achieve common goals, collaboration activities with competitors for exchange or improvement of capabilities, collaboration actions with government, national, and international institutions, allocation of resources by the company to foster the development of knowledge to their benefit, and an organizational culture that enables knowledge transfer between individuals and groups. Based on the previous arguments, two hypotheses are suggested:

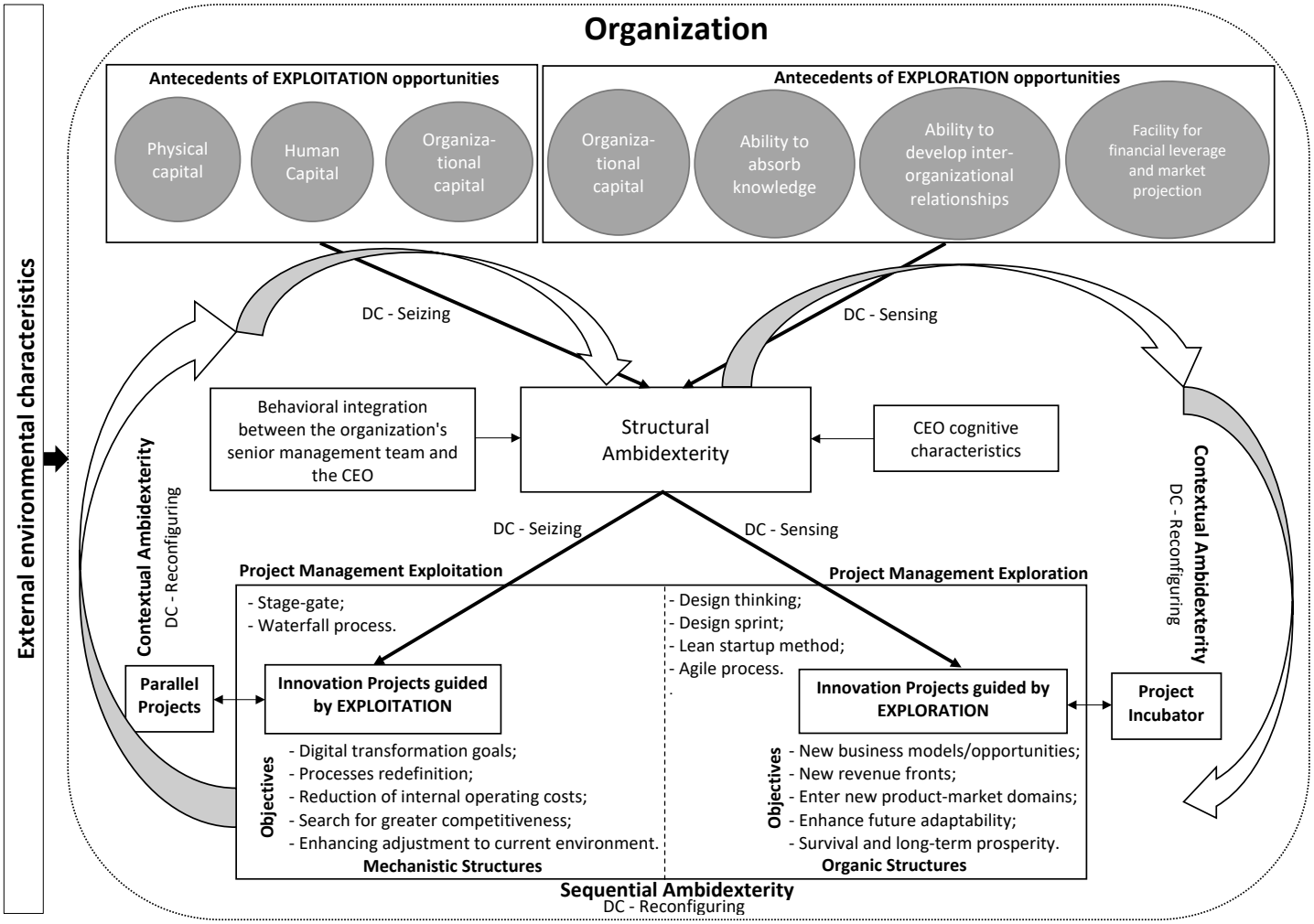


Figure 5. Theoretical model of dynamic ambidexterity (TMDA).
Developed by the authors.

P1: Higher levels of physical, human, and organizational capital expand exploitation opportunities in organizations seeking structural ambidexterity.

