



Individual ambidexterity in SMEs: Towards a typology aligning the concept, antecedents and outcomes

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ABSTRACT

Individual ambidexterity is of vital importance to the competitive advantage of organizations, especially small and medium enterprises (SMEs). Yet the ambiguous conceptualization in literature hinders our understanding of the concept, its antecedents, and its outcomes. We use a systematic review to capture the development of individual ambidexterity in the literature since 2007, identifying several major issues obstructing its conceptual clarity. We further propose a typology based on the exploration-exploitation relationship. By identifying different types of individual ambidexterity and linking the concept to the context of SMEs, this review offers conceptual clarity and directions for studying individual ambidexterity in SMEs for future research.

KEYWORDS

Individual ambidexterity;
small business/small and
medium enterprises;
literature review

Introduction

This article focuses on the phenomenon of ambidexterity on the level of individual employees in small and medium enterprises (SMEs). SMEs represent a vital component of most economies. However, the specific characteristics of SMEs make them more vulnerable in rapidly changing markets; for example, their financial and human resources are more limited than those of larger companies, and they tend to be less diversified in their activities, which reduces their flexibility (Chowdhury, 2011). Simultaneously maintaining existing performance within their industry while being innovative and adaptive is therefore of crucial importance for the survival of SMEs. *Ambidexterity* is defined as simultaneously – and equally successfully – pursuing exploitative activities (that is, focused on the exploitation of current resources and their refinement, efficiency, implementation) and explorative activities (that is, focused on discovery, flexibility, innovation). While larger organizations can achieve this simultaneity by structural separation, it is challenging for SMEs, especially individuals in SMEs, to manage both exploration and exploitation successfully. This systematic literature review not only offers

a comprehensive overview of the literature on the concept, but also addresses problems such as what exploration and exploitation are, how they are related, and the antecedents and outcomes of individual ambidexterity based on which typology of individual ambidexterity is proposed and explained.

Given its relevance for firms, ambidexterity has gained attention in the organizational literature through recent decades, initially mainly at the organizational level. However, over the past decade, an increasing number of studies has observed that ambidexterity exists at multiple levels of analysis (Raisch, Birkinshaw, Probst, & Tushman, 2009). For example, Gibson and Birkinshaw (2004) discuss ambidexterity at the level of the individual, arguing that every employee could potentially contribute to the creation of value for an existing organization while reacting appropriately to changes in their environment. Various studies show that ambidexterity at the individual level not only benefits individual performance (Mom, Fourné, & Jansen, 2015), but also acts as an important source of organizational ambidexterity and can thus be considered an essential basis for organizational success (Birkinshaw & Gibson, 2005; Good & Michel, 2013). Moreover, it is suggested that individual ambidexterity helps companies reach the full potential of organizational ambidexterity (Schnellbacher, Heidenreich, & Wald, 2019). Even if an organization could evenly distribute its employees over either explorative or exploitative roles, to reach the full potential of organizational ambidexterity the results of exploration and exploitation must still be integrated with each other, which requires individual ambidexterity (Schnellbacher et al., 2019).

The need to foster ambidexterity at the individual level is more urgent in SMEs than in larger-sized organizations because SMEs – in contrast to larger companies – have neither the organizational structure nor the resources to separate explorative activities (for example, innovation, research, and development) from more routine tasks (for example, marketing and sales). Chang and Hughes (2012) reviewed the relevant literature and identified several differences between SMEs and larger companies. These differences seem to increase the challenges facing most SMEs in terms of managing tensions, contradictions, and trade-offs when pursuing ambidexterity, including their limited human and financial resources and managerial expertise, the absence or minimal presence of bureaucracy, and different operating conditions and characteristics. Such differences make it difficult for SMEs to achieve ambidexterity at the organization level by means of a structural separation of explorative and exploitative activities, or even to manage ambidexterity at multiple levels. Individual employees in SMEs are therefore more often required to oscillate between different tasks and roles (Carmeli & Halevi, 2009). In many small service firms, for instance, “a single employee delivers the service rather than a ‘team’ of employees” (Sok, Sok, Danaher, & Danaher, 2018, p. 374). Similarly, customer service representatives in small firms are often expected to cross-sell products in the process of delivering service (Jasmand, Blazevic, & de Ruyter,

2012). Due to SMEs' structural limitations, they most likely rely on individuals' initiative, which makes individual ambidexterity crucial to SMEs (Gasda & Fueglistaller, 2016). Moreover, SMEs' flat and informal structures, as well as their vertical knowledge flows, support the development of ambidextrous activities, especially at the individual level. Both Chang and Hughes (2012) and Gasda and Fueglistaller (2016) emphasize the importance of gaining a deeper understanding of ambidexterity at the individual level to help SMEs pursue ambidexterity.

The growing interest in ambidexterity and the importance of individual ambidexterity for SMEs make this field difficult to ignore. Although a literature review by Snehvrat, Kumar, Kumar, and Dutta (2018) suggests that individual ambidexterity has been explored since at least 2007 and that the number of studies focusing on this level of analysis has shown an impressive increase in the past three years, the field still suffers from imprecise and often ambiguous definitions (O'Reilly & Tushman, 2013; Simsek, Heavey, Veiga, & Souder, 2009). For instance, it is unclear whether exploration and exploitation necessarily occur simultaneously or whether employees rapidly switch between them. By analyzing the exploration-exploitation relationship, we propose a typology for four different types of individual ambidexterity relating to four different relationships between exploration and exploitation. Moreover, although studies have considered the antecedents and consequences (outcomes) of individual ambidexterity separately, so far there has been no comprehensive review, leaving an important gap in our understanding of individual ambidexterity. Therefore, we also provide a summary of the antecedents and outcomes for each type of ambidexterity in our typology, which will help form a more comprehensive network for understanding individual ambidexterity as well as what factors affect it and what outcomes it may lead to. The resulting conceptual ambiguity has also resulted in different operationalizations of the construct. For instance, Lee and Lee (2016) show that individual-level ambidexterity can be operationalized as the absolute difference between exploitation and exploration, or alternatively as the multiplicative interaction between them. The conceptual ambiguity has further led to a lack of consistency among the studies in the field. Practically, this lack of conceptual clarity has made it difficult to make recommendations on how to foster individual ambidexterity in a specific context such as SMEs. As scholars conceptualize the relationship between exploration and exploitation differently, their recommendations are subject to their own and others' different understandings.

In this study, we contribute to the field by developing a typology for four types of individual ambidexterity, based on a structured review of the extant literature on individual-level ambidexterity and investigation of the concept specifically in the context of SMEs. A systematic literature review allows us to assess the state of the art in the literature on this topic by using a multistage

review strategy (Pittaway, Robertson, Munir, Denyer, & Neely, 2004; Turner, Maylor, & Swart, 2015). Thus, with this literature review, we address the question: *How is individual ambidexterity conceptualized in the literature, and what does this conceptualization mean for the identification of the antecedents and consequences of individual ambidexterity in SMEs?*

First, we review the extant literature on individual ambidexterity and, second, we contribute to the gap in the research with regard to individual-level ambidexterity within the context of SMEs. This approach will help in the identification of the major problems of conceptualizing the phenomenon. We further categorize individual ambidexterity into four different types, each related to a specific organizational context. This categorization will help organizations, especially SMEs, support the development of the type of individual ambidexterity that is most appropriate for their context. Theoretically, reviewing the different definitions of individual ambidexterity in the literature will help us form a clearer and more comprehensive view of the field, and obtain a better understanding of how different conceptualizations have developed. When it becomes clear how individuals view the relationships between exploration and exploitation and why they respond to them differently, more tailor-made recommendations can be made for how organizations, especially SMEs, can help individual employees become more ambidextrous. Practically, a clearer understanding of what individual ambidexterity entails and how individuals comprehend the relationship between exploration and exploitation will facilitate companies, especially SMEs, in fostering ambidextrous behavior which will, in turn, help enhance their financial performance and long-term survival (Raisch et al., 2009).

