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The Resilient Retail Entrepreneur: Dynamic Capabilities for Facing Natural Disasters

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The Resilient Retail Entrepreneur: Dynamic Capabilities for Facing Natural Disasters

Abstract

Purpose – This paper investigates the formative dimensions of organisational resilience - namely dynamic capabilities (DCs) and social capital - displayed by retail entrepreneurs' in the face of natural disasters (i.e. the 2012 Emilia earthquake). It evaluates social capital and the various types of DCs that support small entrepreneurs' resilience during three temporal units of analysis: before the earthquake; during the emergency period; during the recovery process.

Design/methodology/approach – The study was performed by applying a qualitative approach based on two focus groups and a double set of semi-structured interviews administered to a sample of eight small retail entrepreneurs hit by the 2012 Emilia earthquake. Content analysis was then applied.

Findings – The findings show that DCs and social capital are instrumental to enhancing organizational resilience; moreover the contribution of each category of DCs (reconfiguration, leveraging, sensing and interpreting, learning and knowledge integration) and social capital to entrepreneurs' resilience changes according to the temporal phase of the natural disaster under analysis.

Research limitations/implications – This study will provide small retailer entrepreneurs and public authorities with useful insights on how DCs and social capital can practically support recovery paths at different times in the occurrence of a natural disaster.

Originality/value – This study contributes to the scientific debate on organisational resilience in disaster management, studying it through the lens of DCs and social capital, and analysing the role of different types of DCs in developing entrepreneurs' resilience during the various periods of a natural disaster. Moreover, it contributes by applying the concepts of resilience and DCs to a poorly investigated entrepreneurial context such as the retail one.

Keywords – Organisational Resilience, Dynamic Capabilities, Social Capital, Natural Disasters, Earthquake, Small Retail Entrepreneurs, Content Analysis

Paper type – Research paper

Introduction

Natural disasters pose unpredictable and significant threats to the incumbency and continuity of enterprises, thus directly affecting their ability to offer products and services to customers.

As such, for entrepreneurs to ensure the continuity, sustainability, and future success of their businesses, they must be resilient. However, resilience is a latent characteristic, since it is not possible to evaluate the 'resilience potential' of an entrepreneurial firm until it displays a resilient response to a disruptive event (Linnenluecke, 2017). In the firm context, this paper adopts the organizational resilience view, which is a "firm's ability to effectively absorb, develop situation-specific responses to, and ultimately engage in transformative activities to capitalize on disruptive surprises that potentially threaten organization survival" (Lengnick-Hall *et al.*, 2011, p. 244). However, whether and how organizations can demonstrate resilience in response to environmental shocks and their capacities that lead to that resilience are still debated in the business and management resilience literature

(Linnenluecke, 2017). As empirical research suggests, responding to adverse events depends on the entrepreneurs' ability to reorganize (Comfort, 1994) or mobilize (Yang and Hsieh, 2013) resources and capabilities. Further, Lengnick-Hall and Beck (2005) argue that resilience capacity is a multi-dimensional construct based on three organizational components: cognitive (i.e. sense-making, ideological identity), behavioural (i.e. varied action inventory, functional habits), and contextual capabilities (i.e. social capital, network of external resources). Adding to this debate, the authors propose adopting dynamic capabilities (DCs) (Teece *et al.*, 1997), defined as the capacities of an organization to purposefully create, extend, or modify its resource base (Helfat and Peteraf, 2009), similar to a lens through which the cognitive and behavioural capabilities that trigger organizational resilience from an entrepreneurial perspective are studied. Besides, to further contribute to the study of organizational resilience as a formative construct, this study draws on social capital theory (Dubini and Aldrich, 1991) to also include contextual capabilities (Lengnick-Hall, 2005). This enable us to conceptualize the capability to cultivate relationships based on trust and reciprocity, with individuals that can help when needed, particularly when a natural disaster happens.

In other words, this paper investigates retail entrepreneurs' ability to react to natural disasters (i.e. an earthquake) and display resilience, by analysing its formative elements (i.e. different types of DCs, as well as social capital) over three temporal units of analysis: before the earthquake, during it, and during the recovery process.

Our research questions are as follows. Since resilience is a latent characteristic that manifests as an ongoing process only when a crisis or disaster occur, how can resilience be built in advance? How can DCs and social capital help retail entrepreneurs respond to an adverse event? During which phases of a natural disaster are DCs activated to trigger resilience, and when do the effects of social capital manifest?

To answer the above questions, this study leverages the natural experiment of the 2012 Emilia earthquake to explore the formative dimensions of resilience, to understand whether some of the key aspects of DCs and social capital can be used to describe the determinants of resilience during natural disasters. To this effect, the narratives of several small retail entrepreneurs affected by the earthquake that hit the Emilia region in northern Italy in 2012 were collected and analysed. In this study, the entrepreneur is defined as the founder, owner, and manager of a small firm (Zhao *et al.*, 2010), choosing retail as the analysis context due to the important role it plays in a community hit by a natural disaster: retailers can contribute to building community resilience and reaching a 'new normality' by providing a community with crucial goods and services (Liu *et al.*, 2012; Peterson *et al.*, 2010). However, the DC perspective has rarely been applied to the retail sector, with some exceptions (Conant *et al.*, 1993; Marcus and Anderson, 2006; McGee and Peterson, 2000). Moreover, the analysis of how small retail entrepreneurs mobilize their capabilities in the face of

adverse events is limited in the literature, and the resilience concept has been rarely applied or studied for the retail sector (Dolega and Celińska-Janowicz, 2015).

This paper thus contributes to the extant literature by using the DC perspective, specifically the studies rooted in evolutionary theory (Teece, 2012; Zollo and Winter, 2002), as a perspective for studying organizational resilience to natural disasters. In doing so, this study first aim is to contribute to the main debate on resilience (Kantur and İşeri-Say, 2012, 2015; Lengnick-Hall and Beck, 2003; Linnenluecke, 2017) by exploring the extent to which the application of a DC perspective can help understand retail entrepreneurs' capabilities to survive crises and display resilience. Second, the authors determine that different categories of DCs, along with social capital, show varying degrees of importance in generating resilience, depending on the particular disaster phase that retailers are facing. This study contributes to the literature by providing evidence that the organizational impact of an adverse event should be evaluated according to time phases. As a result, different sets of capabilities are needed to respond to the changing environment before, during, and after the adverse event (Yang and Hsieh, 2013). Finally, our paper contributes to understanding the theoretical and entrepreneurial implications of applying organizational resilience from a DC perspective to the retail sector.

The article proceeds as follows. The next section presents the theoretical background, first focusing on the concept of resilience and its evolution and contextualizing it for natural disasters affecting the retail sector. Second, the DC perspective and social capital are presented and discussed in relation to resilience. The third section describes the proposed methodology: a qualitative approach based on content analysis. The fourth section outlines and discusses the results. The study's implications, limitations and potential avenues for future research are also presented.