P2: Higher levels of knowledge absorption capacity, interorganizational relationships, financial leverage and market projection, and organizational capital expand exploration opportunities in organizations seeking structural ambidexterity.

In the context of the two groups of antecedents of exploitation and exploration opportunities, the organization's ability to develop a structural ambidexterity is discussed. Chen (2017) suggests structural ambidexterity at the corporate level so that distinct exploitation and exploration business units are created. These units must have dissimilar strategies, structures, and processes.

However, structural ambidexterity directs the requirements of organization and coordination of different business units to the organization's senior executives, and may require different skills and competencies from the CEO and high-level managers (Cao et al., 2010; Heavey & Simsek, 2014; Nemanich et al., 2007) to organize structurally (Li, 2013) and decide, at different times, on opportunities for exploration and exploitation.

In this context, the behavioral integration between the team of the organization's senior management and the CEO is fundamental for the structural ambidexterity to be made feasible (Lubatkin et al., 2006). The CEO with characteristic of a transformational leader (Jung, Chow, & Wu, 2003) can facilitate the structuring of an ambidextrous business perspective, integrate the senior management team, and mediate the conflicting relations of ambidexterity (Jansen et al., 2008). In addition, networks of connections (Collins & Clark, 2003; Gibson & Birkinshaw, 2004) of the CEO

and senior management team can facilitate equalization of decisions about exploitation and exploration without compromising essential resources to the organization (Chen, 2017; Smith & Tushman, 2005).

Individual cognitive characteristics of the CEO as learning-oriented goals, approach, or prevention can facilitate or hinder ambidexterity (Mammassis & Kostopoulos, 2019). Moreover, CEOs with a paradoxical picture that considers both exploitation and exploration as relevant (Wilms, Winnen, & Lanwehr, 2019) and have high differentiation and cognitive integration (Bartunek, Gordon, & Weathersby, 1983) can facilitate the development of ambidextrous structures in the organization (Wilms et al., 2019). The differentiation and cognitive integration of the CEO together lead to a single interpretation of a situation and, in turn, to a particular managerial response (Tikkanen, Lamberg, Parvinen, & Kallunki, 2005). In addition, empowered leadership committed to continuous improvement and innovation can promote the development of contextual ambidexterity at the level of organizational units (Assen, 2019). In this sense, contextual ambidexterity can be understood as an 'inner layer' of structural ambidexterity (Figure 5 denotes this relationship by showing the exit arrow of structural ambidexterity toward contextual ambidexterity). However, it is worth pointing out that the contextual model, according to Gibson and Birkinshaw (2004), can be completely exclusive of the structural model (contextual ambidexterity can even 'emerge' from within a company structured in the structural model, but at some point this model takes shape and 'embraces' the entire organization). In other words, contextual ambidexterity is much more than an internal layer, and can refer to the reconfiguration of the organization as a whole as well (Figure 5 denotes this relationship by establishing a cyclical optics involving structural, sequential, and contextual ambidexterity).

Based on the previous discussions, the third, fourth, and fifth hypotheses of the model are suggested:

> **P3:** The behavioral integration between the team of the organization's senior management and the CEO moderates the feasibility of structural ambidexterity in the organization.
>
> **P4:** Individual cognitive characteristics of the CEO (transformational leader, CEO goals orientation, paradoxical frame, and cognitive differentiation and integration) moderate the development of structural ambidexterity in the organization.
>
> **P5:** Individual cognitive characteristics of the CEO (empowering leadership, continuous improvement, and characteristics of a transformational leader) moderate the development of contextual ambidexterity at the level of organizational units.

According to Mammassis and Kostopoulos (2019), different types of CEO objective guidelines can facilitate or hinder ambidexterity, and these effects are conditioned by the level of dynamism of the environment where the organization is situated. Similarly, the moderating effect of the dynamics of the environment was highlighted by Halevi et al. (2015) as a condition of the efficacy of TMT in promoting the balance between exploitation and exploration. Fourné et al. (2019) suggest that environmental munificence can equalize the effects of heterogeneous environments subject to distinct resource opportunities and availability. Thus, we define the construct 'external environmental characteristics' composed of the dynamism and munificence of the environment. Following, the sixth and seventh hypotheses of the study are presented:

> **P6:** The characteristics of the external environment where the organization is situated moderates the individual cognitive characteristics of the CEO in promoting structural ambidexterity in the organization.
>
> **P7:** The characteristics of the external environment where the organization is situated moderates the effectiveness of behavioral integration between the organization's senior management team and the CEO in promoting structural ambidexterity in the organization.