In the following sections, we first provide an overview and discussion of the studies on the topic of individual ambidexterity on a range of subjects across various contexts, followed by a discussion of the methodology used in this structured literature review. We then review the literature in more detail. Based on that discussion, we analyze the existing definitions of individual ambidexterity, and the antecedents and outcomes of individual ambidexterity, as well as how they are connected to and affected by the context and characteristics of SMEs. We also propose a typology for the different types of individual ambidexterity based on the different relationships between individual exploration and exploitation, and provide a detailed explanation of each type with the definitions, contexts, antecedents, and outcomes of each type from the existing literature. We conclude with the theoretical and practical implications of this review and suggest avenues for future research.

Individual ambidexterity

Despite the fact that individual ambidexterity has been studied for only a decade, in the past three years the number of studies focusing on this

level of analysis has increased markedly (see, for example, Gasda & Fueglistaller, 2016; Good & Michel, 2013). To date, researchers have studied individual ambidexterity from different perspectives, targeting different individuals (for example, managers and nonmanagerial employees) while studying it across different contexts (for example, larger organizations and SMEs). This wide variety of perspectives and contexts may have contributed to the conceptual ambiguity surrounding individual ambidexterity. We review the literature on the ambidexterity of managerial and nonmanagerial employees as well as the literature on individual ambidexterity.

Studying the characteristics of ambidextrous managers, Mom, Van Den Bosch, and Volberda (2009) suggest that *individual ambidexterity* can be viewed as a combination of individual exploration (“searching for, discovering, creating, and experimenting with new opportunities”) and *individual exploitation* (“selecting, implementing, improving and refining existing certainties”) (Mom, Van Den Bosch, & Volberda, 2007, p. 910). They also note that “the essence of managers’ exploration activities is creating variety in experience” and “the essence of managers’ exploitation activities is creating reliability in experience” (Mom et al., 2007, pp. 912–913). This observation is supported by Laureiro-Martínez, Brusoni, and Zollo (2010), who define *exploration* as behavior that includes searching for alternatives and disengagement from the current task and *exploitation* as behavior that helps to optimize task performance. In a similar vein, Rogan and Mors (2014) reviewed the previous literature and categorized the ambidextrous behavior of senior managers into four main areas of behavior including the “allocation of resources between new and existing businesses, selective cross-fertilization of knowledge between the new and existing businesses, resource mobilization and opportunity identification as associated with exploitation and exploration, respectively” (p. 1861). Although Rogan and Mors (2014) do not provide a specific definition of individual ambidexterity for senior managers, they provide four specific circumstances or contexts where individuals are confronted with the choice of whether to adopt ambidextrous behaviors. Both studies take into account the content of the ambidextrous behavior of managers and, instead of considering ambidexterity simply in terms of activity, they focus on investigating its content (Turner, Swart, & Maylor, 2013).

Rather than investigating managers’ individual ambidexterity, another group of researchers focuses on the nonmanagerial level. In a study by Rosing and Zacher (2017), *exploration at the individual level* is defined as “behaviors related to experimentation, searching for alternative ways to accomplish a task, and learning from errors” and *individual exploitation* as “relying on previous experience, putting things into action, and incrementally improving well-learned actions” (Rosing & Zacher, 2017, p. 695–696), which is similar to Mom et al.’s (2007) interpretation. Inspired by March (1991) and studies on organizational learning, Holmqvist and Spicer (2012)

describe the “ambidextrous employee” as someone who is no longer bound by traditional organizational restrictive controls. In ambidextrous employees, self-exploration and self-exploitation, which refer to the employees’ abilities “to use their alleged independence to express their resourcefulness as well as to submit themselves to continuous self-scrutiny and audit in the name of accountability” (Costea, Crump, & Amiridis, 2007, p. 253), are encouraged, as is maintaining a balance between the two activities. In a study examining the ambidextrous behaviors of customer service representatives in a call center, Jasmand et al. (2012) describe the duties of these individuals as providing high-quality and low-cost customer service while generating revenues by engaging in cross- and up-selling. Regarding the specific content of exploration and exploitation, Löwik, Rietberg, and Visser (2016) suggest that exploratory activities entail searching for new market opportunities and product development that require developing new knowledge and skills, whereas exploitative activities concern routine-like processes, such as serving existing customers and achieving short-term goals, which are executed based on experience and current knowledge.

As individuals are confronted with the choice of being ambidextrous under certain circumstances, contextual factors are important when investigating the concept of individual ambidexterity (Rogan & Mors, 2014). Regarding the contexts in which researchers have conducted studies on individual ambidexterity, several industries have been explored, including the service industry, academic institutions, and the manufacturing industry. Individual ambidexterity in the service industry is commonly referred to as *service-sales ambidexterity*, and the most common definition is the achievement of both service quality and revenue generation (Gabler, Ogilvie, Rapp, & Bachrach, 2017), or the improvement of productivity while flexibly catering to customer needs (Yu, Gudergan, & Chen, 2018). Studies investigating individual ambidexterity in academic institutions mainly focus on the knowledge perspective. For example, Benavides and Ynalvez (2018) define the *ambidextrous behavior* of professors as the ability to successfully manage conflicts of interests among various sectors such as academia, industry, and government. Similarly, Kaiser, Kongsted, Laursen, and Ejsing (2018) refer to *ambidextrous scientists* as individuals with both academic and industry-specific experience. Some studies (for example, Chang, Yang, Martin, Chi, & Tsai-Lin, 2016) suggest that individual ambidexterity in academic institutions includes academic excellence (for example, publications) and commercialization, which essentially refers to pursuing interests in both academic and industry sectors. Another prevalent context that attracts the attention of researchers is the manufacturing industry. Although Sok and O’Cass (2015) suggest that the two incompatible elements of individual ambidexterity in manufacturing firms are creativity and attention to detail, other studies (for example, Ajayi, Odusanya, & Morton, 2017) refer only to exploration and exploitation in general.

Despite the subjects and contexts of individual ambidexterity identified in the studies discussed above, researchers (for example, Bledow, Frese, Anderson, Erez, & Farr, 2009; Holmqvist & Spicer, 2012) do seem to agree on the idea that individual ambidexterity is a self-regulated activity that combines individual exploration and exploitation. Through self-management, ambidextrous individuals regulate, monitor, and control their own behavior to cope with the tensions and contradictory demands that arise from managing both exploration and exploitation (Holmqvist & Spicer, 2012). However, what individual exploration and exploitation entail differs across industries and positions within organizations. In general, despite these differences, *individual exploration* entails new or alternative knowledge and skills, while *individual exploitation* entails existing experience and present knowledge that help optimize existing job tasks.

Methodology

A systematic literature review allows us to assess the state of the art in the literature on a given topic using a multistage review strategy (Pittaway et al., 2004). In this review, we followed the suggestions of Armstrong, Waters, and Jackson (2007) to first identify the scope of this literature review by identifying the research gaps and forming a clear research question. A comprehensive search for literature was then performed to find all relevant studies using explicit inclusion/exclusion criteria. After collecting and studying all the studies, relevant information was extracted from them to generate the findings of this study.