Literature review

Resilience

Resilience is considered a key feature in the responses individuals, systems, or organizations exhibit to adverse and unexpected events. The term has been widely used in various disciplines due to its multifaceted nature, leading to context-dependency and fragmentation in resilience research (Linnenluecke, 2017). Holling (1973) introduced the use of the concept in ecological domain, defining it as the ability of a system to return to equilibrium after a disturbance. Additionally, resilience conceptualization was also used in socio-ecological systems (Walker *et al.*, 2004), individual and organizational psychology (Powley, 2009), crisis and disaster management (Paton and Johnson, 2001), high-reliability organizations (Weick, 1993; Weick and Sutcliffe, 2001), supply chain management (Sheffi, 2005), and strategic management (Kantur and İşeri-Say, 2012).

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Its multidisciplinary development allowed the concept of resilience to evolve: not only do resilient systems display an adaptive capacity, but they may also reach new equilibriums in new environments and learn in response to disruptions (Carpenter *et al.*, 2001). Consequently, such systems do not play a passive role in the operating environment but rather continuously develop and make use of new knowledge, resulting in better preparedness for turbulences. However, at the organizational level, resilience cannot be simply seen as the ability to recover from unexpected and adverse situations as to return to the previous state (Mallak, 1998; Sutcliffe and Vogus, 2003). In line with Weick (1993), Lengnick-Hall and Beck (2003) conceptualized resilience as the ability to turn challenges into opportunities, and thereby improve performance. In their view, organizational resilience is a process rather than a static state, and goes beyond mere re-establishment to the sensing and seizing of new opportunities (Coutu, 2002; Lengnick-Hall and Beck, 2003, 2005).

This processual view of resilience is consistent with studies (Kuratko and Audretsch, 2009; Zahra, 2003) that consider entrepreneurship itself as a processual phenomenon not strictly limited to the creation of new businesses. Entrepreneurship also encompasses the process of strategic renewal for existing businesses, which refers to changes that “alter pre-existing relationships within the organization or between the organization and its external environment and in most cases will involve some sort of innovation” (Sharma and Chrisman, 1999, p. 19). The renewal or even rebirth of an existing organization after a natural disaster have several common characteristics with the strategic renewal process, as described by the corporate (e.g. Zahra, 2003) and strategic entrepreneurship literature (e.g. Kuratko and Audretsch, 2009). However, there is another point to consider regarding resilience studies as follows. Drawing on social capital theory, the disaster management literature states the importance of relational ties in facing the emergency and the subsequent recovery process. Therefore, organizational resilience also depends on the capability to cultivate relationships based on trust and reciprocation within networks of individuals (parents, friends, commercial networks) that can help when need arises.

Moreover, even if some authors suggest that resilience “implies pre-event readiness for a disruptive event [and] post-event response for appropriate and timely recovery” (Kantur and İşeri-Say, 2012, p. 764), the majority of literature does not provide empirical support for the impact of timing in conceptualizing resilience.

Resilience to natural disasters in the retail sector

Natural disasters can have a direct effect on an organization’s ability to supply finished goods onto a market and provide critical services to its customers (Bhamra *et al.*, 2011). In this context, some studies have underlined the importance of the retail sector and consumption habits in achieving a ‘new normality’ after a natural disaster (Kennett-Hensel *et al.*, 2012; Liu *et al.*, 2012). In the case of

1 an earthquake, consumers show a strong desire to reengage with their normal day-to-day pre-
2 earthquake shopping behaviours as an expression of personal control over event unpredictability
3 (Ballantine *et al.*, 2014). In other words, individuals seek to revert to their previous patterns of
4 consumption to regain a sense of normality and safety. Unsurprisingly, studies have found that, one
5 year after a natural disaster, the retail sector is usually the first to complete the recovery process
6 (Pearson *et al.*, 2011). However, empirical research has also revealed that retail is the industry most
7 affected by natural disasters, as immediately after a disruptive event, there is a high ratio of closure
8 among retail shops (Wasileski *et al.*, 2011) and a general decrease in the number of small retailers
9 (Chang, 2010). The sector's vulnerability is linked to both the direct damage to properties,
10 buildings, and goods, and to the indirect damage due to the negative effects of consumption
11 adjustments. For example, during the post-disaster recovery process of Hurricane Katrina,
12 customers switching to less expensive goods and an increase in 'do-it-yourself' solutions were
13 registered (Liu, 2011). Moreover, a high-impact event possibly reduces the pace of recovery and the
14 ability of a wide number of retailers to regain a good position on the market immediately after the
15 natural disaster. This is also due to the population reconfiguration after a natural disaster:
16 individuals tend to leave the damaged territories and return after a longer period.

17 Resilience has been researched in urban retail studies as a dynamic and evolutionary process, rather
18 than a property or characteristic (Martin, 2012; Wrigley and Dolega, 2011). The resilience of urban
19 retail is considered important not only at the urban system level, but also in terms of the contribu-
20 tion of individual shops to the change. For instance, Erkip *et al.* (2014, p. 113) state that "the viabil-
21 ity and vitality of an urban core can only be sustained through the resilience of different retailers".
22 For retail resilience, variety seems of particular importance in terms of retail offer, ownership, size
23 etc. Although spontaneous reorganization may be suggested in ecological systems, the extent to
24 which self-organizing behaviour can induce anticipatory and/or reactive reorganization in social or
25 economic systems has been questioned (Martin, 2012). This fact suggests the potential effectiveness
26 of controlled reorganization with the support of institutional actors (Dolega and Celińska-Janowicz,
27 2015).

