

Toward a Process-Oriented Model of Organizational Agility: A Dynamic Capability Perspective

Anna-Theresa Walter* & Sebastian Raetze**

* Technische Universität Dresden, Dresden, Germany

** Brandenburg University of Technology, Cottbus, Germany

Contact: anna-theresa.walter@mailbox.tu-dresden.de | DOI: 10.25437/jcsm-vol11-22

Abstract: Recent research highlights organizational agility as a central success factor for companies operating in highly volatile environments. Although agility is a dynamic concept by nature, little attention is devoted to its temporal dynamics. To address this gap, we conceptualize organizational agility as a higher-order dynamic capability facilitated through the development of lower-order dynamic capabilities. Building on this understanding, we propose a two-dimensional capability-building framework, which distinguishes between the development and realization processes of organizational agility. Our paper contributes to research by offering a temporal and process-oriented view of organizational agility, which extends the rather static view of previous work.

Keywords: dynamic capabilities, capability building, organizational agility, organizational learning

1. Introduction

The concept of agility became prominent in management research in the early 1990s as an approach to restore the competitiveness of the US manufacturing industry after a long period of stagnation in economic growth (Nagel & Dove, 1991). Early research primarily focused on agile manufacturing as an approach to increase company success by replacing the traditional mass-production system and dynamically adapting to ongoing environmental changes (e.g., Cho et al., 1996; Gunasekaran, 1998). Over the last decades several global challenges emerged that led to the development of hypercompetitive business environments (D'Aveni et al., 2010), where competitive advantages are temporary in nature. In response, interest in the concept of agility occurred in a broad range of additional management disciplines to explain sustainable and superior performance in dynamic and uncertain business environments (for reviews see, e.g., Fayezi et al., 2017; Tallon et al., 2019; Walter, 2020).

Previous research enhanced our understanding about the relevance of agility and specific elements of the concept. For example, various scholars elaborated on the multiple challenges ubiquitous in modern business environments putting organizations in vulnerable positions, thus acting as agility drivers (e.g., Chakravarty et al., 2013; Mishra et al., 2013). Likewise, researchers proposed and empirically tested capabilities, methods, tools, and practices related to higher agility (e.g., Margherita et al., 2021; Sharifi & Zhang, 1999). Yet, the inter-

disciplinary nature and fast growth of agility research have created fragmented knowledge in this field. Scholars from different domains applied inconsistent conceptualizations and focused on different entities and factors related to agility (see, e.g., Fayezi et al., 2017; Walter, 2020). Accordingly, conceptual clarity is poorly developed and no common nomological network exists linking different agility factors. Moreover, research on the development of agility is scarce and primarily considers static implementation frameworks (e.g., Zhang & Sharifi, 2000). Thus, knowledge about the dynamics of agility building is limited.

This article aims to address these gaps by expanding our current understanding of agility and its underlying processes and theorizing on how agility is built through a two-stage process (Cornelissen, 2017). We combine research on agility, dynamics capabilities (DC), and related concepts such as organizational learning. We suggest moving beyond a rather static understanding of agility toward a developmental perspective, which includes the active management of a required agility level (AL). We leverage the latest agility research and consider *organizational agility* (OA) as a specific DC to provide a foundation for theorizing about the temporal dynamics of agility (e.g., Lee et al., 2015; Teece et al., 2016). We focus on whole companies when referring to the label of OA, but use the terms agility and OA synonymously throughout the article. OA is roughly defined as a DC that allows a company to quickly recognize changes in its dynamic business environment and exploit them for its own

advantage (i.e., for enhancing business performance and competitiveness). We offer a more nuanced integration of OA within the DC logic and thus follow Agarwal and Selen's (2009) suggestion to use agility to reinforce the theoretical DC approach. Based on the capability hierarchy (e.g., Collis, 1994; Zollo & Winter, 2002), we conceptualize OA as a higher-order DC linked through a set of lower-order DCs (e.g., Arbusua et al., 2017; Doz & Kosonen, 2011; Vickery et al., 2010). Thus, we differentiate between OA as an overarching goal and underlying agility capabilities.

Building on this understanding, we argue that agility as a DC is built over time by means of two distinct, yet related, processes. Previous research suggested a gradual development of DCs and a varying OA level (Teece et al., 2016). Our theorizing addresses recent recommendations to focus on the process dimensions of DCs (e.g., Schilke et al., 2018; Wenzel et al., 2020) and investigate them from a temporal perspective (e.g., Helfat & Peteraf, 2003; Mahringer & Renzl, 2018). We extend the capability hierarchy mentioned above by a temporal component. In so doing, we also follow recent research that highlighted the crucial role of organizational learning for the development of DCs (e.g., Bingham et al., 2015; Zollo & Winter, 2002). We develop a model that clarifies the distinction between the developmental and realization processes of agility and thus explains the time course of capability building. Drawing on Salvato and Rerup (2011), we analytically separate the evolution of capabilities from their performance. In addition, our proposed framework describes the interrelationships and effects of the different capability hierarchy levels in more detail and focuses on microfoundations underlying OA as a specific DC (e.g., Suddaby et al., 2020; Wenzel et al., 2020).

Our paper is structured as follows: Section 2 reviews the concepts of OA, DC, and their interrelation. Section 3 introduces our reconceptualization of OA within the DC hierarchy framework and displays our dual-process framework of agility building. Finally, section 4 offers a summary of our findings, presents limitations of our study, and highlights its salient theoretical, methodological, and practical implications.

2. Theoretical foundations

2.1. Organizational agility

Brown and Agnew (1982) introduced the term agility within the business context. While this seminal paper gained limited attention, the

prominence of the agility concept suddenly rose when scholars from Lehigh University recommended agility as a new course of action for regaining the US manufacturing industry's competitive advantage (Nagel & Dove, 1991). Various scholars in the area of production and operations management leveraged this report and conceptualized agility as a manufacturing paradigm (e.g., Meade & Sarkis, 1999), management philosophy (e.g., Sharp et al., 1999), management strategy (e.g., Paixao & Marlow, 2003), or system property (e.g., Giachetti et al., 2003). While most studies on agility applied theoretical-conceptual designs and focused on the manufacturing sector (Walter, 2020), an increasing number of scholars from other domains started to refer to the notion of agility to explain how various organizational entities survive and even thrive in complex and uncertain business environments. For example, scholars investigated the agility of supply chains (e.g., Prater et al., 2001), workforces (e.g., Qin & Nembhard, 2010), and strategies (e.g., Doz & Kosonen, 2011). This development reflects the exponential increase of business dynamics over the last three decades, but also demonstrates that individual research streams on agility have drifted apart.

Thus, scholars recently offered more holistic views by considering agility across or independent of industries (e.g., Felipe et al., 2016; Tallon et al., 2019), usually referring to the term *organizational agility*. Narasimhan et al. (2006) contrasted the most widespread perspectives on OA as a paradigm and capability. The authors advocated approaching OA from a capability perspective, as this clearly separates performance capabilities from agile practices, which in turn promotes conceptual clarity (Podsakoff et al., 2016). Various scholars followed this call by conceptualizing OA as a capability that enables organizations to perceive changes in their volatile and unpredictable business environment, respond to these changes quickly and effectively by reconfiguring processes and resources, capitalize on these changes, and thus increase their competitive advantage (e.g., Nejatian et al., 2018; Teece et al., 2016; Van Oosterhout et al., 2006). While capability-based definitions of OA vary, most contain three characteristics: (1) the main object of OA is to maintain or even increase competitiveness; (2) a functional focus on speed, sensing, and responding; and (3) a focus on continuous and unpredictable change in a volatile business environment (Renzl et al., 2021; Walter, 2020).

Academics also started to differentiate central elements of agility: drivers, enablers, and capabilities (for a recent review see Walter, 2020). *Agility drivers* represent pressures and changes in the business environment that put an organization in a vulnerable position and therefore require searching for approaches to gain a new competitive advantage (Zhang & Sharifi, 2007). Prominent agility drivers are increased innovation rates, faster technological developments, and intense rivalry (e.g., Chakravarty et al., 2013; Mishra et al., 2013). *Agility capabilities* are vital for a company to successfully detect and respond to environmental changes (e.g., Lin et al., 2006; Sharifi & Zhang, 2001). Such capabilities need to be developed at a level (AL) that meets the external and internal demands of a company (e.g., Gunasekaran & Yusuf, 2002; Lin et al., 2006), so they can be utilized when needed (Brown & Bessant, 2003). Researchers have not yet developed a unified understanding of central agility capabilities; however, capabilities such as responsiveness, proactiveness, adaptiveness, cooperation, competency, flexibility, and speed are commonly mentioned (e.g., Fayezi et al., 2017; Lin et al., 2006; Sharifi & Zhang, 1999, 2007). *Agility enablers* are instruments (i.e., methods, tools, and practices) based on which such capabilities can be acquired (e.g., Aravindraj et al., 2013; Sharifi & Zhang, 1999), thus are input factors. Variables such as team-based forms of organizing, (information) technologies, and supportive organizational cultures were identified as potential agility enablers (e.g., Lin, 2004; Sharp et al., 1999; Sindhwan & Malhotra, 2017). Yet, scholars also argued that agility enablers are not valuable in general, but must be aligned with a company's strategies, processes, structures, and environmental demands (e.g., Lin et al., 2006; Vinodh & Aravindraj, 2012). Accordingly, a suitable choice and adequate implementation of agility enablers largely depends on conscious decisions made by the management (e.g., Brown & Bessant, 2003; Vinodh & Aravindraj, 2012).

Previous research primarily focused on agility enablers (e.g., Aravindraj et al., 2013; Overby et al., 2006) and measurement tools (e.g., Sieger et al., 2000; Vinodh et al., 2010). Likewise, different implementation frameworks were proposed that focus on a strategic perspective and suggest methods and actions for compiling new agility enablers and enhancing agility capabilities (e.g., Gunasekaran & Yusuf, 2002; Nejatian et al., 2018; Sharifi & Zhang, 1999). The tenor is a multi-step framework that offers practicing managers an approach for positively

positioning their own organization in a volatile competitive environment. In essence, the proposed steps are: (1) recognizing changes as agility drivers; (2) determining the agility need level, i.e., the necessary degree of agility corresponding to the agility drivers a company encounters; (3) determining the organization's current AL; (4) conducting a gap analysis to determine the necessary need for developing agility capabilities, after which the agility strategy is defined by the management; and (5) implementing agility enablers to increase the AL (Sharifi & Zhang, 1999, 2001). Although such frameworks provide a decent understanding of practices to become agile, the concrete relevance of OA capabilities is rather overlooked. It also remains unclear how OA as a capability differs from agility capabilities. Furthermore, there are still limited insights on how OA and agility capabilities develop over time. The framework development in section 3 intends to increase our understanding by changing the perspective from the previous action-oriented view to a processual capability-oriented view.