The scope of the review is demarcated by the focus of this study on the conceptualization of individual ambidexterity and how the concept can be best understood in the context of SMEs. To meet the requirement of developing clear and precise aims and objectives, the scope of this literature review is defined as follows: (a) only studies focusing on ambidexterity (or both exploration and exploitation or equivalent) at the individual level are included (individual ambidexterity including multilevel studies); (b) Studies published since 2007 are included. Although Birkinshaw and Gibson (2005) suggest adopting contextual ambidexterity to foster ambidextrous individuals and highlight the importance of ambidextrous individuals, to our knowledge no study focused solely on ambidexterity at the individual level until Mom et al. (2007). Reviews such as the one by Snehvrat et al. (2018) have also chosen Mom et al. (2007) as the starting point of the study of individual ambidexterity, which is viewed as seminal on the topic of individual ambidexterity (cited by 480 studies). Mom et al.'s definition and operationalization of individual ambidexterity are widely used (for example, Tempelaar & Rosenkranz, 2019; Zacher, Robinson, & Rosing, 2016, p. 3) We reviewed studies from all journals that are accessible instead of focusing only on journals with high impact factors to eliminate publication bias (which refers to excluding literature from sources such as book chapters or conference

abstracts) and reviewer selection bias (Ahmed, Sutton, & Riley, 2012, p. 4) The focus of this literature review was on theoretical issues or, more precisely, issues concerning the conceptualization of individual ambidexterity, specifically in SMEs.

After identifying the scope of the review, we continued to search the literature for studies that focused on individual ambidexterity. In our preliminary search for literature in April 2019, we used the search term “individual ambidexterity” in the Web of Science database and on Google Scholar. A total of 136 and 279 studies, respectively, were returned from both searches, and 148 studies remained after we eliminated the duplicated results returned from both databases. Thereafter, by manually reviewing the abstract, theory, and methodology, we selected the studies that contained “individual ambidexterity,” “individual exploration and exploitation,” or any two paradoxical elements on the individual level that could be seen as individual ambidexterity. We followed the suggestions of Junni, Sarala, Tarba, Liu, and Cooper (2015) for more specific requirements for studies to be included. Quantitative studies were required to have ambidexterity (or exploration and exploitation combined) as a variable, while qualitative studies were required to have an explicit discussion of ambidexterity. Additionally, for a conceptual paper to be included in the review, it also was required to contain an explicit discussion of ambidexterity. Some papers were eliminated during this process such as quantitative studies that did not include ambidexterity (or the equivalent of the combination of exploration and exploitation) as a variable, qualitative or conceptual work without a clear definition or explicit discussion of ambidexterity, executive summaries of a special issue, or publications that adopted other uses of “ambidexterity” outside the field of management. The number of studies included after this elimination process was 65.

After the preliminary examination of the included studies, we found that “service-sales ambidexterity” (or “sales-service ambidexterity”) is another term widely used to refer to the ambidexterity shown by salespersons or service employees (for example, Jasmand et al., 2012; Yu, Patterson, & de Ruyter, 2013). In these studies, salespeople are required to perform service activities while they generate sales, and vice versa. For a salesperson, selling existing products can be seen as *exploitation*, while providing service requires the employee to inquire into the (potential) needs of the customer, which can be considered an *exploration* of new opportunities. To be more inclusive, we performed a second search following the same procedure but with the search term “service-sales ambidexterity,” which returned 84 studies from Google Scholar and 7 from the Web of Science. After eliminating the duplicate literature that had already been included in the first search and following the same inclusion/exclusion criteria, the final collection of papers included in this review contained 69 studies.

Of the 69 studies in our review, 6 were conceptual or theoretical papers and 63 were empirical studies. Of the 63 empirical studies, 13 were qualitative (based on case studies and/or interviews), 48 were quantitative (used survey data and subsequent statistical analysis), and 2 studies used both qualitative and quantitative approaches. To examine the overall research interest in individual-level ambidexterity in recent years, we mapped the number of studies per year. Figure 1 shows the number of studies included in this literature review from 2007 to early 2019, where there is a spike in the number of publications in 2015. The number of quantitative and qualitative studies and the numbers of empirical and conceptual studies each year are also presented in Figure 1.

To clarify the conceptualization of individual ambidexterity in SMEs, we discuss the literature about the definition itself as well as the literature about its antecedents and consequences. By including the definitions, antecedents, and outcomes of individual ambidexterity in SMEs in the process of conceptualization, we can gain a more holistic and comprehensive understanding of the concept, which will help researchers as well as practitioners to better understand the concept and the phenomenon and help improve the implementation of individual ambidexterity in organizations.

On reviewing the main viewpoints regarding individual ambidexterity in the studies included in this literature review, we noticed several inconsistencies regarding the concept. First, the relationship between these two fundamental elements of individual ambidexterity greatly affects the conceptualization. Regarding the relationship between individual exploration and individual exploitation, most studies have focused on either one or two of the four

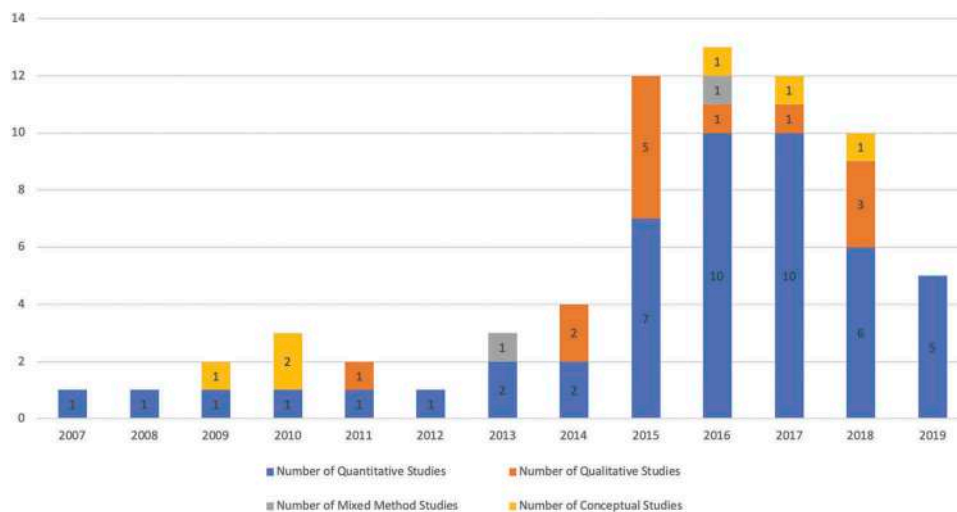


Figure 1. Number of studies in the sample per year.

Table 1. The exploration-exploitation relationship in the literature.