28 *Dynamic capabilities and resilience*

29 In their seminal work, Teece *et al.* (1997) considered DC a special type of capability that integrates,
30 builds, and reconfigures internal and external resources to address rapidly changing environments.
31 Although the linkages with the resource-based view are obvious, the aim of the DC theory is
32 primarily shifting the literature debate beyond the static nature of the resource-based approach. Its
33 focus is rather on the mechanisms through which organizations accumulate capabilities and the
34 respective contingent factors that may affect the process. Unsurprisingly, a consistent body of
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1 literature grounded the DC concept on an evolutionary economics perspective, the foundations of
2 which lay in learning mechanisms such as repeated practice, past mistakes, and experience
3 (Eisenhardt and Martin, 2000), and on organizational processes shaped by firms' assets and their
4 past evolutionary paths (Barreto, 2010).
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8 However, the organizational ability to face changes and even shocking external events like crises
9 and natural disasters cannot be completely related to the functioning of a DC mechanism. For ex-
10 ample, Zollo and Winter (2002) argue that firms, even when DCs are absent or scarce, may make
11 changes as a result of ad-hoc decisions or even luck. Although the DCs perspective cannot encom-
12 pass all managerial responses to change, it currently provides the most valuable framework for new
13 value creation and continuation for enterprises in turbulent and dynamic environments (Lin and Wu,
14 2014; Teece *et al.*, 1997). In such environments, DCs enable the reconfiguration of existing re-
15 sources and capabilities, so that firms sustain a competitive advantage (Teece, 2007). Helfat *et al.*
16 (2009) argue that DCs can assist firms in achieving the necessary evolutionary fitness (i.e. a firm's
17 sustainability capacity when unexpected environmental changes occur).
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21 By building on these studies, the authors argue that an entrepreneur's ability to effectively sense,
22 seize, and face natural disasters can be fruitfully associated with DCs. Consequently, this study con-
23 tributes to the debate on how and which DCs can trigger organizational resilience. Gittell *et al.*
24 (2006, p. 303) define resilience as "a dynamic capacity of organizational adaptability that grows and
25 develops over time" in a form sufficiently flexible to positively face unexpected events. Consistent
26 with the dynamic perspective, Lengnick-Hall *et al.* (2011) argue that organizational resilience is
27 embedded in a set of individual-level abilities and "organizational routines and processes by which
28 a firm conceptually orients itself, acts decisively to move forward, and establishes a setting of di-
29 versity and adjustable integration that enables it to overcome the potentially debilitating conse-
30 quences of a disruptive shock" (p. 244). The adoption of a DC perspective corresponds with the
31 processual perspective of organizational resilience, which looks beyond re-establishment as to in-
32 clude the employment of capabilities adaptable to changing circumstances and the ability to recog-
33 nize new opportunities and move forward (Coutu, 2002; Lengnick-Hall and Beck, 2003, 2005).
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37 The authors believe that the adoption of a DC approach offers a viable perspective to studying how
38 resilience is achieved by small entrepreneurial firms. Despite the growing interest in DCs and their
39 relationship with entrepreneurial processes, relatively few studies have explicitly identified which
40 types of firm are more likely to gain advantages from DCs and why (Barreto, 2010). Attention has
41 been hitherto directed towards large firms and multinational enterprises (Teece, 2007), with
42 relatively limited consideration given to small entrepreneurial ventures (Zahra *et al.*, 2006).
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44 However, Teece (2012) argues that the smaller an organization, the more its capabilities depend on
45 one or few particular individuals (Ambrosini and Bowman, 2009). In firms where the main
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1 decision-maker is also the entrepreneur, a single individual actively develops and applies DCs
2 (Woldesenbet *et al.*, 2012) to sense and seize opportunities, face threats, and evaluate and prescribe
3 changes in the configuration of resources (Teece, 2012).
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6 DCs perspective seems to be also consistent with some of the specificities of the entrepreneurial
7 process. Entrepreneurial capabilities are defined as “the ability to identify opportunities and develop
8 the resource base needed to pursue the opportunities” (Arthurs and Busenitz, 2006, p. 199), and
9 according to Woldesenbet *et al.* (2012), they are intrinsically dynamic since they interact in
10 complex and subtle ways with the environment. As such, DCs and entrepreneurial capabilities
11 coexist in supporting environmental changes so that “it would be difficult to delineate where an
12 entrepreneurial capability ends and a dynamic capability begins” (Woldesenbet *et al.*, 2012, p. 495).
13 Further, this study argues that the DC theoretical setting grounded in an evolutionary perspective,
14 offers adequate latitude to explain entrepreneurial firms’ capacity to respond, adapt, and transform
15 resources in cases of business disruption and, along with social capital, explain their recovery
16 process after a natural disaster. Consequently, the authors believe that a DC perspective could also
17 be adequately adopted to study the activation of resilience for small firms.
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27 *Social capital and resilience*

28 While DCs offer a viable theoretical background to analysing the cognitive and behavioural capa-
29 bilities that constitute organizational resilience, social capital theory helps conceptualize the contex-
30 tual dimensions of resilience (Lengnick-Hall *et al.*, 2005). Social capital has been generally defined
31 as “networks and resources available to people through their connections to others” (Aldrich, 2012,
32 p. 2), which connections offer information, enable the emergence of trustworthiness, and provide
33 access to resources. In the entrepreneurship literature, social capital is considered a contextual sup-
34 plement and key asset for small firms (Lee and Jones, 2015; Stam *et al.*, 2014): through social capi-
35 tal, entrepreneurs can identify opportunities and mobilize resources (Adler and Kwon, 2002).
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38 Moreover, social capital is based on three underlying dimensions: structural, cognitive, and rela-
39 tional (Nahapiet and Ghoshal, 1998). Structural social capital concerns the nature of the entrepre-
40 neur’s social network based on size, density, and diversity. Cognitive social capital relies on actors
41 having different perceptions on their networks. Finally, relational social capital consists of actual
42 relationships or bonds among actors who rely on one another. Therefore, it is concerned with trust,
43 reciprocity, mutual obligations, and expectations. Recently, a symbolic dimension emerged as well,
44 where networks and social relationships accompany stories, narratives, values, or meanings
45 (Nordstrom and Steier, 2015).
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54 In this study social capital is considered as an entrepreneur’s personal network, based on the family
55 members, friends, and business contacts with whom the entrepreneur is directly connected and the
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1 indirect relations between them (Dubini and Aldrich, 1991). Within the academic literature, social
2 capital has been considered as a critical part of resilience to natural disasters both at the community
3 (Aldrich, 2012; Aldrich and Meyer, 2015) and organizational level (Lengnick-Hall *et al.*, 2011). En-
4 trepreneurs with cohesive and flexible relational patterns before the crisis (Kahn *et al.*, 2003)
5 proved well situated to draw on informal insurance after a disaster. In this respect, Powley (2009)
6 argues that relational redundancy plays an important role in favouring the activation of relational
7 networks in case of disruptive events. Therefore, immediate and low-cost access to extensive re-
8 source networks can be considered contextual resilience capability (Lengnick-Hall *et al.*, 2011).
9 This is a key element in creating contextual conditions that support the development of resilience to
10 adverse events and positively affect the recovery timing and process, especially for small independ-
11 ent entrepreneurs (Asgary *et al.*, 2012). In fact, resources and capabilities secured by socially-
12 related networks extend the range of feasible actions, thus stimulating innovation and resilience
13 (Lengnick-Hall and Beck, 2003, 2005).
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26 **Methodology**

27 *Natural experiment: the 2012 Emilia earthquake*

28 The 2012 Emilia earthquake acts as a natural experiment through which the resilience of local small
29 retail entrepreneurs is tested. The earthquake hit in two waves: the first was on 20 May 2012
30 (magnitude M_L 5.9) and the second on 29 May 2012 (M_L 5.8). The earthquake led to 28 deaths and
31 300 wounded, 45,000 individuals left homeless, with an estimate of the damages at EUR 13 billion
32 (Regione Emilia Romagna, 2017a). The crater area included 33 municipalities, with a total of
33 550,000 residents and 66,000 local productive units, and minor damages were also registered in
34 about 50 other neighbouring municipalities.
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41 Almost EUR 4 billion have been granted for the reconstruction of private homes and businesses, in
42 addition to the over EUR 800 million spent in the first emergency phase and more than EUR 1
43 billion liquidated by private insurances (Regione Emilia Romagna, 2017a).
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46 The earthquake affected one of the country's most productive and densely industrialized areas,
47 which accounts for 2% of the Italian gross domestic product, with a high concentration of
48 agricultural, industrial, and handicraft production units. In the six months after the earthquake, more
49 than 40,000 workers had resorted to wage guarantee funds and compensation schemes due to the
50 closure of their firms. The most affected sectors were manufacturing (especially biomedical and
51 textile) and retail (Regione Emilia Romagna, 2012). In the five years after the earthquake, the
52 restoration of damaged buildings and equipment, and temporary relocation of assets and inventory
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1 reached EUR 1,748 million (Regione Emilia Romagna, 2017a). As far as commercial business
2 activities were concerned, 6,893 units were involved in the reconstruction process, of which 2,137
3 belong to the retail sector. Currently, about half of the reconstruction sites have been completed
4 (Regione Emilia Romagna, 2017b).