2.2. (Dynamic) capabilities and the role of organizational learning

The idea of DCs originated in strategic-management research based on the resource-based view, which argues that organizations generate competitive advantages by leveraging their valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). Organizational capabilities are considered a central factor for generating competitive advantages, because they are needed to transfer resources into valuable firm outcomes (Ray et al., 2004). In general, organizational capabilities are understood as collections of routines that serve a clear purpose and contain the knowledge needed to achieve or expand desired organizational outcomes (e.g., Dosi et al., 2000; Nelson & Winter, 1982; Salvato & Rerup, 2011). The literature roughly distinguishes between two types of capabilities: (1) ordinary (also zero or operational) capabilities, which reflect the organization's ability to perform basic functional activities to earn a living in the present (e.g., Helfat & Peteraf, 2003; Salvato & Rerup, 2011; Winter, 2000); and (2) DCs, which reflect "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516). DCs thus enable the company to establish innovative, new types of competitive advantage, depending on its market position and path dependencies by creating, extending, or changing ordinary capabilities and resources

(e.g., Eisenhardt & Martin, 2000; Winter, 2003). As such, DCs are higher-level routines that systematically influence the adaptability of lower-level capabilities and routines (e.g., Salvato & Rerup, 2011; Schilke et al., 2018).

Collis (1994) offered a more nuanced view on hierarchical relations between capability types, which was later extended and empirically tested (e.g., Schilke, 2014; Winter, 2003; Zollo & Winter, 2002). Schilke et al. (2018, p. 397) summarized this approach by arguing that “each capability is nested within a higher-order capability; e.g., first-order dynamic capabilities reconfigure the organizational resource base, second-order dynamic capabilities reconfigure first-order dynamic capabilities, and so on.” Collis (1994) described the valuable potential of DCs, through their ability to enable dynamic improvement, recognize the intrinsic value of other resources, and develop new strategies ahead of competitors (see also Ambrosini & Bowman, 2009).

Scholars also focused on the role of different processes in the DC concept (Schilke et al., 2018). Teece et al. (1997) introduced three process types (i.e., coordinating, learning, and reconfiguring) as key elements of DCs. Later, Teece (2007) offered a more detailed process typology including these processes as a subset. He argued that DCs include the following three “asset ‘orchestration’ processes” (Teece, 2007, p. 1341): (1) sensing opportunities; (2) seizing opportunities; and (3) transforming resources and capabilities (see also Martin, 2011). Other scholars similarly indicated the processual nature of capabilities by distinguishing between the evolution process and the subsequent use of capabilities (e.g., Dosi et al., 2000; Helfat & Martin, 2015). These approaches clearly depict the action orientation and temporal nature of DCs.

DCs also differ in their degree of routinization (Schilke et al., 2018). While capabilities as collective patterns are always routinized to some extent, the degree of routinization is heavily shaped by the organizational context (Eisenhardt & Martin, 2000). This highlights the role of individuals and their interactions for DCs. A solid line of research emerged that focuses on the microfoundations underlying DCs (e.g., Salvato & Rerup, 2011; Suddaby et al., 2020), such as skills, perceptions, and cognitions of key employees and managers (e.g., Helfat & Peteraf, 2015; Mahringer & Renzl, 2018). Scholars applying a practice perspective even argue that DCs cannot exist without individuals, because DCs are formed and reconfigured

through the performance of routines and patterning processes by actors (e.g., Wenzel et al., 2020).

The contextual nature of DCs was also highlighted by scholars who argue that a compelling embeddedness in the enterprise is a key feature of DCs (Schilke et al., 2018). DCs are not imitable, can hardly be acquired externally, and must therefore be built in the company over time, which requires commitment and considerable resources, and leads to high sunk costs (e.g., Helfat & Martin, 2015; Winter, 2003). As such, various scholars explicitly linked the development and adjustment of DCs to the concepts of organizational learning and knowledge management (e.g., Bingham et al., 2015; Konlechner, 2017). Zollo and Winter (2002) argued that DCs can be developed through two types of learning: (1) deliberate learning and (2) learning-by-doing. The latter includes increased competence with growing experience in the utilization of a capability (see also Schilke et al., 2018; Zollo & Winter, 2002).

Scholars recently started to (re)conceptualize various constructs related to uncertainty, complexity, and change from a DC perspective because of the high relevance of DCs in dynamic environments (e.g., Gaertner et al., 2017; O'Reilly & Tushman, 2008).

2.3. Organizational agility and its link to dynamic capabilities

Researchers increasingly agree that OA might be best conceptualized as a capability and have thus started to link agility to DC research. For example, Bessant et al. (2001) defined agility as a DC that enables a company to act in a value-creating way in a continuously changing environment (based on Teece & Pisano, 1994). The authors argued that agility allows organizations “to create and deploy different responses to meet differing environmental challenges” (Bessant et al., 2001, p. 5), which is in line with the general conceptualization of DCs. Moreover, they indicated that the supporting role of managerial capabilities is another alignment between DCs and agility. Other authors also highlighted agility as a potential DC by suggesting that OA is built based on different agility capabilities (e.g., Chakravarty et al., 2013; Lee et al., 2009; Sambamurthy et al., 2003). Overby et al. (2006) proposed that OA is a unique DC type and differentiated OA from DCs by arguing that the latter is a broader concept. Other scholars (e.g., Lee et al., 2015; Vickery et al., 2010) also conceptualized agility as a higher-order capability based on the more general

capability hierarchy logic of Grant (1996). Agility as a higher-order capability is argued to emerge from the integration of lower-order capabilities (e.g., Grant, 1996; Vickery et al., 2010). Finally, Teece et al. (2016) described DCs as valuable and necessary complements to agility, in that agility can be effectuated through sensing and seizing activities and ultimately achieved through transformation. Moreover, the authors proposed that companies with superior DCs should be more proficient in assessing when the pursuit of greater agility at the expense of efficiency is reasonable and profitable.

While such initial research linking OA and DCs provided first valuable insights, important aspects remain unresolved. First, there are still no common understandings on how OA as a DC and agility capabilities are conceptually related and how they interact. Second, while the capability hierarchy was highlighted as a valuable approach to better explain the connection between OA and DCs, this needs to be specified in more detail.

3. Towards a dynamic understanding of organizational agility

3.1. Organizational agility as a dynamic capability

We focus on OA from a DC perspective to explain how OA is realized and developed over time. In this section we generally integrate OA into the DC framework. Drawing upon previous research, we define OA as a learned, higher-order DC that can be performed in a timely and efficient manner, at the required scale, and at any point in time to detect and quickly respond to environmental changes in order to succeed in a volatile business environment (Overby et al., 2006; Walter, 2020). DCs often comprise combinations of simpler capabilities (e.g., Collis, 1994; Eisenhardt & Martin, 2000). We therefore propose that OA is a complex, higher-order capability, facilitated by a certain combination of lower-order capabilities (agility capabilities), which enables a company to sense, understand, and evaluate environmental changes and react to them in a way that these changes no longer threaten the firm's competitive position or even allow an organization to capitalize on them. While the literature does not provide a common understanding of agility capabilities, we leverage the commonly used capability taxonomy of Zhang and Sharifi (1999), who identified responsiveness, competency, flexibility, and speed as central agility capabilities, to illustrate how agility capabilities contribute in increasing the AL.

Figure 1 depicts the hierarchical levels of capabilities. Organizational capabilities represent the all-encompassing category that includes dynamic and ordinary capabilities. Higher-order capabilities include first- and second-order DCs. It also encompasses OA and the underlying agility capabilities, which are derived in detail below.

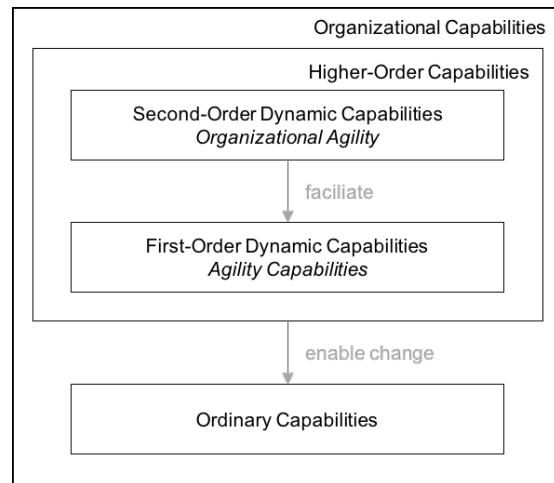


Figure 1: Overview of different hierarchical levels of organizational capabilities, their relationship and classification of OA

Outlining overlaps between the conceptualizations of DCs and OA provides a rationale for integrating OA into the DC framework. Agility corresponds to the complexity characteristic of an organizational capability (Schreyögg & Kliesch, 2006). On the one hand, the task to be solved is complex (i.e., capitalizing on threatening, unpredictable changes in a volatile business environment). On the other hand, agility as a capability is very complex in terms of structure and development. Moreover, the volatile business environment in the DC concept corresponds to that in which agility is a valuable capability (Teece et al., 2016). However, scholars argue that DCs might also be valuable in more stable environments – with higher levels of environmental volatility acting as a precursor for the degree to which DCs become competitive factors (Schirmer & Ziesche, 2010) – while the value of OA is inseparably linked to a dynamic and unpredictable business environment. In this context, there is consensus of directing actions toward the goal of responding appropriately to environmental changes (Walter, 2020). Moreover, agility explicitly focuses on reacting quickly to prosper in the course of a change event (Sambamurthy et al., 2003). The significant role of management (Ambrosini & Bowman, 2009) is consistent, whereby the

realization of agility must have a clear management intent (Brown & Bessant, 2003).