Viewpoint regarding exploration-exploitation relationship	Studies
Simultaneity	Agnihotri et al. (2017); Bouzari and Karatepe (2017); Caniëls, Neghina, and Schaetsaert (2017); Snell et al. (2015); Turner et al. (2015); Hodgkinson et al. (2014); Yu, Patterson, and Ruyter (2010)
Switching between tasks	Lee and Meyer-Doyle (2017); Lee and Lee (2016); Löwik et al. (2016); Burgess, Strauss, Currie, and Wood (2015); Keller and Weibler (2014);
Balanced dimension	Dubard Barbosa, Dantas, and Cajaiba-Santana (2019); Rapp et al. (2017); Tempelaar and Rosenkranz (2019)
Combined dimension	Rosing and Zacher (2017); Johansson (2015); Mom et al. (2007); Mom et al. (2009)
Simultaneous-balance	Salas Vallina, Moreno-Luzon, and Ferrer-Franco (2019); Alghamdi (2018); Benavides and Ynalvez (2018); Ajayi et al. (2017); Gabler et al. (2017); Chang et al. (2016); Gasda and Fueglistaller (2016); Torres, Drago, and Aqueveque (2015); Vidgen, Allen, and Finnegan (2011);
Simultaneous-combined	Caniëls and Veld (2016); Sok and O’Cass (2015)
Sequential-balance	Agnihotri et al. (2017); Hong, Yu, and Hyun (2018); Sok et al. (2018); de Villiers Scheepers, Boshoff, and Oostenbrink (2017); Kobarg, Wollersheim, Welpel, and Sporrle (2017); Swart et al. (2016); Keller and Weibler (2015); Good and Michel (2013); Simon and Tellier (2011); Laureiro-Martínez et al. (2010)
Sequential-combined	Schnellbacher et al. (2019); Kauppila and Tempelaar (2016); Li, Lin, and Tien (2016); Mom et al. (2015); Snell et al. (2015)
Evolving over time or depending on the perspective	Agnihotri et al. (2017); Awojide et al. (2018); Havermans et al. (2015); Bledow et al. (2009) (sequential)

aspects; namely, simultaneous pursuit, rapidly switching between tasks, the balance dimension, and the combined dimension (see Table 1).

Second, the studies suggest that personal characteristics (for example, prior work experience) and contextual factors inside and outside of organizations (for example, different industries) may affect individual ambidexterity. Investigating the antecedents of individual ambidexterity, both personal and contextual, is thus crucial to the conceptualization.

Third, most studies that have considered the outcomes of individual ambidexterity focused only on positive outcomes such as the increased performance outcomes of individuals. However, negative outcomes such as cognitive strain and burnout also exist. Learning how these negative outcomes are linked to individual ambidexterity can help scholars more holistically understand the concept and help organizations, especially SMEs, develop measures to mitigate the production of negative outcomes. In the following sections, we introduce the three inconsistencies in more detail and consider the context of SMEs.

Individual ambidexterity: Simultaneous or switching? Combined or finding balance?

Despite the different tasks of individual exploration and exploitation, researchers seem to agree that exploration and exploitation somehow coexist in individual ambidexterity. The literature on individual ambidexterity shows that, regarding the relationship between exploration and exploitation, the typology by Simsek et al. (2009) may be transferrable to the individual level. Simsek et al.'s (2009) typology of the relationships between exploration and exploitation at the organizational level integrates the temporal and structural dimensions of organizational ambidexterity. Translating this to individual ambidexterity, the temporal dimension reflects one of the unresolved debates surrounding the conceptualization of individual ambidexterity: whether it is the simultaneous pursuit of both orientations, or rapidly switching between them. Even though the structural dimension cannot be directly used at the individual level, individuals do manage explorative and exploitative activities in different ways. More recently, following Cao, Gedajlovic, and Zhang (2009), several studies (for example, Lee & Lee, 2016) consider two other relationships between exploration and exploitation; namely, the *combined dimension*, defined as the combined extent to which subjects engage in exploratory and exploitative activities (Cao et al., 2009), and the *balance dimension*, referring to “a close relative balance between exploratory and exploitative activities” (Cao et al., 2009, p. 781). After reviewing the literature on individual ambidexterity, we found that most studies have adopted one or two of the four views regarding the relationship between exploration and exploitation (see Table 1). Despite the number of different views from literature, fundamentally there are four major relationships between exploration and exploitation that represent two dimensions that coexist (the time and the balance dimensions, which will be examined in more detail in the discussion).

One group of studies emphasizes *simultaneity*; that is, the simultaneous pursuit of exploration and exploitation at the individual level. For example, *individual research ambidexterity* is defined as “the ability to which academic scientists can simultaneously achieve research publication and research commercialization at the individual level” (Chang et al., 2016, p. 9) in the investigation of individual research ambidexterity in entrepreneurial universities. In another example, *growth-quality of work life ambidexterity* refers to “the pursuit of both financial outcomes in the form of growth and non-financial outcomes in the form of quality of work life simultaneously” (Snell et al., p. 530). Within this group of definitions, studies discuss the relationship between elements such as service and sales objectives (for example, Yu et al., 2013), alignment and adaptability (Hodgkinson, Ravishankar, & Aitken-Fischer, 2014), and attention to detail and creativity (Sok & O’Cass, 2015). Some studies refer only to elements such as exploitation and exploration (for example, Swart, Turner, van Rossenberg, & Kinnie, 2016), or

conflicting tasks and goals (Agnihotri, Gabler, Itani, Jaramillo, & Krush, 2017). It is not difficult to recognize that what exploration and exploitation entail in the aforementioned studies tends to be rather general and to fit into rather broad categories. It remains unclear whether individuals necessarily undertake conflicting tasks that usually require different knowledge and mind-sets *at the same time*.

Conversely, critics of the rapid switching approach argue that individual ambidexterity entails switching (or shifting) between individual exploration and individual exploitation (Good & Michel, 2013; Johansson, 2015; Kauppila & Tempelaar, 2016; Schultz, Schreyoegg, & von Reitzenstein, 2013; Sok, Sok, & De Luca, 2016). Bledow et al. (2009) describe *individual ambidexterity* as “the capability of individuals to perform contradictory activities and switch between different mind-sets and action sets (e.g., switching from unconstrained creativity to scrutinizing the usefulness of ideas)” (p. 322). The definition of *individual ambidexterity* in Good and Michel (2013), which is “the individual-level cognitive ability to flexibly adapt within a dynamic context by appropriately shifting between exploration and exploitation” (p. 437), points out that the individual’s cognitive flexibility matters when behaving ambidextrously. Kauppila and Tempelaar (2016) propose that “rather than being a psychological trait, ambidexterity is an individual’s behavioral capacity to engage in and alternate between opposing task elements” (p. 1022). Studies adopting the switching perspective tend to view exploration and exploitation as opposing or contradictory elements, while the pursuit of ambidexterity requires alternating between the two opposing elements. However, studies also show that the interrelationship between exploration and exploitation implies that the two elements/activities can both be maintained at high levels despite the need to balance them (Lubatkin, Simsek, Ling, & Veiga, 2006). Similarly, there is a complementarity view, maintained by researchers such as Farjoun (2010), proposing that “rather than opposing one another, elements of exploitation and exploration potentially enable each other” (p. 217).

Thus, instead of focusing on simultaneity or switching between exploration and exploitation, another group of studies has added the aspect of balance to the conceptualization of individual ambidexterity. On investigating entrepreneurs’ ambidextrous behavioral patterns, Volery, Mueller, and von Siemens (2015) define *ambidexterity at the individual level* as “the ability to pursue both exploration and exploitation with equal dexterity” (p. 113), which reflects another balance dimension. Both Ajayi et al. (2017) and Rosing and Zacher (2017) propose defining *individual ambidexterity* as “an individual’s balanced pursuit of exploitative and explorative activities” (Ajayi et al., 2017, p. 664). The latter authors also specified that “the balance of exploration and exploitation is exploration and exploitation being essentially the same, independent of their absolute values (i.e., high or low)” (Rosing & Zacher, 2017, p. 696). However, according to Rosing and Zacher (2017),

a balance between exploration and exploitation as well as a high level of both exploration and exploitation are necessary for optimal performance.

