

Pertusa-Ortega, Eva M.; Molina Azorín, José Francisco; Tarí, Juan José; Pereira-Moliner, Jorge; López-Gamero, María D.

Article

The microfoundations of organizational ambidexterity: A systematic review of individual ambidexterity through a multilevel framework

BRQ Business Research Quarterly

Provided in Cooperation with:

Asociación Científica de Economía y Dirección de Empresas (ACEDE), Madrid

Suggested Citation: Pertusa-Ortega, Eva M.; Molina Azorín, José Francisco; Tarí, Juan José; Pereira-Moliner, Jorge; López-Gamero, María D. (2021) : The microfoundations of organizational ambidexterity: A systematic review of individual ambidexterity through a multilevel framework, BRQ Business Research Quarterly, ISSN 2340-9436, Sage Publishing, London, Vol. 24, Iss. 4, pp. 355-371, <https://doi.org/10.1177/2340944420929711>

This Version is available at:

<https://hdl.handle.net/10419/261912>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by-nc/4.0/>

The microfoundations of organizational ambidexterity: A systematic review of individual ambidexterity through a multilevel framework

Business Research Quarterly
2021, Vol. 24(4) 355–371
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2340944420929711
journals.sagepub.com/home/brq



Eva M Pertusa-Ortega, José F Molina-Azorín, Juan José Tarí,
Jorge Pereira-Moliner and María D López-Gamero

Abstract

The analysis of ambidexterity at the individual level may help to open the black box of organizational ambidexterity and to address the microfoundations of the exploration/exploitation dilemma in order to know how it can be achieved. The purpose of this article is to examine the main characteristics, antecedents, and consequences of individual ambidexterity, highlighting several key theoretical and methodological issues. Through a systematic literature review, we synthesize and integrate knowledge about individual ambidexterity, identifying opportunities and challenges for future research. We propose a multilevel framework that includes antecedents, consequences, and contingent effects of individual ambidexterity and their relationships. This multilevel framework may help to overcome the micro–macro divide in the management field. We also provide a synthesis of future research proposals.

JEL CLASSIFICATION: M10

Keywords

Microfoundations, individual ambidexterity, systematic review, multilevel research

Introduction

Global and dynamic environments have increased the need for organizations to be ambidextrous in order to outperform competition in the long run (Dolz et al., 2019). Tushman and O'Reilly (1996) conceptualize the ambidextrous organization as a firm that has the ability to compete in mature markets (where efficiency and incremental innovation are crucial) at the same time as developing new products for emerging markets (where experimentation and flexibility are critical). Ambidextrous organizations can develop exploration and exploitation activities, or other conflicting demands, with the same dexterity. Exploitation activities address the current viability of a firm, whereas exploration activities focus on its future viability (Levinthal & March, 1993).

Previous research on this topic has mainly focused on the organizational level, studying antecedents and consequences of organizational ambidexterity (O'Reilly &

Tushman, 2013). However, many scholars highlight the key role that individuals may play in ambidexterity, to address the root of the problem, that is, how organizations can be ambidextrous (Birkinshaw & Gupta, 2013; Eisenhardt et al., 2010; Keller & Weibler, 2015; Laureiro-Martínez et al., 2015; O'Reilly & Tushman, 2008, 2013; Raisch et al., 2009), encouraging studies that specifically focus on this individual level of analysis. Bonesso et al. (2014) point out that the analysis of ambidexterity only at the firm level implicitly assumes homogeneity at the individual level, neglecting how organizational members might influence the firm's ability to pursue a balance

Department of Management, University of Alicante, Alicante, Spain

Corresponding author:

Eva M Pertusa-Ortega, Department of Management, University of Alicante, Campus de San Vicente, Ap. 99, E-03080 Alicante, Spain.
Email: eva.pertusa@ua.es



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access page (<https://uk.sagepub.com/aboutus/openaccess.htm>).

between exploration and exploitation or between other conflicting demands.

In this article, we are interested in ambidexterity at the individual level (individual ambidexterity) as a key microfoundation of organizational ambidexterity. Although the term “ambidexterity” has been adapted to the organizational level to mean an organization’s capacity to do two different things equally well, the original meaning of ambidexterity is an individual’s capacity, specifically to be equally skillful with both hands (Birkinshaw & Gupta, 2013). Many authors conceptualize individual ambidexterity as the individual ability to pursue both exploitation and exploration activities and find synergies between them (Mom et al., 2009; Rogan & Mors, 2014; Tempelaar & Rosenkranz, 2019). As ambidexterity may also refer to other conflicting tasks, we use the term individual ambidexterity to refer to “the capability of individuals to perform contradictory activities and switch between different mindsets and action sets” (Bledow et al., 2009, p. 322).

The interest in the microfoundations of organizational ambidexterity has increased, and the number of articles that focus on this topic has multiplied. More and more scholars have examined characteristics of ambidextrous individuals (managers, leaders, employees) along with antecedents and consequences of individual ambidexterity. However, what do we know and don’t know about individual ambidexterity as a key microfoundation of organizational ambidexterity until now? To address this gap, the purpose of this article is to examine the main characteristics, antecedents, and consequences of ambidexterity at the individual level, emphasizing several key theoretical and methodological issues of individual ambidexterity in order to advance research on this topic. Thus, the aim is to synthesize and integrate knowledge about individual ambidexterity, identifying opportunities and challenges for future research.

For this purpose, we conduct a systematic literature review on individual ambidexterity. In the last 5 years, more than 50 papers have been published about this topic. This makes it difficult to keep up with state of the art and to assess the collective evidence in this particular area of business research (Snyder, 2019). This is why a literature review in the specific topic of individual ambidexterity can be relevant at this moment. To the best of our knowledge, no study has reviewed this specific literature on individual ambidexterity. In this article, we synthesize current knowledge and provide a research agenda for future research on some relevant issues of individual ambidexterity.

This review adds value not only to take stock of studies published and integrate individual ambidexterity knowledge, but also to provide some ideas and suggestions for future research in order to make progress on this topic. Accordingly, this review makes the following value-added contributions. First, we discuss key issues that researchers should take into account to advance knowledge on this

topic in a rigorous way. Second, we propose a framework that includes antecedents, consequences, and moderators of individual ambidexterity and their relationships, identifying gaps that need more research. Third, in order to help overcome the micro–macro divide in the management field (Aguinis et al., 2011; Molina-Azorín, 2014), the proposed framework is multilevel, integrating variables at the individual (micro) level and variables at the organizational (macro) level.

This article is organized as follows. First, characteristics of methods employed to conduct the systematic review of individual ambidexterity are indicated. Next, the main findings about eight key issues are presented, taking stock of published literature on individual ambidexterity and examining problems, opportunities, and challenges to moving ambidexterity research forward. This article concludes with a discussion of what we know and do not know about the key issues of individual ambidexterity research, and a synthesis of future research proposals.

Methods

To produce a reliable knowledge stock about the microfoundations of ambidexterity, we follow the approach suggested by Denyer and Tranfield (2008) and Tranfield et al. (2003) for producing a systematic review, and the recommendations by Jones and Gatrell (2014). They suggest five main steps to carry out a systematic literature review that fulfills transparency, inclusivity, explanatory, and heuristic principles: (1) question formulation, (2) locating studies, (3) study selection and evaluation, (4) analysis and synthesis, and (5) reporting and using the results.

The first step is to formulate our research question: what do we know and don’t know about individual ambidexterity up to now? In the following sections, we address the other four steps.

Data collection

According to this research question, our review is based on a systematic search to identify the relevant literature on individual ambidexterity. An electronic search was conducted in December, 2018, and updated in December, 2019. In order to identify relevant and rigorous studies about individual ambidexterity, we searched only for articles published in peer-reviewed journals, theoretical and empirical, published in any year. We excluded from our search conference papers, books, book chapters, monographs, theses, and unpublished works due to its limited impact in knowledge production in a research field and less quality demands compared to journals (Thunnissen & Gallardo-Gallardo, 2019). We also excluded non-English articles, as English is the prevalent language for scientific research.

For the articles search, we used two of the largest and most generally accepted databases in the management field: Web of Science and Scopus. We used the term “ambidext*” combined with “microfoundat*,” “individual*,” “manager*,” “leader*,” “employee*,” or “multi-level*” in the topic section of Web of Science (title, abstract, and/or keywords), and in the “article title, abstract and keywords” section of Scopus. We also searched for studies that combined these last terms together with “exploit*” and “explorat*” as exploration and exploitation are the most common terms used to refer to the tensions and contradictory demands in the ambidexterity literature. These searches yield a total of 885 articles, after removing duplicate papers.

Inclusion criteria, coding, and data analysis

Taking into account the purpose of this study, the present review examines studies that specifically analyze ambidexterity at the individual level (individual ambidexterity). Two authors read the abstracts of studies identified in the electronic search to determine whether these studies specifically examined individual ambidexterity. Papers that studied individual ambidexterity, and doubtful studies, were selected in order to read the full text. In this regard, we initially identified 130 papers. Moreover, we reviewed the lists of references of these studies for identifying other possible works. Furthermore, we checked several special issues published on ambidexterity (Ahammad et al., 2019; Birkinshaw & Gupta, 2013; Gupta et al., 2006; Junni et al., 2015; Raisch et al., 2009).

Some papers identified with our search strategy examined ambidexterity at organizational or team level, but not at individual level, with some papers studying individual antecedents of organizational or team ambidexterity. These papers were not considered because our review only focused on individual ambidexterity. Through discussion of authors, 71 papers were finally included in the list of studies that specifically examined individual ambidexterity (these studies are marked with an asterisk in the references list). The articles covered the period from 1999 to June 2020 (including papers in press).