With the structural ambidexterity made possible, the organization begins to demand exploitation projects for its central business unit (end-of-company activity) and exploration projects for a unit specially developed for this purpose. Sequential ambidexterity is applied at the level of the organization's exploitation and exploration projects, as suggested by Chen (2017). The exploration unit must follow an organic, open structure without rigid processes and should be a place that seeks new business models or new revenue fronts with small bets on multiple types of initiatives. Projects of this nature should use search-oriented processes (Banfield, Lombardo, & Wax, 2015; Brown, 2008; Ries, 2011) due to the uncertainty characteristic that permeates exploration projects (Chen, 2017). Evaluation of exploration projects is suggested via learning, internal validation and evaluation by external users based on interest and involvement (Bever & Christensen, 2014; Christensen & Raynor, 2003; Perrin, 2002). Exploration projects can arise or develop with the involvement of leading users. Hippel (1986) conceptualizes leading users as those who perceive products or needs ahead of major competitors. Leading users are not necessarily a customer of the company, but they can be a company operating in a completely different branch of

the organization that seeks exploration. Here we return to the history of exploration discussed earlier about the transfer of knowledge and alliances with other organizations.

Despite the exploitation units, projects guided by a mechanistic structure are suggested, based on initiatives that prioritize key strategies and are predefined by the organization. Exploitation practices in these units should be for the expansion of operational efficiency and improvement of the capacity to adapt to the current environment (March, 1991). Execution-oriented processes in exploitation projects may be more appropriate due to the need for complete specifications (start to finish); this characteristic makes it impossible to use this type of process in exploration projects due to its level of uncertainty (Chen, 2017). In this case, execution-oriented processes such as stage-gate are suggested (Cooper, 2008). Stage-gate "has attracted a number of criticisms: It is accused of being too linear, too rigid, and too planned to handle more innovative or dynamic projects" (Cooper, 2014, p. 20) — characteristics of exploration projects. Kauppila's (2010) study highlights the application of stage-gate in exploitation projects and as a form of discipline to enable exploration ideas.

The involvement of key clients in exploitation projects is recommended by the fact that customers are the main stakeholders and knowledgeable of the demands that need to be met (Chen, 2017). Evaluation of exploitation projects is suggested through traditional financial metrics (Bever & Christensen, 2014; Christensen & Raynor, 2003).

The results of exploitation and exploration projects influence the organization's performance through organizational ambidexterity. Thus, we consider that the expected economic profitability offers a theoretical construction that accounts for the future paths of profits generated from past and current levels of investments in exploitation and exploration, but does not consider the returns of potential future investments (Carnahan et al., 2010). Ignoring organization costs, short-term organizational performance (instantaneous rate of expected economic profitability) increases with corresponding increases in the level of exploitation or exploration activities within the organization. Long-term performance, therefore, is defined by integrating instant economic performance over time (Carnahan et al., 2010). This approach suggests that 'organizational performance' will take over through the results of the management of exploitation and exploration projects executed in the organization. In this context, the following hypotheses are proposed:

> **P10:** Exploration projects that develop through an organic structure, apply research/search-oriented processes, perform assessments based on learning, internal validation, and external users, and involve leading users positively influence the organization's performance.

> **P11:** Exploitation projects that develop through a mechanistic structure, prioritize key strategies, plan their execution, apply execution-oriented processes, involve key clients, and perform traditional financial assessments positively influence the organization's performance.

Exploitation and exploration projects were modeled in Figure 5 separated by a dashed line due to the possibility that exploitation projects become an exploration unit, a principle of sequential ambidexterity (Chen, 2017). The ambidexterity that completes the dynamic optics of the model (Figure 5) is contextual ambidexterity, being applied at the business level.

Contextual ambidexterity suggests that the organizational environment in business units allows the fluidity of new ideas and new initiatives to emerge unintentionally. In this context, mechanisms of incentives to exploitation and exploration are discussed. At the exploration level, organizations can motivate employees by paying for performance (Chen, 2017). Performance compensation links compensation to measurable results and therefore motivates employees to pursue objectives and improve organizational performance. However, this incentive model can inhibit exploration where failures can be common (Ederer, 2013; Eriksson, 2017; Manso, 2017). Thus, the hypothesis eight is suggested:

> **P8:** Contextual ambidexterity at the level of exploitation developed through a performance compensation program positively influences exploitation projects.