Another perspective that is often adopted by researchers when defining individual ambidexterity is the combined dimension. One of the most cited definitions across the literature is the one by Mom et al. (2015), who define *managerial-level ambidexterity* as “a manager’s behavioral orientation toward combining exploration and exploitation-related activities within a certain period of time.” From a knowledge-based view, Keller and Weibler (2015) consider ambidexterity as “combining new knowledge with existing knowledge equally at the individual level of analysis” (Keller & Weibler, 2015, p. 56), which coincides with the findings of Cao et al. (2009), who suggest that ambidexterity is fostered by close interrelations between existing and new knowledge.

Despite the four types of relationship discussed in the literature, there are some exceptions such as Zimmermann, Raisch, and Cardinal (2018), who state that the tension between exploration and exploitation is less stable and uniform than suggested by the previous literature. This evolving and dynamic tension presents individuals with substantial challenges that require them to be flexible and agile when managing that tension. Similarly, focusing more on the individual actors, Havermans, Den Hartog, Keegan, and Uhl-Bien (2015) suggest that individuals should use their own judgment when managing ambidexterity, meaning that they must adapt their levels of exploration and exploitation according to the dynamics of the environment while maintaining both at high levels. Although favoring the sequential approach Bledow et al. (2009) agree that, as the dynamics of markets change over time, the relative importance of exploration and exploitation changes accordingly.

The identified disagreements stem from how the relationships between exploitation and exploration are interpreted, as either conflicting with or complementary to each other. Studies that favor the simultaneous and combined dimension consider exploration and exploitation to be complementary. In studies where exploration and exploitation are considered to generate internal competition for resources, tensions, and trade-offs, the authors argue that individuals cannot simultaneously explore and exploit at a single point in time; one must allocate time and resources between the two and maintain a balance between them. This view is in line with Awojide, Hodgkinson, and Ravishankar’s (2018) notion regarding the differences between a structural and behavioral approach to ambidexterity. According to Awojide et al. (2018), a structural approach to managing exploration and exploitation considers the two to compete for the same resources and that individual ambidexterity is about managing the trade-offs and finding the appropriate degree of emphasis between the two. The behavioral approach, however, emphasizes the complementary effects of pursuing exploration and exploitation and that it is necessary for individuals to pursue both on a daily basis.

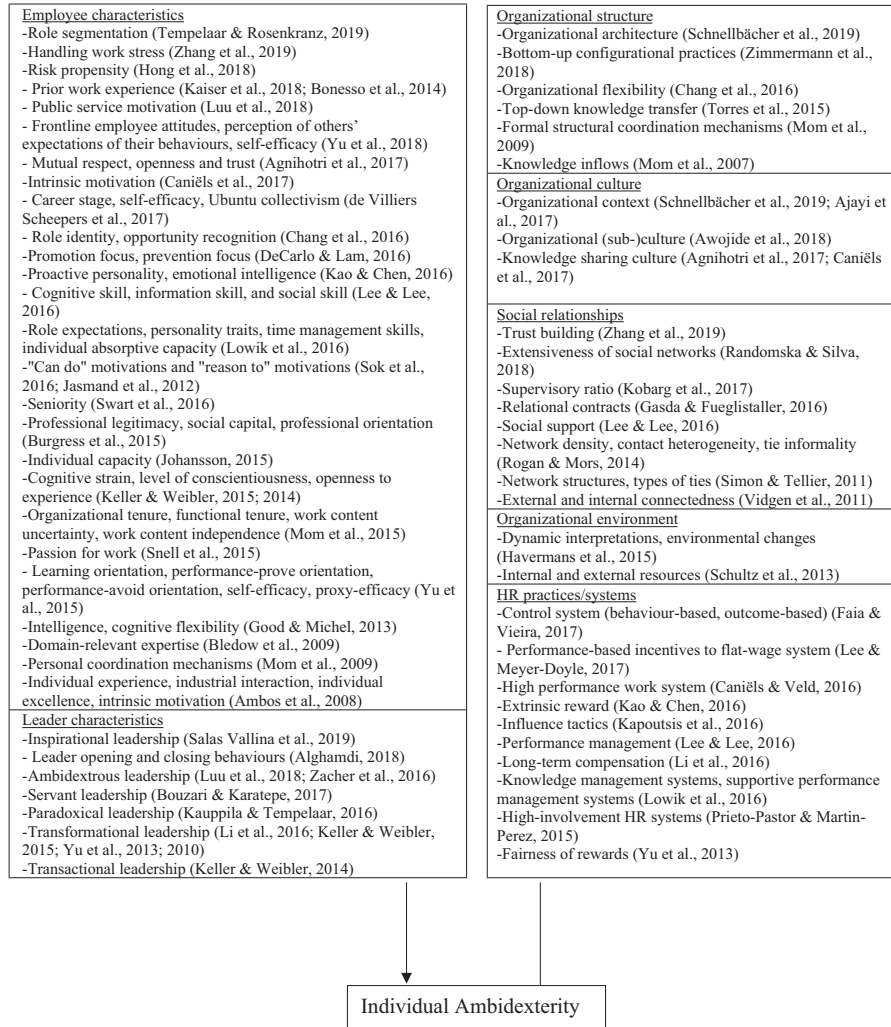
According to Turner et al. (2013), Farjoun's (2010) duality theory, which states that "stability and change ... can be considered as a duality" (Turner et al., 2013, p. 186), applies to the exploitation (stability) and exploration (change) relationship. It allows an enhanced understanding of ambidexterity at the individual level, which is of great relevance to the context of SMEs. Investigating the mutually enhancing effects of individual exploration and individual exploitation may aid SMEs in their development of ambidexterity at the individual level. Other researchers, such as Cao et al. (2009), who focus on SMEs, found that companies of relatively smaller sizes suffer from limited resources, and the balance dimension of ambidexterity is more suitable considering their unique characteristics. In contrast, it is more beneficial for companies of larger size, such as international firms, to adopt the combined dimension of ambidexterity. According to Patterson and Kerrin (2014), unlike larger companies, SMEs – due to their resource constraints – should focus on managing trade-offs between exploration and exploitation.

Despite the apparently contradictory propositions by Farjoun (2010) and Cao et al. (2009), we suggest that the two views can be reconciled. As Good and Michel (2013) mention, whether they do so in a simultaneous or rapidly sequential way, individuals must respond to the changing requirements by switching between different tasks and mind-sets. Moreover, under conditions of time pressure and resource scarcity, individuals make their own judgments about how to divide their time and resources between the conflicting demands of exploitation and exploration. Following the propositions of Papachroni, Heracleous, and Paroutis (2016), we argue that the relationship between exploration and exploitation (complementary, conflicting, or interrelated) results from different perceptions of different individuals, who can then make their own judgments as to how to best spend their time and implement specific management approaches (integration, temporal balancing, or separation).

Antecedents of individual ambidexterity

The antecedents of individual ambidexterity (De Ruyter, Patterson, & Yu, 2014) – for example, individual drivers such as locomotion and assessment (Jasmand et al., 2012), and contextual drivers such as empowerment, team support, and transformational leadership (Yu et al., 2013) – have been discussed only recently. Both types of drivers contribute to service-sales ambidexterity. In a similar vein, Raisch et al. (2009) state that organizational mechanisms and individual ambidexterity (ambidextrous individuals) are complementary to each other when they enable ambidexterity. By understanding both personal characteristics and (internal and external) contextual factors, we can more comprehensively conceptualize individual ambidexterity, as Hempel (1952) proposes that an empirical analysis can be used to define a concept by listing its necessary and sufficient conditions.