These 71 papers were included in the final sample for a content analysis in order to determine some general characteristics of articles and a specific analysis of key issues related to individual ambidexterity. Authors discussed possible codifications to identify the relevant categories. The coding categories are as follows: general publication data (authors, journal and year of publication); theoretical frameworks indicated in the articles; the concept and tensions or conflicting demands in individual ambidexterity and the approach to address them; the levels at which ambidexterity is analyzed (only individual or at the organizational or team level too); relationships analyzed (antecedents, consequences, moderators) and at which level (organization,

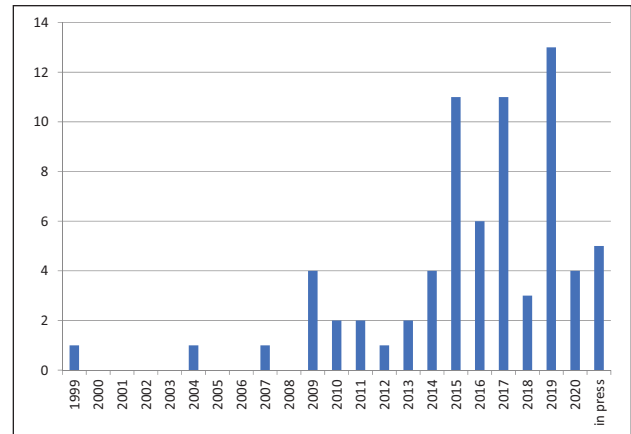


Figure 1. Published articles per year.

group or individual level); the type of study; and main findings. Regarding the type of study, for empirical studies, we created subcategories about characteristics of the sample/population, data collection procedures, statistical analyses applied, and the measure and operationalization of the individual ambidexterity variable. The coding template with these categories and subcategories was used for each article, and the content of the coding categories and subcategories for the final sample of 71 articles was included in an Excel file. Two authors coded all studies. The resultant inter-rater reliability, as measured by percentage of agreement, was 92%. Disagreements were discussed and resolved. Then, frequency counts and text coding and interpretation were used to analyze the data. A summary of the coded studies is presented in Appendix 1 in Supplemental Material. From data analysis, we identified eight key issues that are examined in the “Results” section.

Characteristics of articles

In this section, we indicate the main characteristics of the articles that have analyzed individual ambidexterity. As said above, the sample articles covered the period from 1999 to June 2020 (including papers in press). However, Figure 1 shows an increasing interest since 2015 (74.64% of the papers have been published since 2015).

Regarding journals (Table 1), a total of 47 journals have published studies about individual ambidexterity. *Organization Science* is the journal with the greater number of published articles (six papers). However, 33 out of 47 journals have published just one article, which reflects that individual ambidexterity knowledge is widely dispersed around different journals. This reveals that individual ambidexterity is a multidisciplinary topic that can be addressed from different fields of study, because there are generic organizational journals but also other more specific journals from different fields, such as psychology, marketing, human resources,

Table 1. Published articles per journal.

<i>Organization Science</i>	6	<i>International Journal of Innovation Management</i>	1
<i>Journal of Service Research</i>	4	<i>International Journal of Project Management</i>	1
<i>The International Journal of Human Resource Management</i>	4	<i>International Small Business Journal</i>	1
<i>Long Range Planning</i>	3	<i>Journal of Business & Industrial Marketing</i>	1
<i>Management Decision</i>	3	<i>Journal of Innovation and Entrepreneurship</i>	1
<i>European Management Journal</i>	2	<i>Journal of Knowledge Management</i>	1
<i>Human Resource Management</i>	2	<i>Journal of Leadership & Organizational Studies</i>	1
<i>Industrial Marketing Management</i>	2	<i>Journal of Management & Organization</i>	1
<i>Journal of Business Research</i>	2	<i>Journal of Marketing</i>	1
<i>Journal of Management</i>	2	<i>Journal of Product Innovation Management</i>	1
<i>Journal of Management Studies</i>	2	<i>The Journal of Psychology</i>	1
<i>Journal of Personal Selling & Sales Management</i>	2	<i>Journal of Small Business Management</i>	1
<i>Leadership & Organization Development Journal</i>	2	<i>Journal of the Academy of Marketing Science</i>	1
<i>Strategic Management Journal</i>	2	<i>The Leadership Quarterly</i>	1
<i>Asian Journal of Technology Innovation</i>	1	<i>MIT Sloan Management Review</i>	1
<i>British Journal of Management</i>	1	<i>Nankai Business Review International</i>	1
<i>Creativity and Innovation Management</i>	1	<i>Organization Management Journal</i>	1
<i>Employee Relations: The International Journal</i>	1	<i>Organizational Dynamics</i>	1
<i>European Journal of Work and Organizational Psychology</i>	1	<i>Research Policy</i>	1
<i>Harvard Business Review</i>	1	<i>Supply Chain Management: An International Journal</i>	1
<i>Human Resource Management Review</i>	1	<i>Technology Innovation Management Review</i>	1
<i>Industrial and Organizational Psychology</i>	1	<i>Technovation</i>	1
<i>International Business Review</i>	1	<i>The Journal of Creative Behavior</i>	1
<i>International Journal of Bank Marketing</i>	1	Total	71

Table 2. Industry contexts of individual ambidexterity research.

Industries	Exemplars
Banks	Faia and Vieira (2017), Mom et al. (2019)
Consulting firms	Rogan and Mors (2014), Luu et al. (2018)
Hospitals	Burgess et al. (2015), Salas Vallina et al. (2019), Yu et al. (2018)
Universities	Y. C. Chang et al. (2016), Alghamdi (2018)
Telecommunications	Affum-Osei et al. (2020)
Call centers	Jasmand et al. (2012)
Pharmaceutical industry	K. Sok et al. (2016)
Adhesives	Souza-Luz and Gavronski (2020)
Airline industry	Kao and Chen (2016)
Defense organizations	Caniëls and Veld (2019), Kassotaki et al. (2019)
High-tech sectors	Zhang et al. (2019), Busola Oluwafemi et al. (2019), De Ruyter et al. (2020)
Multiple industries	Ajayi et al. (2017), Kauppila and Tempelaar (2016), Lee and Lee (2016)

leadership, and innovation. This diversity of journals can make it more difficult to achieve a comprehensive knowledge of the topic (Thunnissen & Gallardo-Gallardo, 2019). Therefore, our literature review can be useful to integrate this knowledge.

The studies have been carried out both in manufacturing and service firms. Some studies have focused on one specific sector, while other studies have analyzed multiple industries, both manufacturing and services (see Table 2).

Figure 2 illustrates the distribution of articles based on the type of study. There are both, theoretical and empirical

studies, although empirical quantitative studies prevail (70.4% of the total).

Results

In this section, we examine several specific and important issues related to individual ambidexterity identified from the literature review. For each issue, we take stock of published studies, and we highlight some challenges to overcome gaps or problems identified, emphasizing opportunities for future research.

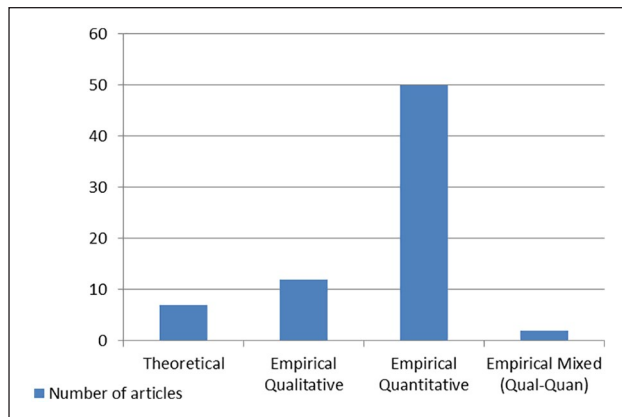


Figure 2. Types of study in sample articles.

Issue 1: theoretical and conceptual frameworks

Several theoretical frameworks and perspectives have been used to study individual ambidexterity. Some papers are only based on the literature about organizational ambidexterity, while other studies use more specific theoretical and conceptual frameworks. However, about one-third of the studies (29.6%) do not specify any theoretical approach (e.g., Bidmon & Boe-Lillegraven, 2019; De Ruyter et al., 2020; Hughes & Ogilvie, 2020).

The studies of individual ambidexterity that explicitly indicate some theoretical framework are mainly based on micro- or psychological theories, such as cognitive dissonance and evaluation theory (Bonesso et al., 2014), social cognitive theory (Xiang et al., 2019), social exchange theory (Caniëls et al., 2017), neuroscience literature (Laureiro-Martínez et al., 2015), behavioral complexity theory (Keller & Weibler, 2015), regulatory mode and focus theories (Jasmand et al., 2012), self-determination theory (Garcia et al., 2019), social identity theory (Luu et al., 2018), or the theory of planned behavior (Yu et al., 2018), among others.

Theoretical frameworks at the organizational level have also been used, such as organizational learning and knowledge management theory (Greco et al., 2019), social capital theory (Lee & Lee, 2016), leadership (Probst et al., 2011), dynamic capabilities theory (Shamim et al., 2019), entrepreneurship theories (Yeganegi et al., 2019), upper echelon theory (Li et al., 2015), or strategy (Torres et al., 2015). Few papers combine organizational and individual theories (De Visser & Faems, 2015; Eisenhardt et al., 2010; Good & Michel, 2013).