5 The consequences of the earthquake were amplified by various factors. First, the territory was not
6 classified as having a high seismic potential. As a result, the earthquake was unexpected. Second,
7 this was the first time in Italy an earthquake hit a highly industrialized area. Finally, the disaster
8 happened after a period of economic crisis that had already greatly weakened the local economic
9 system, especially the smallest retailers.

10 *Data collection and sampling*

11 Data were collected based on a qualitative approach in three steps as follows. First, a focus group
12 (FG) with a first group of small retail entrepreneurs affected by the Emilia earthquake in 2012 was
13 conducted. During this exploratory phase, the authors identified the recovery paths and explored the
14 formative dimensions of resilience by the retailers. Second, since a single firm's resilience to a
15 natural disaster is related to the resilience exhibited by the entire community, a second FG was
16 organized, involving the representatives of local authorities and retail trade associations to gain
17 insights into the nature and intensity of the support provided at the system level. Finally, as the most
18 important phase of the data collection process, the authors conducted personal, semi-structured
19 interviews with a sample of eight small retail entrepreneurs not included in the first FG. The authors
20 conducted two interviews with each entrepreneur at different times to better evaluate the key
21 aspects of DCs and social capital as formative factors for resilience. The interviews were conducted
22 at the small retailers' current places of operation in the municipalities most affected by the
23 earthquake. This also gave us the opportunity to directly observe each small retailer in his/her actual
24 place of business. All FGs and narratives were recorded and fully transcribed. The FGs lasted
25 approximately two and half hours, and the personal interviews around one and half hours each.
26 Both data collection methods focused on three temporal units of analysis the respondents were
27 asked to reflect upon. As previously mentioned, the first unit was 'before the earthquake': the
28 respondents were asked to describe their retail activity and circumstances of their businesses before
29 May 2012, self-reported effects of the economic crisis on the pre-earthquake business, and
30 competencies they used. The second was the 'emergency phase': the respondents were asked to
31 describe the actions put into practice immediately following the earthquake, list the competencies
32 used, and the support they received from external actors and their own network. The third and last
33 analysis unit is 'post-earthquake phase and the recovery process': the respondents were asked to
34 describe the recovery plan they intended to adopt to place themselves favourably in the marketplace

again and the competencies they employed. Along this temporal sequence of analysis, the utilized protocol allowed asking questions developed a priori, as well as approach specific relevant themes that emerged during each interview.

For both the FGs and personal interviews, this study adopted a reasoned sample of small retail entrepreneurs, selected with the support of three local retail entrepreneurial trade associations. The criteria for the selection were as follows: entrepreneurs whose shops were located within the earthquake crater; entrepreneurs acknowledged for their business vision, who could critically identify and analyse the current state and future trends of the local retail sector; and entrepreneurs whose businesses survived the natural disaster and regained satisfying levels of performance during the post-earthquake phase.

The retail entrepreneurial trade associations provided a list of small retail entrepreneurs still active after the earthquake and helped the research group shortlist small retail entrepreneurs that satisfies all selection criteria above. The final purpose of the sample selection process was to ensure sampling validity, as an important part of the empirical validity of the proposed content analysis process (Krippendorff, 2013, p. 336). The characteristics of the sample for the personal interviews are reported in Table 1.

Insert table 1 here

As previously mentioned, the collection of personal interviews took place during two phases. The first set of interviews was conducted in 2014, two years after the earthquake, a phase that the interviewees defined as still plagued by emergency characteristics. The purpose was observing and examining the patterns of recovery they started to put into practice and actions they took to achieve resilience. The follow-up interviews were conducted in 2017, during the phase of post-earthquake and recovery process. The purposes were twofold: to evaluate their patterns of recovery five years after the earthquake, and thus the capability to overcome the emergency phase, and gain a deeper understanding of the antecedents for the entrepreneurs' actions and the role of DCs and social capital as formative factors of resilience.

Data analysis

This study adopted content analysis, defined as “a research technique for making replicable and valid inferences from texts” (Krippendorff, 2013, p. 24), using a three-step procedure to ensure the reliability of the process, consistency and replicability of data, and minimization of subjectivity and coding distortions. First, the authors used an iterative process to create the labels for analysing entrepreneurs' actions and patterns of recovery. The process started with the analysis of academic

1 literature regarding the scales used to measure DCs and social capital. A codebook was thus created
2 with the chosen labels and tested it with the entrepreneurs' FG to validate categories. The authors
3 repeated the application of the rules in the codebook until they became mutually exclusive and
4 exhaustive, and met the study's purposes. The coding protocol provided item definitions derived
5 from the literature, and gave examples of application to minimize the coders' subjectivity and
6 personal interpretation of the text. This guaranteed the semantic validity of the procedure and
7 guided the coders so that "the recording units, when placed in one category, may differ in all kinds
8 of way, but not regarding the meanings that are relevant to the analysis" (Krippendorff, 2013, p.
9 343).

10 Second, the retailing firms were defined as sampling units and the narrative from each retailer was
11 analysed independently. Our context unit is the sentence, defined as "units of textual matter that set
12 the limits on the information" (Krippendorff, 2013, p. 101). To perform reliability testing, three
13 researchers were involved in the coding phase (Krippendorff, 2013, p. 268). The research group
14 applied the codebook to each interview separately, and interpreted the texts and measured the
15 intensity of use of each item counting how many times it emerged as an explanation of the
16 entrepreneur's actions for resilience. The coding procedure was performed on the same text for
17 repeated trials. Under the test-retest, the results of interpretation and coding remained stable,
18 ensuring procedural stability (Krippendorff, 2013, p. 270). Moreover, in order to ensure
19 replicability, the three coders worked individually in applying the same coding protocol on the same
20 texts, and inter-observer differences were discussed until reaching result consistency (Krippendorff,
21 2013, p. 271) and a unique attribution of each phrase that was rich in relevant meaning to one
22 category.

23 Third, the results of each interview were merged and interpreted as a whole, according to the
24 temporal sequence and the theory under analysis. In doing so, for the structural validity of the
25 procedure, the authors ensured the incidence of the relationships between the categorized items
26 within the aim of the content analysis and extant literature (Krippendorff, 2013, p. 346).

27 In this study, organizational resilience is considered as a formative construct (Bollen and Lennox,
28 1991), which is actually latent and determined as a combination of five indicators (shown in Table
29 2) that are not interchangeable and concur to form the construct of organizational resilience. Three
30 of them – reconfiguration, leveraging and sensing and interpreting – directly stem from the DC
31 analysis of Makkonen *et al.* (2014). The fourth label, 'learning and knowledge integration', resulted
32 from the merging of the other three DC categories presented by Makkonen *et al.* (2014): learning,
33 knowledge creation, and knowledge integration. Since these categories relate to knowledge creation
34 from internal or external sources, the authors merged them to avoid overlapping, repetitions, or
35 misinterpretations. The fifth label that concurs to form organizational resilience is the 'social
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capital'. The entrepreneurs involved in the FG confirmed the importance of this last dimension in facing the earthquake, and emphasized the support they had received from consumers, suppliers, and even other retailers. Similar conclusions resulted from the FG with local authorities and retail trade associations: participants acknowledged their crucial role in facilitating entrepreneurs' networking in facing the earthquake, and confirmed the higher resilience potential of the retail entrepreneurs strongly involved in the local community and trade associations.