3.2. Agility capability building as a two-stage process

Having outlined our conceptualization of OA, we now focus on the processes involved in its construction. To allow a detailed investigation of this phenomenon we analytically separate two interrelated processes: (1) the realization process of agility focused on a realignment between environmental needs and internal operational capabilities by deploying different agility capabilities, and (2) the process of further developing OA as a DC through different types of organizational learning. We argue, that this separation is helpful to better capture the dynamic process of OA building (e.g., Dosi et al., 2000; Helfat & Martin, 2015; Salvato & Rerup, 2011). Figure 2 depicts our dual-process framework of OA building as an interaction between capability realization and capability development.

This inevitable connection results from a mutual dependency. The capability realization process represents the short-term component and takes place by means of a conscious increase or decrease in the company's level of capabilities over the course of an event. We extend recent

findings that focused on developing agility capabilities from a strategic perspective. As described in section 2.1, previous implementation frameworks suggested several steps for increasing AL by implementing agility enablers and realigning the capability set to close significant gaps between an organization's actual AL and the agility requirements of the business environment. (e.g., Gunasekaran, 1998; Zhang & Sharifi, 2000). We see the merit of this action perspective, but believe that a more holistic view on the temporal course of capability building is needed to more precisely understand the evolution of OA and its varying levels. We build upon microfoundational findings and focus on agility from a processual, social-constructivist perspective. According to this view, organizational routines underlying DCs are not abstract objects, but rather socially constructed, emerging through repetitive performance by organizational actors (e.g., Dionysiou & Tsoukas, 2013; Wenzel et al., 2020).

Yet, agility cannot be successfully enacted without further development in the long run by means of growing experience (e.g., Schilke et al., 2018; Zollo & Winter, 2002). The respective capabilities continue to compulsorily develop during their realization through organizational learning, which is highlighted as an important

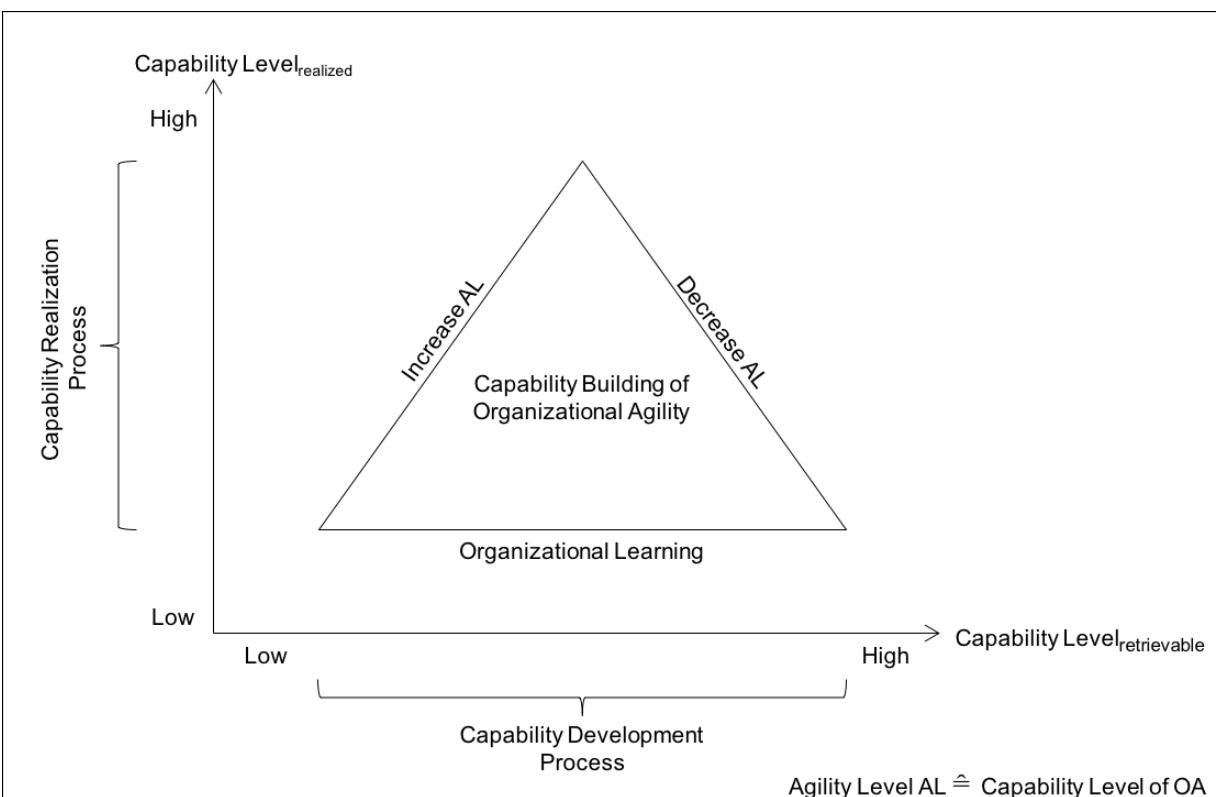


Figure 2: Capability building as a consolidation of capability realization and development

factor in research on the general development of DCs (e.g., Bingham et al., 2015; Zollo & Winter, 2002). That said, organizational learning takes place while the realized capability level increases and decreases; i.e., the capability develops further and the retrievable capability level increases. Conversely, it is difficult to further develop the capability base without realizing the respective capabilities.

The capability development process shows the long-term temporal development of agility capabilities, which means an increase in the organizational basal level of OA during the change in AL. This process can be divided into two steps: (1) increasing the organizational basal level of OA through organizational learning, and (2) maintaining the existing organizational basal level of OA through the preservation of knowledge from past experiences in a pronounced organizational memory and through a well-functioning knowledge management. Referring to the emphasis on organizational actors, recent research also indicates that individuals play a fundamental role in the learning-by-experience process, as they primarily store the accumulated knowledge and the organization ultimately benefits from it through collaboration of knowledge holders (Jain, 2013). Thus, “organizations do not have a (dynamic) capability, but they *become* (Tsoukas & Chia, 2002) *capable* in and through the enactment of organizational routines” (Wenzel et al., 2020, p. 6). DCs are less routinized and rather depend on heuristics offering space for individual and collective decision-making, especially in highly-volatile environments (e.g., Peteraf et al., 2013; Salvato, 2009). Accordingly, when theorizing about the two processes of capability realization and capability development in the next sections, we put a specific emphasis on temporal dynamics and microfoundational underpinnings.

As outlined above, both processes unfold in a dynamic and interwoven way. The recursive nature of agility capability building makes it somewhat arbitrary to define a specific starting point. However, we begin with the process of realization in reaction to a specific event, and next discuss the process of capability development, which occurs in part at the same time, but can be theoretically separated to allow a more sophisticated analysis.

3.2.1. Capability realization on multiple levels of the capability hierarchy

In this section we focus on the short-term view and explain how the enactment of DCs at

different hierarchical levels allows an organization to successfully capitalize on environmental uncertainty. Linking with section 3.1, we elaborate more specifically on the assignments of OA and the agility capabilities to the individual hierarchy levels. More precisely, we outline how OA as a second-order DC and different first-order agility capabilities interact over the course of a consciously initiated change event. The assignment of the specific DCs and the mechanisms of action are now described starting at the top of the hierarchy (vertical logic) and in the horizontal logic over time starting at t_0 .

As argued by Doz and Kosonen (2008; 2011), an increased AL occurs by a constructive interplay and multiplicative interaction of a set of capabilities (see also Arbussa et al., 2017). Accordingly, a better understanding of the realization process of OA necessitates a processual view of the interplay between OA as a second-order DC and underlying first-order agility capabilities. We apply an event-based perspective to explain the process of agility realization (Morgeson et al., 2015; Salvato, 2009). We focus on a single change event in reaction to triggers occurring from ongoing environmental changes (agility drivers) and argue that organizations apply their OA and agility capabilities to transfer this change into an opportunity.

OA seeks to leverage ongoing changes that reduce the fit between the organization's operational capabilities and environmental dynamics before they become major challenges. OA demonstrates a DC-typical value-creating character (Collis, 1994) by its inherent feature of reconfiguring agility capabilities at a lower level to eventually generate a tactical or strategic change (Overby et al., 2006). This highlights the unique contribution of DCs in creating a competitive advantage: changing the resource base according to environmental needs by recombining, integrating, or even creating new resources (Eisenhardt & Martin, 2000). The task of higher-order capabilities is to (re)configure the company's resources in response to changes in the business environment (Lee et al., 2015). Through the integration of lower-order capabilities, new higher-order DCs, such as OA, are developed to ultimately enable innovative action in the company (Lee et al., 2015). Considering agility capabilities as lower-order DCs on a first level, the integration of these capabilities leads to OA on a higher (second) level (e.g., Grant, 1996; Vickery et al., 2010). Thus, a DC enables organizational change and the emergence of new and innovative types of competitive advantage (e.g., Teece et al., 1997; Schilke et al., 2018). Agility

utilizes the inherent attribute of higher-order DCs to reconfigure underlying capabilities (first level agility capabilities) in order to create value (Ambrosini & Bowman, 2009; Winter, 2003).

Recent research highlighted the key role of management in the capability building process (e.g., Helfat & Martin, 2015; Tripsas & Gavetti, 2000) and the agility concept (e.g., Bessant et al., 2001). Here, we argue that the correct enactment of agility capabilities is shaped by the OA capability, which guide managerial action over the OA realization process. Agility capabilities as first-order capabilities operate in combination with each other and are nested in the higher-order capability OA, allowing strategic change and a reconfiguration of ordinary capabilities (Schilke et al., 2018). Agility capabilities therefore allow the replacement and new configuration of a company's resources. OA is directed at quickly enabling a strategy change through resource or capability reconfiguration to develop a new, profitable strategy before other competitors and to exploit valuable other capabilities or resources for this purpose (Ambrosini & Bowman, 2009; Collis, 1994). Therefore, OA demonstrates a behavioral orientation "to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities [ed. note: here first-order capabilities] in response to the changing environment to attain and sustain competitive advantage" (Wang & Ahmed, 2007, p. 35). Reconfiguration across the three capability levels can take place, for example, if the enactment of OA displays that the current agility capability set does not meet the requirements of the business environment (e.g., the company is too slow according to the agility driver currently in effect). This means, the agility capability quickness should be increased. This is done through the conscious management decision (Brown & Bessant, 2003; Vinodh & Aravindraj, 2012) to implement a suitable agility enabler (Aravindraj et al., 2013; Sharifi & Zhang, 1999), which requires resources, for example the labor of a production employee. A reconfiguration of the ordinary capabilities takes place at the moment a member of the production team is assigned to the enabler-related task, since the respective employee is withdrawn from his or her everyday role and is now responsible for enhancing the DC quickness (Winter, 2003). A higher-level capability therefore modifies an ordinary capability on the zero-level (Ambrosini & Bowman, 2009; Winter, 2003). It is important that this role change is also used and implemented in a goal-oriented manner, i.e., that it is

used to improve the quickness capability. If the work there is not directed at the purpose of the first-order DC, then this role change can lead to resource loss and is therefore associated with higher costs (Winter, 2003). In Figure 3 we propose a second framework that provides a more nuanced view of realizing agility as a sub-process of building agility (as illustrated in Figure 2). We previously described the top-down mechanisms of action; in the following we will elaborate on the time course.