This diversity of theoretical approaches shows again that individual ambidexterity is a multidisciplinary topic that can be addressed from different lenses. But to achieve comprehensive understanding, different theories should be jointly analyzed. In this regard, to advance knowledge about how firms go from individual to organizational ambidexterity, as these issues are at different levels of analysis (individual and organization), future research

should integrate micro- and macro-theories to a greater extent. As explained below, a multilevel approach may be useful. Furthermore, it is important for future studies to identify the theoretical and conceptual framework in which research is conducted to add rigor and better understanding of both the concepts and the results achieved.

Issue 2: concept and tensions in individual ambidexterity

The concept of ambidexterity has been largely discussed at the organizational level. In general, the concept of ambidexterity refers to the capacity to address two organizationally incompatible objectives equally well (Birkinshaw & Gupta, 2013), with the same dexterity. At the organizational level, there has been some debate about the degree in which an organization should develop both conflicting activities to consider it is ambidextrous. That is, is an organization ambidextrous when it is capable of developing both activities in balance, in a similar degree, or when it is capable of developing high levels of both activities? This debate also occurs at the individual level. As this debate has been largely discussed at the organizational level, we will not extend on this point. We focus on three different points regarding the concept of individual ambidexterity.

First, at the individual level, scholars use the term ambidexterity to refer to different tensions or conflicting demands. Most papers have focused on the tensions between the exploration of new knowledge and the exploitation of current capabilities (De Visser & Faems, 2015; Kobarg et al., 2017; Laureiro-Martínez et al., 2015; Rosing & Zacher, 2017). However, other types of tensions and conflicting demands have also been analyzed at the level of individuals, for instance, flexibility versus efficiency in workplaces (Adler et al., 1999; Eisenhardt et al., 2010; Yu et al., 2018), adaptability versus alignment (Birkinshaw & Gibson, 2004), or creativity versus attention to detail (P. Sok & O'Cass, 2015). There is also a number of studies which addresses the individual ambidexterity as the trade-off between sales and service quality (Agnihotri et al., 2017; Jasmand et al., 2012; Patterson et al., 2014; K. Sok et al., 2016), the sale of existing and new products (Van der Borgh et al., 2017; Van der Borgh & Schepers, 2014), or the exploitation of existing customers (farming) and the exploration of new customers (hunting) (Lam et al., 2019).

Second, when researchers study individual ambidexterity, are they actually referring to a capability or behavior, or an outcome? (Awojide et al., 2018). There is some confusion in research about whether ambidexterity is an activity or an outcome (Vicentini et al., 2019). In this regard, authors should differentiate between individual ambidextrous behaviors (the ability to develop two contradictory behaviors, actions or activities equally well) and individual ambidextrous performance (the achievement of two

conflicting objectives). Other researchers even differentiate between individual ambidextrous orientation (Lam et al., 2019) and ambidextrous attitudes (Yu et al., 2018) as antecedents of individual ambidextrous behavior. These distinctions are important, and scholars should clearly identify and define these terms related to orientation, attitudes, behaviors, and outcomes to recognize the antecedents and consequences of ambidexterity at the individual level, to discern what we know and do not yet know about individual ambidexterity, to advance knowledge. In this regard, it could be also useful to analyze the relationships between these more specific concepts jointly, that is, the influence of ambidextrous orientation on ambidextrous behavior, and the effect of ambidextrous behavior on individual ambidextrous performance.

Third, new concepts related to individual ambidexterity have been identified in our systematic review. Kapoutsis et al. (2019) introduce the concept of “influence tactic ambidexterity” at the manager level to denote the frequent use of both hard (maintaining efficiency and control through tactics such as exhibit higher task performance) and soft influence tactics (e.g., motivation, engagement, risk-taking, and trust). Kassotaki et al. (2019) introduce the term “ambidexterity penetration” that refers to the enactment of ambidexterity across multiple organizational levels, distinguishing among horizontal, vertical, and organizational penetration. Ajayi et al. (2017) propose two dimensions of employee ambidexterity: “employee passive ambidexterity,” that is the propensity of employees to exploit existing opportunities and explore new opportunities simply by following organizational procedures, and “employee active ambidexterity” that is the employees’ tendency to seek novel means to engage in exploitation and exploration activities outside organizational rules and procedures.

As illustrated, there is not a clear dominant concept of individual ambidexterity. All this diversity of terms around the concept of individual ambidexterity raises the issue whether they actually provide value and increase knowledge about the microfoundations of ambidexterity or whether they are leading to a diffuse and dispersed field of study without solid foundations. One way to solve this issue in future research might be addressing more theoretical studies and conceptual developments to clarify terms, and to achieve a solid definition to be able to consolidate knowledge. We recognize that there is a great diversity of individuals and jobs in which individual ambidexterity can be applied. Therefore, different tensions or conflicting demands can be analyzed. However, researchers should be accurate in defining the concepts, and coherent with measures in empirical studies, as we will explain below.

Issue 3: specific individuals and characteristics of ambidextrous individuals

Individual ambidexterity has been examined for different types of individuals. Both managers and employees have

been studied. With regard to managers, some papers analyze top or senior managers (Li et al., 2015; Tushman et al., 2011), and other papers focus on middle managers (e.g., Bonesso et al., 2014; Burgess et al., 2015; Keller & Weibler, 2015; Taylor & Helfat, 2009). Regarding other workers, different types of employees have also been analyzed, for example, knowledge workers (Lee & Lee, 2016), university researchers (Y. C. Chang et al., 2016), surgeons (Schultz et al., 2013), medical staff (Salas Vallina et al., 2019), nurses (Yu et al., 2018), salespeople (Agnihotri et al., 2017; Van der Borgh et al., 2017), frontline employees (Faia & Vieira, 2017; Gabler et al., 2017; Patterson et al., 2014), or legal service consultants (Luu et al., 2018), among others.

Specific characteristics and skills of individuals to be ambidextrous have been examined. For example, Birkinshaw and Gibson (2004) identified four ambidextrous behaviors: ambidextrous individuals take the initiative and are alert to opportunities beyond the confines of their own jobs; they are cooperative and seek out opportunities to combine their efforts with others; they are brokers, always looking to build internal linkages; and they are multitaskers who are comfortable wearing more than one hat. These behaviors were also identified in the study by Fiset and Dostaler (2017). Andriopoulos and Lewis (2009, 2010) pointed out that ambidextrous individuals are individuals with passion and discipline.

Mom et al. (2009) proposed three related characteristics of ambidextrous managers: ambidextrous managers host contradictions, they are multitasker, and they both refine and renew their knowledge, skills, and expertise to deal with explorative and exploitative tasks. Probst et al. (2011) emphasize that becoming an ambidextrous organization is first and foremost a leadership challenge, and business leaders need to balance current and new activities, combining short-term and long-term thinking, and craft emotionally engaging visions while staying focused on execution. In the specific area of supply chain, Souza-Luz and Gavronski (2020) found that the characteristics of an ambidextrous supply chain manager are a holistic yet focused approach, prior experience in multiple functional areas, technical knowledge, network connectivity, openness for sharing ideas with other managers, empathy skills and entrepreneurial capabilities. From a theoretical point of view, Bledow et al. (2009) proposed that ambidextrous leaders are characterized by cognitive as well as behavioral complexity and are able to dynamically adapt their tactics (such as being directive or providing autonomy) to contextual demands.

These studies provide an inventory of different skills an individual would need to be ambidextrous. However, several questions arise at this point: are these characteristics present in every ambidextrous employee or manager? Are all of these characteristics equally relevant to become ambidextrous? Or are some of them more relevant than others? In this regard, Rapp et al. (2017) point out that

there is an assumption of homogeneity in research in this topic, where all ambidextrous individuals are assumed to have the same abilities to manage the dual requirements, but this is unlikely. To solve these questions, more research is needed in different specific work contexts, organizational levels (top manager, middle manager, line manager, employees, etc.), industries, and so on, to gain clarity about specific characteristics for each type of individual.

Issue 4: how to reconcile conflicting demands?

Different approaches

Research about organizational ambidexterity has identified three different approaches to reconcile the conflicting activities of exploration and exploitation: sequential, structural, and contextual (O'Reilly & Tushman, 2013). Sequential ambidexterity refers to a temporal cycle through periods of exploration and periods of exploitation. The structural approach proposes that it is possible to pursue exploration and exploitation activities simultaneously, but in separated spaces, for example in separate or differentiated organizational units (Jansen et al., 2009). Contextual ambidexterity refers to the possibility of pursuing the two activities simultaneously and internally (Raisch & Birkinshaw, 2008). The analysis of the microfoundations of ambidexterity is mainly included in the contextual approach, as this perspective is focused on the contextual factors that can help individuals to be ambidextrous, dividing their time between the two contradictory demands (Gibson & Birkinshaw, 2004). However, is it possible to transfer the other two approaches to the study of ambidexterity at the individual level? Could we refer to sequential and structural individual ambidexterity? Which one can be more beneficial for a company?

In this regard, Bledow et al. (2009) highlight that exploration and exploitation activities can be structurally separated to different subsystems or temporally separated within the same subsystem. They note that the structural approach may make sense at the team level, but not at the individual level. For instance, in a team responsible for the development of a new product, some members may concentrate on the exploration of radically new ideas, whereas others focus on the exploitation of useful ideas. Likewise, the same activities can be performed by an individual alone switching back and forth between engaging in exploration and exploitation activities, what refers to the individual sequential approach. Nevertheless, they do not examine empirically these two options.

Andriopoulos and Lewis (2009, 2010) consider that there also exist two ways to achieve ambidexterity at the individual level: the sequential approach (employees which explore and exploit at different times in their work) and the structural approach (some workers focus more on exploitation and others on exploration). In the latter case,

we would be referring to ambidextrous teams but not to ambidextrous individuals, as noted by Bledow et al. (2009). In the case studies examined by Andriopoulos and Lewis (2009, 2010), they found the two approaches, but they do not compare their effects.

