International Institute of Social Studies

Working Paper
No. 559

Critical learning episodes in the evolution of Brazilian business start-ups: A theoretical and analytical tool

Ariane Agnes Corradi

May 2013

ISSN 0921-0210

Please address comments and/or queries for information to:

Institute of Social Studies
P.O. Box 29776
2502 LT The Hague
The Netherlands

or

E-mail: wpapers@iss.nl

Table of Contents

Abstract

This study investigates critical learning episodes as landmarks in the evolution of business start-ups. A framework that combines individual learning processes with the Penrosian resource-based theory of the firm, and the concepts of search and routines from evolutionary economics provides the theoretical ground on which this study is developed. Multilevel factors, ranging from entrepreneurial agency to the institutional setting of business development services, represent different levels of analysis. These levels are connected through critical learning episodes, which are triggered by endogenous or exogenous factors and culminate in the creation of new or in the change of current organizational routines. These episodes were narrated by 43 entrepreneurs-founders through semi-structured interviews. Their business start-ups were operating for an average of 4 years (s.d.=1,9) and were linked to business incubation programmes in the two most resource-rich regions in Brazil. These start-ups were in three sectors: a) manufacturing, b) information and communication, and c) professional, scientific and technical activities. The analysis of these narratives combined qualitative (i.e., grounded theory principles) and quantitative (i.e., social networks analysis) techniques. This paper focusses on the most common type of critical learning episode: entry and survival in the market (n=36 start-ups). Results show how micro-processes of learning influence access and creation of resources at the firm level. A temporal analysis of networks configurations shows how processes of embeddedness in market relations influence intra- and inter-organizational dynamics. It is argued that critical learning episodes, for combining multiple factors and levels of analysis, are a useful theoretical and analytical tool to better understand the evolution of these businesses. In addition to this, issues of path-breaking and innovation are discussed in light of institutionalized practices of business development services.

Keywords

Evolution of business start-ups, organizational learning, social networks, critical learning episodes, organizational routines, and mixed methods.

Critical learning episodes in the evolution of Brazilian business start-ups[1, 2]
A theoretical and analytical tool

1 Introduction

The role of learning processes in firms have been emphasized by economic literature at least since the 1980s, when Nelson and Winter claimed learning as a fundamental intra-firm process for transformations at the industry level and impacts on economic change (Nelson and Winter 1982). Similarly, the literature on theory of the firm has recognized learning as a micro-process at the core of growth dynamics (e.g., Best 1990; Lundvall 2007; Penrose 1980 [1959]). A consensus amongst these authors is that learning is a type of 'black box' (Lundvall 2007), beyond economic fields to be examined (Penrose 1980 [1959]), and that can be somehow taken for granted by looking at outcomes of learning, such as R&D levels (Nelson and Winter 1982). This consensual view, however, reveals a gap in the explanation of how this core process in fact influences the evolution of firms.

This research, supported by organizational psychology literature (e.g., Bastos, Gondim, and Loiola 2004; Pantoja and Borges-Andrade 2004; Warr and Downing 2000), contributes to fill in this gap through investigating learning processes of entrepreneurs in the first years of their business start-ups. This literature, predominantly concerned with learning in complex organizations, has developed a number of taxonomies of learning such as the concepts of single and double loop learning (Argyris and Schon 1978), the multilevel concepts of learning per composition and per compilation (Klein and Kozlowski 2000), and the distinction between continuous and discontinuous learning events (e.g.,Cope 2003). However, all these taxonomies face the methodological challenge of identifying the boundaries of a learning event and demonstrating how different types of learning interact in organizational contexts.

In this study, learning is defined as an individual process of knowledge acquisition, storage, transformation and use that is contingent to the social and institutional context in which the learner is embedded. The learner receives inputs from the environment – firms, networks and institutions – which in turn is influenced by the outcomes of learning. These dynamics, in business start-ups, are crucial for the establishment of the first organizational routines

---

[1] A draft version of this paper was presented in the 9th Development Dialogue Conference, May/2011, The Hague, Netherlands.

[2] This study is part of my PhD dissertation at the International Institute of Social Studies (ISS). It was supported by the Brazilian Ministry of Education, CAPES (Brazilian Agency for the Support and Evaluation of Graduate Education), Process n. 3957-06-03, 2007-2011. I am a social and organizational psychologist, researcher on learning in organizations, entrepreneurship, evolution of business start-ups, social networks dynamics, business incubation programmes, and production of scientific and technological knowledge.

that define the boundaries and the identity of the firm. The importance of these first routines relates to the survival of the firm in its most critical years, as the literature indicates (e.g., Cressy (2008 [2006]; Kelley, Bosma, and Amorós 2010; Naudé 2008; Nichter and Goldmark 2005; SEBRAE 2007). The literature points out lack of access to needed resources (e.g., Mead and Liedholm 1998) and mal-management of available resources (e.g., SEBRAE 2007) as possible explanations for failures in the first two to five years.

This study examines critical learning episodes as the milestones that punctuate the evolution of business start-ups in these first years. These episodes are caused by what the literature has called 'discontinuous events' (e.g., Cope 2003) or a focus on 'change over stability' (e.g., Knight and Pye 2007) and are triggered by endogenous or exogenous factors (Nelson and Winter 1982). They are accountable for major changes in the organizational routines, which are critical for the survival of these businesses. Hence, the main research question of this study is: *How do critical learning episodes explain the evolution of business start-ups?*

2 Critical learning episodes

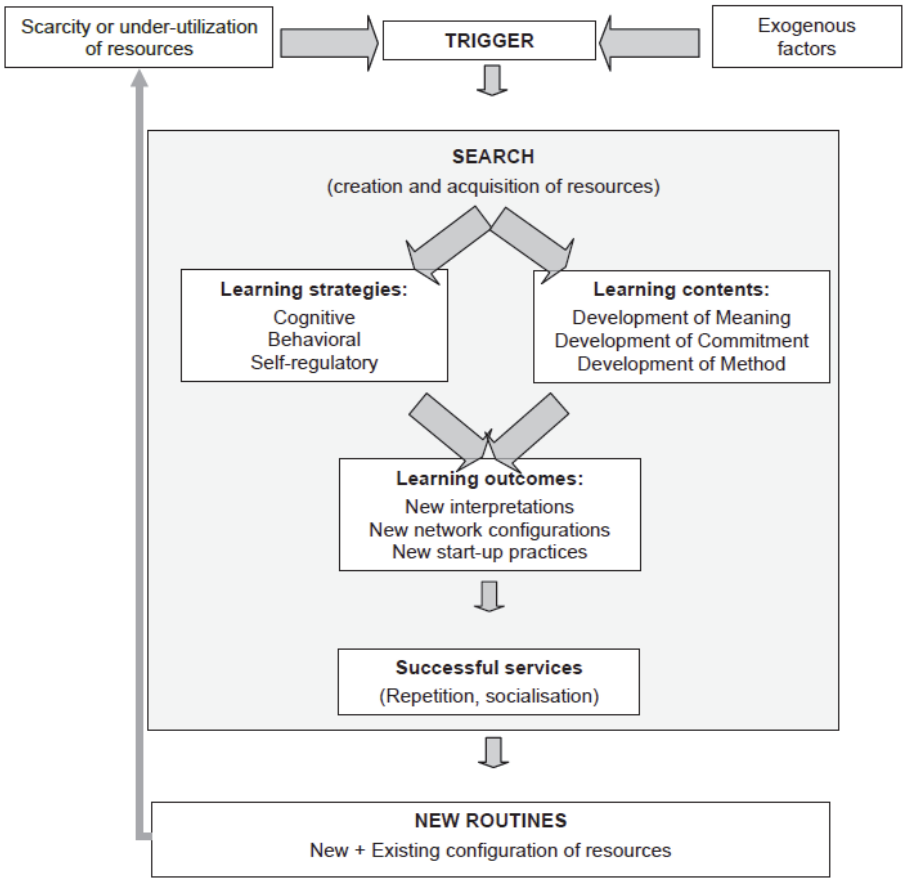
The concept of critical learning episodes was originally conceived at the network level, referring to long-term changes in network practices, structures and interpretations (Knight and Pye 2007) and allowing comparative analysis across networks in different sectors (Knight and Pye 2004). Learning episodes are bracketed and punctuated experiences in the continuum of start-up's learning. Their boundaries are temporal and structural. As Knight and Pye (2004, 481) state, these episodes "are not evenly distributed in time or among actors, but can be seen as coalescing into a number of 'sub-plots' that are critical components of the episode storyline. Sub-plots can be compared across episodes". These sub-plots reflect the development of new meanings, commitments and methods, which are here reconceptualized at the firm level.