Exploration incentives should be tolerant of early failures and reward long-term successes (Ederer, 2013; Manso, 2017). It is suggested that initial failures in exploration projects be celebrated as a way to reduce the average of failures and motivate people to take great risks (Chen, 2017), allowing the ninth hypothesis to be defined:

> **P9:** Contextual ambidexterity at the level of exploration developed through incentives that tolerate early failures, celebrate initial failures, and reward long-term successes positively influences exploration projects.

Based on the TMDA model presented in Figure 5 and the hypotheses suggested above, a hypothetical theoretical model of dynamic ambidexterity — HTMDA is proposed next (Figure 6).

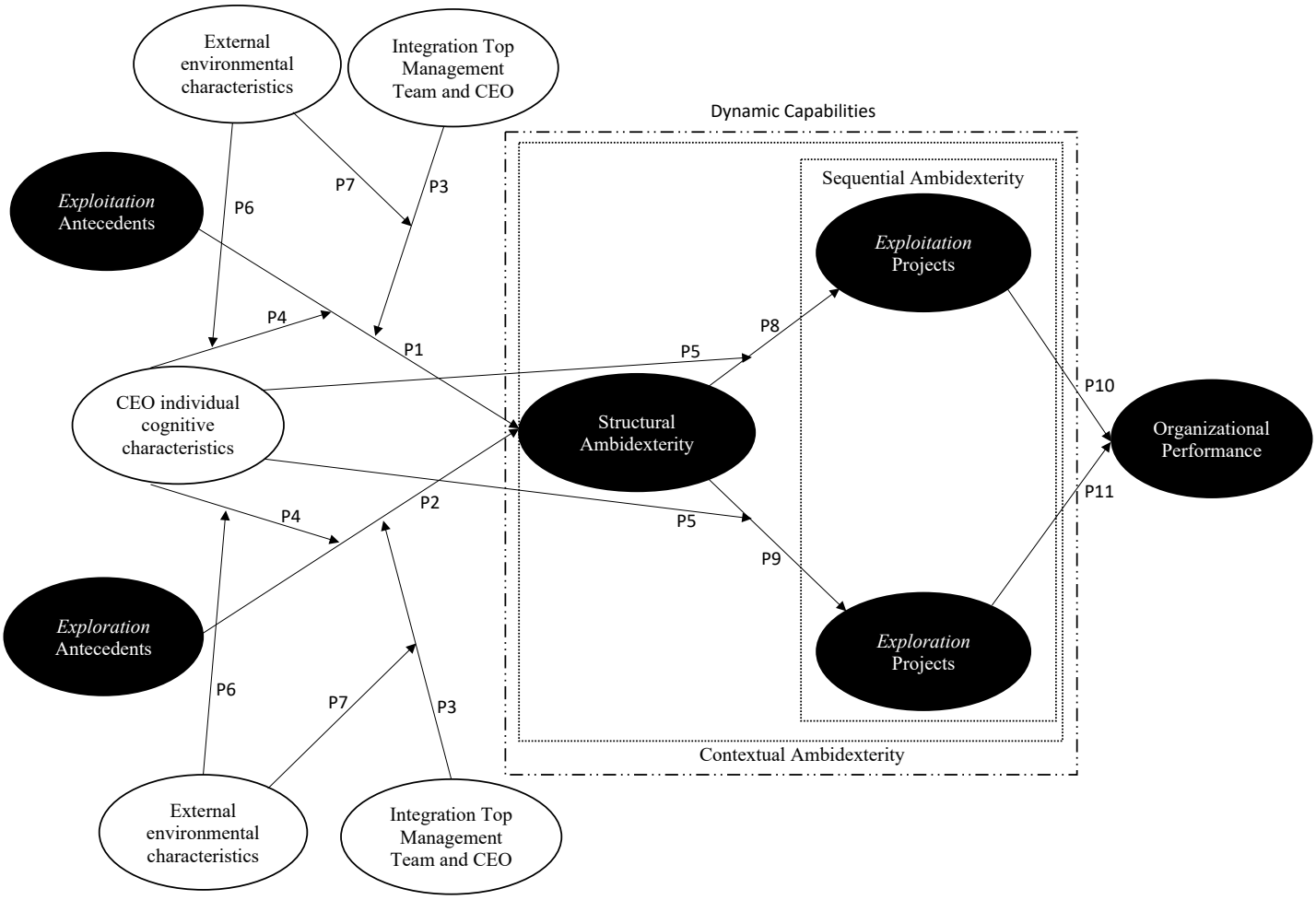


Figure 6. Hypothetical theoretical model of dynamic ambidexterity — HTMDA.
Developed by the authors.