Agility and DC research agree that organizational decision makers must first perceive a capability gap, before engaging in capability development or change; both at operational and dynamic levels (e.g., Helfat & Peteraf 2003; Lavie, 2006; Sharifi & Zhang, 2001). As such, having and enacting the capabilities to sense and evaluate agility drivers (i.e., recognizing and understanding future developments) is a precursor for realizing agility capabilities (Teece et al., 2016). This sensing process is patterned and stable, always proceeding in similar ways, and can subsequently trigger a strategic change in the company. Moreover, sensing constitutes an important element of DCs (e.g., Ambrosini & Bowman, 2009, Augier & Teece, 2007). While perceiving capability gaps primarily occurs at individual and group levels (Konlechner, 2017), operating in complex, fast changing environments that require OA is likely to require highly-routinized patterns of environmental screening and evaluation. Various agility capabilities must be aligned and deployed to create opportunities and exploit them before competitors do (Teece et al., 2016). This includes routines for recognizing weak signals (Ansoff, 1975), gathering, sharing, and discussing cues/new information, and making proactive decisions (Teece, 2007).

Wenzel et al. (2020) recently argued that organizational change emerges when actors perform (enact) organizational routines. Accordingly, after having sensed and shaped a valuable opportunity to act on, this opportunity must be seized through changes in operations based on conscious investments by enacting relevant agility capabilities (Teece, 2007).

That said, first-order capabilities must be performed by organizational actors, which means increasing the organization's AL. This investment decision necessarily depends on managerial actions (e.g., Dosi et al., 2008; Teece, 2016) and must be treated as a managerial priority (Teece, 2016). O'Reilly and Tushman (2008, p. 195) argued that DCs "manifest in the decisions of senior management."

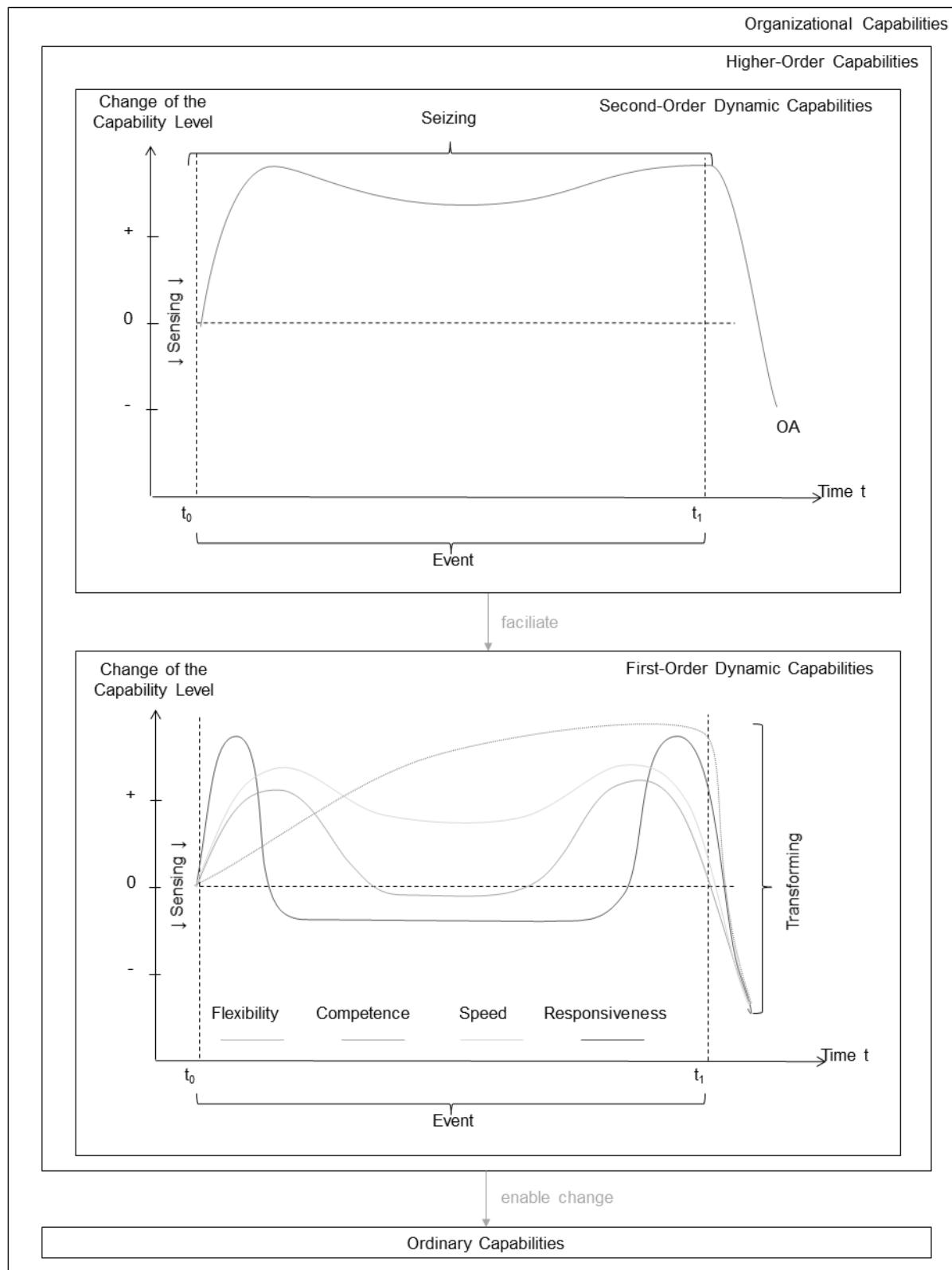


Figure 3: Realization process of OA from a dynamic capability perspective

Entrepreneurial initiatives are identified as microfoundations to change operational routines (Mahringen & Renzl, 2018). Managers can consciously start such initiatives to kick-start the enactment of agility capabilities. Intensive efforts in organizational change and learning can be triggered by proactively constructing an internal crisis and thus, a shift in attention (Kim, 1998). Such an internally constructed crisis supports fast learning (Kim, 1998). The concomitant entrepreneurial behavior constitutes a component of DCs (Teece, 2012). Additional agility capabilities are enacted by organizational actors during the change event. Through the realization of agility capabilities, the AL of the organization is facilitated and ordinary capabilities are adjusted so the event can be carried out successfully and aligned to the modified environmental conditions. OA, in turn, enables an efficient alignment of the agility capabilities by reconfiguring them in a situation-specific and economic way. In line with Doz and Kosonen (2011), we suggest a varying level in the realization of each agility capability in the course of an event (see varying trajectories of lines for each agility capability in Figure 3). The corresponding capability level adapts to the requirements of the respective situation and the current drivers (Gunasekaran & Yusuf, 2002; Lin et al., 2006). This enables the organization to exploit the sensed change as an opportunity to grow and prosper.

The eventual reconfiguration of resources and the transformations of routines, behaviors, and attitudes (Teece, 2007) will consequently increase (+) or decrease (-) the level to which different agility capabilities are performed. The agility capabilities show different effectiveness in mitigating the negative effects of agility drivers (Yusuf & Adeleye, 2002). Winter (2000, p. 981) introduced the “matter of degree” to which an organization has (or does not have) a specific capability. Thus, we propose a variability of the realized capability levels. Because the agility need level is situation-dependent (Overby et al., 2006), organizations should assess the degree to which they can realize relevant agility capabilities and subsequently develop a strategy for improving the respective capabilities, if needed (Brown & Bessant, 2003). Therefore, the agility capabilities of an organization occur in a continuum. This means an organization is not *agile* or *not agile*, but is always agile to a certain extent. The degree depends on the prevailing situation and the successful enactment of OA, as only a harmonious interplay of all agility capabilities enables the full exploitation of a positive effect

of OA on business performance. Thus, the higher-order capability OA must be deployed at a higher level over the full change event (see upper part of Figure 3). Alignment of agility capabilities is important because a disharmony between them could be harmful. Imagine, for example, an organization excellent in sensing environmental changes (responsiveness), but lacking the ability to do this faster than competitors (quickness). OA encompasses the ability to reconfigure capabilities, routines, and processes to realize and align a set of agility capabilities in a situation-specific manner. OA as a DC is a collection of routines that respond to internal or external stimuli (Zollo & Winter, 2002), i.e., the impact of an agility driver (Van Oosterhout et al., 2006). Here, we regard the step-by-step approach to realize agility in the enterprise proposed in previous implementation frameworks (e.g., Gunasekaran & Yusuf, 2002; Nejatian et al., 2018; Sharifi & Zhang, 1999) as a higher-level routine to systematically influence the adaptability of agility capabilities on a lower level (according to Salvato & Rerup, 2011 and Schilke et al., 2018). According to the implementation framework as a management action-plan, OA thus runs according to a structured pattern (routine) that can be consolidated and is persistent.

3.2.2. Capability development as an organizational learning process

In this section we focus on the long-term view and theorize about the development of agility over time. We do not focus on specific capabilities, but on the mechanisms shaping OA as a DC. From the literature, we know that DCs as collective patterns of behavior do not exist in general, but must be developed and regularly updated over time (e.g., Salvato & Rerup, 2011; Zollo & Winter, 2002). Thus, we offer a third framework (see Figure 4), which displays a more detailed view of one element of the framework presented in Figure 2 (i.e., the development process of OA). Simultaneously, it zooms further out of Figure 3 by providing a multi-event perspective.

