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COWORKING SPACES AND ENTREPRENEURSHIP:
LITERATURE REVIEW AND RESEARCH AGENDA

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ABSTRACT

With the growth of the sharing economy, coworking became a phenomenon of global interest. As the number of coworking spaces are increasing in world's leading metropolises, the new smart look of cities also reflects on the changing image of working practices. Acknowledging the concurrently trending literature about the topic, the aim of this research is twofold: first, to classify the related themes and theories that explore the contingencies of coworking spaces and coworking through a systematic literature review and second, to propose a research agenda about the subject in order to highlight directions for future research. The methodology covers a bibliometric literature analysis of 51 existing articles from academic journals. This process is performed on the extracted data of contingencies, underpinning theories, and methodological details between the constructs from the collected articles based on coworking and entrepreneurship. The research contributes to the literature by developing a model that includes the adoption of basic theories from field of entrepreneurship, after establishing a comprehensive review of dominant analogies suggested so far. The findings of this research provide an agenda for future studies in terms of methodology, context and theoretical framework. Practical implications obtained from this study will help to build connections to reframe alternative transitions from sharing economy and to tackle the disruptive social and economic dimensions of this crisis, with an optimistic entrepreneurial focus.

Keywords: Coworking spaces, entrepreneurship, sharing economy.

JEL Classification: L26, 031, P48.

ABSTRACT

Con el crecimiento de la economía colaborativa, el coworking se convirtió en un fenómeno de interés mundial. A medida que aumenta el número de espacios de coworking en las principales metrópolis del mundo, la nueva apariencia inteligente de las ciudades también se refleja en la imagen cambiante de las prácticas laborales. Reconociendo la literatura de tendencias concurrentes sobre el tema, el objetivo de esta investigación es doble: primero, clasificar los temas y teorías relacionadas que exploran las contingencias de los espacios de coworking y el coworking a través de una revisión sistemática de la literatura y, en segundo lugar, proponer una agenda de investigación sobre el tema sujeto con el fin de resaltar las direcciones para futuras investigaciones. La metodología cubre un análisis bibliográfico bibliométrico de 51 artículos existentes de revistas académicas. Este proceso se realiza sobre los datos extraídos de contingencias, teorías subyacentes y detalles metodológicos entre los constructos de los artículos recopilados basados en el coworking y el espíritu empresarial. La investigación contribuye a la literatura al desarrollar un modelo que incluye la adopción de teorías básicas del campo del emprendimiento, luego de establecer una revisión exhaustiva de las analogías dominantes sugeridas hasta ahora. Los resultados de esta investigación proporcionan una agenda para futuros estudios en términos de metodología, contexto y marco teórico. Las implicaciones prácticas obtenidas de este estudio ayudarán a construir conexiones para replantear las transiciones alternativas de la economía compartida y abordar las disruptivas dimensiones sociales y económicas de esta crisis, con un enfoque empresarial optimista.

Palabras clave: espacios de coworking, emprendimiento, economía compartida.

Clasificación JEL: L26, 031, P48.

1. INTRODUCTION

Coworking is a product of the conditions of the social system that we live in today, with its roots in the sharing economy (Gandini, 2015; Bouncken et al., 2020) and is closely tied to the ideals of the creative industries shaping the contemporary economics (Lange, 2011; Moriset, 2014; Wang & Loo, 2017). Industry reports show that top fifteen international coworking markets include metropolises like New York, Chicago, San Francisco, Los Angeles, London, Paris, Tokyo, Dubai, Abu Dhabi, Hong Kong, Sydney, Shanghai, Melbourne, Singapore, and Berlin (Instant Group 2017). Among these, New York and London are the world's leading cities in terms of the number of new coworking space opening up, followed by other big hubs outside US like Toronto, Berlin and Paris (Coworking Resources, 2020).

The term "coworking" developed as a by-product of the coworking spaces flourishing in urban cities (Spinuzzi, 2012; Lorne, 2019). Dissatisfied with the freelance work situation, collective forms of self-help and self-organization among the creative worker groups (Merkel, 2019; McRobbie, 2016) resulted in rehabilitation of former old buildings in towns into coworking spaces, where flexible, independent and collaborative work could be pursued (Sykes, 2014; Luo & Chan, 2020). Coworking spaces were originally formed as an alternative to working from a home office (Waters-Lynch & Potts, 2017; McRobbie, 2013), but in time they transformed into popular alternatives, fueled with steep prices of office infrastructure, the economic changes caused by the financial crisis and the subsequent rise of unemployment rates and self-employment (Štefko & Steffek, 2017). As a result, coworking is an urban practice that helps to cope with the prevalent informality, uncertainty, and risks of independent work of the current system (Spinuzzi, 2012; McRobbie, 2016; Luo & Chan, 2020).