The development of new meanings reflects attitudinal changes in the values and culture of entrepreneurs; what would elsewhere be referred to as higher level learning or double loop learning (Argyris and Schon 1978; Cope 2003; Fiol and Lyles 1985). The development of new commitments signals changes at the network level, reconfiguring the role played by actors in the start-up's institutional setting in relation to the start-up's demands. The development of new methods reflects changes in behavioural patterns, observable by the way of doing things, such as the organization of the production.

The concept of critical learning episodes (CLEs) combines different levels of analysis by explaining the impacts of exogenous and endogenous triggers (Nelson and Winter 1982) on individual (Abbad and Borges-Andrade 2004), network (Granovetter 1983), organizational (Penrose 1980 [1959]) and inter-organizational levels (Best 1990; Cooke and Morgan 1998). CLEs vary in terms of properties such as: type and duration of the episode, combination of learning strategies (Riding and Rayner 1998; Warr and Downing 2000), types of resource use (Penrose 1980 [1959]), types of learning outcomes and content of

the resulting organizational routines (Nelson and Winter 1982). Figure 1 shows how these concepts form the framework of this study.

FIGURE 1
Conceptual framework



The main concepts in Figure 1 are triggers, search and routines (in capital letters). Triggers are those factors that ignite a search process and will ultimately change the organizational routines. The flow triggers-search-routines reflects theorizations of evolutionary economics (Nelson and Winter 1982) and raises questions about what triggers are, and what a search process is about for it to create new routines. To answer these questions, a worthy starting point is Penrose's theory of the firm (Penrose 1980 [1959]) and its concepts of resources and services. Resources include managerial competences, technological knowledge, financial resources, infrastructural facilities, and so forth. These resources can be acquired, under-utilized (Penrose 1980 [1959]), created or lost. The scarcity or under-utilization of resources endogenously triggers a search process to either acquire or make use of these resources in the firm. Specific uses of these resources correspond to services to the firm growth

(Penrose 1980 [1959]), since they establish or change the current routines. The same process can be triggered by exogenous factors (Nelson and Winter 1982), with the difference that these are originated by actors in the institutional setting, such as buyers, competitors, support organizations, regulatory and legal frameworks, etc.

Search is defined here as the process of acquisition or creation of resources that solves a CLE and results in new or changed organizational routines. The focus, therefore, is on those episodes that can potentially be path-breaking in their impact on the firm (e.g., Cope 2003). In this study, the concept of search includes activities other than R&D (Nelson and Winter 1982), ranging from the acquisition of managerial competences, to the development of new equipment for the production line, or the development of an innovative product. This search process has two main stages, shown in the central part of Figure 1. The first, at the individual level, is the application of learning strategies to generate the needed resources (learning content box in Figure 1). The second stage, at the organizational level, is the selection of those effective learning outcomes to be incorporated into the current routines.

The components of these two stages of a search process are as follows. Learning strategies are defined in cognitive psychology as activities of processing information to facilitate the acquisition, storage and future retrieval of learnt information (e.g., Warr and Downing 2000; Abbad and Borges-Andrade 2004). They are contingent to each learning situation and applied to improve performance (Riding and Rayner 1998). Learning strategies can be cognitive, behavioural or self-regulatory (Warr and Downing 2000). Cognitive learning strategies concern psychological processing of information through attention, acquisition, memorizing and transferring of knowledge to new situations (Abbad and Borges-Andrade 2004). Behavioural strategies refer to interactions between the learner and information sources, such as documents, people, organizations, and experimentation (Abbad and Borges-Andrade 2004). This type of strategy is closely linked to what the literature has called experiential learning (Cope 2003) or learning by doing (Best 1990). Self-regulatory learning strategies are metacognitions for the self-assessment and, if needed, the adjustment of how and what the individual has been learning (Abbad and Borges-Andrade 2004).

These strategies are commonly combined to create or access resources, which will be directed to one or more types of learning contents: the development of new meanings, new commitments, and new methods. These categories of learning contents originate from network learning studies (e.g., Knight and Pye 2004; Knight and Pye 2007) and are reframed here to the firm level. They refer, for instance, to the pursuit of a firm identity, the building of market-based networks, and the establishment of operational routines, respectively to meanings, commitments and methods. Since several outcomes can result from learning, the second stage of a search process depicts those learning outcomes that promote enduring and widespread changes in the start-up. In evolutionary terms, this stage corresponds to the selection of learning outcomes according to their impacts on the firm functioning and survival.

Learning outcomes are categorized in three categories: the development of new interpretations, new network configurations, and new start-up practices. It

is noteworthy that these categories do not necessarily mirror the three categories of learning contents (Knight and Pye 2007). Moreover, not all outcomes are incorporated into the organizational routines because much of what the individual learns does not translate into job performance or organizational change (e.g., Rousseau 1997; Weick and Quinn 1999; Cope 2003; Abbad and Borges-Andrade 2004). Therefore, only those outcomes that solve the trigger of a specific CLE will then be incorporated into the organizational routines. This selection process occurs through repetition, and adjustments of the services represented by these outcomes (Lazaric 2008).

In terms of complexity, organizational routines are more complex (firm level) than learning outcomes (episode-specific) and more stable over time. This implies that once organizational routines are established, socialized and legitimized, they will tend to be less subject to change by new learning outcomes for path-dependence reasons and costs to change the resource-base of the firm in case of path-breaking outcomes. Nevertheless, if the current routines are not effective to solve a CLE, and the entrepreneur judges that the path-breaking outcome is worth undertaking, the trajectory of the firm might change. Evidence of these processes of path-breaking and path-dependence in the selection of learning outcomes is provided in the empirical section.

3 Method

This paper is based on the narratives of entrepreneurs-founders of 43 business start-ups. These narratives were based on retrospective interviews (Flick 2007) about the critical events that marked the story of the business. These events correspond to 'chapters' in the storyline of the business that demanded search for solutions, knowledge, and resources by the entrepreneurs. The aspect of criticality is subjectively assessed by the entrepreneur, based on the extent in which each episode impacted the evolution of the start-up. Since the interview items did not predefine types of episodes, the researcher was concerned with collecting elements that could be compared between episodes of any type, in light with the conceptual framework. For instance, what triggered the episode, whose actors were involved, what strategies were used to cope with the episode, what were the outcomes, and who the episode changed the organizational routines. It is noteworthy that these details were most of the times spontaneously reported by the entrepreneurs. Despite the risk of memory bias caused by salience[3], it is assumed that the interviewees indeed narrated their most important episodes, given the coherence of their storylines.