Zollo and Winter (2002) argued that DCs develop via different learning mechanisms. Likewise, agility scholars focused on the role of organizational learning for the agility of a company (e.g., Jafari & Amoozegar, 2017), yet did not explain how this learning unfolds. We propose that OA as a complex, higher-order DC develops in large part through the realization of existing agility capabilities by organizational actors. Because DCs are shaped through their performance they can only be changed to a

limited degree through deliberate, exogenous interventions (e.g., Pentland & Feldman, 2008; Royer & Daniel, 2019; Wenzel et al., 2020). Accordingly, we argue that the development of OA heavily depends on learning by experience (Argote & Miron-Spektor, 2011; Zollo & Winter, 2002), which occurs over recurring change events. Our argumentation starts at a point in time (t_0), where the organization has already developed a certain organizational basal level of OA defined as AL (t_0) (see Figure 4). This means the organization already made a strategic decision to build OA as a DC to address environmental demands by implementing agility enablers (Sharifi & Zhang, 1999; 2001) and/or by leveraging interventions to learn initial agility capabilities (Zollo & Winter, 2002). However, these capabilities were not deliberately realized. Learning completely new capabilities during change events marked by high uncertainty and volatility is rather difficult. Uncertainty generates fear and anxiety at the individual level, and thus hinders adequate action (e.g., Carleton et al., 2007; Carleton, 2016). Accordingly, basic routines or heuristics guiding the uncertainty regulation of individuals, i.e., uncertainty appraisal and proactive behavior (Griffin & Grote, 2020), must be in place before starting a change event.

Deliberately realizing OA advocates the occurrence of certain events. The organization realizes its OA each time an external change occurs that prompts the organization to re-configure a set of operational resources and routines. In Figure 4, the first event starts at t_0 and continues until t_1 . Over the course of this realization event the organization increases its basal level of OA to AL (t_1) via internal organizational learning from cumulative experience

(Bapuji & Crossan, 2004) and experiments (Salvato, 2009). The company shows an increasing basal level (ΔAL_1). Argote and Miron-Spektor (2011) focused on learning from experience and introduced a circuit: experience is transformed into knowledge, which changes the characteristics of an organization and subsequently affects future experiences. Micro-scholars emphasized the vital role of lower-level entities in organizational learning. Employees, who directly or indirectly participate in a change event, are affected by the enactment of agility capabilities. During the event individuals enact routines underlying agility via human interactions (e.g., Argote & Ingram, 2000; Kremser & Schreyögg, 2016; Wenzel et al., 2020). Individuals develop and share knowledge and observe each other (e.g., Annosi et al., 2020; Jain, 2013; Zollo & Winter, 2002) during this “collaborative problem-solving” (Felin et al., 2012, p. 1368). In so doing, they develop a common understanding of the successful use of OA and agility capabilities. This experience is collectively interpreted, which leads to the development of shared cognitive frames and superstitious learning (Annosi et al., 2020). As collectives engage in codification and storing processes (Zollo & Winter, 2020), the related *know-how*, *know-who*, and *know-what* content can be stored in the organizational memory (e.g., Argote & Ren, 2012; Easterby-Smith & Lyles, 2011; Felin et al., 2012).

This displays patterning processes (Turner & Rindova, 2018; Wenzel et al., 2020), which allow for a more advanced enactment of OA and agility capabilities in the future (e.g., Antunes & Pinheiro, 2020; Walsh & Ungson, 1991). Cegarra-Navarro and Martelo-Landroguez

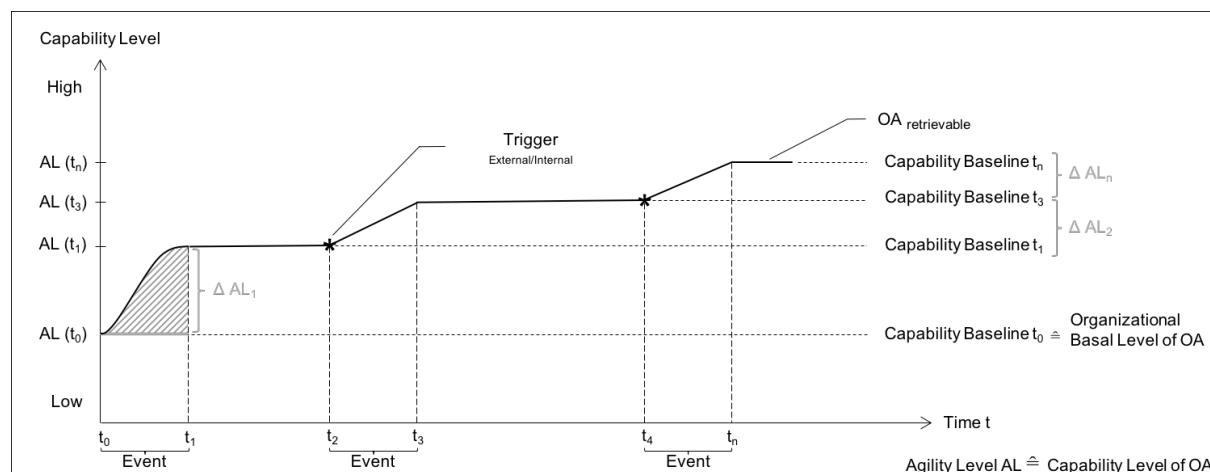


Figure 4: Agility capability development as an organizational learning process

(2020) confirmed a positive link between organizational memory and OA, which is reinforced by the application of knowledge. Thus, we believe that after an episode of OA realization the organization will probably have a higher capability baseline, and consequently the retrievable capability level of OA increases, enabling the organization to better handle future change events in reaction to environmental uncertainty. Therefore, the organization becomes more capable of enacting their agility and OA capabilities (e.g., Tsoukas & Chia, 2002; Wenzel et al., 2020). An increase of OA can also occur through experimental learning (Kolb, 2014). For example, Salvato (2009) found that DCs are adapted and refined based on variations in how individuals implemented routines.

Because capability development is a gradual and cumulative process (Montealegre, 2002), additional organizational learning processes take place during following events until the capability baseline at time t_n increases to AL (t_n). The framework of a dynamic satisficing level (Winter, 2000), which is applicable in uncertain environments, explains the rising basal level. This means, learning organizational capabilities goes hand in hand with variability of the satisfaction level with the mastery of the respective capability. The satisficing level raises when increased competence is required in the course of the event. Because this cannot be fulfilled simultaneously, organizational learning occurs until the new satisficing level (i.e., a higher capability baseline) is reached and the organization can master a capability to the desired degree at the end of the event. We propose that a high organizational learning capability is a prerequisite for sustainable agility development. Previous research highlighted rapid organizational learning as an important competitive factor (e.g., Argote, 2015; Senge, 1990) and described a direct connection to an organization's ability to adapt to changing environmental conditions and prosper in such uncertain environments (Argote, 2015). Similarly, Meredith and Francis (2000) mentioned the ability of an organization to capture knowledge and learn from experience as an important prerequisite for an organization on the way to agility.

While we assume that the successful enactment of OA will become more professionalized, we also believe there will be a decrease of learning over time. Thus, we propose the learning curve will flatten from event to event. We explain the phenomenon of progressively lower learning progress and a diminished increasing basal level of OA as a result of the repeated implementation of the same agility enablers and

the ongoing patterning of routines underlying OA. We leverage Jain's (2013) understanding of learning curves with a focus on OA. As mentioned above, capability development depends on individual learning and collective processes for developing patterns. When organizations initiate their first change event to capitalize on environmental uncertainty, they leverage new capabilities developed primarily through learning from research or simulations (Cant & Cooper, 2010) and deploy newly established agility enablers. Accordingly, the experience level is very low. When using such enablers and capabilities in reality for the first time, the participating individuals quickly increase their knowledge (Schilling et al., 2003) so that productivity that was comparatively low in the beginning increases relatively fast with increasing knowledge (Jain, 2013). New knowledge is shared between actors and transferred between different business units of an organization (Argote, 2015). Thus, collective routines evolve (patterning), which allow for a more effective and better-aligned enactment of agility capabilities. The degree of novelty decreases through the repetitive enactment of agility capabilities, which leads to reduced learning effects (Argote, 2011; Lampel et al., 2009). Well-known and practiced agility enablers and capabilities can be transferred to following events and can proceed in a targeted manner, dealing with challenges more consciously. OA as a higher-order DC especially guides the behaviors of managers and management teams. They face particularly high requirements for aligning and leading the enactment of lower-order agility capabilities when managing first internal changes in reaction to environmental demands. Over recurring events they accumulate experience in which agility capabilities work well and where managerial action is needed to support their application and alignment. Thus, organizational attention as an important and dynamic managerial capability raises (Salvato, 2009).

Because routinized DCs are relatively stable over time (Schilke et al., 2018), we argue that the capability baseline will remain approximately the same between any two events. We are aware of concepts such as organizational forgetting (de Holan & Phillips, 2004), which might trigger opposing trajectories, but will postpone this discussion to the next section. Moreover, there are likely several factors that influence the rate of change in OA over time, but this is beyond the scope of this manuscript. Again, we will address this issue in the next section.

4. Discussion and conclusion

Our study offers a dynamic view of how agility unfolds in organizations. Although previous research enhanced our understanding about the various factors related to agility and ways to implement agility capabilities successfully (Walter, 2020), little knowledge exists on the temporal dynamics and microfoundations underlying agility. We reconceptualized OA as a second-order DC, which allows organizations to enact different agility capabilities (first-order DCs) to successfully change operational (zero-level) capabilities in a constantly changing business environment, thus facilitating company performance and competitiveness. We systematically linked research on OA and DCs by clearly embedding the OA capability and related agility capabilities within the hierarchical DC framework. Based on this understanding we offered a dual-process framework of agility building. This framework advances previous research on the implementation of OA by focusing on the enactment and improvement of existing agility capabilities. In particular, we analytically differentiated between the processes of agility realization and agility development to carve out the temporal dynamics and microfoundations underlying these two partly overlapping processes.