In our review, we have identified only one study that compares the two approaches to analyze which one could be more effective. Caniëls and Veld (2019) compare empirically the individual structural approach (individuals specialized in one of the two activities, exploration or exploitation) with the sequential approach (individuals that develop both exploration and exploitation activities during the last year). They find that when employees specialize in doing exploitative or explorative activities, innovative work behavior is higher than when employees undertake both explorative and exploitative activities in equal amounts. Therefore, this issue should be addressed by researchers in future studies, comparing the effects of the structural approach (ambidexterity at the team level) and the sequential approach of individual ambidexterity.

Focusing our attention only at individual ambidexterity, two different research streams arise from our literature review about how an individual can develop two contradictory activities: one more general, which includes most studies, and another more specific which includes mainly studies from frontline employees. The general research stream defends that the development of two contradictory activities simultaneously by the same individual seems impossible. This point of view is in line with the neuroscientific research on individual exploration and exploitation by Laureiro-Martínez et al. (2015), who provide evidence that exploration and exploitation involve different modes of human attention and cannot be pursued simultaneously, rather, exploration and exploitation tasks have to be conducted consecutively.

Keller and Weibler (2015) also argue against a simultaneous pursuit of exploration and exploitation at the individual level as individuals are forced to divide their time between both competing patterns. Adler et al. (1999) could be also framed within this individual sequential approach, because they point out that "work can be organized so that people switch sequentially between the two types of tasks rather than attempting to do them both simultaneously. Switching allows greater focus and reduces the risk of confusion" (p. 46). In our review, there are studies that clearly focus on this sequential, temporal or cyclical approach of individual ambidexterity (e.g., Bidmon & Boe-Lillegraven, 2019; Greco et al., 2019; Lam et al., 2019; Schnellbacher et al., 2019), although most studies just name the contextual approach to justify the analysis of antecedents that help create the organizational context which facilitates that individuals can easily develop and integrate exploration and exploitation activities during a period of time.

However, which period of time should we take into account to consider that an individual is ambidextrous? Most empirical papers measure individual exploration and exploitation activities carried out during the last year, following Mom et al. (2007, 2009), but others consider the last month (Affum-Osei et al., 2020), weekly and daily activities (Rosing & Zacher, 2017), or specific units of action (Bidmon & Boe-Lillegraven, 2019; Volery et al., 2015). Then, how frequently should an individual switch between exploration and exploitation activities to consider him or her ambidextrous? Greco et al. (2019) answer this question from a theoretical point of view. They propose as a general rule of thumb

that cycling between exploration and exploitation mindsets becomes counterproductive at the point that switching costs and mixing costs from rapid cycling outweigh the performance benefits of doing so. Whether this occurs over a span of minutes, hours, days, or longer will depend on a host of worker and work characteristics, along with the nature of the task. (p. 190)

Therefore, future studies should try to measure these costs of individual switching between activities along with its performance benefits, to find out the optimal frequency in different specific context on work, individuals, industries, and so on.

A second research stream that has arisen in our literature review defends that, in some industries, activities and jobs, it is possible for individuals to simultaneously develop exploration and exploitation activities, at the same time. Even more, this ambidextrous capability of employees is becoming more valuable. For instance, “in the services field, firms look for employees who have the dual capacity of exploiting existing competencies in service encounter and exploring new sales opportunities” at the same time (Faia & Vieira, 2017, p. 448). Employees dealing directly with customers (e.g., salespersons, frontline service employees) are under increased pressure to simultaneously engage in cross-/up-selling opportunities and fulfill service requests (K. Sok et al., 2016, p. 144). In these cases, there exists the possibility of trying to achieve both purposes simultaneously while attending the customer. During the few minutes a frontline employee is attending to a customer, the worker must be capable of thinking and acting ambidextrously to help the customer in what he or she is requesting and at the same time trying to surpass his or her needs and expectations by offering him or her new products or services. In our literature review, we have found examples at the bank industry (Faia & Vieira, 2017) or consulting firms (Luu et al., 2018). Other sectors in which meetings between employees and customers may require ambidextrous abilities by workers are, for example, the hotel industry and other tourism firms. However, no study has

been published about individual ambidexterity in this sector.

Issue 5: antecedents and contingent effects in individual ambidexterity research

Some quantitative studies analyze antecedents of individual ambidexterity, which can be grouped at different levels: organization, group, or individual. In this regard, there are individual characteristics that may enhance employee's ambidexterity, such as intrinsic motivation (Kao & Chen, 2016; Mom et al., 2019); cognitive, information, and social individual capabilities (Lee & Lee, 2016); self-efficacy (Kauppila & Tempelaar, 2016; Mom et al., 2019; Patterson et al., 2014); attitudes and orientation of individuals (Lam et al., 2019; Yu et al., 2018) handling work stress and trust building for social support (Zhang et al., 2019); or psychological empowerment (Garcia et al., 2019). In the case of managers, the individual characteristics that can favor their ambidexterity are, for example, their decision-making authority, cross-functional interfaces and connectedness to other organization members (Mom et al., 2009), individual risk propensity (Li et al., 2015), or their tenure in the organization (Mom et al., 2015), although functional tenure of managers limits their ambidextrous behavior.

Regarding organizational antecedents that might favor individual ambidexterity, we can highlight flexible and organic organizational structures (Ajayi et al., 2017; Y. C. Chang et al., 2016), clan culture (Ajayi et al., 2017), an organizational culture that promotes empowerment (Caniëls et al., 2017), or high-involvement human resource systems (Prieto-Pastor & Martin-Perez, 2015). At the team or unit level, different leadership styles have a positive influence on employee's ambidexterity, such as paradoxical leadership (that combines strong managerial support with high performance expectations) (Kauppila & Tempelaar, 2016), inspirational leadership (Salas Vallina et al., 2019), or ambidextrous leadership (that combines opening and closing behaviors of leaders) (Alghamdi, 2018; Busola Oluwafemi et al., 2019; Luu et al., 2018; Zacher et al., 2016).

Some of these relationships between individual ambidexterity and its antecedents are moderated by other variables related to individual and organizational characteristics. For instance, some individual characteristics that may play a moderating role are age (Van der Borgh & Schepers, 2014), job experience (Patterson et al., 2014), proactive personality and emotional intelligence (Kao & Chen, 2016), or motivation (K. Sok et al., 2016). Organizational moderators that have been studied in the antecedents' relationships are related to leadership styles (Kauppila & Tempelaar, 2016; Yu et al., 2018), management support (Prieto-Pastor & Martin-Perez, 2015) or cross-functional coordination (Tempelaar & Rosenkranz, 2019).

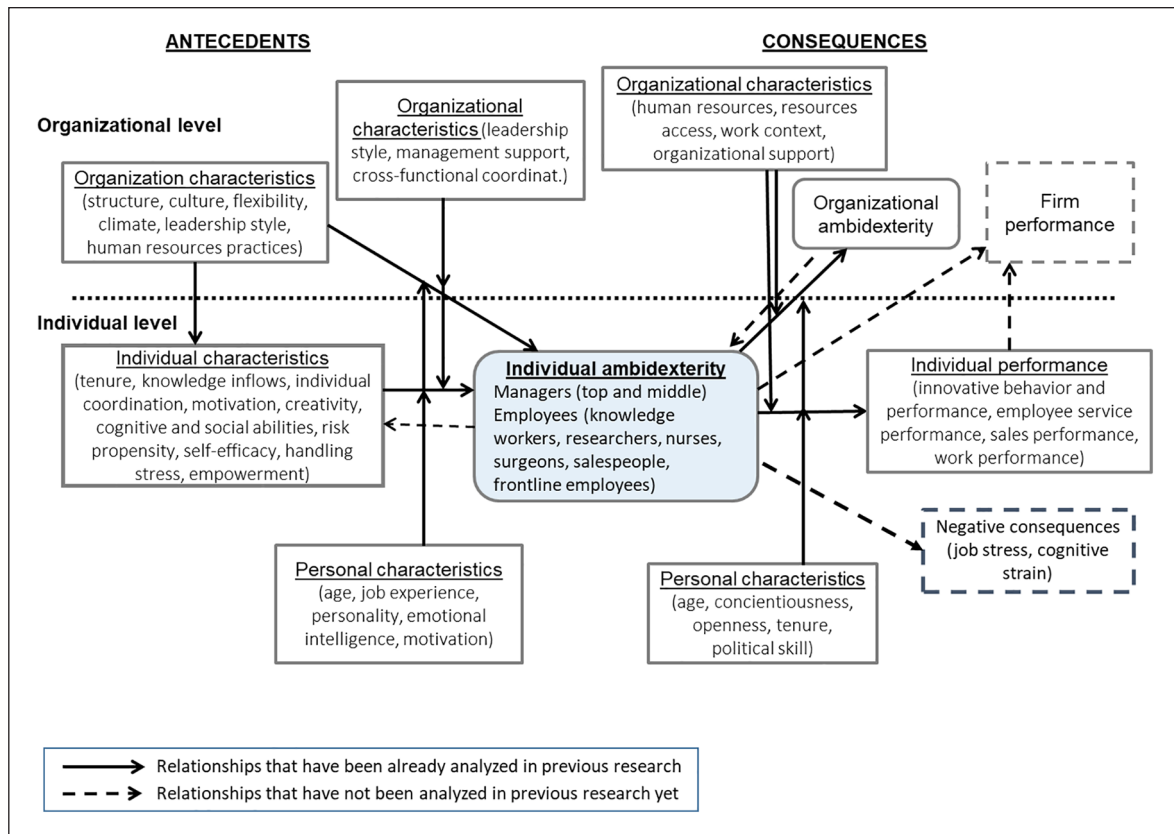


Figure 3. Summary of individual ambidexterity relationships.