Insert table 2 here

By labelling and coding the semi-structured interviews, the authors identified the actions taken by the retail entrepreneurs to overcome the effects of shocking external events, namely the global financial crisis from the period before the earthquake and the earthquake itself during the emergency phase and recovery process. Since "a dynamic capability consists of patterned and somewhat practiced activity" (Helfat *et al.*, 2009, p. 5), the follow-up interviews also responded to the specific methodological issue of tracing the determinants that would classify retailers' actions as related to DCs. Specifically, the patterned elements that distinguish DCs from ad-hoc problem solving or innate talent were verified (Helfat *et al.*, 2009). To this end, every time a DC was assumed to explain a given action in terms of resilience, the authors traced the action's origin by investigating whether its function had been repeated over time. Consequently, it was traced when the item had been first applied and reconstructed the pattern behind its development (Helfat *et al.*, 2009). Table 3 summarizes the antecedents of resilience from the first personal interviews, and the explanatory role of DCs and social capital according to the follow-up interviews. The authors conservatively considered as resilience antecedents only those actions both related to a pattern of experience and already used in the past by the entrepreneur.

Insert table 3 here

Findings

The findings show that the relative importance of the different DC categories and social capital changes, according to the temporal phase under analysis and the contribution of each factor to resilience, are evaluated differently according to the characteristics of the pre-earthquake, emergency, and post-earthquake phases. Table 4 shows the intensity of using DCs and social capital in the different phases, as subjectively reconstructed by each retail entrepreneur.

Insert table 4 here

Some common patterns and similarities arise from the importance given to some of the determinants of resilience along each phase, as shown in Figure 1. For example, in the pre-earthquake phase, the sensing and interpreting DC or the learning and knowledge integration DCs were mainly applied, while during the emergency phase, the leveraging DC and/or social capital gained more importance towards achieving resilience. In the post-earthquake phase, the reconfiguration DC was moderately cited, while sensing and interpreting became the most important DC.

Insert Figure 1 here

All interviewees described the pre-earthquake phase as a period of economic crisis, in which they had to pay increased attention to market changes to maintain a sustainable position in the market. The capability of sensing and interpreting the changing environment was then the most frequently applied.

The retail activity started to diminish: the competition of malls; birth of digital photography, which took away my work as people do not print pictures anymore; decrease in weddings. [I2]

Before the earthquake, the retail activity was already suffering because the crisis had already begun. In my city, there was a successful historical open-air market on Sunday morning, but in recent years, it started to decline. [I7]

Moreover, some retailers foresaw their historical city centre, as the nucleus of all commercial activities, was experiencing a deep commercial crisis and tried to integrate new knowledge using external resources to overcome these difficulties. Therefore, learning and knowledge integration DCs were heavily applied and took different forms:

That year, I participated in three exhibitions and one course organized by a supplier. I want to be continuously up-to-date. [I1]

In September 2011, I was in Paris to search for the most up-to-date products. [I5]

The reconfiguration DC had a lower importance in the pre-earthquake phase, while leveraging and social capital were not applied. The latter did not seem to appear as key formative factors of resilience during economic crisis in the pre-earthquake phase.

All small retailers described the moments immediately after the earthquake as extremely confused and chaotic: there were no formal protocols or previous experience that would lead the action. Everybody did their best and had to improvise to accomplish the pressing needs of the earliest moments after the disaster. The factors that sustained most rapid and resilient reactions were the solid net of relationships built over the years of experience and/or the leveraging capability to

1 exploit own resources, according to the intensity of the damage reported and the personal and
2 professional history of each small retailer.
3

4
5 During the emergency phase, the capability to exploit social capital with different stakeholders
6 showed the highest intensity for four entrepreneurs. Long-term and trustworthy relationships with
7 the suppliers helped firms by providing discounts on goods, temporarily interrupting invoice
8 payments, providing support in the rebuilding of the damaged shop or in the setting up of temporary
9 store solutions:
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14 *I have a supplier who allowed me to stop making payments. Moreover, he helped me when I had to move.*
15 *[11]*

16 *The aid was mostly from my main supplier, who gave me means and men to clean and empty the store. [16]*

17 Relationships with loyal consumers also played an important role in stimulating the continuity of
18 the selling activity, and many small retailers reported strong solidarity:
19

20
21 *We felt strong solidarity from established customers, who call us asking, 'How are you doing? I'm going to*
22 *come to buy something from you!' That solidarity gave us the strength to go on. [13]*

23 *My strength was in my customers, people who, when meeting me while cycling, asked about my re-opening.*
24 *[15]*

25
26 Finally, the support and cohesion among the retailers themselves was of great importance, as was
27 the support of retail entrepreneurs' trade associations and experts in obtaining information on the
28 formal procedures, granting access to public subsidies, and grasping all available opportunities to
29 sustain the recovery:
30
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32
33 *The help of other shopkeepers in my chain: there was a great support, given in friendship. [16]*

34 *Trade associations gave us indications about opportunities for subsidies. [15]*

35 *An expert showed us how a consortium could be established, and the possibilities and constraints related to*
36 *it. [13]*

37
38 During the emergency phase, the leveraging capability also showed a high use intensity, as did the
39 capability to sense and interpret the sudden changes in consumer needs. By definition, the
40 leveraging capability allows the deployment and utilization of existing resources in new situations,
41 even in disruptive ones such as those occurring due to a natural disaster. Retailers adopted different
42 and, in some cases, creative solutions to continue operating their businesses and provide the
43 population first-aid retailing services. Since almost all shops were declared unfit for use, the
44 majority was forced to adopt temporary business locations. Some used their homes as shops, while
45 others chose different locations, such as a gazebo or a small wooden house. Some transformed
46 themselves into peddlers in open-air markets outside the affected area.
47
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53 *On 24 June, we re-opened at my house. In the morning, I prepared ice cream, and in the afternoon, I left my*
54 *ice-cream activity to go to the 'Renza' [an ice cream shop, around 30 km away] from 4 pm to midnight. [11]*

55 *We brought into the biggest room in our house some of the summer clothes, and we started to sell from*
56 *there, simply putting a billboard in front of the house. We worked in this way until mid-August 2012. [18]*
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60

1 The learning and knowledge integration DCs and the reconfiguration DCs were not intensively used
2 in the emergency phase as resilience capacity determinants.
3
4

5 Beyond the initial reaction, over time, the interviewees began to engage in more organized forms of
6 disaster response, trying to sustain individual basic needs for consumption as means to regain a
7 sense of normality. In the post-earthquake phase, the sensing and interpreting capabilities became
8 more important, registering a high usage rate. According to the small retail entrepreneurs, these
9 capabilities assumed a fundamental role in the assessment of strategic alternatives and in the
10 generation of new solutions on the market after the earthquake:
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14

15 *You are like in a new town, in a new world, where you have begun a new activity; you cannot use your*
16 *experience and the fact that they know you. From my personal experience, I sell goods that I was not selling*
17 *before, and before, I was selling things that I do not sell now. [16]*
18