4.1. Limitations and implications for future research

Despite the benefits our paper presents, our work also offers different limitations. In this section we critically reflect on some limitations and outline aspects we believe researchers should consider in future work. Our proposed framework on the dynamics of agility building outlined in Figure 2 and detailed in Figures 3 and 4 provides, by necessity, a simplification of a complex phenomenon. To our knowledge, our paper is the first to theorize on the processes related to agility building from a DC perspective. Thus, a focus on core factors underlying the realization and development processes of agility was necessary to offer a clear line of argument and to address parsimony—a key factor in high-quality theory building (Suddaby, 2010; Whetten, 1989). For example, to illustrate how different first-order agility capabilities interact with second-order OA capability, we leveraged the highly-cited agility capability taxonomy proposed by Zhang and Sharifi (1999). Yet, we also highlighted work suggesting other agility capabilities in the theoretical foundations and believe that future researchers must elaborate more deeply on central agility capabilities. Likewise, we want to

clearly state we leveraged the chosen representations in Figures 3 and 4 for illustrative purposes only. That said, both the agility capabilities included and the process trajectories presented are of exemplary nature and were introduced to make our theoretical derivations more comprehensible. Neither figure is designed to indicate an approach for measuring OA or different agility capabilities.

While we offer the first valuable insight in the processual dynamics of agility, this should only be seen as a starting point for further research on temporal dynamics. We agree with scholars from a practice-based perspective who argued that DCs as collective routines are produced and recreated through actors' performances (enactment) and patterning (development of understanding) processes (e.g., Dionysiou & Tsoukas, 2013; Turner & Rindova, 2018). Following this line of argumentation, organizational capabilities based on routines (such as OA) can neither exist nor be improved without organizational actors. Moreover, if organizational routines are streams of action that come into being through their performance (Wenzel et al., 2020), this will always involve temporal dynamics. As such, we encourage future researchers to leverage our theorizing to engage in a deeper investigation of the temporal and microfoundational factors shaping OA.

For example, we highlighted the key role managers play in the capability development process (e.g., Helfat & Martin, 2015; Tripsas & Gavetti, 2000). Teece et al. (2016) argued that managers can support the successful development of an agile organization. Similarly, Schoemaker et al. (2018) confirmed that strong strategic leadership from top management is a crucial component during capability development. We believe that dynamic managerial capabilities as a microfoundation of OA are an important topic to investigate. DC research focuses primarily on the cognitive, affective, and behavioral capabilities of top managers that underlie organizational DCs (e.g., Adner & Helfat, 2003; Helfat & Peteraf, 2015; Hodgkinson & Healey, 2011). Yet, Mahringer and Renzl (2018, p. 71) recently suggested focusing on the specific role of middle managers to supersede top management as "lonely heroes" in the capability framework. As such, further research on the role of diverse management levels in the agility capability building process would advance the current understanding of the respective areas of responsibility and potential influence. Moreover, because organizational members at all hierarchical levels increasingly operate in teams,

investigating the importance of DCs of key groups (e.g., top management teams) might be another fruitful area for better understanding the microfoundations of OA (e.g., Friedman et al., 2016; Martin, 2011).

Next, when presenting our framework on the development of agility (see Figure 4) we leveraged a few simplifications that merit more detailed investigations. In particular, we built upon a rather positive view when offering our arguments for learning through repetitive events. First, when explaining learning from experience as part of agility capability building, we argued in favor of a stable trajectory of the AL between two environmental change events because agility capabilities were defined as DCs. DC research argues that DCs are routines, which are relatively stable over time. However, we are aware of phenomena such as organizational forgetting (Easterby-Smith & Lyles, 2011) and, as such, we encourage researchers to focus on factors that might hinder rather than stabilize trajectories over time. We believe a more nuanced focus on event characteristics may offer helpful guidance. Morgeson et al. (2015) proposed event system theory as an approach for clustering events and their consequences based on the characteristics of event strength, space, and time. For example, long breaks between two events may trigger a degeneration of DCs, as involved actors might change.

Moreover, we implicitly focused on learning through successful capability realization when arguing how learning from experience occurs. Yet, we believe that organizations can also learn from situations in which they fail to reorganize their operational capabilities in a way that supports ongoing superior performance. Various scholars also demonstrate that organizational entities can learn from setbacks and failures (e.g., Ariño & De La Torre, 1998; Rauter et al., 2018). Research on entrepreneurship especially highlights the role of (entrepreneurial) learning from failure (e.g., Cope, 2011; Lattacher & Wdowiak, 2020). Diving deeper into how unsuccessful capability realization is related to learning might offer additional insights on OA development.

Finally, we solely focused on learning through the first-hand experience of change events. Yet, we believe that deliberate learning mechanism (Zollo & Winter, 2002) could complement OA development in a meaningful way. For example, using specific interventions might help maintain agility between change events. Further, an analysis of the interplay between experience-

based and deliberate learning on OA building thus constitutes another fruitful topic for future elaboration.

4.2. Methodological implications

As mentioned above, most literature on agility is conceptual in nature. Empirical work has mainly applied observational designs and analyzed cross-sectional data. Such methods are not well suited to capture and explore temporal dynamics and organizational processes (Spector & Meier, 2014). Accordingly, and based on our call for more research on the dynamics of OA, we also call for the application of time- and context-sensitive research designs, which allow gathering detailed data on collective actions that constitute OA. We echo Teece's (2012) sentiment that in-depth qualitative research might be a powerful tool to reveal fresh insight about the processes underlying DCs. This is in line with the general recommendation for using qualitative, open-ended inquiries for investigating new phenomena in nascent fields (Edmondson & McManus, 2007). Social science offers a broad range of qualitative methods that allow scholars to engage "with the everyday realities of organizational life" (Feldman & Orlikowski, 2011, p. 1249), such as case studies (Eisenhardt, 1989), ethnographic approaches (Van Maanen, 1979), and action research (Eden & Huxham, 1996). Similarly, quantitative research offers various approaches to gather and analyze longitudinal and process-related data (Spector & Meier, 2014), such as social network analysis (Park et al., 2020) and diary methods (Bolger et al., 2003).

4.3. Implications for practice

Current conceptualizations of OA typically focus on the implementation of agility capabilities and the role of fundamental capability reconfigurations to major changes. Our theorizing provides several implications on how organizations might manage the realization of agility to adopt their operational capabilities to demands arising from an ever-changing business environment. For instance, organizations acting in highly uncertain environments should actively engage with their environment to recognize opportunities for enhancing their competitiveness. This calls for tools that allow the integration of external knowledge, even knowledge with a rather low perception threshold. Mahringer and Renzl (2018) argued that instruments such as customer feedback forms, market surveys, and communities of practice with external participants might be applicable. Moreover, we highlighted the role of microfoundations for successful OA building.

Thus, organizations must be aware of the crucial role individuals play in the development and application of agility. Higher-level managers should actively monitor when and how agility capabilities are leveraged to change operational capabilities. They play a vital role in the implementation of agility enablers as they are usually responsible for the allocation of resources. Moreover, they might consider the use of simulations and trainings to obtain acquired agility capabilities. Frontline employees and lower- and middle-level managers play key roles in sensing minor changes (because of their direct customer contact) and the way agility capabilities and learning practices are enacted. Therefore, companies working in a very uncertain environment need to support their employees by offering adequate organizational conditions.

References

- Adner, R., & Helfat, C. E. (2003). Corporate effects and dynamic managerial capabilities. *Strategic Management Journal*, 24(10), 1011-1025.
- Agarwal, R., & Selen, W. (2009). Dynamic capability building in service value networks for achieving service innovation. *Decision Sciences*, 40(3), 431-475.
- Ambrosini, V., & Bowman, C. (2009). What are dynamic capabilities and are they a useful construct in strategic management?. *International Journal of Management Reviews*, 11(1), 29-49.
- Annosi, M. C., Martini, A., Brunetta, F., & Marchegiani, L. (2020). Learning in an agile setting: A multilevel research study on the evolution of organizational routines. *Journal of Business Research*, 110, 554-566.
- Ansoff, H. I. (1975). Managing strategic surprise by response to weak signals. *California Management Review*, 18(2), 21-33.
- Antunes, H. de J. G., & Pinheiro, P. G. (2020). Linking knowledge management, organizational learning and memory. *Journal of Innovation & Knowledge*, 5(2), 140-149.
- Aravindraj, S., Sudheer, A., Vinodh, S., & Anand, G. (2013). A mathematical model to evaluate the role of agility enablers and criteria in a manufacturing environment. *International Journal of Production Research*, 51(19), 5971-5984.
- Arbussa, A., Bikfalvi, A., & Marquès, P. (2017). Strategic agility-driven business model renewal: The case of an SME. *Management Decision*, 55(2), 271-293.
- Argote, L. (2011). Organizational learning research: Past, present and future. *Management Learning*, 42(4), 439-446.
- Argote, L. (2015). Knowledge transfer and organizational learning. In K. Kraiger, J. Passmore, N. Rebelo dos Santos, & S. Malvezzi (Eds.), *The Wiley Blackwell Handbook of the Psychology of Training, Development, and Performance Improvement* (pp.154-170). John Wiley & Sons.
- Argote, L., & Ingram, P. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes*, 82(1), 150-169.
- Argote, L., & Miron-Spektor, E. (2011). Organizational learning: From experience to knowledge. *Organization Science*, 22(5), 1123-1137.
- Argote, L., & Ren, Y. (2012). Transactional memory systems: A microfoundation of dynamic capabilities. *Journal of Management Studies*, 49(8), 1375-1382.
- Ariño, A., & De La Torre, J. (1998). Learning from failure: Towards an evolutionary model of collaborative ventures. *Organization Science*, 9(3), 306-325.
- Augier, M., & Teece, D. J. (2007). Dynamic capabilities and multinational enterprise: Penrosean insights and omissions. *Management International Review*, 47(2), 175-192.
- Bapuji, H., & Crossan, M. (2004). From questions to answers: Reviewing organizational learning research. *Management Learning*, 35(4), 397-417.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Bessant, J., Francis, D., Meredith, S., Kaplinsky, R., & Brown, S. (2001). Developing manufacturing agility in SMEs. *International Journal of Technology Management*, 22(1-3), 730-756.
- Bingham, C. B., Heimeriks, K. H., Schijven, M., & Gates, S. (2015). Concurrent learning: How firms develop multiple dynamic capabilities in parallel. *Strategic Management Journal*, 36(12), 1802-1825.
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, 54(1), 579-616.
- Brown, J. L., & Agnew, N. M. (1982). Corporate agility. *Business Horizons*, 25(2), 29-33.
- Brown, S., & Bessant, J. (2003). The manufacturing strategy-capabilities links in mass customisation and agile manufacturing: An exploratory study. *International Journal of Operations & Production Management*, 23(7), 707-730.