3.1 Characteristics of entrepreneurs and business start-ups

None of these start-ups were family businesses; they were operating for an average of four years (s.d.=1,9), and the majority of their founders (55,8%) did

[3] Salience: "the property of a stimulus that makes it stand out relative to other stimuli in a particular context" (Hogg and Vaughan 2010, 24-61). It can influence which episodes are remembered first and affect the judgement of entrepreneurs about how critical they were.

not have entrepreneurship role models, not even in different fields of activity. All start-ups were linked to business incubation programmes, which provide institutional support and a learning environment.

Business incubators are a type of business development service aimed at small and medium enterprises and their entrepreneurs (Altenburg and Stamm 2004; DCED 2001). These services can be operational and strategic. Operational services refer to business infrastructure, and information and communication facilities (source: 15 incubators' managers and incubator's documentary data). These are considered standard in Brazil. Strategic services aim to "enhance the long-term capacity of an enterprise to compete", through training, consultancy, research and development, and technology development (Altenburg and Stamm 2004, 27, 13). Strategic services, in Brazil, vary per region and per business incubator, depending on institutional and competence-based factors (Corradi 2012).

Business incubators and start-ups in this study are located in the most resource-rich Brazilian states, São Paulo and Minas Gerais, which are national leaders in development indicators such as efficiency-driven economies[4], contribution to the national GDP, presence of large corporations that create niches for SMEs (IBGE 2008), and investment in continuous or occasional R&D activities by universities and firms (IBGE 2010). The selection of these regions facilitated the investigation of start-ups' dynamics in relation to access and transformation of resources.

TABLE 1
Characteristics of entrepreneurs and start-ups

Entrepreneurs characteristics	Values (%)	Start-up characteristics	Values (%)
Pull-entrepreneurs (driven by business opportunity)	86,1	Manufacturing	55,6
No entrepreneurial experience	80,6	Information and communication	27,8
Work experience in the same field	47,2	Scientific and technical activities	16,7
No work experience	22,2	Capital goods	27,8
Work experience in a different field	16,7	Consumption goods	25,0
Academic career	13,9	Intermediate goods	22,2
Not mentioned/Secondary education	19,5	Business services	22,2
Tertiary education	47,2	Final consumer services	2,8
PhD degree	19,4	Years in operation (mean, s.d.)	4 (1,9)
MA degree	13,9		

[4] Efficiency-driven economies are characterized by increased industrialization and economies of scale (Kelley, Bosma, and Amorós 2010).

Some key characteristics of the entrepreneurs and start-ups in this study are summarized in Table 1. It shows that the majority of the entrepreneurs were driven by the identification of a business opportunity, had higher education, and no entrepreneurial experience, although almost half of them had some work experience in the field of the start-up. In relation to the start-ups, most of them develop manufacturing activities, and produce capital goods, consumption goods, intermediate goods, or provide business services.

3.2 Data analysis: Identification of critical learning episodes

In order to identify each CLE with its constituent elements, the narratives were sequenced as a storyline with the following elements: the beginning of the idea, the first steps to set up the business, the temporal sequence of critical learning episodes, the current status of the business and perspectives for the future. The backbone of a storyline is the critical learning episodes, which connect different parts of the narrative. The boundaries of each CLE are the trigger and the new organizational routines, or alternatively, the routines in progress. Additional issues, processes and contextual factors that are not directly related to CLEs play important role in picturing the relationships between start-up and external environment.

The identification of potential episodes often related to expressions that attribute importance to an event. For instance, *"What indeed pushed us ahead was, in the next year, when we went to a [business] fair"*, *"But as things evolved, in eight months' time, there was a disagreement between me and my associate"*, *"Our critique was accepting that in a given time we would have to accept the entry of an investor"*.

Following these expressions, entrepreneurs addressed the triggers to episodes. For instance, *"We had the follow up of the people who provide consultancy, who started passing information on"*, *"Then you enter a market, a huge market. It's a shock"*, *"Until the end of 2006 we earned nothing. We were working 12 hours a day and earning nothing"*, *"To be honest, when I started, I didn't even know that commercial area, financial area existed"*.

Then, the end of an episode could be indicated by two sets of expressions. First, completed episodes were signalled by the description of new routines, such as *"Where did we aggregate more? I think it was in the entrepreneurial culture"*, *"Now we create our own documents, our own registers [referring to quality procedures]"*, *"First we established the [business] model, then the strategies to fulfil that model. In fact it was a gradual thing"*, *"We already have a whole system of project management. We have focus on development. We have partnerships with many universities"*.

Second, episodes with routines in the making were indicated by expressions of work in progress, such as *"It's in the very beginning and all, we're in the first steps in this part"*, *"Currently the biggest barrier is the associate having to work in something else to be able to survive. [With subvention] you don't need to be weaving several other things at the same time"*, *"We have a problem here… of demand management. We haven't been able to attend the demand"*. It is noteworthy that many of these expressions, removed from context, could also signal a trigger. However, they appeared in the entrepreneurs' narratives as consequences of episodes.

This phase of data analysis resulted in 204 critical learning episodes, which were, then, categorized.

3.3 Data analysis: Classification of critical learning episodes

The identified CLEs were aggregated according to the subject of their triggers, since they signal the key challenges activating a search process. It is noteworthy that the trigger alone does not reflect the total content of an episode, nor have a necessary relationship with the resulting routines, as shown in the results section.

A preliminary categorization, based on the empirical properties of these episodes, was revised and adjusted according to the literature (e.g., Stretton 1999). This first categorisation was double-blind checked by two experts. Each of them received an evaluation sheet with the definitions of each category and a short description of a sample of 56 episodes. The assessments of these evaluators were compared and mismatches guided further reviews and the refinement of specific categories. The final categorization resulted in 10 types of CLEs. Table 2 orders these episodes by descendent frequencies of the first two columns of values. The most common episode, reported by 84% of the start-ups, is entry and survival in the market, appearing at least once in 25% of the start-ups. When multiple occurrences are counted, in the last two columns of Table 2, these episodes account for 35% of all CLEs. Given its prevalence, this type of CLE is the focus of this paper's empirical sections.

TABLE 2
Distribution of CLEs in 10 categories of triggers

Types of triggers	N cases	% cases	N occurrences	% occurrences
Entry and survival in the market	36	25.35	72	35.29
Entrepreneurial specific triggers	29	20.42	43	21.08
Other triggers	14	9.86	17	8.33
Labour force issues	13	9.15	17	8.33
Lack of working capital	10	7.04	10	4.90
Access and relationship with suppliers	9	6.34	10	4.90
Access to investment capital	9	6.34	12	5.88
Joint venture breakdowns	8	5.63	8	3.92
Regulation issues	8	5.63	9	4.41
Access to technology	6	4.23	6	2.94
Total	142	100.00	204	100.00

Note: The first two columns of values consider one occurrence of each episode per start-up. The other two count multiple occurrences