These relationships between antecedents, individual ambidexterity, and contingent effects are summarized in Figure 3, with black arrows, distinguishing between organizational and individual antecedents. The team or unit level is not represented in Figure 3, as only leadership styles have been analyzed at this level.

To advance and consolidate knowledge about the antecedents of individual ambidexterity, more research is needed (Kobarg et al., 2017). For example, it would be interesting to analyze the influence of other individual characteristics such as cognitive, behavioral and cultural factors, or gender; or organizational factors such as climate, incentives, and organizational support. Other determinants at a higher level than the organization, such as external governance pressures from an independent board of directors and shareholders, or national culture and other external environmental factors, should be also analyzed. De Ruyter et al. (2020) contemplate to analyze whether artificial intelligence could facilitate individual ambidexterity of employees in specific work contexts.

In our sample articles, no study has analyzed the effect of organizational ambidexterity, as an organizational dynamic capability, on individual ambidexterity. This analysis would help to understand if organizational capabilities and routines can help individuals to become more ambidextrous. For future research, it could also be

interesting to study whether individual ambidexterity could have an effect on the characteristics of individuals. In this regard, Yeganegi et al. (2019) find that individual ambidexterity increases the entrepreneurship capabilities of employees outside their organizations. Similarly, Zhang et al. (2019) propose to analyze if a high degree of ambidextrous behaviors may enable people to become less stressed at work. These possible reverse relationships are represented in a broken arrow in Figure 3.

Issue 6: consequences and contingent effects in individual ambidexterity research

With regard to consequences of individual ambidexterity, only three studies analyze the influence of ambidextrous individuals on organizational ambidexterity (Li et al., 2015; Mom et al., 2019; Prieto-Pastor & Martin-Perez, 2015), finding a positive relationship. Regarding other organizational consequences, De Visser and Faems (2015) found that individual ambidexterity indirectly and positively influences incremental innovation performance, but there is a negative indirect influence on radical innovation. Most studies have analyzed the influence of individual ambidexterity on individual performance measured with different variables. For example, individual ambidexterity positively influences employee innovative performance

(Zacher et al., 2016), employees service (Affum-Osei et al., 2020) and sales performance (Van der Borgh et al., 2017), task performance (Good & Michel, 2013), or individual R&D performance (Kobarg et al., 2017). Only Schnellbächer et al. (2019) analyze the effect of individual ambidexterity on team or unit level variables, finding a positive effect on team performance and on the effectiveness and efficiency of the department.

Some of these relationships between individual ambidexterity and its consequences are moderated by other variables related to individual and organizational characteristics. For example, some individual characteristics that moderate these relationships are age (Van der Borgh & Schepers, 2014), conscientiousness and openness to experience (Keller & Weibler, 2015), tenure (Mom et al., 2015), or political skill (Kapoutsis et al., 2019). Organizational factors that moderate the impact of individual ambidexterity on other variables are related to human resource practices (Mom et al., 2019), resources access (Schultz et al., 2013), work context (Mom et al., 2015), or perceived organizational support (Affum-Osei et al., 2020). Figure 3 summarizes the consequences of individual ambidexterity and contingent effects that have been analyzed (with black arrows).

Our review shows that empirical research has mainly examined individual performance outcomes of individual ambidexterity. However, there is a lack of research analyzing not only positive consequences but also negative effects of individual ambidexterity (Rapp et al., 2017). For example, K. Sok et al. (2016) state that while individual ambidexterity may benefit individual performance, it can also lead to role stress or similar negative job outcomes. In our literature review, we have only identified two papers that examine negative effects of individual ambidexterity: Keller and Weibler (2015) find that the more ambidextrous behavior of a manager, the more s/he may suffer from cognitive strain; and Gabler et al. (2017) find that ambidextrous employees experience role conflict. Therefore, future research should try to solve this issue by examining the combined effect of individual ambidexterity and job stress or cognitive strains on multiple criteria of employee effectiveness (e.g., task performance, job satisfaction, turnover intentions).

Moreover, there are few studies that analyze the influence of individual ambidexterity on a higher level variable, such as team, group (Schnellbächer et al., 2019) or organizational outcomes. Only De Visser and Faems (2015) analyze the effect on innovation performance, and just three papers examine the effect of ambidextrous individuals on organizational ambidexterity (Li et al., 2015; Mom et al., 2019; Prieto-Pastor & Martin-Perez, 2015). Future research analyzing these relationships is needed to gain evidence that individual ambidexterity will have positive effects, not only at the individual level, but also at group or organizational levels (these relationships are represented in broken

arrows and lines in Figure 3). If, along with the positive effects, negative consequences are also detected (e.g., job stress or dissatisfaction that can affect negatively to firm performance), managers and leaders should take measures to cope with these negative effects. From a theoretical point of view, it seems clear that an ambidextrous individual can contribute more to the organization than someone who is not (Bledow et al., 2009). However, does this relationship occur in any context or situation? In any job and/or industry? Rosing and Zacher (2017) propose to conduct more empirical research about this issue. Perhaps, it is not necessary to have ambidextrous individuals, but individuals with certain characteristics that favor the organizational ambidexterity (this aspect can be appropriate at the level of leaders), or ambidextrous teams, with individuals specialized in either exploration or exploitation activities, as suggested in Issue 4.

Issue 7: methods

First published papers about ambidextrous individuals were qualitative studies, mainly case (Adler et al., 1999) or multicase studies (e.g., Andriopoulos and Lewis, 2009, 2010) through in-depth interviews, observation, and documents. Since 2012, studies that apply quantitative empirical analysis begin to prevail (e.g., Faia & Vieira, 2017; Mom et al., 2015; Volery et al., 2015). Quantitative studies have mainly used questionnaires for data collection, and regression analysis and structural equation modeling for their analysis. Moreover, Birkinshaw and Gibson (2004) and Rogan and Mors (2014) are mixed methods studies as these authors combined qualitative and quantitative methods. Furthermore, we have found seven theoretical/conceptual works (Bledow et al., 2009; Eisenhardt et al., 2010; Greco et al., 2019; Hughes & Ogilvie, 2020; Jackson et al., 2017; Rapp et al., 2017; Tuncdogan et al., 2015). Some of these theoretical studies are very recent, what means that the topic of individual ambidexterity is not yet consolidated, and needs more theoretical development, as suggested in previous issues.

As said above, both antecedents and consequences of individual ambidexterity, and contingent variables, can be examined at different levels of analysis (see Figure 3). However, few studies conduct multilevel research, either qualitative or quantitative. From a qualitative point of view, Andriopoulos and Lewis (2009, 2010) addressed ambidexterity at the individual, group, and organizational levels. Burgess et al. (2015) studied a macro-level (external regulatory pressures) and a micro-level (individual), and Kassotaki et al. (2019) analyzed the way ambidexterity penetrates across three different levels (senior executives, middle managers, and employees) and the way ambidexterity penetrates through the whole organization. Moreover, although some papers seem to propose a multi-level theoretical model, only few studies use multilevel

statistical techniques (Y. C. Chang et al., 2016; Y. Y. Chang et al., 2019; Jasmand et al., 2012; Kapoutsis et al., 2019; Kauppila & Tempelaar, 2016; Kobarg et al., 2017; Li et al., 2015; Mom et al., 2019; Schultz et al., 2013; Van der Borgh et al., 2017; Yu et al., 2018). Most of these studies analyze the individual level together with the organization or unit level.

The use of multilevel studies to advance ambidexterity research poses a challenge regarding research designs and methodologies. From a quantitative perspective, multilevel modeling can help to overcome some limitations of traditional regression analysis when examining factors that determine ambidexterity. Multilevel models take into account that these factors can be located at different levels and that the relationships between these levels may be of a nested nature (Hofmann, 1997; Molina-Azorín et al., 2019). Therefore, multilevel analysis overcomes the problem of non-independence of regression analysis (Mathieu & Chen, 2011), providing opportunities to study relationships between individual ambidexterity and other variables at different levels, such as organizational ambidexterity or firm performance.

Together with quantitative methods, the use of qualitative methods can also contribute to the advance of multilevel ambidexterity research. A relevant issue for future research would be how individual ambidexterity and individual actions, interactions, and characteristics aggregate through some processes to create and develop collective phenomena (team ambidexterity and organizational ambidexterity). In other words, how these collective levels of ambidexterity emerge through a process of aggregation of individual ambidexterity and individual variables. Detailed, in-depth longitudinal studies of these processes may be carried out through qualitative research (Mathieu & Chen, 2011). In our review, several qualitative studies were found, but they did not analyze these processes of aggregation from a qualitative perspective. Only Kassotaki et al. (2019), in their qualitative analysis of an aerospace defense organization, found high degree of vertical penetration of ambidexterity among different levels in the organization (individual, teams and senior executives). But they do not study aggregation and interaction processes.

Issue 8: measures and operationalization of individual ambidexterity

Regarding measurement of individual ambidexterity in quantitative empirical studies, most papers consider the variables of exploration and exploitation (or other tensions noted above) as two orthogonal dimensions. Only one paper measures individual ambidexterity from a continuum (1- to 5-point scale) with the intermediate value (3) reflecting ambidexterity (Rogan & Mors, 2014), and Yeganegi et al. (2019) use a dichotomous variable.