- Cant, R. P., & Cooper, S. J. (2010). Simulation-based learning in nurse education: Systematic review. *Journal of Advanced Nursing*, 66(1), 3-15.
- Carleton, R. N. (2016). Into the unknown: A review and synthesis of contemporary models involving uncertainty. *Journal of Anxiety Disorders*, 39, 30-43.
- Carleton, R. N., Norton, M. P. J., & Asmundson, G. J. (2007). Fearing the unknown: A short version of the Intolerance of Uncertainty Scale. *Journal of Anxiety Disorders*, 21(1), 105-117.
- Cegarra-Navarro, J.G., & Martelo-Landroguez, S. (2020). The effect of organizational memory on organizational agility. *Journal of Intellectual Capital*, 21(3), 459-479.
- Chakravarty, A., Grewal, R., & Sambamurthy, V. (2013). Information technology competencies, organizational agility, and firm performance: Enabling and facilitating roles. *Information Systems Research*, 24(4), 976-997.
- Cho, H., Jung, M., & Kim, M. (1996). Enabling technologies of agile manufacturing and its related activities in Korea. *Computers & Industrial Engineering*, 30(3), 323-334.
- Collis, D. J. (1994). Research note: How valuable are organizational capabilities? *Strategic Management Journal*, 15(1), 143-152.
- Cope, J. (2011). Entrepreneurial learning from failure: An interpretative phenomenological analysis. *Journal of Business Venturing*, 26(6), 604-623.
- Cornelissen, J. (2017). Editor's comments: Developing propositions, a process model, or a typology? Addressing the challenges of writing theory without a boilerplate. *Academy of Management Review*, 42(1), 1-9.
- D'Aveni, R. A., Dagnino, G. B., & Smith, K. G. (2010). The age of temporary advantage. *Strategic Management Journal*, 31(13), 1371-1385.
- De Holan, P. M., & Phillips, N. (2004). Remembrance of things past? The dynamics of organizational forgetting. *Management Science*, 50(11), 1603-1613.
- Dionysiou, D. D., & Tsoukas, H. (2013). Understanding the (re)creation of routines from within: A symbolic interactionist perspective. *Academy of Management Review*, 38(2), 181-205.
- Dosi, G., Faillo, M., & Marengo, L. (2008). Organizational capabilities, patterns of knowledge accumulation and governance structures in business firms: An introduction. *Organization Studies*, 29(8-9), 1165-1185.
- Dosi, G., Nelson, R. R., & Winter, S. G. (2000). Introduction: The nature and dynamics of organizational capabilities. In G. Dosi, R. R. Nelson, & S. G. Winter (Eds.), *The nature and dynamics of organizational capabilities* (pp. 1-22). Oxford University Press.
- Doz, Y., & Kosonen, M. (2008). The dynamics of strategic agility: Nokia's rollercoaster experience. *California Management Review*, 50(3), 95-118.
- Doz, Y., & Kosonen, M. (2011). Nokia and strategic agility: A postscript. *California Management Review*, 53(4), 154-156.
- Easterby-Smith, M., & Lyles, M. A. (2011). The evolving field of organizational learning and knowledge management. In M. Easterby-Smith & M. A. Lyles (Eds.), *Handbook of organizational learning and knowledge management* (2nd ed., pp. 1-20). John Wiley & Sons.
- Eden, C., & Huxham, C. (1996). Action research for management research. *British Journal of Management*, 7(1), 75-86.
- Edmondson, A. C., & McManus, S. E. (2007). Methodological fit in management field research. *Academy of Management Review*, 32(4), 1246-1264.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532-550.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they?. *Strategic Management Journal*, 21(10-11), 1105-1121.
- Fayez, S., Zutshi, A., & O'Loughlin, A. (2017). Understanding and development of supply chain agility and flexibility: A structured literature review. *International Journal of Management Reviews*, 19(4), 379-407.
- Feldman, M. S., & Orlikowski, W. J. (2011). Theorizing practice and practicing theory. *Organization Science*, 22(5), 1240-1253.
- Felin, T., Foss, N. J., Heimeriks, K. H., & Madsen, T. L. (2012). Microfoundations of routines and capabilities: Individuals, processes, and structure. *Journal of Management Studies*, 49(8), 1351-1374.
- Felipe, C. M., Roldán, J. L., & Leal-Rodríguez, A. L. (2016). An explanatory and predictive model for organizational agility. *Journal of Business Research*, 69(10), 4624-4631.
- Friedman, Y., Carmeli, A., & Tishler, A. (2016). How CEOs and TMTs build adaptive capacity in small entrepreneurial firms. *Journal of Management Studies*, 53(6), 996-1018.

- Gaertner, C., Duschek, S., Ortmann, G., Schüßler, E., Müller-Seitz, G., & Hülsbeck, M. (2017). Emergence of responsiveness across organizations, networks, and clusters from a dynamic capability perspective. *Journal of Competences, Strategy & Management*, 9, 7-32.
- Giachetti, R. E., Martinez, L. D., Sáenz, O. A., & Chen, C. S. (2003). Analysis of the structural measures of flexibility and agility using a measurement theoretical framework. *International Journal of Production Economics*, 86(1), 47-62.
- Grant, R. M. (1996). Prospering in dynamically competitive environments: Organizational capability as knowledge integration. *Organization Science*, 7(4), 375-387.
- Griffin, M. A., & Grote, G. (2020). When is more uncertainty better? A model of uncertainty regulation and effectiveness. *Academy of Management Review*, 45(4), 745-765.
- Gunasekaran, A. (1998). An integrated product development-quality management system for manufacturing. *The TQM Magazine*, 10(2), 115-123.
- Gunasekaran, A., & Yusuf, Y. Y. (2002). Agile manufacturing: A taxonomy of strategic and technological imperatives. *International Journal of Production Research*, 40(6), 1357-1385.
- Helfat, C. E., & Martin, J. A. (2015). Dynamic managerial capabilities. *Journal of Management*, 41(5), 1281-1312.
- Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal*, 24(10), 997-1010.
- Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal*, 36(6), 831-850.
- Hodgkinson, G. P., & Healey, M. P. (2011). Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management. *Strategic Management Journal*, 32(13), 1500-1516.
- Jafari, S. M., & Amoozegar, E. (2017). Business model innovation: Exploring the role of strategic agility and organizational learning. In E. Tsui & B. Cheung (Eds.), *Proceedings of the 14th International Conference on Intellectual Capital, Knowledge Management & Organisational Learning* (pp. 104-108). Academic Conferences International Limited.
- Jain, A. (2013). Learning by doing and the locus of innovative capability in biotechnology research. *Organization Science*, 24(6), 1683-1700.
- Kim, L. (1998). Crisis construction and organizational learning: Capability building in catching-up at Hyundai motor. *Organization Science*, 9(4), 506-521.
- Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT Press.
- Konlechner, S. (2017). Organizational search, capability reconfiguration and capability re-orientation: A framework of organizational responses to perceived capability gaps. *Journal of Competences, Strategy & Management*, 9, 109-135.
- Kremser, W., & Schreyögg, G. (2016). The dynamics of interrelated routines: Introducing the cluster level. *Organization Science*, 27(3), 698-721.
- Lampel, J., Shamsie, J., & Shapira, Z. (2009). Experiencing the improbable: Rare events and organizational learning. *Organization Science*, 20(5), 835-845.
- Lattacher, W., & Wdowiak, M. A. (2020). Entrepreneurial learning from failure. A systematic review. *International Journal of Entrepreneurial Behavior & Research*, 26(5) 1093-1131.
- Lavie, D. (2006). Capability reconfiguration: An analysis of incumbent responses to technological change. *Academy of Management Review*, 31(1), 153-174.
- Lee, O. K. D., Sambamurthy, V., Lim, K. H., & Wei, K. K. (2015). How does IT ambidexterity impact organizational agility? *Information Systems Research*, 26(2), 398-417.
- Lin, B. W. (2004). Original equipment manufacturers (OEM) manufacturing strategy for network innovation agility: the case of Taiwanese manufacturing networks. *International Journal of Production Research*, 42(5), 943-957.
- Lin, C., Chiu, H., & Tseng, Y. (2006). Agility evaluation using fuzzy logic. *International Journal of Production Economics*, 101(2), 353-368.
- Lu, Y., & Ramamurthy, K. R. (2011). Understanding the link between information technology capability and organizational agility: An empirical examination. *MIS Quarterly* 35(4), 931-954.
- Mahringer, C. A., & Renzl, B. (2018). Entrepreneurial initiatives as a microfoundation of dynamic capabilities. *Journal of Accounting & Organizational Change*, 14(1), 61-79.