Table 2. Antecedents of individual ambidexterity from literature in 2007 to early 2019.



Considering the importance of antecedents, we further reviewed the antecedents of individual ambidexterity as discussed in the literature. Based on Junni et al.'s (2015) model of human resources (HR) and organizational antecedents of ambidexterity, we categorized the antecedents of individual ambidexterity in the literature from 2007 to early 2019, as shown in Table 2. The review conducted by Junni et al. (2015) offers an extensive framework of studies that investigated the HR and organizational antecedents of ambidexterity until 2014. As a considerable number of studies have appeared since then, we added to the existing framework by reviewing the literature from

2007 to early 2019. Table 2 presents 56 studies. Some of the studies were excluded from Table 2 because they investigated outcomes of individual ambidexterity rather than its antecedents (for example, Gabler et al., 2017; Rosing & Zacher, 2017), or because they investigated the antecedents of ambidexterity at levels of analysis other than the individual level (for example, Hodgkinson et al., 2014).

To date, researchers have proposed various personal characteristics to be related to the development of individual ambidexterity, including a locomotion orientation (Jasmand et al., 2012), networks (Rogan & Mors, 2014), individual competence (Johansson, 2015), cognitive strain (Keller & Weibler, 2015), employees' learning orientation (Yu, Patterson, & de Ruyter, 2015), self-belief and passion (Snell, Sok, & Danaher, 2015), intrinsic motivation (Kao & Chen, 2016), and perceived role expectations (Löwik et al., 2016). These authors observed that some individuals seem to be able to take on contradictory tasks while others fail to do so, and that exploring individuals' personal competences is the key to explaining this phenomenon. For instance, according to Snell et al. (2015), individuals' strong self-belief and passion for successfully performing their jobs can enhance their ability to work ambidextrously. Yu et al. (2015) note that employees' learning orientation has a positive influence on service-sales ambidexterity in such a way that it enables individual employees to utilize new knowledge and combine it with their existing knowledge to improve their abilities in performing conflicting tasks.

In addition to personal competences, internal and external contextual factors play a role in forming and aiding individual ambidexterity. For example, organizational mechanisms are sometimes required to enable ambidexterity at the individual level (Volery et al., 2015). Similarly, organizational and environmental antecedents can influence the development of the balance dimension of ambidexterity (Chang, Hughes, & Hotho, 2011), which is of great relevance to SMEs, as suggested above. Regarding the internal organizational factors, Gibson and Birkinshaw (2004) were first to propose that ambidexterity can be better developed through an appropriate organizational context, which comprises the four characteristics of stretch, discipline, support, and trust. In a later study, Mom et al. (2009) confirmed the positive relationships among connectedness, cross-functional interfaces, decision-making autonomy, and managerial ambidexterity. On investigating individual research ambidexterity in entrepreneurial universities, Chang et al. (2016) found organizational flexibility to be critical to the ambidexterity of department leaders, which entails both academic and commercialization activities. Some studies, for example, Jansen, Van den Bosch, and Volberda (2006), reveal that external environmental conditions, such as competition and rapidly evolving technology, also play a role in affecting ambidexterity: intertwined dynamic and competitive environments can encourage the pursuit of ambidexterity and make the process more effective. It can be concluded from the aforementioned studies

that contextual factors influence individual ambidexterity as much as personal characteristics and must be taken into consideration when investigating the antecedents of individual ambidexterity.

Furthermore, various studies show that personal characteristics and contextual factors are interrelated in affecting individual ambidexterity following Raisch et al.'s (2009) proposition that ambidexterity is likely to be a function of closely interrelated individual and organizational effects. Other studies, for example, Ajayi et al. (2017), show that mutual respect, openness, and trust among employees contribute to the fostering of a knowledge-sharing culture that positively affects individual ambidexterity. Yu et al. (2013) show that individual perceptions of specific organizational antecedents play an important role in affecting ambidexterity at the individual level, and also confirm that service-sales ambidexterity is positively related to perceptions of empowerment and team support, which reinforces the idea that both organizational context and individual differences in perception should be considered when managing an ambidextrous strategy. This is in line with our previous statement that we should take into consideration individual perceptions when conceptualizing individual ambidexterity.

Considering the unique context of SMEs, individual employees in SMEs are influenced by different mechanisms than are employees in larger organizations. Referring to the categories in Table 2, we discuss the differences between SMEs and larger companies in their structures, culture, external environment, social relationships, and HR practices/systems. Structurally, SMEs have flat hierarchies, organic structures, and less formalization (Hafkesbrink, Bachem, & Kulenovic, 2012). Individuals are more closely and horizontally connected in an informal manner in that organizational structure, and they are generally given more decision-making autonomy. SME culture can be described as less diverse, more flexible, and more industry specific, which helps these enterprises to maintain flexibility in volatile and competitive environments (Hafkesbrink et al., 2012). This flexibility in the organizational context is of crucial importance for individuals because they must flexibly adapt to the demands of exploration and exploitation when pursuing ambidexterity, which makes SMEs the ideal context for ambidextrous individuals. The external environment facing most SMEs entails uncertainty and competition, which pose extra challenges for SMEs that lack resources (Prajogo & McDermott, 2014). To meet the changing demands from the external environment and stand out from their competitors, firms often strive to offer innovative products or services. Moreover, SMEs may implement certain cost-control strategies (for example, economize on staff) to at least maintain performance outcome levels (Chang & Hughes, 2012). Regarding the social relationships in SMEs, *connectedness* is the most researched antecedent. It refers to the extent to which individuals work together through direct contact (for example, informal conversations) within the firm (Chang & Hughes, 2012; Prajogo &

McDermott, 2014). This work is enabled by the unique structure of SMEs and is sometimes discussed in the literature under the category of organizational structure (for example, Chang & Hughes, 2012; Prajogo & McDermott, 2014). Various HR practices and systems can be used to stimulate individual ambidexterity, as suggested in the literature (for example, Caniels & Veld, 2016; Prieto-Pastor & Martin-Perez, 2015). Common practices or systems include high-involvement HR systems and high-performance HR systems as well as modes of compensation and the use of incentives.

Due to the unique characteristics of SMEs, employees are often confronted with the requirement that they take on tasks outside of their existing job roles. As discussed above, ambidextrous individuals are able to cope with the tensions of managing both exploration and exploitation through self-management (Holmqvist & Spicer, 2012). They interpret those tasks and make choices based on their own knowledge and intuitions, largely due to the lack of organizational structures and measures for managing individual ambidexterity. They also have enough leeway to independently divide their time between explorative and exploitative activities. Thus, it is highly likely that individual ambidexterity is a self-regulated activity in SMEs, and that the decision-making process of individuals is deeply influenced by both personal and organizational characteristics.

Outcomes of individual ambidexterity

Investigating the outcomes of individual ambidexterity has always been prevalent in the literature. Of particular interest has been the relationship between individual ambidexterity and the performance outcomes of individual employees as well as more distant outcomes such as organizational performance. It is increasingly being argued that the excessive pursuit of individual ambidexterity is also likely to lead to negative outcomes, one of the foremost being work intensification (Geary & Trif, 2011). However, few studies have examined the negative outcomes related to the implementation of individual ambidexterity such as stress, cognitive strain, and burnout (for example, Keller & Weibler, 2015). By including the outcomes of individual ambidexterity in the conceptualization process, the concept becomes more complete and more comprehensive, which will help researchers as well as practitioners to better understand the concept and the phenomenon, thus facilitating the implementation of individual ambidexterity in organizations.