Regarding the way the construct of individual ambidexterity is operationalized from the two dimensions studied, the way that predominates is the interaction or multiplication of the two variables to obtain the individual ambidextrous measure (e.g., Li et al., 2015; Mom et al., 2015; Schultz et al., 2013; Torres et al., 2015), although there are also papers that use balance (subtraction) (Caniëls & Veld, 2019; De Visser & Faems, 2015; Keller & Weibler, 2015), addition (Caniëls et al., 2017; Prieto-Pastor & Martin-Perez, 2015; Xiang et al., 2019), or combine several measures (Lee & Lee, 2016; Rosing & Zacher, 2017; P. Sok & O'Cass, 2015). Other studies use a second-order construct (Good & Michel, 2013; Mom et al., 2019; Salas Vallina et al., 2019; Schnellbacher et al., 2019).

The way researchers measure individual ambidexterity depends on the concept and the approach considered to reconcile both tensions, as explained above. If scholars think of ambidexterity as high levels in both exploration and exploitation activities, they should measure ambidexterity as an interaction term. If they consider ambidexterity as a balance between exploration and exploitation, the subtraction could be a better measure. For example, Keller and Weibler (2015) found more appropriate the operationalization of individual ambidexterity through the balance perspective (the balance between exploration and exploitation), because they consider that exploration and exploitation cannot be pursued simultaneously. According to Rosing and Zacher (2017),

the operationalization as difference score (balance) implies that ambidexterity is highest when exploration and exploitation are approximately at the same level, irrelevant of the absolute level (Cao et al., 2009). That is, the difference score only captures the degree of imbalance, but not the level of (im)balance. In other words, an organization or individual with low levels of both exploration and exploitation is considered as ambidextrous as an organization or individual with high levels of both exploration and exploitation. (p. 697)

Because of these different conceptualizations, some studies compare both measurements (balance and interaction) (Rosing and Zacher, 2017; P. Sok & O'Cass, 2015), but the operationalization of individual ambidexterity by the interaction between exploration and exploitation constructs has been the most used measure in empirical studies. This way of operationalization is in line with the concept of individual ambidexterity proposed by Bledow et al. (2009), who defend that exploration and exploitation are contradictory activities, but intertwined and mutually dependent.

In summary, the fact of not having a clear and solid definition of the concept of individual ambidexterity, as indicated in Issue 2, and the different approaches to reconcile tensions explained in Issue 4, is also reflected in the use of various measures. Consequently, addressing previous conceptual issues would also help to solve the

measurement issue. In any case, researchers should be accurate in defining concepts in their studies and in explaining coherence with their measures of individual ambidexterity. As Rosing and Zacher (2017) explain, in extant research, “most studies lack a thorough discussion of how the chosen operationalization captures the theoretical understanding of ambidexterity applied in a given study” (p. 697). Therefore, to advance the study of this topic, researchers must be precise about theories, definitions, context, and approaches to study individual ambidexterity, but also coherent about methods and measures, and explain it explicitly.

Discussion and conclusion

In this study, we were interested in ambidexterity at the individual level (individual ambidexterity) as a key microfoundation of organizational ambidexterity. The systematic literature review carried out in this study has enabled us to evaluate the accumulated knowledge in the topic of individual ambidexterity. In this last section, we synthesize the current state of knowledge about individual ambidexterity, and the proposals for future research, according to the research question examined in the paper: what do we know and don't know about individual ambidexterity as a key microfoundation of organizational ambidexterity?

Regarding theoretical frameworks (Issue 1), although both psychological (micro) and organizational (macro) theories have been used, few studies combine them. As companies deal with multilevel problems, several theories at different levels must be combined. Integrative theories might help to advance and overcome the micro–macro divide in management research, in general, and in organizational and individual ambidexterity in particular.

Different tensions can be considered when referring to individual ambidexterity (Issue 2). However, scholars should clearly state whether they are analyzing individual ambidextrous behaviors or ambidextrous outcomes. Besides, new related but different terms are appearing around the concept of individual ambidexterity. Therefore, more theoretical development is also needed to achieve a solid conceptualization of individual ambidexterity, in order to consolidate foundations of this topic.

Regarding the way to reconcile conflicting demands at the individual level (Issue 4), different approaches have been considered: temporal or cyclical switch versus simultaneous development. Although the most general approach at individual ambidexterity is the cyclical switch between exploration and exploitation activities, simultaneous individual ambidexterity is possible and advisable at specific jobs, such as frontline employees, mainly in service firms. Related to this, maybe all individuals in a firm are not equally relevant to achieve organizational ambidexterity. Then, it would be necessary to identify the relevant individuals (Issue 3), both at managers and employees level, in

different industries (e.g., tourism firms), in order to identify in which jobs ambidextrous workers or managers can be more effective for organizational ambidexterity.

Another important question to solve related to Issue 4 is to find out the more effective level to be ambidextrous (individual, team or unit, organization). Future research should compare the structural individual approach (individuals specialized in either exploration or exploitation activities within a team or organizational unit) with the sequential approach (ambidextrous individuals). In this type of studies, researchers should also take into account the possible negative effects and costs of individual ambidexterity in order to find out the most beneficial level to be ambidextrous (individual or team).

Figure 3 summarizes what we know about antecedents, consequences, and contingent effects of individual ambidexterity (Issues 5 and 6). Some reverse relationships could be analyzed, such as the effect of organizational ambidexterity, as an organizational dynamic capability, on the ambidexterity of individuals. In addition, future research should jointly consider positive and negative effects of individual ambidexterity on personal characteristics of individuals, both managers and employees. In this regard, individual ambidexterity could have a positive effect on the abilities to handling stress or entrepreneurship capabilities of some individuals, but a negative effect on employees' satisfaction or task performance for other individuals. More research is also required to examine consequences of individual ambidexterity at the organizational level, for instance, analyzing the effect on organizational ambidexterity and also on some firm performance variable. Therefore, there is a need to jointly consider individual and organizational consequences of individual ambidexterity.

From a methodological point of view (Issue 7), another challenge for future research of microfoundations of ambidexterity is the development and consolidation of multilevel research in the analysis of the micro- and macro-variables related to this topic. Ambidexterity is a “nested” concept, such that it transpires at multiple levels in the organization (firms, business units, teams, individual employees) (Birkinshaw & Gupta, 2013; Raisch et al., 2009), but studies have been usually conducted at only one of these different levels of analysis. More studies that explicitly consider two or more levels simultaneously would be valuable. Not only quantitative but also qualitative longitudinal studies would be relevant for future analysis of the interaction and integration processes of ambidexterity at different levels.

Finally, researchers must explicitly indicate theories, definitions, context, and approaches they focus their studies and clearly discuss in their papers how they measure and operationalize individual ambidexterity (Issue 8) and why that measure represents the theoretical concept and approach. Table 3 summarizes future research proposals in the key issues examined.

Table 3. Summary of future research proposals in key issues of individual ambidexterity.

Key issues	Future research proposals
1. Theoretical and conceptual frameworks	– Integrate micro- and macro-theories
2. Concept and tensions in individual ambidexterity	– More theoretical developments to achieve solid definitions of the concept
3. Specific individuals and characteristics of ambidextrous individuals	– More research about the specific ambidextrous characteristics for each type of individuals
4. How to reconcile conflicting demands? Different approaches	– Compare performance achievements of ambidextrous individuals and ambidextrous teams (with individuals specialized either in exploration or exploitation) – Analyze switching costs between individual exploration and exploitation activities – Analyze simultaneous development of exploration and exploitation activities in frontline employees in tourism industries and other service firms
5. Antecedents and contingent effects in individual ambidexterity research	– Analyze new individual and organizational antecedents (e.g., the organizational ambidexterity capability) – Analyze the effect of individual ambidexterity on the characteristics of individuals (reverse relationships)
6. Consequences and contingent effects in individual ambidexterity research	– Analyze possible negative effects or consequences of individual ambidexterity – Analyze effects on more organizational level variables such as organizational ambidexterity and firm performance
7. Methods	– Multilevel analysis to study relationships between individual ambidexterity and organizational level variables (e.g., organizational ambidexterity and firm performance) – Qualitative longitudinal studies to analyze aggregation processes from individual ambidexterity to collective effects/phenomena.
8. Measures and operationalization of individual ambidexterity	– Coherence between concept and operationalization of individual ambidexterity

The main theoretical contribution of this study is that it takes stock of knowledge and identifies some important issues to conduct more research to advance and consolidate understanding on this topic. Moreover, one of the contributions of this systematic review for management practice is the identification of individuals that have been analyzed (managers at different hierarchical levels and different types of employees), because it might help managers to identify in their firms the more relevant individuals that could be ambidextrous. They must be also aware that individual ambidexterity could have negative effects on employees and managers, and then they should take measures to avoid them. Finally, the microfoundation focus of our review could help them in their own decision-making processes and actions to sustain competitiveness.

The systematic review carried out in this study has also shown that there is actually little knowledge about how firms go from individual to organizational ambidexterity. Similarly, there is no study that analyzes the effect of individual ambidexterity on firm performance, neither directly nor indirectly. This may be due to the greater complexity in applying multilevel statistical techniques. The multilevel approach is more difficult than research conducted at only one level, as more time, effort, and research capacities are needed. On the contrary, there has been substantial

development in terms of determinants or antecedents that can facilitate ambidexterity at the individual level, as well as its effect on individual performance, or the characteristics of some ambidextrous individuals, both managers and employees. However, these characteristics may vary depending on the specific job, as well as the industry. Therefore, there are still important aspects to be addressed in this topic, as suggested in this article, both from a theoretical and empirical point of view. We hope our systematic review may help to advance research in this interesting topic of individual ambidexterity.