The term "coworking" was first coined in 1999 by DeKoven, a game designer, who used it to refer to the way of working with an attempt to involve collaboration, a breakdown of hierarchy and perceive co-workers as equals, rather than attributing to relate the term to space (Brown, 2017). The opening of the first coworking space followed afterwards in 2005, in Berlin, one of the megacities with largest network of coworking spaces today (Instant Group, 2017). Until then, the number of coworking spaces has multiplied fast and tremendously as a reaction to the economic crisis of 2007-2008, proving to be a profitable component of the post-crisis era (Lorne, 2019).

Coworking spaces are shared workplaces where independent entrepreneurs and various sorts of professionals (Gandini, 2015) work side by side (Capdevila, 2015), as a solution to increasingly atomized and precarious working patterns within the creative industries (McRobbie, 2016). Coworking spaces are considered as preferential alternatives to home working or to semi-public “Third Spaces” (Oldenburg, 1989; Florida, 2002) by the independent professionals and those with workplace flexibility, who work better together than they do alone (Spinuzzi, 2012). In these local networks, coworkers may benefit from events and projects that are accessible to wider society and that create encounters for sharing information, ideas, and knowledge (Capdevila, 2015). One of the first attempts by Spinuzzi (2012) to define coworking as an associated activity of coworking spaces resulted in a variety of understandings for different user types of these spaces. Later, Parrino (2015) defined coworking in three basic dimensions, emphasizing either a form of action, status or method, i.e.:

- i. the *co-localisation* of various coworkers within the same work environment,
- ii. the presence of workers heterogeneous by occupation and/or sector in which they operate and/or *organizational status* and *affiliation* (freelancers in the strict sense, microbusiness, employees or self-employed workers),
- iii. the presence (or not) of *activities* and *tools* designed to stimulate the emergence of relationships and collaboration among coworkers.

This expression with reference to individual work in a shared environment, should be separated from the co-working (with hyphen), which involves working together on the same work project, while the two terms are often substituted with each other (Constantinescu & Devisch, 2018).

The study of coworking as a topic in academic literature dates to the booming of coworking spaces, when Spinuzzi (2012) marked the arrival with three fundamental research questions asking about “What is coworking?”, “Who coworks?” and “Why do people cowork?”. Later, coworking studies have been pioneered by many researchers, especially those focusing on the cities where phenomenon was observed at is highest (McRobbie, 2013; Capdevila, 2015; di Marino et al., 2018; Fiorentino, 2019; Grazian, 2019; Luo & Chan, 2020). Moving from the definition of these basics, for a decade, academics highlighted the underlying factors behind the expansion of coworking spaces, and the ways these collaborative areas could result in beneficiary outcomes for business.

Knowledge exchange and spillover effects in relation to working in an independent but collaborative manner were largely put into the center of these suggestions (Capdevila, 2015; Parrino, 2015; Rus & Orel, 2015; Bouncken et al., 2018b). Flexible (Spinuzzi, 2012) and loner (Garrett et al., 2017; Moriset, 2014) user profiles of coworking spaces contended in those studies also help outline the idea of a knowledge society. Often individual and project-based nature of creative work generated in these places represented a nomadic and precarious labor format in search of new identification styles (Gandini, 2015). Alternatively, with the use of empirical studies, the driving factors which lead to better coworking conditions were revealed (Sykes, 2014; Gandini, 2015; Spinuzzi, 2012) and definitions were remastered to answer the increasing sprouting of various collaborative work place typologies (Fuzi, 2015; Kojo & Nenonen, 2016; Waters-Lynch & Potts, 2017; Clayton et al., 2018). Contemplating the extensively evolving global phenomenon, researchers from various disciplines including applied psychology (Gerdenitsch et al., 2016), geography (Brown, 2017; Capdevila, 2015; Merkel, 2015; Fiorentino, 2019), entrepreneurship (Bouncken & Reuschl, 2018; 2020; Fraiberg 2017), library studies (Lumley, 2014; Bieraugel, 2019), organization studies (Garrett et al., 2017; Jakonen et al., 2017) and critical coworking research that foregrounds the structural context of neoliberal capitalism and precarious work (De pauter, 2017; Papageorgiou, 2020) have shown interest in coworking.