4 Results

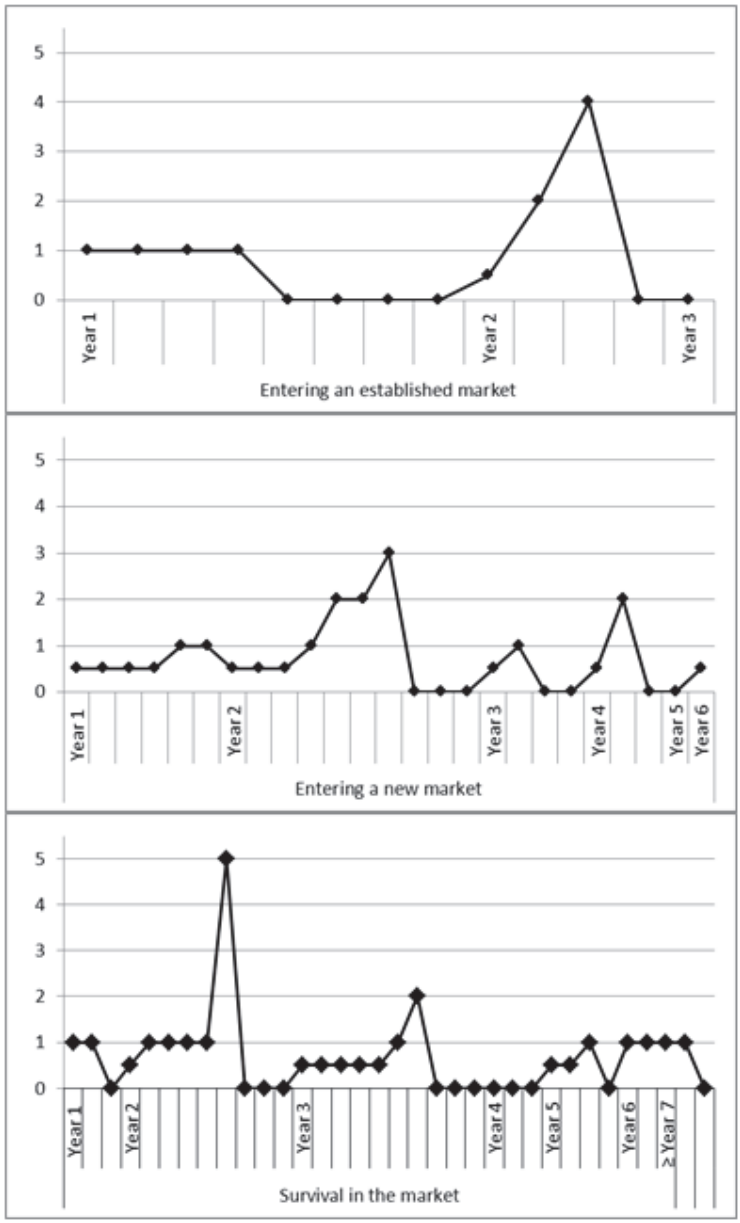
Critical learning episodes of entry and survival in the market are triggered by three types of needs. The first is the need to enter a well-established market, for which the business has to develop a competitive differential or design a competitive business model in order to attract buyers from other sellers. The second is the need to create a new market niche for an innovative product, in which case the start-up has to reach out potential buyers. The third is to outlive threats to survival, such as price war and unfair competition. These CLEs were unpacked in triggers, learning strategies, learning contents, learning outcomes, organizational routines, and networks' dynamics.

This section groups the results in a) year of the start-up's operation in which the episode started, and b) type of need that triggered the episode: entering an established market, creating or entering a new market, or surviving in the market. Figure 2 presents some general patters, based on the frequency (each dot corresponding to one CLE) and the duration of episodes (Y axis).

In relation to frequency across sub-categories, Figure 2 shows higher occurrence of these CLEs in the first three years, ranging from 17-22-15-6, respectively between Year 1 and Year 4, and slowing down thereafter. Results per sub-categories show that the first year is the most critical for those entering an established market, with higher number of occurrences and many in progress. Differently, the second year is the most challenging for those creating a new market. This is explained by the focus on product development in the first year. In turn, both second and third years are the most critical in the sub-category of needing to survive in the market. This is the period when most of the start-ups are actively interacting with market (i.e., competitors, buyers) and institutional actors (i.e., regulatory frameworks, standards), that challenge the start-up's survival and growth.

In relation to duration, most of the CLEs last from a few months to 1 year, or are in progress (zeros). For those entering an established market, patterns indicate yearlong episodes in the first year. Conversely, those creating or entering a new market show shorter episodes in the first year, and a peak of episodes longer than one year in Year 2. At the bottom of the figure, episodes of survival in the market are numerous after the first year. There are multiple occurrences of episodes triggered by needing to survive in the market for most cases and, although entering or creating markets may consume the first three years of a start-up, threats to survival are pervasive beyond the first three years. This result provides empirical evidence to the claim that these are the most critical years of business start-ups.

FIGURE 2
Frequency and duration of CLEs per year and sub-category of trigger



4.1 Critical learning episodes as micro processes

This section shows the dynamic connections between the elements of a CLE: trigger content and actors, learning strategies, learning content and outcomes, resulting organizational routines, and the duration of the episode. As above, these can be seen both per year and by type of market. A sample of these episodes started in the first and second years are detailed in Table 3 and 4, respectively. Types of learning contents and outcomes are represented by symbols, as follows. In the learning contents column, puzzle pieces reflect the

initial fragmentation of the information entrepreneurs have access to; the small redundant network reflects the initial strong ties that are less likely to provide innovative inputs; and the Gyro Gearloose represents the entrepreneurs' efforts to develop new work methods by transforming the resources available.

In the outcomes column, the yin-yang symbol reflects the new interpretations of entrepreneurs resulting from that CLE. The expansive network represents the inclusion of weak and business-related ties to the entrepreneurs' connections. Last, the coordinated gears represent new operational practices or work methods. Note that these symbols do not imply successful outcomes; rather, they signal changes in entrepreneurs' interpretations, network configurations, and working practices. Despite the presentation of just a sample of CLEs in Tables 3 and 4, the discussion that follows reflects the dynamics for all 72 CLEs of entering and surviving in the market.

Across episodes, the role of initial actors ranges between two opposing directions. In one, they open up market opportunities (i.e., increased demand), while in the other they narrow down the start-up's access to markets (i.e., entry barriers). The main actors here are the start-up and buyers. Most of the triggers by the start-up lead to opening access to markets (i.e., expansion of the portfolio of buyers); while others narrow this access (i.e., development of a non- marketable product). In the latter case, the search process results in routines such as investing in a new market or changing the production line. Buyers, instead, tend to trigger episodes of restricting the access to markets (i.e., default in payments). It is noteworthy that, from the third year, start-ups trigger only episodes to open up access to markets and buyers trigger only episodes that restrict this access.

In relation to outcomes, a common result in the first two years is increased dynamism in networks. Even when entrepreneurs did not aim at changing the configuration of their networks, around 1/3 of episodes in Year 1 and Year 2 showed outcomes of maintenance, expansion or strengthening of networks, inclusive during crises. This pattern is not observed in further years.

Table 3 shows that needing to enter an established market demands learning contents aimed at developing new methods. However, learning outcomes are beyond new organizational practices and include the development of new interpretations about how to work, changes in the identity of the firm and expansion of networks. Some start-ups report drastic changes, with new routines expressing their adaptability to market niche demands through decisions of refocusing the business, reconfiguring strategic networks with buyers and competitors, and balancing efforts of product development with market opportunities. This analysis qualifies the pattern observed in Figure 2, upper graph.