Finally, one of the limitations of this study is related to the inclusion and exclusion criteria used in this literature review. In our data collection, we identified some studies focused on ambidextrous leadership. In the studies on this topic included in the final list of papers, authors explicitly indicated specific characteristics of leaders at the individual level (e.g., Probst et al., 2011). However, we found other studies on ambidextrous leadership from an organizational perspective or where authors did not examine specific ambidextrous characteristics of leaders, but how organizational leadership style may promote and facilitate team or organizational ambidexterity. A specific review about ambidextrous leadership would be also interesting for future research, taken into account the diversity of aspects studied.

Acknowledgements

We are grateful to two anonymous reviewers for their helpful and constructive comments.

Declaration of conflicting interests

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

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Spanish Ministry of Economy and Competitiveness (grant number ECO2015-67310P).

Supplemental material

Supplemental material for this article is available online.

References

References marked with an asterisk indicate the studies identified.

- *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, 43–68.
- *Affum-Osei, E., Asante, E. A., Forkouh, S. K., & Abdul-Nasiru, I. (2020). Career adaptability and ambidextrous behavior among customer-service representatives: The role of perceived organizational support. *Journal of Personal Selling & Sales Management*, 40, 4–18. <https://doi.org/10.1080/08853134.2019.1594241>
- *Agnihotri, R., Gabler, C. B., Itani, O. S., Jaramillo, F., & Krush, M. T. (2017). Salesperson ambidexterity and customer satisfaction: Examining the role of customer demandingness, adaptive selling, and role conflict. *Journal of Personal Selling & Sales Management*, 37, 27–41.
- Aguinis, H., Boyd, B. K., Pierce, C. A., & Short, J. C. (2011). Walking new avenues in management research methods and theories: Bridging micro and macro domains. *Journal of Management*, 37, 395–403.
- Ahammad, M. F., Glaister, K. W., & Junni, P. (2019). Organizational ambidexterity and human resource practices. *The International Journal of Human Resource Management*, 30, 503–507.
- *Ajayi, O. M., Odusanya, K., & Morton, S. (2017). Stimulating employee ambidexterity and employee engagement in SMEs. *Management Decision*, 55, 662–680.
- *Alghamdi, F. (2018). Ambidextrous leadership, ambidextrous employee, and the interaction between ambidextrous leadership and employee innovative performance. *Journal of Innovation and Entrepreneurship*, 7, Article 1. <https://doi.org/10.1186/s13731-018-0081-8>
- *Andriopoulos, C., & Lewis, M. W. (2009). Exploitation-exploration tensions and organizational ambidexterity: Managing paradoxes of innovation. *Organization Science*, 20, 696–717.
- *Andriopoulos, C., & Lewis, M. W. (2010). Managing innovation paradoxes: Ambidexterity lessons from leading product design companies. *Long Range Planning*, 43, 104–122.
- *Awojide, O., Hodgkinson, I. R., & Ravishankar, M. N. (2018). Managerial ambidexterity and the cultural toolkit in project delivery. *International Journal of Project Management*, 36, 1019–1033.
- *Bidmon, C. M., & Boe-Lillegraven, S. (2019). Now, switch! Individuals' responses to imposed switches between exploration and exploitation. *Long Range Planning*. Advance online publication. <https://doi.org/10.1016/j.lrp.2019.101928>
- *Birkinshaw, J., & Gibson, C. (2004, Summer). Building ambidexterity into an organization. *MIT Sloan Management Review*, pp. 47–55.
- Birkinshaw, J., & Gupta, K. (2013). Clarifying the distinctive contribution of ambidexterity to the field of organization studies. *Academy of Management Perspectives*, 27, 287–298.
- *Bledow, R., Frese, M., Anderson, N., Erez, M., & Farr, J. (2009). A dialectic perspective on innovation: Conflicting demands, multiple pathways, and ambidexterity. *Industrial and Organizational Psychology*, 2, 305–337.
- *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, 392–405.
- *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, S87–S109.
- *Busola Oluwafemi, T., Mitchelmore, S., & Nikolopoulos, K. (2019). Leading innovation: Empirical evidence for ambidextrous leadership from UK high-tech SMEs. *Journal of Business Research*. Advance online publication. <https://doi.org/10.1016/j.jbusres.2019.10.035>
- *Caniëls, M. C. J., Neghina, C., & Schaetsaert, N. (2017). Ambidexterity of employees: The role of empowerment and knowledge sharing. *Journal of Knowledge Management*, 21, 1098–1119.
- *Caniëls, M. C. J., & Veld, M. (2019). Employee ambidexterity, high performance work systems and innovative work behaviour: How much balance do we need? *The International Journal of Human Resource Management*, 30, 565–585.
- Cao, Q., Gedajlovic, E., & Zhang, H. (2009). Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects. *Organization Science*, 20, 781–796.
- *Chang, Y. C., Yang, P. Y., Martin, B. R., Chi, H. R., & Tsai-Lin, T. F. (2016). Entrepreneurial universities and research ambidexterity: A multilevel analysis. *Technovation*, 54, 7–21.
- *Chang, Y. Y., Chang, C. Y., Chen, C. W., Chen, Y. C. K., & Chang, S. Y. (2019). Firm-level participative leadership and individual-level employee ambidexterity: A multilevel moderated mediation analysis. *Leadership & Organization Development Journal*, 40, 561–582.
- Denyer, D., & Tranfield, D. (2008). Producing a systematic review. In D. Buchanan (Ed.), *The SAGE handbook of organizational research methods* (pp. 671–689). SAGE.
- *De Ruyter, K., Keeling, D. I., & Yu, T. (2020). Service-sales ambidexterity: Evidence, practice, and opportunities for future research. *Journal of Service Research*, 23, 13–21. <https://doi.org/10.1177/1094670519878880>
- *De Visser, M., & Faems, D. (2015). Exploration and exploitation within firms: The impact of CEOs' cognitive style

- on incremental and radical innovation performance. *Creativity and Innovation Management*, 24, 359–372.
- 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, 119–136.
- *Eisenhardt, K., Furr, N., & Bingham, C. (2010). Microfoundations of performance: Balancing efficiency and flexibility in dynamic environments. *Organization Science*, 21, 1263–1273.
- *Faia, V. D., & Vieira, V. A. (2017). Generating sales while providing service: The moderating effect of the control system on ambidextrous behaviour. *International Journal of Bank Marketing*, 35, 447–471.
- *Fiset, J., & Dostaler, I. (2017). Opening the black box of ambidexterity: Three product development stories. *Technology Innovation Management Review*, 7, 4–11.
- *Gabler, C. B., Ogilvie, J. L., Rapp, A., & Bachrach, D. G. (2017). Is there a dark side of ambidexterity? Implications of duelling sales and service orientations. *Journal of Service Research*, 20, 379–392.
- *Garcia, F., Guidice, R. M., & Mero, N. P. (2019). The interactive effect of person and situation on explorative and exploitative behavior. *Journal of Management & Organization*. Advance online publication. <https://doi.org/10.1017/jmo.2019.50>
- Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47, 209–226.
- *Good, D., & Michel, E. J. (2013). Individual ambidexterity: Exploring and exploiting in dynamic contexts. *Journal of Psychology*, 147, 435–453.
- *Greco, L. M., Charlier, S. D., & Brown, K. G. (2019). Trading off learning and performance: Exploration and exploitation at work. *Human Resource Management Review*, 29, 179–195.
- Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal*, 49, 693–706.
- Hofmann, D. (1997). An overview of the logic and rationale of hierarchical linear models. *Journal of Management*, 23, 723–744.
- *Hughes, D. E., & Ogilvie, J. L. (2020). When sales becomes service: The evolution of the professional selling role and an organic model of frontline ambidexterity. *Journal of Service Research*, 23, 22–32. <https://doi.org/10.1177/1094670519878882>
- *Jackson, N. C., Lescant-Giles, I., & Dunn-Jensen, L. M. (2017). Managing careers for ambidexterity and organizational alignment: Why it matters today to HR practice. *Organization Management Journal*, 14, 147–159.
- Jansen, J. J. P., Tempelaar, M. P., Van den Bosch, F. A. J., & Volberda, H. W. (2009). Structural differentiation and ambidexterity: The mediating role of integration mechanisms. *Organization Science*, 20, 797–811.
- *Jasmand, C., Blazevic, V., & De Ruyter, K. (2012). Generating sales while providing service: A study of customer service representatives' ambidextrous behavior. *Journal of Marketing*, 76, 20–37.
- Jones, O., & Gatrell, C. (2014). Editorial: The future of writing and reviewing for IJMR. *International Journal of Management Reviews*, 16, 249–264.
- 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–S28.
- *Kao, Y. L., & Chen, C. F. (2016). Antecedents, consequences and moderators of ambidextrous behaviours among front-line employees. *Management Decision*, 54, 1846–1860.
- *Kapoutsis, I., Papalexandris, A., & Thanos, I. C. (2019). Hard, soft or ambidextrous? Which influence style promotes managers' task performance and the role of political skill. *The International Journal of Human Resource Management*, 30, 618–647.
- *Kassotaki, O., Paroutis, S., & Morrell, K. (2019). Ambidexterity penetration across multiple organizational levels in an aerospace and defense organization. *Long Range Planning*, 52, 366–385.
- *Kauppila, O. P., & Tempelaar, M. P. (2016). The social-cognitive underpinnings of employees' ambidextrous behaviour and the supportive role of group managers' leadership. *Journal of Management Studies*, 53, 1019–1044.
- *Keller, T., & Weibler, J. (2015). What it takes and costs to be an ambidextrous manager: Linking leadership and cognitive strain to balancing exploration and exploitation. *Journal of Leadership and Organizational Studies*, 22, 54–71.
- *Kobarg, S., Wollersheim, J., & Welp, I. (2017). Individual ambidexterity and performance in the public sector: A multilevel analysis. *International Public Management Journal*, 20, 226–260.
- *Lam, S. K., DeCarlo, T. E., & Sharma, A. (2019). Salesperson ambidexterity in customer engagement: Do customer base characteristics matter? *Journal of the Academy of Marketing Science*, 47, 659–680.
- *Laureiro-Martínez, D., Brusoni, S., Canessa, N., & Zollo, M. (2015). Understanding the exploration-exploitation dilemma: An fMRI study of attention control and decision-making performance. *Strategic Management Journal*, 36, 319–338.
- *Lee, Y. J., & Lee, J. H. (2016). Knowledge workers' ambidexterity: Conceptual separation of competences and behavioural dispositions. *Asian Journal of Technology Innovation*, 24, 22–40.
- Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic Management Journal*, 14, 95–112.
- *Li, C. R., Lin, C. J., & Tien, Y. H. (2015). CEO transformations leadership and top manager ambidexterity: An empirical study in Taiwan SMEs. *Leadership & Organization Development Journal*, 36, 927–954.
- *Luu, T. T., Rowley, C., & Dinh, K. C. (2018). Enhancing the effect of frontline public employees' individual ambidexterity on customer value co-creation. *Journal of Business & Industrial Marketing*, 33, 506–522.
- Mathieu, J., & Chen, G. (2011). The etiology of the multilevel paradigm in management research. *Journal of Management*, 37, 610–641.
- Molina-Azorin, J. F. (2014). Microfoundations of strategic management: Toward micro-macro research in the resource-based theory. *BRQ Business Research Quarterly*, 17, 102–114.
- Molina-Azorin, J. F., Pereira-Moliner, J., López-Gamero, M. D., Pertusa-Ortega, E. M., & Tarí, J. J. (2019). Multilevel research: Foundations and opportunities in management.