As a modern-day phenomenon, coworking spaces and coworking are byproducts of collective low budget organizing and urban practice (Merkel, 2015). Originally formed as an alternative to remedy the isolation of working from a home office, or distracting effects of simple coffee-shops, they are gradually evolving to answer the necessities of the day with the rising popularity of the sharing economy (Gandini, 2015). While the studies in the first half of the 2010's defined the coworker types as self-employed or extended workers, entrepreneurs, freelancers, SMEs, students and employees of large firms (Capdevila, 2015; Fuzi, 2015; Gandini, 2015; Merkel, 2015; Moriset, 2014; Parrino, 2015; Spinuzzi, 2012; Sykes, 2014), the most recent sources signal the strategic benefits enjoyed by utilization of coworking spaces by corporate companies as well (Worktech Academy, 2020). Meanwhile, coworking is also practiced in academic cycles in conjunction with colleges or universities, to foster the entrepreneurial education (Bouncken, 2018; Nichols et al., 2017).

From a broader framework, the topic enters the realm of entrepreneurship literature by definition that coworking spaces are not just used by workers or professionals, but rather, mostly non-employee enterprises (Spinuzzi, 2012). However, not all previous studies have emphasized the contingencies with regards to entrepreneurship. Since coworking spaces are playground for the urbanization process, a great deal of writing effort has been put to conceptualize spatial design and user characteristics that impact coworking space selections (Spinuzzi, 2012; Sykes, 2014). Otherwise, within a decade of explorations on the potentials to create a sense of community (Garrett et al., 2017; Bouncken et al., 2018b) and knowledge exchange (Bouncken & Aslam, 2019), the mechanisms through which these institutions create entrepreneurial advantages were discussed. Coworking spaces encourage creativity (Schmidt, 2019; Cheah & Ho, 2019), diversity (Avdikos & Merkel, 2019), and innovation (Wijngaarden et al., 2020; Barwinski et al., 2020), three main concepts which form the backbone of entrepreneurial activity (Lee et al., 2004). They also provide a strong and diverse knowledge base (Morisson, 2019), well-developed business and social networks (Lorne, 2019), and an ability to identify opportunities (Hicks & Faulk, 2018) which supports a successful entrepreneurial behavior (Lee et al., 2004). With that hybrid approach, coworking spaces can assist to strengthen entrepreneurial activities in towns or regions with weaker entrepreneurial environments (Fuzi, 2015). That is why, in most universities or libraries coworking spaces are administered to provide an efficient source of entrepreneurial education, support, services and training directed to small enterprises, and a contribution to new job creation (Lumley, 2014; Bieraugel, 2019).

The field of entrepreneurship research has grown more than a half century and as a significant field of intellectual activity requires timely to look back in order to more systematically analyze previous efforts and to attempt to identify the main intellectual contributions within the field, as also reflected in the callings of Landström et al. (2012). Therefore, the fact that not all literature that deal with coworking is concerned specifically with entrepreneurship (Spinuzzi 2012; Moriset, 2014; Capdevila, 2015) should be addressed critically.

Shane and Venkatamaran (2000) define entrepreneurial process, opportunity, and the nature of organizational interaction as core topics of entrepreneurship research and make a call to academics about the inclusion of theory in the field, with its own theoretical framework. Neither, in most of the studies of coworking the mentioned ideas

do focus on entrepreneurship theoretically, although they in fact relate to basic underpinning theories of the field. Besides, portrayal of coworking as a character of urban development is prominently observed in several arguments, which leads to contractual implementations of urban and dynamic city theories associated with Jane Jacobs (1969) and Alfred Marshall (1890) that suggest the tendency of innovative and entrepreneurial activity to cluster geographically. Likely, creativity in cities (Florida, 2005) is extensively a visited source to strengthen the theoretical base of arguments to justify the importance of a lively social and cultural open environment in innovation, by attracting innovative coworkers (Capdevila, 2015; Lorne, 2019). It is problematic that, to the best of knowledge, the subject of coworking has not been questioned in a theoretical manner so far, with the exceptionality of some researchers drawing on theoretical perspectives of social approach (Fraiberg, 2017; Oliva & Kotabe, 2018). In particular, the articles address to the subject from the economist view of transaction costs approach (de Ruijter et al., 2008) or historical urbanization development (Wang & Loo, 2017; Florida et al., 2020).