- Margherita, A., Sharifi, H., & Caforio, A. (2021). A conceptual framework of strategy, action and performance dimensions of organisational agility development. *Technology Analysis & Strategic Management*, 33(7), 829-842.
- Martin, J. A. (2011). Dynamic managerial capabilities and the multibusiness team: The role of episodic teams in executive leadership groups. *Organization Science*, 22(1), 118-140.
- Meade, L. M., & Sarkis, J. (1999). Analyzing organizational project alternatives for Agile manufacturing processes: An analytical network approach. *International Journal of Production Research*, 37(2), 241-261.
- Meredith, S., & Francis, D. (2000). Journey towards agility: The agile wheel explored. *The TQM Magazine*, 12(2), 137-143.
- Mishra, S., Datta, S., & Mahapatra, S. S. (2013). Grey-based and fuzzy TOPSIS decision-making approach for agility evaluation of mass customization systems. *Benchmarking: An International Journal*, 20(4), 440-462.
- Montealegre, R. (2002). A process model of capability development: Lessons from the electronic commerce strategy at Bolsa de Valores de Guayaquil. *Organization Science*, 13(5), 514-531.
- Morgeson, F. P., Mitchell, T. R., & Liu, D. (2015). Event system theory: An event-oriented approach to the organizational sciences. *Academy of Management Review*, 40(4), 515-537.
- Nagel, R. N., & Dove, R. (1991). 21st Century manufacturing enterprise strategy. An industry-led view (Volume 1). Lehigh University Press.
- Narasimhan, R., Swink, M., & Kim, S. W. (2006). Disentangling leanness and agility: An empirical investigation. *Journal of Operations Management*, 24(5), 440-457.
- Nejatian, M., Zarei, M. H., Nejati, M., & Zanjirchi, S. M. (2018). A hybrid approach to achieve organizational agility. *Benchmarking: An International Journal*, 25(1), 201-234.
- Nelson, R. R., & Winter, S. G. (1982). The Schumpeterian tradeoff revisited. *The American Economic Review*, 72(1), 114-132.
- O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, 28, 185-206.
- Overby, E., Bharadwaj, A., & Sambamurthy, V. (2006). Enterprise agility and the enabling role of information technology. *European Journal of Information Systems*, 15(2), 120-131.
- Paixao, A. C., & Marlow, P. B. (2003). Fourth generation ports—a question of agility?. *International Journal of Physical Distribution & Logistics Management*, 33(4), 355-376.
- Park, S., Grosser, T. J., Roebuck, A. A., & Mathieu, J. E. (2020). Understanding work teams from a network perspective: A review and future research directions. *Journal of Management*, 46(6), 1002-1028.
- Pentland, B. T., & Feldman, M. S. (2008). Designing routines: On the folly of designing artifacts, while hoping for patterns of action. *Information and Organization*, 18(4), 235-250.
- Peteraf, M., Di Stefano, G., & Verona, G. (2013). The elephant in the room of dynamic capabilities: Bringing two diverging conversations together. *Strategic Management Journal*, 34(12), 1389-1410.
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2016). Recommendations for creating better concept definitions in the organizational, behavioral, and social sciences. *Organizational Research Methods*, 19(2), 159-203.
- Prater, E., Biehl, M., & Smith, M. A. (2001). International supply chain agility-tradeoffs between flexibility and uncertainty. *International Journal of Operations & Production Management*, 21(5/6), 823-839.
- Qin, R., & Nembhard, D. A. (2010). Workforce agility for stochastically diffused conditions: A real options perspective. *International Journal of Production Economics*, 125(2), 324-334.
- Rauter, S., Weiss, M., & Hoegl, M. (2018). Team learning from setbacks: A study in the context of start-up teams. *Journal of Organizational Behavior*, 39(6), 783-795.
- Ray, G., Barney, J. B., & Muhanna, W. A. (2004). Capabilities, business processes, and competitive advantage: Choosing the dependent variable in empirical tests of the resource-based view. *Strategic Management Journal*, 25(1), 23-37.
- Renzl, B., Mahringer, C. A., & Rost, M. (2021). Organizational agility: Current challenges and future opportunities. *Journal of Competences, Strategy & Management*, 11.
- Royer, I., & Daniel, A. (2019). Organizational routines and institutional maintenance: The influence of legal artifacts. *Journal of Management Inquiry*, 28(2), 204-224.

- Salvato, C. (2009). Capabilities unveiled: The role of ordinary activities in the evolution of product development processes. *Organization Science*, 20(2), 384-409.
- Salvato, C., & Rerup, C. (2011). Beyond collective entities: Multilevel research on organizational routines and capabilities. *Journal of Management*, 37(2), 468-490.
- Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. *MIS Quarterly*, 27(2), 237-263.
- Schilke, O. (2014). Second-order dynamic capabilities: How do they matter?. *Academy of Management Perspectives*, 28(4), 368-380.
- Schilke, O., Hu, S., & Helfat, C. E. (2018). Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research. *Academy of Management Annals*, 12(1), 390-439.
- Schilling, M. A., Vidal, P., Ployhart, R. E., & Marangoni, A. (2003). Learning by doing something else: Variation, relatedness, and the learning curve. *Management Science*, 49(1), 39-56.
- Schirmer, F., & Ziesche, K. (2010). Dynamic Capabilities: Das Dilemma von Stabilität und Dynamik aus organisationspolitischer Perspektive. In E. Barthel, A. Hanft, & J. Hasenbrook (Eds), *Integriertes Kompetenzmanagement im Spannungsfeld von Innovation und Routine* (pp. 14-41). Waxmann.
- Schoemaker, P. J. H., Heaton, S., & Teece, D. (2018). Innovation, dynamic capabilities, and leadership. *California Management Review*, 61(1), 15-42.
- Schreyögg, G., & Kliesch, M. (2006). Zur Dynamisierung Organisational Kompetenzen – „Dynamic Capabilities“ als Lösungsansatz?. *Schmalenbachs Zeitschrift für Betriebswirtschaftliche Forschung*, 58(4), 455-476.
- Senge, P.M. (1990). The leader's New Work: Building learning organizations. *Sloan Management Review*, 32(1), 7-23.
- Sharifi, H., & Zhang, Z. (1999). A methodology for achieving agility in manufacturing organisations: An introduction. *International Journal of Production Economics*, 62(1/2), 7-22.
- Sharifi, H., & Zhang, Z. (2001). Agile manufacturing in practice: Application of a methodology. *International Journal of Operations & Production Management*, 21(5/6), 772-794.
- Sharp, J., Irani, Z., & Desai, S. (1999). Working towards agile manufacturing in the UK industry. *International Journal of Production Economics*, 62(1/2), 155-169.
- Sieger, D. B., Badiru, A. B., & Milatovic, M. (2000). A metric for agility measurement in product development. *IIE Transactions*, 32(7), 637-645.
- Sindhwan, R., & Malhotra, V. (2017). A framework to enhance agile manufacturing system. *Benchmarking: An International Journal* 24(2), 467-487.
- Spector, P. E., & Meier, L. L. (2014). Methodologies for the study of organizational behavior processes: How to find your keys in the dark. *Journal of Organizational Behavior*, 35(8), 1109-1119.
- Suddaby, R. (2010). Editor's comments: Construct clarity in theories of management and organization. *Academy of Management Review*, 35(3), 346-357.
- Suddaby, R., Coraiola, D., Harvey, C., & Foster, W. (2020). History and the micro-foundations of dynamic capabilities. *Strategic Management Journal*, 41(3), 530-556.
- Tallon, P. P., Queiroz, M., Coltman, T., & Sharma, R. (2019). Information technology and the search for organizational agility: A systematic review with future research possibilities. *The Journal of Strategic Information Systems*, 28(2), 218-237.
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350.
- Teece, D. J. (2012). Dynamic capabilities: Routines versus entrepreneurial action. *Journal of Management Studies*, 49(8), 1395-1401.
- Teece, D. J. (2016). Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm. *European Economic Review*, 86, 202-216.
- Teece, D. J., & Pisano, G. (1994). The dynamic capabilities of firms: An introduction. *Industrial and Corporate Change*, 3(3), 537-556.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58(4), 13-35.
- Tripsas, M., & Gavetti, G. (2000). Capabilities, cognition, and inertia: Evidence from digital imaging. *Strategic Management Journal*, 21(10/11), 1147-1161.

- Tsoukas, H., & Chia, R. (2002). On organizational becoming: Rethinking organizational change. *Organization Science*, 13(5), 567-582.
- Turner, S. F., & Rindova, V. P. (2018). Watching the clock: Action timing, patterning, and routine performance. *Academy of Management Journal*, 61(4), 1253-1280.
- Van Maanen, J. (1979). The fact of fiction in organizational ethnography. *Administrative Science Quarterly*, 24(4), 539-550.
- Van Oosterhout, M., Waarts, E., & Van Hillegersberg, J. (2006). Change factors requiring agility and implications for IT. *European Journal of Information Systems*, 15(2), 132-145.
- Vickery, S., Droege, C., Setia, P., & Sambamurthy, V. (2010). Supply chain information technologies and organisational initiatives: Complementary versus independent effects on agility and firm performance. *International Journal of Production Research*, 48(23), 7025-7042.
- Vinodh, S., & Aravindraj, S. (2012). Agility evaluation using the IF–THEN approach. *International Journal of Production Research*, 50(24), 7100-7109.
- Vinodh, S., Devadasan, S. R., Vasudeva Reddy, B., & Ravichand, K. (2010). Agility index measurement using multi-grade fuzzy approach integrated in a 20 criteria agile model. *International Journal of Production Research*, 48(23), 7159-7176.
- Walsh, J. P., & Ungson, G. R. (1991). Organizational memory. *Academy of Management Review*, 16(1), 57-91.
- Walter, A. T. (2020). Organizational agility: Ill-defined and somewhat confusing? A systematic literature review and conceptualization. *Management Review Quarterly*, 71(2), 343-391.
- Wang, C. L., & Ahmed, P. K. (2007). Dynamic capabilities: A review and research agenda. *International Journal of Management Reviews*, 9(1), 31-51.
- Wenzel, M., Danner-Schröder, A., & Spee, A. P. (2020). Dynamic capabilities? Unleashing their dynamics through a practice perspective on organizational routines. *Journal of Management Inquiry*.
- Whetten, D. A. (1989). What constitutes a theoretical contribution?. *Academy of Management Review*, 14(4), 490-495.
- Winter, S. G. (2000). The satisficing principle in capability learning. *Strategic Management Journal*, 21(10/11), 981-996.
- Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, 24(10), 991-995.
- Yusuf, Y.Y., & Adeleye, E. O. (2002). A comparative study of lean and agile manufacturing with a related survey of current practices in the UK. *International Journal of Production Research*, 40(17), 4545-4562.
- Zhang, Z., & Sharifi, H. (2000). A methodology for achieving agility in manufacturing organisations. *International Journal of Operations & Production Management*, 20(4), 496-513.
- Zhang, Z., & Sharifi, H. (2007). Towards theory building in agile manufacturing strategy: A taxonomical approach. *IEEE Transactions on Engineering Management*, 54(2), 351-370.
- Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339-351.

Author biographies

Anna-Theresa Walter is a doctoral candidate at the Chair of Business Management, esp. Organization at the German University of Excellence TU Dresden and awarded an ESF doctoral scholarship. In the context of her Ph.D. project, her research focuses on organizational agility, its conceptualization, development and barriers in its emergence.

Sebastian Raetze is a postdoctoral researcher in the Chair of Organization and Corporate Governance at Brandenburg University of Technology, Germany. He received his Ph.D. in Business Administration from the German University of Excellence TU Dresden. His research focuses on how organizational entities at different levels of analysis effectively deal with adversity; with a special emphasis on the concepts of resilience and adaptation at the team level of analysis.

Acknowledgements

This research was funded by the European Social Fund and co-financed by tax funds based on the budget decided by the members of the Saxon State Parliament.

License

Creative Commons Non Commercial CC BY-ND: This article is distributed under the terms of the Creative Commons Attribution-NoDerivatives 4.0 International (CC BY-ND 4.0) License:

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