TABLE 3
Critical learning episodes started in the first year of the business start-up (n=17)

	Trigger	Actors	Strategy	Learning content	Learning outcomes	Routines	Duration
Established market (n=8)	Refusal of clients to accept receipts (to reduce tax expenses)	Buyers	Diversification of sales according to the clients			A combination of formality and informality in the business transactions	1y
	Need to cope with high barriers to entry in the surgical instruments' market	Big companies	Try a market of easier entry (easier registration and legalisation)			Development of a new production line, with a new business-network. Continuous search for easier markets in which they can apply their productive capacity	On (>3y)
	Refocusing of the start-up to the wholesales' market	Start-up	New cost sheet for wholesalers			Close negotiation with buyers for alternative products to keep prices down and quality high	1y
	Development of a software that was not marketable	Start-up	Development of a marketable product; partnerships for sales (failed)			Prize "Best enterprise of 2008"; "The entrepreneur has to know his market"; Shared focus: development and market	1y
New market (n=6)	Need of water-soluble packages for ethanol fermentation	Buyers	Import from China; adaptation of conventional packaging machine			Service provision in packaging chemical products according to tailor-made formulas	<1y
	Increasing demand for the products	Buyers	Extended working hours; outsourcing; hiring of a secretary			Formalization of the business; structuration of formal labour	1y
	3rd place in an entrepreneurial contest in the university (incubation + money)	University	Courses and events organised by the business incubator			Orientation towards after-marketing (regular motorcycles); temporary end of the fellowships for interns	<1y
	Market research showed a period of 2-3 years to generate income	NPT (Nucleus for technological research, BI)	Networks & Partnerships: 1) bigger enterprise in the sector for product development; 2)university + incubator for courses			Creation of an educational department, apart from the core business. Business is a long-term investment	<1y
Survival in the market (n=3)	Too many sales for the production capacity (4000-8000 pairs)	Start-up	Extended working hours; outsourcing; SENAI technicians; financial & marketing consultant			Better balance between sales and production capacity	On (>2y)
	Loss by the failure of the second product to enter the market	Buyers	Business incubator: finance consultancy + general guidance; courses via university and SEBRAE and access to clients. Bank loan			Reduction of use of financial favours by friends, bank loans cause more costs; focus on services for the food sector	1y
	Clients in default	Buyers	Bearing the costs themselves (incubator's fee, suppliers, registrations); later: local cooperative of credit			Bank system to invoice clients, instead of bank transfers to their personal accounts.	1y

TABLE 4
Critical learning episodes started in the second year of the business start-up (n=22)

	Trigger	Actors	Strategy	Learning content	Learning outcomes	Routines	Duration
Established market (n=4)	Need of new buyers	Start-up	Support from the business incubator			Broader portfolio of clients	<1y
	Need to participate in fairs to enter the market	Incubator consultants	Partnerships with other small and medium enterprises in the market			Business-related partnerships to share costs related to entering the market.	On (>2y)
	Negative advertisement and unfair competition by his former employer	Big companies	Count on the support of the business incubator			Production of regular and special pieces, with high quality and good price to be able to compete	4y
	Two too big sales right from the start	Buyers; start-up	Hiring workers, all associates dedicated to programming			Modularization of systems, creation of a web application (easier sales, less workload). Partnerships to develop new products	2y
New market (n=9)	First contacts with potential buyers (researchers)	Entrepreneurs; buyers	Partnerships with researchers that had developed antibodies for their own research			Spin-off of the first start-up for the agriculture sector; balance between market needs and technology developed	2y
	Resistance of laboratories to outsource R&D	Buyers	Subventions from the government (FINEP)			Creation of conditions to develop higher scale innovations in advance of the market demands; possibility to profit from royalties	On (>2y)
	Demand for services from enterprises in similar areas than the target sector	Buyers; Ministry of Agriculture	Studying the legislation for animal food sector			Expansion of the scope of the business to other sectors in food production	On (<1y)
	Research with high economic potential, but no expertise in industrialization	Start-up	Business incubator (consultancies, fairs); public funding (CNPq, FINEP)			Change of equipment (research vs. production); research vs. firm timeframes	1y
Survival in the market (n=9)	International financial crisis reaches the industries (buyers) - no new contracts	Buyers	Focus on contracts of maintenance			Maintenance contracts are an alternative to market crisis.	1y
	Market demand for monthly new creations	Buyers	Hiring of a stylist			Division of tasks between associates: sister does exclusively modelling; monthly creations	On (>2y)
	Important client in default	Buyers	(Failed) trials for bank loan; later: business account in another bank (2007)			End of the working capital problems, given the bank facilities to the business (from year 2 on)	1y
	Rapid acceptance of the 1st product + demand for a mix of products	Buyers	Development of a mix of products based on the technology of the first			Fast development of new technologies and derived products; focus on "development for technological innovation"	On (>1y)

In cases of needing to create or enter a new market, the main learning contents are the development of new methods and the establishment of networks. Again, learning outcomes included the development of new meanings, illustrated by the formation of a business' identity linked to the development of alternative products and services; these alternative activities generate working capital and support the formation of business networks. These networks will facilitate the insertion of the main product or service in the target market, once it is ready for commercialization. Such episodes are the shortest in the first year, with 67% of them lasting for only a few months.

Episodes related to survival in the market, in the first year, are typical of entrepreneurs who already started with some expertise and networks in the sector. The main learning contents are searching for managerial knowledge, expanding networks and developing innovative working methods. Learning outcomes show that entrepreneurs accomplish this task, through unlearning previous routines (i.e., incorporation of expert advice). These episodes last between one and two years.

A comparison between routines in Tables 3 and 4 shows less drastic changes in the second year than in the first. Instead of redesigning the whole business, there seems to be a stronger effort in expanding the mix of products or services, and in developing innovations based on what is already being traded. Episodes involving diversification and innovation in the second year are the majority amongst those start-ups creating or entering a new market.

Episodes of entering an established market starting in the second year show routines of reaching out the market, improving the production process, and establishing partnerships to reduce market entry costs and diversify the mix of products. Episodes of entering or creating a new market show great diversity of contents and outcomes. For instance, CLEs triggered by needing to reach out buyers may result in routines of participation in business fairs that leverage sales and production up to semi-industrial levels. Alternatively, expansion and growth relate to the creation of spin-offs. Different triggers could also result in similar routines, such as purchase offers from competitors, preparation to sell a product, or initial efforts to transform technology in product, all resulting in managerial schemes to deal with market dynamics. The shortest episodes (months) relate to increased access to markets and the longest ones (up to three years) relate to restrictions to this access.

Episodes of needing to survive in the market, taking place in the second year, show buyers as key actors, predominantly posing barriers. Episodes triggered by the international financial crisis, for instance, resulted in routines of maintenance of clients and contingency of expenses. Other cases expanded diversification through shortened product creation cycles. These routines are triggered either by demands from buyers or by needing to outcompete copiers of the product. Most of these episodes are complete in about one year, except for trust building with buyers, which episodes were five years long.

4.2 Individual learning strategies

This section examines the use of learning strategies (cognitive, behavioural, or self-regulatory) to cope with triggers per year and sub-category of trigger. Figure 3 shows that behavioural strategies are the most frequent across years and for almost all types of triggers; cognitive strategies are the next and self-regulatory strategies are marginally reported. The distribution indicates that the number of learning strategies is closely related to the number of critical learning episodes, not showing specific patterns related to sub-category of trigger or temporal factors.

The correlation between cognitive and behavioural strategies was very high (0,94 $p<0,01$), inasmuch as the correlation between the sum of these two strategies and the number of episodes (0,94 $p<0,01$). These coefficients indicate that entrepreneurs consistently combine cognitive and behavioural strategies across all types of CLEs. Hence, the most often used sub-categories of cognitive and behavioural strategies are discussed next.