To confront the HTMDA model (Figure 6), we considered two models from the literature that showed structural similarities — see Figure 1 (Úbeda-García et al., 2019) and Figure 2 (Birkinshaw et al., 2016).

The construct 'structural differentiation' proposed by Úbeda-García et al. (2019) was measured by means of the level of agreement or disagreement of the respondents about the extent to which organizations segment the activities involved in the exploitation and exploration process into separate units. We believe that the construct 'structural differentiation' is met in our model (Figure 6) since the antecedents of exploitation and exploration already have variables capable of observing the existence of structural differentiation practices in the organization, which may or may not lead to opportunities for exploitation or exploration. Again, we believe that the construct 'interorganizational relations' (Úbeda-García et al., 2019) is contemplated in our model (Figure 6) through the construct 'exploration antecedents.'

The construct 'organizational context' (Úbeda-García et al., 2019) involves understanding the degree to which management systems within organizations encourage people to challenge outdated practices, and the degree to which managers use business goals and performance indicators to manage their business, thus setting clear standards and leading employees to voluntarily strive to meet all expectations (Úbeda-García et al., 2019). For this construct, we observed that the mediating hypotheses 'CEO individual cognitive characteristics' and 'integration between senior management and the CEO' with the practices associated with the management of exploitation and exploration projects allow to measure the organization's ability to develop and stimulate innovative exploitation or exploration practices. Moreover, our model (Figure 6) is shown to be more coherent and adapted to the dynamics

of organizational ambidexterity because it contemplates essentials elements in this context (Cao et al., 2010; Heavey & Simsek, 2014; Lubatkin et al., 2006; Nemanich et al., 2007) — the moderating effect of the 'dynamism of the environment' on the constructs 'CEO individual cognitive characteristics' and 'integration top team management and CEO' (Halevi, Carmeli, & Brueller, 2015; Mammassis & Kostopoulos, 2019).

Úbeda-García et al. (2019) considered the construct 'organizational ambidexterity' at the level of exploitation as being composed of small adjustments that the company makes in existing products, improvements in efficiency in the provision of services and products, increase in economies of scale in existing markets, expansion of services for existing customers; and at the level of exploration as acceptance of demands that go beyond existing ones, trade in products and services that are completely new to the organization, taking advantage of new opportunities in new markets, and regular use of new distribution channels.

In this context, our model (Figure 6) suggests that 'structural ambidexterity' is achieved by higher levels in the history of exploitation and exploration. The organizational ambidexterity, suggested by Úbeda-García et al. (2019), in our model is formed by structural, contextual, and sequential ambidexterity that act at different levels of exploitation and exploration practices within the organization (Chen, 2017), suggesting greater adaptation to the scenario of innovation by exploration and exploration in an organization.

Considering the model suggested by Birkinshaw et al. (2016), we observe that our theoretical model (Figure 5) presents greater detail between the relationship of the micro-foundations of DC and the forms of organizational ambidexterity. Furthermore, we advance the literature by graphically demonstrating how and at what level these relationships can occur. Furthermore, it was observed that there is a predominance in the literature of hypothetical models (see Table 4) that reduce the organizational ambidexterity phenomenon in order to simplify the analysis, but, as demonstrated in this study, they may disregard relevant constructs and variables that make up the organizational phenomenon.

We believe that a theoretical model of dynamic ambidexterity that ignores the ambidextrous practices at the project level — and even at the contextual level (e.g., Úbeda-García et al., 2019) — provides a narrow lens in relation to the real dynamics of exploitation and exploration in organizations, and may compromise studies that seek to analyze the phenomenon of dynamic ambidexterity. We suggest that the model proposed in this study (Figure 6) allows different approaches of ambidexterity (structural, sequential, and contextual) to be observed in an integrated manner both at a conceptual abstraction level (Figure 5) — TMDA and at a hypothetical level (Figure 6) — HTMDA.

Furthermore, we believe that the conceptual model (Figure 5) developed in this study can provide theoretical support for studies that observe ambidexterity at a micro level of analysis (Bonesso, Gerli, & Scapolan, 2014). Exploitation and exploration project management units, guided by sequential ambidexterity, can be the locus of analyses at either a group or individual level.