Studies have examined the relationship between individual ambidexterity and employee performance as well as more distal outcomes such as organizational performance outcomes. Rosing and Zacher (2017) found that individuals show better performance outcomes when they engage in high levels of exploration and exploitation, and when exploration and exploitation are at approximately the same level (for example, in a small service company,

a salesperson generates sales while providing an adequate amount of customer service). A more comprehensive framework regarding the antecedents, outcomes, and moderators of ambidextrous behaviors among frontline employees (Kao & Chen, 2016) shows that intrinsic motivation is positively related to individual ambidexterity, which in turn improves service performance. A positive relationship between individual ambidexterity and performance effects across different organizational levels is also shown by Schnellbacher et al. (2019), confirming that fostering ambidexterity at the individual level can indeed improve organizational performance outcomes.

To achieve individual ambidexterity, employees must conduct both exploitative and exploratory tasks. Organizations often provide resources such as ability-enhancing training programs, motivation-enhancing incentives, and opportunity-enhancing decision-making autonomy (Mom, Chang, Cholakova, & Jansen, 2018) to stimulate individual employees' ambidexterity. There is little doubt that ambidexterity-enhancing resources lead to better performance outcomes. However, with limited time and energy, employees can be overly "stretched" or even "strained" as a result of managing contradictory tasks (Gibson & Birkinshaw, 2004). Keller and Weibler (2015) found empirical evidence that a manager's level of ambidexterity is (to a certain extent) positively related to cognitive strain. Taking a behavioral ambidexterity approach, Hunter, Cushenbery, and Jayne (2017) suggest that asking individuals to simultaneously juggle exploration and exploitation is stressful for them because of the conflicting roles it demands. However, certain personal competences could mitigate the negative outcomes of individual ambidexterity. For instance, an individual with a better ability to handle work stress would encounter less stress resulting from pursuing individual ambidexterity (Zhang, Wei, & van Horne, 2019).

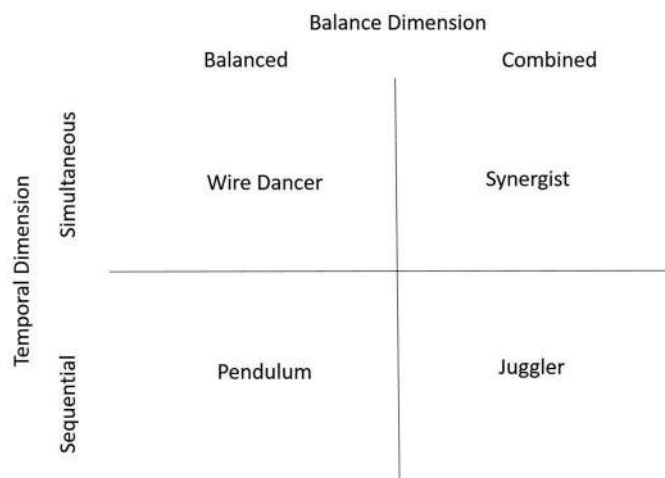


Figure 2. A proposed typology of individual ambidexterity.

Discussion

Although the research on individual ambidexterity has become more prevalent over the past decade, no unifying conceptualization of the term *individual ambidexterity* has been discussed systematically. One of the main reasons for the lack of a unifying conceptualization is the relationship between the two fundamental elements of individual ambidexterity: exploration and exploitation. To date, researchers have suggested four major possibilities; namely, the simultaneous pursuit of both orientations, rapidly switching between these two activities, the balance dimension, and the combined dimension. These perspectives essentially exist because the simultaneity and combined perspectives view exploration and exploitation as mutually enhancing and complementary to each other, while the switching and balance perspectives identify them as conflicting, which would result in trade-offs (Cao et al., 2009; Simsek et al., 2009). Studies so far have typically focused on one or two of the possibilities; however, there is no integrative framework that considers the full complexity of the relationships between exploration and exploitation. To map out the types of individual ambidexterity resulting from these relationships, we propose a two-by-two typology (Figure 2) to depict the types of individual ambidexterity by referring to Simsek et al.'s (2009) typology of organizational ambidexterity.

In constructing our typology, we first identified two dimensions of individual ambidexterity with regard to the four relationships between individual exploration and exploitation that we discovered in the recent literature. We used the first dimension, “temporal dimension,” from Simsek et al. (2009), as it contains the same element, simultaneous and sequential, and it applies to both the organizational and individual levels. As discussed above, *simultaneous* refers to the pursuit of both exploration and exploitation at the same time, and *sequential* refers to switching or shifting from exploration to exploitation, or the other way around. The second dimension distinguishes between the balance dimension and the combined dimension, as suggested by Cao et al. (2009). *Balance* refers to maintaining a balance between exploration and exploitation, and *combined* refers to the combined magnitude of exploration and exploitation.

Our typology includes four types of individual ambidexterity based on the two dimensions described above; namely, simultaneous-balanced, simultaneous-combined, sequential-balanced, and sequential-combined individual ambidexterity. We believe that different theoretical groundings, antecedents, and outcomes for each type of organizational ambidexterity identified in the study of Simsek et al. (2009) can be applied at the individual level. For instance, Ajayi et al. (2017) state that employees' simultaneous pursuit of both explorative and exploitative activities is hindered by the rigid flow of resources, rules, and regulations, which means they must find a balance when

Table 3. An explanation of four types of individual ambidexterity.

Type of individual ambidexterity	Example definition from literature	Context	Antecedents (might interact with each other)	Outcomes
Wire dancer (simultaneous-balance)	To be ambidextrous, workers should be able to be explorative and exploitative simultaneously in equal amounts (Alghamdi, 2018). When simultaneously achieving research publication and research commercialization at the individual level, (individuals) are encouraged to make their own judgments about how to sustain an optimal balance of academic works (Chang et al., 2016). Individual ambidexterity is the behavioral orientation of employees toward combining exploitation and exploration related activities ... simultaneously (Cantiels et al., 2017). The extent that new product innovation's effect on performance can be enhanced when the individual engages in high levels of creativity and attention-to-detail simultaneously within the form of combined individual ambidexterity (Sok & O'Cass, 2015).	Knowledge-intensive context, small and medium enterprises (resource-constrained organizations with fewer regulations)	Inspirational leadership; ambidextrous leadership; job autonomy; training; less bureaucracy; opportunity recognition; relational contracting	Employee engagement; commitment to service quality; job performance; role conflict
Synergist (simultaneous-combined)	Organizations facing changing demands and need rapid innovations	Empowerment	Innovative work behavior; financial performance	
Pendulum (sequential-balance)	An ambidextrous manager as someone who is equally engaged in exploration and exploitation tasks with equal dexterity to avoid path dependency and obsolescence of knowledge and competencies. Exploration and exploitation tasks have to be conducted consecutively and in close correspondence to the situational context (Keller & Weibler, 2015).	Continuous learning context, rapidly changing environment	Handling work stress; social support; seniority (career stage); self-efficacy; individual enabling action; leadership; network structures	Performance outcomes; cognitive strain

(Continued)



Table 3. (Continued).