To relate, this study contemplates the coworking literature with a theoretical lens to explore the following three research questions:

Research Question 1: What is the relationship between coworking and entrepreneurship?

Research Question 2: What are the underpinning theories of entrepreneurship behind coworking studies?

Research Question 3: How can future coworking studies contribute to the entrepreneurship literature?

This paper reviews existing coworking literature to map out the major streams of entrepreneurship research and identify widely used theories, themes and methods, with an attempt to refocus on entrepreneurial aspects. This is accomplished through a comprehensive review of previous research addressing the research questions in an empirical method and consequently, developing a research agenda based on the gap and the proposed conceptual model. To map out the relation of coworking with major area of entrepreneurship, the systematic literature review method was applied. As such, this paper contributes to the field by connecting widely accepted definitions of coworking around a grounded theoretical basis, with an attempt to answer the call by Shane and

Venkatamaran (2000) and by refocusing on the entrepreneurial perspective, as previously mentioned by Landström et al. (2012). By doing so, in light of the proposed conceptual model, it is expected to provide a strong ground incorporating economic, educational, industrial, and social explanations introduced in the coworking literature so far. Moreover, this theoretical frame is expected to help foresee the probable disruptions for the future and assist in maintaining prudent solutions. One example for that congruent application area is the recent upsurge of Covid-19 crisis, which is likely to reshape the habits of the society and shake the vulnerable balance of sharing economy. Under such a threat of shift in people's trust in mobile working models, the synthesis of ideas included in this paper is expected to lead to a comprehensive understanding of planning and optimistic practical management for the future challenges.

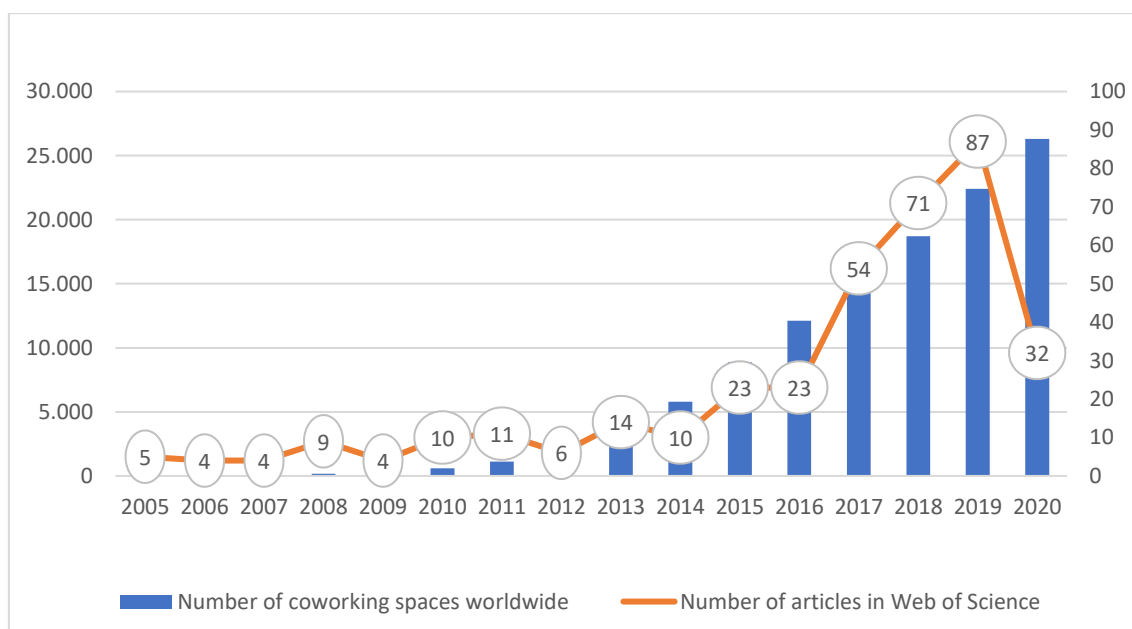
The motivation of this paper resides basically in the popularity of coworking spaces both as a smart city component and as an academic concept. Fast adaptation of coworking spaces into the "smart city" and the fact that Barcelona is also a devoted case for that context (Capdevila, 2015) strengthens the impetus to pursue this subject. In addition, resulting from the upsurge of Covid-19 crisis, an academic gap has now been opened for this subject matter and this collaborative working phenomenon will have to reinvent its new own business models to stand against the isolationist approaches in economy and individuals' reluctance to share. Besides, the "new normal" might be the playground for coworking spaces for disruptive innovation, since departure from offices will most likely be the new reality of doing business in the near future. In light of these arguments, this paper is an introductory beginning to the concept of coworking, which is expected to continue in the form of a PhD Thesis. The information gathered from this systematical literature review, will hopefully lay the basis of an empirical research, to be scheduled on this interesting and important problem in the field.