19 During this phase, the reconfiguration DCs gained a higher importance and showed a moderate
20 intensity of use in organizing to provide services of sale for the modified necessities. Retailers
21 declared they had to modify their suppliers' portfolio to adapt the product offering to the new
22 context and consumer needs:
23
24

25 *We tried to get a larger slice of younger customers, following what we already changed in the past, with*
26 *some minor variations. [18]*
27

28 The social capital factor diminished its importance, its function becoming limited to the support
29 from loyal consumers, as reported by the majority of interviewees:
30
31

32 *Even if I made the choice to stay in the town centre, I'm well known by customers: if they need an herbalist*
33 *they know where I am. [15]*
34

35 *Those who came into the town centre were our loyal customers; just for them, we tried to remain there for*
36 *more than one year. [18]*
37

38 Additionally, the leveraging capabilities diminished their importance during the post-earthquake
39 phase. The necessity of knowledge integration remained stable, but at a lower level, and many of
40 the small retailers declared that the experience from the emergency phase was absorbed and became
41 part of their resources and expertise:
42
43

44 *My experience with Renza was insightful: she was making chocolate ice creams, and all of the customers*
45 *were asking what that ice cream was. Therefore, in my new shop, I made an ice cream with hazelnut, white*
46 *chocolate and wafers. People really went mad for it! [11]*
47

48 Findings also show that some actions rely on factors that cannot be strictly related to DCs and social
49 capital conceptualization. These include the innate talent that allows some individuals to turn
50 challenges into opportunities, as well as contingency-based problem-solving abilities. When
51 analysing the small entrepreneurs' narratives using a grounded perspective, the authors identified a
52 group of actions linked to the ability to recognize and seize new opportunities arising from the
53 unfavourable conditions of the post-earthquake phase to turn challenges into opportunities (Weick,
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1993). Therefore, based on Lengnick-Hall and Beck (2003) and Weick (1993), these were named 'disruptive creation abilities'. Completely absent in the pre-earthquake phase, they were observed for the first time during the emergency phase. However, it was during the post-earthquake phase the disruptive creation abilities showed their highest intensity. During that time, they assumed a relevant role as to complement the resilient responses of the interviewees facing disruption due to the natural disaster. New opportunities arose from the disruptive contingencies of the natural disaster, and the affected small retail entrepreneurs were able to recognize and seize them using their resilience capacity. Sometimes, municipalities and trade associations offered opportunities in terms of subsidies, new commercial spaces, or collaborative projects, as part of a broader community resilience project. Otherwise, in most observed cases, the earthquake resulted in enhanced or new business opportunities:

In Cavezzo, a new retail idea was born approximately 10–12 days after the earthquake. In an area outside the town centre, we made a container mall there, a camp for damaged retailers. This structure is relatively costless and is anti-earthquake. It has also the advantage that people can quickly enter it, and that's attractive for consumers. I believe that this was a really winning idea. [FG7]

These events could also create opportunities! I think to myself: without the earthquake, I would never have the courage to make another shop, after establishing the old one six years ago. Now I'm glad I did it. [I1]

Discussion

The concept of resilience has been mostly regarded in disaster management studies as an important factor ensuring continuity, sustainability, and future success in the case of disruptive events (Kantur and İşeri-Say, 2015). Hitherto, limited attention has been devoted to analysing the formative dimensions of resilience. Particularly, few studies investigated what set of DCs an entrepreneur should exhibit when he/she realizes that an uncommon situation (e.g. a natural disaster) requires a resilient response (Linnenluecke, 2017).

Based on the experiences of a sample of small retail entrepreneurs, before, during, and after the 2012 earthquake in the Emilia area, different types of DCs, namely reconfiguration, leveraging, sensing and interpreting, learning and knowledge integration, along with their respective relational ties due to social capital, played different roles and exhibited various levels of intensity during the three analysed phases. The only exception was the sensing and interpreting DCs, which maintained a constant relevance over time. The narratives regarding the formative factors applied in the pre-earthquake phase were the benchmark in analysing the resilient reaction of each small retailer afterwards. Immediately after the earthquake, DCs mostly untapped during the pre-shock phase emerged as fundamental pillars of resilience, particularly the leveraging capability. Leveraging capabilities guaranteed a quicker reaction to an unexpected external shock. When forced to respond immediately, firms tended to use the existing resources to extract all the potential value from them

(Gittel *et al.*, 2006). The relevance of leveraging capabilities is thus consistent with the approaches to resilience (Gittel *et al.*, 2006; Legnick-Hall and Beck, 2005; Meyer, 1982; Sutcliffe and Vogus, 2003) that suggest the key role of slack resources in absorbing organizational shocks due to disruptive events. Actually, the leveraging of existing resources and competencies has been considered the most common resilient reaction to a disruptive event (Paton and Johnston, 2001), especially in the emergency phase, when the speed of external changes is high and volatility extreme. The findings also suggest that, during the emergency phase, a key role is played by the rapid exploitation of social capital as to have an immediate and costless access to extra resources from relatives and friends, business networks (suppliers, customers, competitors), and public agencies. The importance of social capital in facing a disruptive event is particularly important for small independent retailers (Asgary *et al.*, 2012), which do not directly possess a set of resources and competencies large enough to make internal leveraging always possible.

During the post-earthquake phase, retailers had to place themselves favourably in the 'new normality', where customers' needs and preferences were likely to change. In an arduous search for a new stability, the most important DC became the sensing and interpreting capability. Its effectiveness is less dependent on a short-term reaction, and mainly related to the ability to analyse the evolution of an environmental context and make strategic decisions for the middle term (6–12 months) to find the right positioning in the new post-earthquake situation. Moreover, this ability is developed over time. The entrepreneurs that showed a greater sensing and interpreting capability in the pre-earthquake phase tended to apply this capability more intensely in the post-earthquake phase as well. This is consistent with the existence of routines to noticing exceptions and unexpected events in the environment, which increases a firm's ability to understand its current situation and develop a broader variety of potential actions that reflect their understanding (Lengnick-Hall and Beck, 2005). The ability of a firm to capture signals from the new environment and interpret changes before competitors leads to more rapid and effective paths of strategic repositioning (in terms of products, price ranges, customer targets etc.). This can be decisive in making the recovery process successful and achieving resilience, thus influencing the organization strategic positioning and even its survival (Linnenluecke, 2017).

Our findings confirm the multifaceted nature of resilience. Although different types of DCs, along with social capital, enhance a firm's ability to respond to changes, their role in a recovery strategy varies significantly according to firm characteristics and existing base of resources, and the nature of the environmental change. Our study demonstrates that the relational ties related to social capital are more decisive for firms reporting less damage and a lower application of DCs during the pre-earthquake phase, whereas for firms with greater resources and experience in the running of the business leveraging, the DC pertaining to reconfiguration are likely to have a greater importance.

1 Furthermore, some DCs are more suitable to shorter reaction times (leveraging DCs, social capital),
2 while other capabilities (sensing and interpreting capabilities, reconfiguration capabilities) sustain
3 longer-term actions. Additionally, their effectiveness in facing the external changes that require
4 different reaction times differ accordingly. Since the recovery strategies from natural disasters are
5 based on actions that embrace different time spans (Yang and Hsieh, 2013), the overall resilience of
6 a firm should be assessed by considering the variety of DCs in relation to its ability to effectively
7 react over the short term and over longer periods.