Type of individual ambidexterity	Example definition from literature	Context	Antecedents (might interact with each other)	Outcomes
Juggler (sequential-combined)	Individual ambidexterity consists of combining the exploration of new opportunities and the exploitation of existing capabilities over a period of time. In contrast to companies, which can distribute these different approaches among organizational units or team members, individuals cannot simultaneously explore and exploit at a single point in time. Individuals have to overcome the challenges of distributing resources between exploration and exploitation and how to integrate the outcomes to generate better results (Schnellbacher et al., 2019).	small and medium enterprises (with flatter structure); uncertain and interdependent work contexts; organizations facing changing demands and rapid innovation	Organizational architecture; organizational context; self-efficacy; paradoxical leadership; transformational leadership; tenure; high-involvement human resources systems; management support	Performance outcomes

pursuing exploitative and explorative activities, which resembles simultaneous-balanced individual ambidexterity in the typology. In their study, organizational context (for example, knowledge-sharing context) is found to be an antecedent of individual ambidexterity, and increasing employee engagement is a result of individual ambidexterity. As each type of individual ambidexterity is more than simply a definition, we further explored the existing literature to establish, for each type of individual-level ambidexterity; (a) the context in which they have been studied; (b) the antecedents that have been studied (all the antecedents are taken from the existing literature, and there might be interrelations among them); and (c) the outcomes that have been studied. A summary of the example definitions, research contexts, antecedents, and outcomes for each type of individual ambidexterity from the existing literature is presented in [Table 3](#).

Second, the antecedents of individual ambidexterity are a source of ambiguity, increasing the difficulty of conceptualizing the forms of individual-level ambidexterity. By reviewing the literature, we now know that the extent to which employees are ambidextrous varies within and across contexts. The variance stems from both personal characteristics and the contexts faced by employees. Nishii and Wright (2008) propose that individuals' perceptions of HR practices act as antecedents of their attitudes and behaviors, and the difference in perceptions largely depends on individuals' personal characteristics (for example, educational background, prior work experience). Individuals perceive and react differently to the antecedents of individual ambidexterity, such as HR practices, which further leads to variations in organizational performance, as suggested by Nishii and Wright (2008). It may be possible to extend the study of Nishii and Wright (2008) by investigating other antecedents in addition to HR practices and testing whether the difference in individual perceptions acts as a moderator of the relationship between organizational antecedents and individual ambidexterity.

Third, we included the outcomes of individual ambidexterity when we considered the concept as a whole. There is a noticeable research gap regarding the negative outcomes of individual ambidexterity. Identifying the negative outcomes can help the field form a more holistic individual ambidexterity network and help HR practitioners identify appropriate HR practices to mitigate the negative impacts. Moreover, as suggested in the human resource management (HRM) literature, there appear to be a range of relationships between positive and negative outcomes such as parallel outcomes, conflicting outcomes, and mutual gains (van de Voorde, Paauwe, & Van Veldhoven, 2012). The mutual gains perspective suggests that performance outcomes and employee well-being can be enhanced simultaneously, while the conflicting outcomes perspective contends that the development of performance outcomes is always at the expense of employee well-being and vice versa (van de Voorde et al., 2012). However, to our knowledge, to date

no study in the ambidexterity literature has investigated how positive outcomes (for example, performance outcomes) and negative outcomes (for example, stress or strain) are related. Both the differences in the relationship between exploration and exploitation and the differences in individuals' perceptions of the antecedents of individual ambidexterity could lead to different relationships between positive and negative outcomes of individual ambidexterity. Future studies should investigate the possible causes of these relationships with respect to the outcomes.

Conclusion

The number of studies devoted to individual ambidexterity is growing rapidly. However, in our search of the literature, no review thus far has exclusively focused on the concept of individual ambidexterity or taken into consideration the context of SMEs. The present systematic literature review addresses this gap in the literature by comprehensively reviewing the concept of individual ambidexterity, including its antecedents and outcomes. From the review of the existing literature on individual ambidexterity, three main conclusions can be reached. First, individual ambidexterity is a self-regulated activity in such a way that individuals make their own decisions on how to best distribute their resources over explorative and exploitative tasks. This self-management is affected by both individual characteristics and organizational contextual factors. Second, there are many types of relationships between exploration and exploitation based on two dimensions; namely, the time dimension and the balance dimension. Third, individual ambidexterity leads to both positive and negative outcomes. These conclusions offer further theoretical and practical implications and limitations, and they open up avenues for future research.

Our literature review makes theoretical and practical contributions to the field of individual ambidexterity. Theoretically, we have integrated the ideas from different streams of literature on individual ambidexterity and built a typology to facilitate a more comprehensive understanding of the concept of individual ambidexterity. To do this, we considered the organizational and personal antecedents of individual ambidexterity, the relationship between individual exploration and exploitation, and the positive and negative outcomes of individual ambidexterity. Especially regarding the relationship between individual exploration and exploitation, we proposed a typology of individual ambidexterity combining the temporal and balance dimensions. The typology of individual ambidexterity provides a clearer picture of the concept, which heretofore has lacked focus in the previous research. Future studies can refer to this typology when identifying different types of individual ambidexterity. By doing so, individuals exhibiting different types ambidexterity can be categorized accordingly, and organizations can provide more

specific HR practices (for example, training programs) for each type. However, the typology is based on only the existing literature. Thus, future studies should try to define each type more accurately and develop measurements for each type of individual ambidexterity. Future empirical studies should also explore the antecedents and outcomes of each type of individual ambidexterity in specific organizational contexts. For instance, Cao et al. (2009) found that pursuing balance is more beneficial to resource-constrained firms such as SMEs because they must manage the trade-offs between explorative and exploitative activities, whereas the combination of these two activities is more beneficial to larger firms with access to sufficient resources. Future studies should investigate whether simultaneous or sequential ambidexterity is more suitable for a specific organizational context. We provided an overview of the viewpoints in the literature regarding the relationship between exploration and exploitation. We believe that (to a certain extent) individuals, as agents of ambidexterity at the individual level, consciously make their own judgments and decisions based on whether they perceive exploration and exploitation to be at opposite ends of the spectrum or synergetic and complementary. Future studies should further investigate which factors contribute to individual differences in perception (for example, personal characteristics or organizational contextual factors). Additionally, to date, scant research has investigated how the antecedents of individual ambidexterity might be interrelated, which opens up opportunities for future research. For instance, it could be beneficial, theoretically and practically, to investigate the personal characteristics and contextual factors that mitigate the negative outcomes of work stress that result from pursuing individual ambidexterity.

Practically, by considering the differences between SMEs and larger organizations, we contribute to the attainment of individual ambidexterity in SMEs. The pursuit of ambidexterity has become imperative for most organizations. Considering the unique context of SMEs, fostering ambidexterity at the individual level has been suggested as the most suitable way to develop ambidextrous SMEs. SMEs' unique structure and culture (for example, less formalization, more connectedness, and more flexibility) strengthen the interplay between organizational and personal factors, both of which affect the attainment of individual ambidexterity. Moreover, as suggested in the literature (for example, Hafkesbrink et al., 2012), individual perceptions play an important role in how well individuals can act ambidextrously, such that individuals' personal competences and their perceptions of the organizational antecedents may lead to different levels of individual ambidexterity. Therefore, SMEs can utilize the personal characteristics that are beneficial for developing individual ambidexterity in their recruiting and selection process to recruit individuals with ambidexterity potential. By investigating individuals' perceptions of contextual factors (for example, formalization,

centralization, and connectedness), we can form a clearer understanding of how individuals respond to contextual factors. This may help HR practitioners (in SMEs) implement more effective practices when developing individual ambidexterity. Moreover, by referring to the types of individual ambidexterity introduced in our typology, SMEs can identify which type of individual ambidexterity is most suitable for their organization based on their organizational context and external environment. They can then adopt more specific HR practices or provide a more suitable context to facilitate the appropriate type of individual ambidexterity.

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