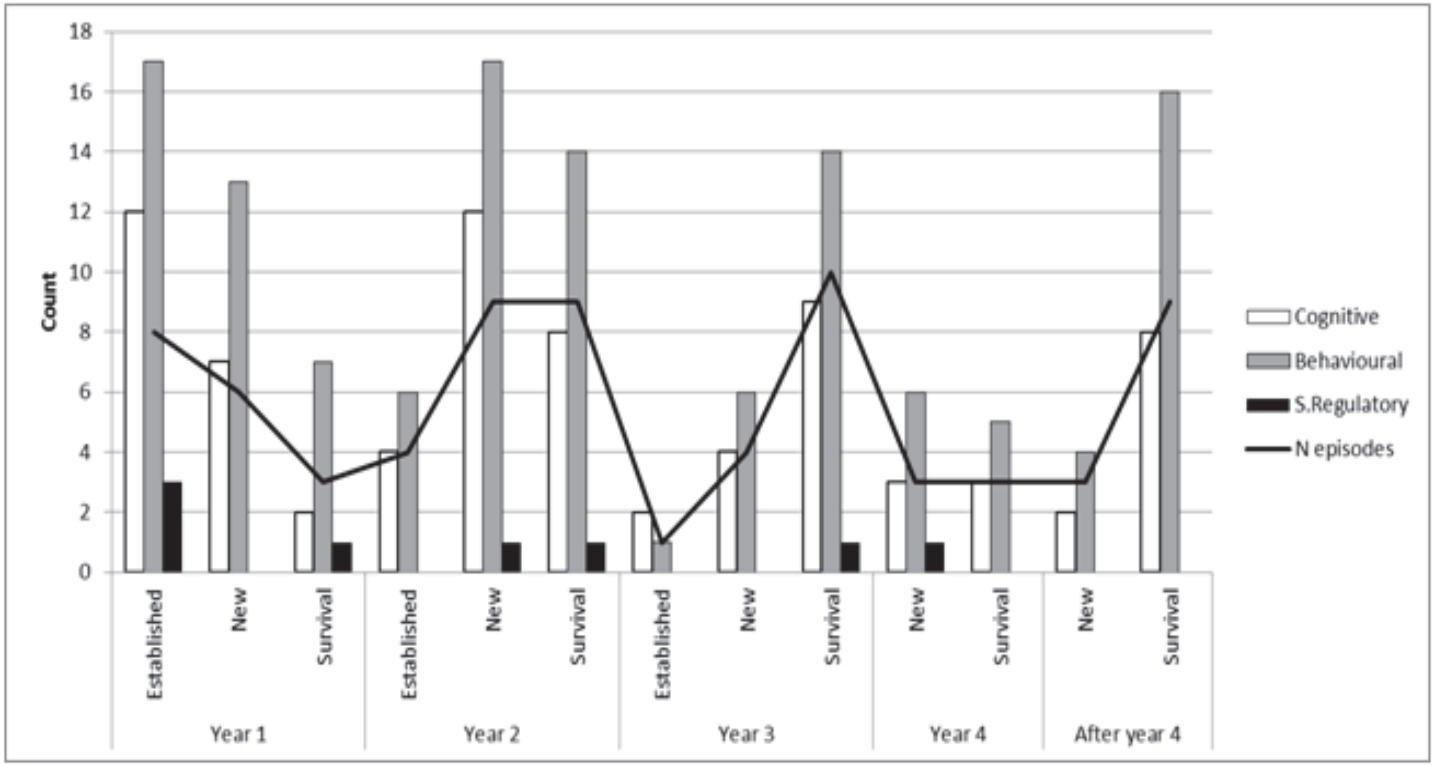
The preferred sub-category of learning strategies is practical application (reported 62 times in 72 episodes). This behavioural strategy refers to the application of new knowledge (i.e., use of cost sheet introduced by the financial consultant), gradual experimentation (i.e., diversification of designs), incorporation of new information into the working practices (i.e., adoption of knowledge management tools to cope with high turnover of employees), and trial and error (i.e., development of an innovative product). Because of these characteristics, learning strategies of practical application influence the formation of operational routines directly.

The two next most frequent strategies are interpersonal/inter-organizational help-seeking (behavioural) and extrinsic reflection (cognitive), with 53 occurrences each in 72 episodes). The former reflects the search for colleagues to discuss problems (i.e., other incubatees), transfer of knowledge to newcomers (i.e., training of interns), clarification of doubts with suppliers (i.e., trust-based relationships), relationship with clients (i.e., inputs for the customization of products), and search for experts in specific topics (i.e., marketing consultant).

Extrinsic reflection, in turn, refers to the establishment of cognitive relationships between entrepreneurs' activities, strategies and the business of the firm (i.e., suitability of a certain business model), relationships between entrepreneurs' activities and the fulfilment of clients' expectations (i.e., broadening the mix of products), and the impact of entrepreneurs' performance on different areas of the start-up (i.e., distribution of tasks between associates).

Patterns over time showed that, in the first year, networking-based strategies are preferred to the other two. This suggests that networking with resourceful actors is crucial to acquire and create resources that will compose the initial organizational routines. In the second and third years, however, there is increased use of practical application combined with extrinsic reflection. This

FIGURE 5
Distribution of learning strategies per year of CLE, sub-category of trigger and number of episodes



result indicates that those initial routines provide services (in Penrosian terms) to cope with new CLEs. Therefore, the firm starts relying on a coherent internal resource-base to cope with new challenges. Entrepreneurs, after the first year, consistently examine the relationships between internal activities and external demands from clients, buyers, support institutions, governmental agencies and so forth, before acting upon a CLE.

There are two important implications of these results. First, endogenous firm processes become increasingly important, in comparison to networking with external actors. Second, if the emphasis on endogenous search through repetitive use of these routines crystalizes, exchanges with the external environment and inputs to innovative activities can be compromised.

4.3 Networks' dynamics

Since networking activities are so crucial in the first year, this section investigates changes in the configuration of these business start-ups' networks in two points in time. Through techniques of social network analysis (e.g., Scott 2005), it examines who the resourceful actors were at the beginning of the business and by the time of the interview. As expected, the overall results show that start-ups are currently more embedded in market-based networks than when they started.

There are three main types of actors: family members and friends providing financial support or expertise, former workmates, and support institutions. For the initial network, out-degree centrality measures[5], pointed out the following actors, from the most to the least central (cut point = 0,10): other incubatees, university, business incubation consultants, buyers, and university professors. These central actors provide information and support; they hold a power position in the entrepreneur's network for possessing critical resources. This is clear in relation to university, consultants, buyers, and suppliers. However, high centrality of other incubatees is an unexpected result, which is explained by previous friendship and kinship ties between interviewees and other incubatees.

In the current network, most central actors are, from the most to the least (cut point = 0,10) are buyers, other incubatees, business incubation consultants, university, family experts, small enterprises support institutions at the State level (SEBRAEs), suppliers, university professors, and one business incubator. In general, this comparison indicates entrepreneurial efforts to expand the initial networks and increased embeddedness of business start-ups in market and institutional settings.

At the level of the individual firms, comparisons between initial and current networks show that new actors were included and others excluded, which is explained mostly by more rigorous selection of suppliers and buyers, and reconfigurations of the team of associates. There is also qualitative change

[5] Centrality is a whole network measure that considers all indications of relationships between all actors. However, here, since all relationships were reported by the entrepreneurs, the measure of out-degree is used. This measure indicates who the actors mostly looked for by the entrepreneurs to access resources are.

in the resources exchanged by the start-up with these actors. For instance, the university, in the initial networks, is a source of business ideas and informal information and support. Later, the university becomes a source of partnerships for product development and technological update. These relationships tend to become more formalized, and some cases have formal contracts to regulate intellectual property rights.