- BRQ Business Research Quarterly*. Advance online publication. <https://doi.org/10.1016/j.brq.2019.03.004>
- *Mom, T. J. M., Chang, Y. Y., Cholakova, M., & Jansen, J. J. P. (2019). A multilevel integrated framework of firm HR practices, individual ambidexterity, and organizational ambidexterity. *Journal of Management*, 45, 3009–3034.
- *Mom, T. J. M., Fourné, S. P. L., & Jansen, J. J. P. (2015). Managers' work experience, ambidexterity, and performance: The contingency role of the work context. *Human Resource Management*, 54, s133–s153.
- *Mom, T. J. M., Van Den Bosch, F. A. J., & Volberda, H. W. (2007). Investigating managers' exploration and exploitation activities: The influence of top-down, bottom-up, and horizontal knowledge inflows. *Journal of Management Studies*, 44, 910–931.
- *Mom, T. J. M., Van den Bosch, F. A. J., & Volberda, H. W. (2009). Understanding variation in managers' ambidexterity: Investigating direct and interaction effects of formal structural and personal coordination mechanisms. *Organization Science*, 20, 812–828.
- O'Reilly, C., & Tushman, M. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, 28, 185–206.
- O'Reilly, C., & Tushman, M. (2013). Organizational ambidexterity: Past, present and future. *Academy of Management Perspectives*, 27, 324–338.
- *Patterson, P., Yu, T., & Kimpakorn, N. (2014). Killing two birds with one stone: Cross-selling during service delivery. *Journal of Business Research*, 67, 1944–1953.
- *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, 589–615.
- *Probst, G., Raisch, S., & Tushman, M. L. (2011). Ambidextrous leadership: Emerging challenges for business and HR leaders. *Organizational Dynamics*, 40, 326–334.
- Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management*, 34, 375–409.
- Raisch, S., Birkinshaw, J., Probst, G., & Tushman, M. (2009). Organizational ambidexterity: Balancing exploitation and exploration for sustained performance. *Organization Science*, 20, 685–695.
- *Rapp, A. A., Bachrach, D. G., Flaherty, K. E., Hughes, D. E., Sharma, A., & Voorhees, C. M. (2017). The role of the sales-service interface and ambidexterity in the evolving organization: A multilevel research agenda. *Journal of Service Research*, 20, 59–75.
- *Rogan, M., & Mors, M. L. (2014). A network perspective on individual-level ambidexterity in organizations. *Organization Science*, 25, 1860–1877.
- *Rosing, K., & Zacher, H. (2017). Individual ambidexterity: The duality of exploration and exploitation and its relationship with innovative performance. *European Journal of Work and Organizational Psychology*, 26, 694–709.
- *Salas Vallina, A., Moreno-Luzon, M. D., & Ferrer-Franco, A. (2019). The individual side of ambidexterity. Do inspirational leaders and organizational learning resolve the exploitation-exploration dilemma? *Employee Relations: The International Journal*, 41, 592–613.
- *Schnellbacher, B., Heidenreich, S., & Wald, A. (2019). Antecedents and effects of individual ambidexterity: A cross-level investigation of exploration and exploitation activities at the employee level. *European Management Journal*, 37, 442–454.
- *Schultz, C., Schreyoegg, J., & von Reitzenstein, C. (2013). The moderating role of internal and external resources on the performance effect of multitasking: Evidence from the R&D performance of surgeons. *Research Policy*, 42, 1356–1365.
- *Shamim, S., Zeng, J., Choksy, U. S., & Shariq, S. M. (2019). Connecting big data management capabilities with employee ambidexterity in Chinese multinational enterprises through the mediation of big data value creation at the employee level. *International Business Review*. Advance online publication. <https://doi.org/10.1016/j.ibusrev.2019.101604>
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339.
- *Sok, K., Sok, P., & De Luca, L. (2016). The effect of “can do” and “reason to do” motivations on service-sales ambidexterity. *Industrial Marketing Management*, 55, 144–155.
- *Sok, P., & O'Cass, A. (2015). Examining the new product innovation—performance relationship: Optimizing the role of individual-level creativity and attention-to-detail. *Industrial Marketing Management*, 47, 156–165.
- *Souza-Luz, A. R., & Gavronski, I. (2020). Ambidextrous supply chain managers in a slow clockspeed industry: Evidence from a Brazilian adhesive manufacturer. *Supply Chain Management: An International Journal*, 25(1), pp. 101–114. <https://doi.org/10.1108/SCM-09-2018-0318>
- *Taylor, A., & Helfat, C. (2009). Organizational linkages for surviving technological change: Complementary assets, middle management and ambidexterity. *Organization Science*, 20, 718–739.
- *Tempelaar, M. P., & Rosenkranz, N. A. (2019). Switching hats: The effect of role transition on individual ambidexterity. *Journal of Management*, 45, 1517–1539.
- Thunnissen, M., & Gallardo-Gallardo, E. (2019). Rigor and relevance in empirical TM research: Key issues and challenges. *BRQ Business Research Quarterly*, 22, 171–180.
- *Torres, J. P., Drago, C., & Aqueveque, C. (2015). Knowledge inflows effects on middle managers' ambidexterity and performance. *Management Decision*, 53, 2303–2320.
- 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, 207–222.
- *Tuncdogan, A., Van den Bosch, F., & Volberda, H. (2015). Regulatory focus as a psychological micro-foundation of leaders' exploration and exploitation activities. *Leadership Quarterly*, 26, 838–850.
- Tushman, M. L., & O'Reilly, C. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38, 8–30.
- *Tushman, M. L., Smith, W., & Binns, A. (2011). The ambidextrous CEO. *Harvard Business Review*, 89, 74–80.
- *Van der Borgh, M., de Jong, A., & Nijssen, E. J. (2017). Alternative mechanisms guiding salespersons' ambidextrous product selling. *British Journal of Management*, 28, 331–353.

- *Van der Borgh, M., & Schepers, J. J. L. (2014). Do retailers really profit from ambidextrous managers? The impact of frontline mechanisms on new and existing product selling performance. *Journal of Product Innovation Management*, 31, 710–727.
- Vicentini, F., Peruffo, E., Meissner, D., & Mueller, J. (2019). Unpacking entrepreneurial intensity and individual ambidexterity in small project-based enterprises: A new perspective for the TV drama industry. *IEEE Transactions on Engineering Management*. Advance online publication. <https://doi.org/10.1109/TEM.2019.2914662>
- *Volery, T., Mueller, S., & Von Siemens, B. (2015). Entrepreneur ambidexterity: A study of entrepreneur behaviours and competencies in growth-oriented small and medium-sized enterprises. *International Small Business Journal*, 33, 109–129.
- *Xiang, S., Chen, G., Liu, W., Zhou, Q., & Xing, S. (2019). An empirical study of the impact of goal orientation on individual ambidexterity: Moderating roles of goal interdependence and constructive controversy. *Nankai Business Review International*, 10, 465–484.
- *Yeganegi, S., Laplume, A. O., Dass, P., & Greidanus, N. S. (2019). Individual-Level Ambidexterity and Entrepreneurial Entry. *Journal of Small Business Management*, 57, 1444–1463.
- *Yu, T., Gudergan, S., & Chen, C. F. (2018). Achieving employee efficiency–flexibility ambidexterity. *The International Journal of Human Resource Management*. Advance online publication. <https://doi.org/10.1080/09585192.2018.1449762>
- *Zacher, H., Robinson, A. J., & Rosing, K. (2016). Ambidextrous leadership and employees' self-reported innovative performance: The role of exploration and exploitation behaviors. *The Journal of Creative Behavior*, 50, 24–46.
- *Zhang, Y., Wei, F., & Van Horne, C. (2019). Individual ambidexterity and antecedents in a changing context. *International Journal of Innovation Management*, 23(3), Article 1950021.