8 The authors also expanded the classification model of Makkonen *et al.* (2014) by exploring the role
9 of another factor contributing to entrepreneurial resilience: social capital. The prominent role of
10 social capital means it can provide small retail entrepreneurs with a promptly available set of new
11 resources to complement their endowment of resources and competencies. This suggests a close
12 relationship between the ability of a retail firm to react to a natural shock and the economic and
13 social strength of its relationships with its family, friends, customers, and suppliers.

14 While offering new evidence on the relationships between DCs dimensions, social capital, and
15 entrepreneurs' resilience to natural disasters, our results also suggest the existence of a more
16 complex set of factors in creating organizational resilience. Additionally, disruptive creation
17 capabilities emerged as a driver of change for resilient retail entrepreneurs. While social capital has
18 its origin in the entrepreneur's existing network, disruptive creation resides in forward-oriented
19 capabilities, which enable a firm to capitalize on environmental changes in ways that create new
20 options and capabilities (Lengnick-Hall and Beck, 2005). Weick (1993) stated that improvisation
21 and acting as 'bricoleurs' help organizations survive in chaotic conditions and restore order after a
22 critical event. Some of our respondents were able to move forward and proactively create change
23 with whatever resources they have at hand, including those offered by public authorities and other
24 collective actors. Moving from organizational inertia and creatively recombining their limited set of
25 resources, they made decisions that led them to radically and successfully modifying their market
26 positioning and business models. Therefore, resilience seems to consist of more than adaptation: it
27 is about being solution-oriented, proactive in seizing new opportunities, and turning deeply adverse
28 conditions into innovative opportunities for business renewal and change (Kantur and İşeri-Say,
29 2015).

30 Our study also offers insights into the disaster recovery management perspective. The authors
31 demonstrated that, during the emergency phase, resilience was based on blocks of DCs that were
32 significantly different from those used in the subsequent stages of the recovery path. Therefore,
33 when analysing a firm's crisis response after a natural disaster, it is crucial to consider that the
34 resources and competencies most suitable for facing the changes can differ according to the
35 different stages of the critical event (Yang and Hsieh, 2013). Consequently, the scholars interested

1 in acquiring a deeper understanding of resilience should focus their attention on the phasing of the
2 natural disasters to clearly identify the shifting sets of external conditions that have different
3 impacts on a firms' recovery strategies.
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11 **Conclusions**

12 This study provides practitioners with useful insights on how recovery paths are practically used at
13 different times in the case of an earthquake, thus indicating what response capabilities are useful for
14 similar natural disasters. The resilient retailer should be aware of the enormous importance of being
15 in a favourable social capital condition, with a portfolio of long-lasting and strong relationships
16 with both suppliers and customers. In fact, the ability to build solid relational capital not only gives
17 retailers an advantage in managing operations during ordinary times, but could also ensure the im-
18 mediate availability of support in reacting to uncommon and unplanned shocking events. Moreover,
19 this could complement the leveraging of internal resources, which proved the most relevant group
20 of DCs during the emergency phase. The results of this study suggest that retailers who enter the
21 crisis phase with a consolidated set of sensing and interpreting capabilities have better chances to
22 deploy these capabilities during the crucial post-disaster phase, when firms need to fine-tune or
23 even turn around their strategies to tackle competitive discontinuities or react to unexpected cus-
24 tomer changes. Therefore, retailers endowed with marked environmental sensing capabilities are al-
25 so more likely to show greater resilience when facing natural disasters. These findings confirm that
26 natural disasters can create entrepreneurial opportunities, as they can result in "a kind of impetus for
27 transforming entrepreneurial intentions into behaviours" (Monllor and Murphy, 2017, p. 619), act-
28 ing as sources of innovative ideas and new ventures.
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40 The findings of this study could also serve as a start for the institutions designed to support retailers
41 affected by calamities, allowing for better-designed crisis response strategies and tactics. Similar to
42 entrepreneurial self-efficacy, resilience can also be developed at the wider institutional level (Coutu,
43 2002). As such, local governments and retail entrepreneur trade associations should consider
44 implementing training programs that include reporting and mentoring from resilient retail
45 entrepreneurs to spread good practices within the sector and acknowledge small retailers' disaster
46 preparedness and contingency planning. Overall, the findings suggest that educational programs and
47 training efforts for enhancing retail entrepreneurs' market sensing capabilities and extending the
48 opportunities associated with resource stretching practices could adequately support the
49 development of organizational resilience. Moreover, local authorities should learn how to support
50 and facilitate emerging coordination nodes (Boin and McConnell, 2007) between citizens and/or
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1 retail entrepreneurs and their suppliers. For example, to provide continuity to firms' operations in
2 the direst period immediately after a disaster, retail entrepreneur trade associations can offer
3 instantly available relational platforms for channelling essential resources during the emergency
4 phase (e.g. productive capacity, warehouses) from and in favour of their members.
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8 This study, by focusing on small retail entrepreneurs' crisis responses after a natural disaster, fills a
9 gap in the crisis management literature regarding the retail sector, as limited attention has been hith-
10 erto given to the process of capability deployment to support a crisis response strategy in the retail
11 sector. Moreover, this study makes an important contribution by examining the role of DCs de-
12 ployed by small independent retailers in the aftermath of a natural disaster, and the role of different
13 types of DCs in sustaining resilience during the different phases of a disaster. This study also sug-
14 gests the existence of other antecedents of resilience: social capital and disruptive creation, meaning
15 all aspects of resilience are considered. Not only does resilience lead retail entrepreneurs to recov-
16 ery, but also to renewing their business activities both internally and externally, turning unfavoura-
17 ble conditions into new opportunities of managing successful businesses (Kantur and İşeri-Say,
18 2015).
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22 As this research effort is an empirical exploration, it is not without limitations. First, it uses a
23 sample limited to small retailers, which does not allow us to compare them with the big retail
24 chains. Second, this study focuses strictly on small retailers' competencies and capabilities, while
25 ignoring the bundles of resources (tangible and intangible) that could be activated and integrated to
26 better respond to an adverse event. Third, methodologically, our content analysis protocol is
27 designed *ex novo*, which limits inference to the analysed case. However, the structural validity and
28 reliability of the research process is ensured. As such, the application of the same protocol in
29 another context (i.e. a different natural disaster) may lead to higher accuracy and enhance the
30 predictive validity of the current analysis. Additionally, some areas for future research can be as
31 follows. First, it is worthwhile examining not only DCs, but also the role of resources in the design
32 of resilient responses to natural disasters. Moreover, a single case study would allow collecting the
33 viewpoints of the stakeholders involved in the ongoing resilient pattern of recovery of small retail
34 entrepreneurs. Second, future analyses should compare the DC endowment of small retailers with
35 those of large retail chains. This could lead scholars to identify patterns in the recovery of both
36 small and large retailers, as in fact, small businesses are more vulnerable to environmental forces
37 than medium- and large-sized firms (Schindehutte and Morris, 2001). Finally, the authors intend to
38 conduct quantitative analysis using a structured questionnaire on a large sample of small retailers
39 affected by the Emilia earthquake to further develop this research endeavour and generalize the
40 results.
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Table 1. Characteristics of the small retail entrepreneurs interviewed