CONCLUSIONS

At this point, it is opportune to resume the research question that guided the study — how the various types of organizational ambidexterity (structural, sequential, and contextual) can influence the development of dynamic capabilities and their relation to organizational performance? Following Chen's (2017) recommendations, contextual, sequential, and structural ambidexterity were allocated at different levels of application in the organization. The antecedents of exploitation and exploration influence the organization in the development of structural ambidexterity. Structural ambidexterity, in turn, is applied at the organizational level as an element of viability of the units of exploitation and exploration. We discussed that structural ambidexterity is mediated by the existence of an integration between the team of the senior management of the organization and the CEO. Senior management team in conjunction with the CEO can provide a decision environment capable of equalizing the contradictory logics of exploitation and exploration and minimize coordination requirements on different business fronts. The CEO's individual cognitive characteristics were also considered with a mediator effect in the establishment of the structural and contextual ambidexterity. The CEO individual cognitive characteristics can motivate both senior management staff and employees in the level of execution of exploitation and exploration activities, thus allowing an ambidextrous structure to be established in the organization. However, we believe that the external environmental characteristics (dynamism and munificence of the environment) of the organization can mediate the promotion of the balance between exploitation and exploration promoted by the CEO and the TMT.

According to our model, exploitation and exploration units accommodate distinct projects that are organized through sequential ambidexterity. Ambidextrous organizations should develop environments that encourage innovation practices at both the exploitation and exploration levels. In this sense, in the proposed model, contextual ambidexterity can either emerge from structural ambidexterity or involve the entire organization. Finally,

we suggest that the results of exploitation and exploration projects influence the organization's performance, which can increase as exploitation and exploration activities within the organization also increase over time.

We believe that this study contributes to the literature of organizational strategies by organizing, conceptually and hypothetically, the principles that involve dynamic ambidexterity. The models proposed in this study can be used as a basis for discussions at micro or macro levels of exploitation and exploration in organizations.

As a contribution to practitioners, we believe that the study presents relevant constructs and variables to guide initial organizational ambidexterity corporate strategies (e.g., antecedents of exploitation and exploration can guide reflections about OA in an initial stage, or discussions regarding the behavioral integration between the team of the organization's senior management and the CEO). These reflections can be complemented by studies that have looked at what skills are needed and how they can be developed when pursuing OA (e.g., Stelzl, Röglinger, & Wyrtki, 2020). Furthermore, the suggested theoretical model (Figure 5) can enable discussions and macro understanding of a complex problem (organizational ambidexterity), even by practitioners who are not involved in academia.

LIMITATIONS AND FUTURE STUDIES

Even though methodological principles essential to a study of this nature are used, limitations can be considered. The analysis of the literature review was performed under an inductive logic based on the authors' reading and understanding; this approach may present limitations in the establishment of conceptual and causal relationships of the proposed models. Moreover, we have to consider that the literature on dynamic ambidexterity is quite incipient and developing. Also, our findings and discussions do not consider a micro-foundational perspective of organizational ambidexterity (Tarba, Jansen, Mom, Raisch, & Lawton, 2020).

One of the main limitations of the study that deserves to be highlighted is its complexity. The objective of organizing into a single theoretical model themes that by their nature are broad and complex opens space for weaknesses that were not observed by the authors. The antecedents of exploitation and exploration are presented in the literature in great numbers, and the organization of these antecedents may be a weakness of this study that deserves more attention. We discussed in a superficial way the role of culture in the context of organizational ambidexterity. Furthermore, the way different types of ambidexterity occur and relate within organizations is quite dynamic and difficult to model graphically.

The understanding of dynamic ambidexterity is still under development in the organizational strategy literature. Understanding the relationship between each of the types of ambidexterity over time may be a relevant approach. The practical application of dynamic ambidexterity involves understanding the harmony between the different elements that make up the phenomenon. Thus, it is believed that some questions may help in the definition of a more solid scientific body: Is dynamic ambidexterity as approached in this study feasible and does it really occur in organizations? How does the transition from static ambidexterity to dynamic ambidexterity develop in organizations, if such a transition exists? What are the difficulties in integrating, in practice, the three forms of ambidexterity? Is there a prevalence of one form of ambidexterity or are there moments over time when one form of ambidexterity is more evident than the other? If there are changes over time, which form of ambidexterity is more relevant and at what point in time?

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Data Availability

The authors claim that all data and materials have been made publicly available through the Harvard Dataverse platform and can be accessed at:

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