These two networks were compared also in terms of density, geodesic distance, size of the main component and relationships of core-periphery (Table 5). These indicators point out a denser current network, with shorter paths to reach other actors (smaller geodesic distance) and more actors grouped together in closer ties (larger principal component). The current network is less fragmented and allows more intensified flow of resources between actors than the initial network.

The analysis of core/periphery indicates who the actors in the core of the network are. It is through them that more resources are exchanged and from whom peripheral actors search for resources. Relationships between peripheral and central actors tend to be more frequent than relationships between peripheral actors. Results show that the core actors in the initial network are: three business incubators, incubatees, support institutions (SEBRAE, FIESP) and incubators' consultants. The current network presents more core actors and stronger relationships. These core actors include more business incubators, support institutions, incubators' consultants, university, and university professors. The embeddedness process into the institutional setting of business incubation programmes is noteworthy, in that 43% of the business incubators were positioned in the core of the current network. Other new actors in the core relate to the university environment, corroborating their additional roles.

TABLE 5
Structural measures comparing networks configurations in two points in time

Measure	Initial network	Last network
Density (proportion of effective ties*)	0,236	0,263
Geodesic distance (average number of intermediaries between two actors*)	3,54	2,89
Components	18 (137 nodes in component 1)	9 (147 nodes in component 1)
Core-periphery	Core actors: BI01, BI04, BI10, Incubatees, SEBRAE/SP, SEBRAE/MG, FIESP, Incubators' consultants	Core actors: BI01, BI04, BI05, BI10, BI12, BI14, Incubatees, SEBRAE/SP, SEBRAE/MG, Incubators' consultants, University, University professors, ParqTec, ParqTec consultants

BI=Business Incubator; SP=São Paulo; MG=Minas Gerais. Other acronyms refer to support institutions (SEBRAE, FIESP).

An important point of this social network analysis is the disclosure of multiple roles played by incubatees. In the initial stages of a business start-up, they link new entrepreneurs to business development services. For being more experienced, they contribute to informal exchanges of information about funding, managerial practices, etc. They are also key sources of social support. Furthermore, formal relations develop, for instance, in the form of partnerships for product development or service provision. These between-entrepreneurs' dynamics characterize incubators as learning environments and breeding ground for informal exchanges between incubatees. Second, they function as network brokers between start-ups and resourceful actors, as indicated by the core-periphery analysis.

5 Discussion

This paper investigated the role of critical learning episodes as a conceptual and analytical tool to explain the evolution of business start-ups. Evolution, in this regard, is punctuated by discontinuous turning points that result in new organizational routines. The breaking down of a business start-up's pathway into CLEs and of these into its elements provided rich information on processes that Penrose (1980 [1959], 42) called "the nature and extent of the 'subjective' productive opportunity of the firm".

The analysis of the triggers, for instance, corroborated Nelson's and Winter's claims (1982) about deliberate and non-deliberate processes of change, and showed additional nuances. Deliberate choices, for instance, can lead to hazardous outcomes and trigger new learning episodes, such as entrepreneurial decisions that hinder the entrance in the market. Moreover, exogenous triggers are not always unwelcome, since buyers and competitors, amongst other actors, can either close or open business opportunities. Therefore, learning outcomes, rather than triggers to search, are more likely to be associated to positive or negative impacts on organizational routines.

As an analytical tool, critical learning episodes permitted the systematization of the entrepreneurs' narratives in terms of the development of new meanings, commitments, and methods. This included the individual, social and organizational levels of analysis, in which combinations of market, entrepreneur, and time factors play a role. Temporal comparisons showed that the balance between elements of search changes in time, by the increased role of endogenous processes to solve CLEs and the relative reduction in networking to search resources externally. These results imply, first, an increased process of stabilization of routines; second, cost reduction for the deployment of the internal resources; and third, a role of routines as internal resources to cope with CLEs.

The increased reliance on established organizational routines to reduce the costs of searching has two sides. On the positive side, the perceived criticality of many triggers is diminished, and the start-up can focus on more complex routines and growth. On the risk side, excessive or non-assessed reliance on these routines may compromise flexibility to adapt to new situations through active networking with other actors, especially regarding the deployment of weak ties for innovation (e.g., Granovetter 1983).

In relation to the third point above, concerning resource use dynamics, this study contributes to the literature on learning in organizations by demonstrating that resources are created through combinations of learning strategies of extrinsic reflection and practical application. This literature, because of focussing on complex organizational systems (e.g., Warren 2004), emphasizes access to resources, rather than creation (Penrose 1980 [1959]; Best 1990; Cooke and Morgan 1998; Abbad and Borges-Andrade 2004). Hence, this study also contributes to the literature on business start-ups by showing that entrepreneurial learning is not restricted to acquisition and transformation of external resources; it also includes intra-firm creation.

Yet at the theoretical level, dynamics of critical learning episodes and their and impacts on start-ups' routines support the argument that path dependence does not explain the entire story of the evolution of business start-ups. Path-dependence processes are interrupted by critical learning episodes, which change the start-up's pathway through new resources, services and routines. Therefore, path-breaking seems to be crucial to survive the first years, in which new technological platforms are created, by-products are developed, new markets are reached, and so on. These path-breaking activities are on the opposite end of reliance on bank loans or governmental grants if path-dependent processes were to be followed.

This argument corroborates studies on the role of discontinuous events in thrusting new solutions to the firm (e.g., Argyris and Schon 1978; Fiol and Lyles 1985). This literature, although not yet cohesive, shares the assumption that some learning processes exert stronger impacts than others on individual and organizational outcomes (e.g., Cope 2003). Results of this paper confirm that some events are more critical than others for organizational evolution. Another claim of this literature is that lower level learning encompasses the development of working methods and organizational routines; whereas higher level learning relates to the development of interpretive frameworks by entrepreneurs. Results here do not support this claim, since interpretative and practical outcomes are much intertwined in the first years of business start-ups. This divergence can be explained by the ex-post definition of lower and higher level learning based on learning outcomes alone. Conversely, by examining learning processes, this paper argues that only those critical learning episodes that combine the interpretative and practical dimensions of learning are path-breaking. This conclusion advances the literature that assumes hierarchies of relevance between cognition and practice.

At the institutional level, this study indicates that arrangements for innovation and market development should take into account endogenous capabilities to produce new resources, in addition to those that are institutionalized (i.e., monthly consultancies, R&D grants). One constructive example found in a few business incubators is the organization of consortia between incubatees around a common target sector or innovative product. This brings in the issue of embeddedness of business start-ups in market and institutional networks. Changes in the networks' configurations demonstrated the increased centrality of business incubators and support institutions. Peripheral actors, such as buyers, suppliers, business partners and others often represent weak ties (Granovetter 1983). This is a positive scenario for

continuous exchange of non-redundant information and resources for start-ups. However, if relationships with core actors (i.e., support institutions) are excessively emphasized, entrepreneurs may overlook or miss valuable information, and may face difficulties to become independent from these support institutions.

At the methodological level, this study demonstrated how critical learning episodes can be identified in narratives of entrepreneurs, without pre-defined categories of these episodes. The qualitative analysis of these narratives disclosed connections between micro- and meso-levels, corresponding to the entrepreneurial learning strategies to develop new organizational routines. Furthermore, the in-depth examination of the CLEs triggered by needs of entering, creating or surviving in the market in 36 business start-ups showed patterns in the application of learning strategies through time. This combination of qualitative and quantitative data analysis also supported the investigation of dynamics of connectedness to resourceful actors across the first three to five years of evolution of these business start-ups.