Code	Shop characteristics	Product specialization	Firm foundation	Damages	Interviewee characteristics
I1	Town centre 2 partners and 1 employee, rented shop	Ice-cream shop	2006	Type: building declared unfit for use Amount: not declared	Sex: Male Education: high school diploma Prev. experience: employee in a firm N. years running that shop at the time of earthquake: 6
I2	Town centre, 1 entrepreneur, owned shop,	Photo shop	1949	Type: building declared unfit for use Amount: 304,000 euros	Sex: Male Education: junior high school diploma Prev. experience: electrician N. years running that shop at the time of earthquake: 32
I3	Town centre, 2 partners, owned shop,	Apparel store	1983	Type: building declared unfit for use Amount: 20,000 euros	Sex: Female Education: high school diploma Prev. experience: employee in a firm N. years running that shop at the time of earthquake: 18
I4	Town centre, 1 entrepreneur, rented shop	Gift shop	1991	Type: building declared unfit for use Amount: 60,000 euros	Sex: Female Education: high school diploma Prev. experience: employee in a photo shop N. years running that shop at the time of earthquake: 21
I5	Town centre, 1 entrepreneur and 1 employee, two owned shops	Herbalist's shops	1984	Type: building declared unfit for use, one shop permanently closed Amount: 10,000 euros	Sex: Female Education: degree Prev. experience: none N. years running that shop at the time of earthquake: 28
I6	Near the town centre, 2 partners and 1 employee, rented shop	Drugstore	2001	Type: building declared unfit for use Amount: 430,000 euros	Sex: Male Education: junior high school diploma Prev. experience: employee in other shops N. years running that shop at the time of earthquake: 11
I7	Town centre, 1 entrepreneur, owned shop	Optician shop	1953	Type: habitable Amount: 5,000 euros	Sex: Male Education: high school diploma Prev. experience: none N. years running that shop at the time of earthquake: 30
I8	Town centre, 2 partners, rented shop,	Apparel store	1990	Type: habitable but only after renovation Amount: not declared	Sex: Male Education: junior high school diploma Prev. experience: employee in an apparel store N. years running that shop at the time of earthquake: 22

Table 2. Labels and coding rules applied in the analysis

Label	Definition	Action coding: Examples
Reconfiguration	The capability to continuously and purposefully reconfigure the existing resource base in order to exploit its existing knowledge	"I think that, every 10 years, you have to modify your activity. You have to introduce new things and renovate your shop".
Leveraging	The capability to utilize and deploy existing resources in new situations	"After a week, I started to sell clothes at home, in my garden: it looked like a shop in Provence!"
Sensing and interpreting	The capability to interpret the environment and to position oneself favourably in the changed/changing market	"It was a critical moment for the people hit by the earthquake, so I had to change my products: I decided to list products of good quality but at a lower price".
Learning and knowledge integration	The capability to adopt, create and acquire new capabilities through the learning process of experimentation and repetition or through external sources	"I usually visit a number of fairs in order to find new products different from those of competitors".
Social capital	The capability to exploit long-term and faithful relationships related to the entrepreneur's personal network	"My supplier was great. He really made the difference: he gave me all the merchandise on consignment, and this saved my shop". "My customers were great, coming to my home in order to buy something and helping me in that way".

Table 3. Resilience formative factors in each phase and generative factors*

	Resilience formative factors	Phases			Generative factors	
		pre-earthquake	emergency	post-earthquake	patterned experience	repeatability
11	Reconfiguration	1	1	0	1	0
	Leveraging	0	1	1	0	1
	Sensing & interpreting	1	1	1	1	1
	Learning & knowledge integration	1	0	1	1	1
	Social capital	0	1	0	0	1
12	Reconfiguration	1	0	1	1	1
	Leveraging	0	1	0	1	1
	Sensing & interpreting	1	1	1	1	1
	Learning & knowledge integration	1	0	1	1	1
	Social capital	1	1	1	1	1
13	Reconfiguration	1	0	1	1	1
	Leveraging	0	1	1	1	1
	Sensing & interpreting	1	1	1	1	1
	Learning & knowledge integration	0	0	0	0	0
	Social capital	0	1	0	1	0
14	Reconfiguration	0	0	0	0	0
	Leveraging	0	1	0	1	1
	Sensing & interpreting	1	0	1	1	1
	Learning & knowledge integration	1	0	0	1	1
	Social capital	0	1	1	1	1
15	Reconfiguration	0	0	1	0	0
	Leveraging	0	1	0	0	1
	Sensing & interpreting	1	1	1	1	1
	Learning & knowledge integration	1	1	1	1	1
	Social capital	0	1	1	1	1
16	Reconfiguration	1	0	1	1	1
	Leveraging	0	1	0	1	1
	Sensing & interpreting	0	0	1	1	1
	Learning & knowledge integration	1	1	0	1	1
	Social capital	0	1	1	1	1
17	Reconfiguration	1	0	1	1	1
	Leveraging	0	0	0	0	0
	Sensing & interpreting	1	1	0	1	1
	Learning & knowledge integration	0	0	0	0	0
	Social capital	0	1	0	1	0
18	Reconfiguration	0	1	1	1	1
	Leveraging	0	1	0	1	1
	Sensing & interpreting	0	1	1	1	1
	Learning & knowledge integration	1	1	0	1	1
	Social capital	0	1	1	1	0

*dummy variables: 0= absence; 1 = presence

Table 4. Resilience formative factors for the eight small retail entrepreneurs investigated

	Resilience formative factors	Intensity by phases		
		Pre-earthquake	Emergency	Post-earthquake
I1	Reconfiguration	0	0	0
	Leveraging	0	0	0
	Sensing & interpreting	4	3	1
	Learning & knowledge integration	1	0	1
	Social capital	0	0	0
I2	Reconfiguration	1	0	1
	Leveraging	0	2	0
	Sensing & interpreting	1	1	1
	Learning & knowledge integration	1	0	1
	Social capital	1	4	1
I3	Reconfiguration	1	0	1
	Leveraging	0	2	1
	Sensing & interpreting	1	2	2
	Learning & knowledge integration	0	0	0
	Social capital	0	0	0
I4	Reconfiguration	0	0	0
	Leveraging	0	2	0
	Sensing & interpreting	1	0	4
	Learning & knowledge integration	1	0	0
	Social capital	0	1	4
I5	Reconfiguration	0	0	0
	Leveraging	0	0	0
	Sensing & interpreting	1	4	2
	Learning & knowledge integration	1	1	1
	Social capital	0	4	1
I6	Reconfiguration	1	0	3
	Leveraging	0	1	0
	Sensing & interpreting	0	0	3
	Learning & knowledge integration	1	2	0
	Social capital	0	2	1
I7	Reconfiguration	1	0	1
	Leveraging	0	0	0
	Sensing & interpreting	3	1	0
	Learning & knowledge integration	0	0	0
	Social capital	0	0	0
I8	Reconfiguration	0	1	1
	Leveraging	0	1	0
	Sensing & interpreting	0	2	2
	Learning & knowledge integration	1	1	0
	Social capital	0	0	0

Figure 1. Resilience Formative Factors: importance by phases