Future research could investigate the generalizability of these results to business start-ups that are not linked to business incubators, considering types of CLEs and their internal dynamics. Another area of interest is the investigation of relationships between critical learning episodes and how they influence the evolution of different types of business.

References

Abbad, G., and J. E. Borges-Andrade. 2004. Aprendizagem humana em organizações de trabalho [Human learning in work organizations]. In *Psicologia, organizações e trabalho no Brasil*., eds. José Carlos Zanelli, Jairo Eduardo Borges-Andrade and Antonio Virgílio Bittencourt Bastos. 1st ed., 237-275. Porto Alegre (Brazil): Artmed.

Altenburg, T., and A. Stamm (2004) *Towards a more effective provision of business services*. Bonn: German Development Institute.

Argyris, C., and D. A. Schon (1978) *Organizational learning*. MA: Addison-Wesley: Reading.

Bastos, A. V. B., S. M. G. Gondim, and E. Loiola (2004) Aprendizagem organizacional versus organizações que aprendem: Características e desafios que cercam essas duas abordagens de pesquisa [Organizational learning and learning organizations: characteristics and challenges around these two research approaches]. *RAUSP - Revista de Administração da Universidade de São Paulo* 39(3): 231-41.

Best, M. H. (1990) *The new competition: Institutions of industrial restructuring*. Cambridge: Polity Press.

Cooke, P., and K. Morgan (1998) *The associational economy: Firms, regions and innovation*. Oxford: Oxford University Press.

Cope, J. (2003) 'Entrepreneurial learning and critical reflection: Discontinuous events as triggers for 'higher-level' learning'. *Management Learning* 34(4): 429-450.

Corradi, A.A. (2012) Informal Networks in Business Development Services: Case Studies from Two Brazilian Business Incubators. In *Networks for Prosperity. Connecting Development Knowledge Beyond 2015.,* eds. K. Kitaoka, A. Marx, J. Fuentes and C. O'Reilly, 113-121, 3.3. Vienna, Austria: UNIDO (United Nations

Industrial Development Organization)/Leuven Centre for Global Governance Studies.

Cressy, R. (2008 [2006]) 'Determinants of Small Firm Survival and Growth', in M. Casson, B. Yeung, A. Basu and N. Wadeson (eds) *The Oxford Handbbok of Entrepreneurship*, Vol. Chapter 7. pp. 161-193. Oxford: Oxford University Press.

DCED (The Donor Committee for Enterprise Development) (2001) *Business development services for small enterprises: Guiding principles for donor intervention.*

Fiol, C. M., and M. A. Lyles (1985) 'Organizational learning'. *The Academy of Management Review* 10(4): 803-813.

Flick, U. (2007) *Designing qualitative research*. The sage qualitative research kit. Vol. 1. Los Angeles; London; New Delhi; Singapore: Sage Publications Ltd.

Granovetter, M. 1983. The strength of weak ties: A network theory revisited. *Sociological Theory* 1: 201,233; 201.

Hogg, M. A., and G. M. Vaughan. 2010. Chapter 2. Social thinking. In Essentials of social psychology, eds. Michael A. Hogg, Graham M. Vaughan. 1st ed., 24-61. Harlow, UK: Pearson Education Ltd.

IBGE, Directory of Research, Coordination of Industry (2010) *Pesquisa de inovação tecnológica: 2008*. Rio de Janeiro: IBGE (Instituto Brasileiro de Geografia e Estatística), Ministry of Planning, Budget and Management.

——— (2008) *Pesquisa industrial 2008*. Rio de Janeiro: IBGE (Instituto Brasileiro de Geografia e Estatística), Ministry of Planning, Budget and Management.

Kelley, D. J., N. Bosma, and J. E. Amorós (2010) *GEM - global entrepreneurship monitor - 2010 global report*. Babson College, United States; Universidad del Desarrollo, Chile; London Business School, England.

Klein, K. J., and S. W. J. Kozlowski, eds (2000) *Multilevel theory, research, and methods in organizations: Foundations, extensions and new directions.* Society for Industrial and Organizational Psychology Frontiers Series. 1st ed. San Francisco: Jossey-Bass.

Knight, L., and A. Pye (2007) The search for network learning: Some practical and theoretical challenges in process research. In *Inside networks: A process view on multi-organisational partnerships, alliances and networks*., eds. Tobias Gössling, Leon Oerlemans and Rob Jansen, 163-191; 8. Cheltenham (UK), Northampton (USA): Edward Elgar.

———. 2004. Exploring the relationships between network change and network learning. *Management Learning* 35(4): 473-90.

Lazaric, N. (2008) Routines and Routinization: An Exploration of some Micro-Cognitive Foundations. In *Handbook of Organizational Routines*., eds. M.C. Becker, 205-227, 10. Cheltenham (UK), Nothampton (USA): Edward Elgar.

Lundvall, B. A. (2007) National innovation systems - analytical concept and development tool. *Industry and Innovation* 14(1): 95-119.

Mead, D. C., and C. Liedholm (1998) 'The dynamics of micro and small enterprises in developing countries', *World Development* 26(1): 61-74.

Naudé, W. (2008) "Entrepreneurship in Economic Development". Research Paper, UNU-WIDER - United Nations University, World Institute for Development Economics Research, Helsinki, Finland, Mar. 2008.

Nelson, R. R., and S. G. Winter (1982) *An evolutionary theory of economic change.* Cambridge (Massachusetts-USA); London (United Kingdom): The Belknap Press of Harvard University Press.

Nichter, S., and L. Goldmark (2005) *Understanding micro and small enterprise growth*. USAID: United States Agency for International Development, 36.

Pantoja, M. J., and J. E. Borges-Andrade (2004) Contribuições teóricas e metodológicas da abordagem multinível para o estudo da aprendizagem e sua transferência nas organizações. *RAC (Revista de Administração Contemporânea)* 8(4) (Oct/Dec 2004): 115-38.

Penrose, E. T. (1980 [1959]) *The theory of the growth of the firm*. 2nd ed. Oxford: Basil Blackwell.

Riding, R. J., and S. G. Rayner (1998) *Cognitive styles and learning strategies: Understanding style differences in learning and behaviour*. 1st ed. London: David Fulton Publishers.

Rousseau, D..M. 1997. Organizational behavior in the new organizational era. Annual Review of Psychology 48: 515-546.

Scott, J. (2005) *Social networks analysis: A handbook*. 2nd ed. London, Thousand Oaks, New Delhi: Sage Publications.

SEBRAE (2007) *Fatores condicionantes e taxas de sobrevivência e mortalidade das micro e pequenas empresas no Brasil - 2003-2005* [Conditional factors and survival mortality rates in small enterprises in Brazil – 2003-2005]. Brasília-DF, Brasil: SEBRAE - Serviço Brasileiro de Apoio às Micro e Pequenas Empresas.

Stretton, H. (1999) *Economics: A New Introduction*. London, UK: Pluto.

Warr, P., and J. Downing (2000) 'Learning strategies, learning anxiety and knowledge acquisition', *British Journal of Psychology* 91: 311-333.

Warren, L. (2004) 'A systemic approach to entrepreneurial learning: An exploration using storytelling', *Systems Research and Behavioral Science* 21(1): 3-16.

Weick, K. E., and R. E. Quinn (1999) Organizational change and development', *Annual Review of Psychololgy* 50: 361-386.