The structure of this article is as follows. First, the employed methodology of this research is described. This is followed by the results section of literature review highlighting the key themes and relevant theoretical underpinnings utilized in the field with their reflections in the reviewed articles. Next, discussions on the results, including a proposed conceptual model, potential directions and recommendations for future research are laid. The paper concludes with theoretical and practical implications, contributions and limitations.

2. METHODOLOGY

Given the foregoing arguments on coworking spaces and coworking, this paper adds to the growing body of literature by presenting a comprehensive review of coworking studies, exploring the theoretical foundations behind those discussions. In that sense, the type of systematic review that is implemented to accomplish that aim is a hybrid approach of bibliographic research following the suggestions of Hart (1998) and adoption of a theory based review applied in Gilal et al. (2019), Paul and Rosado-Serrano (2019) and Dabić et al. (2020), studies of business research. That composite structure built on themes is expected to feed the systematic background of the study with extended intellectual structure for the field of entrepreneurship, and ultimately assist to set a plausible agenda for future research.

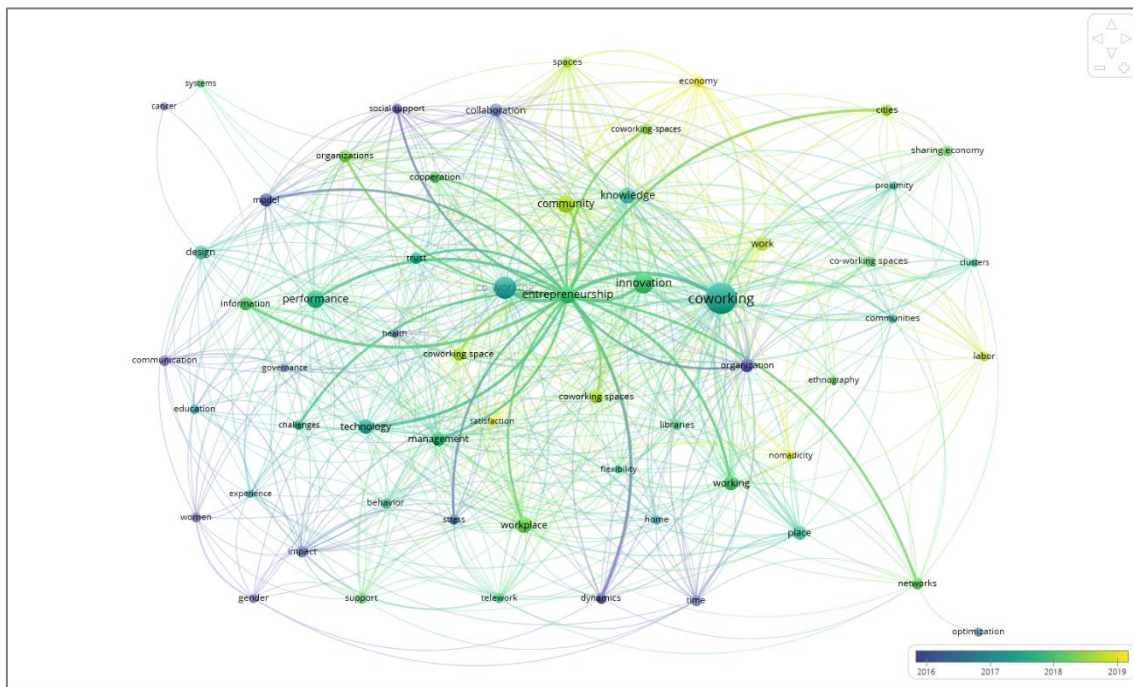
Figure 1: Increased academic interest in coworking



Source: Number of academic articles with keyword “coworking” or “co-working” in abstract Thomson Reuters (2020). Number of coworking spaces worldwide (Statista, 2020). Own elaboration from sources.

Since the publication of the first definitive articles about coworking spaces, the issue is trending incrementally, as also revealed in Figure 1. This increasing publication trend suggests that this research area is gaining interest in correlation with the number of coworking places are tangibly attracting more people worldwide.

Figure 2: Entrepreneurship focus on concepts map

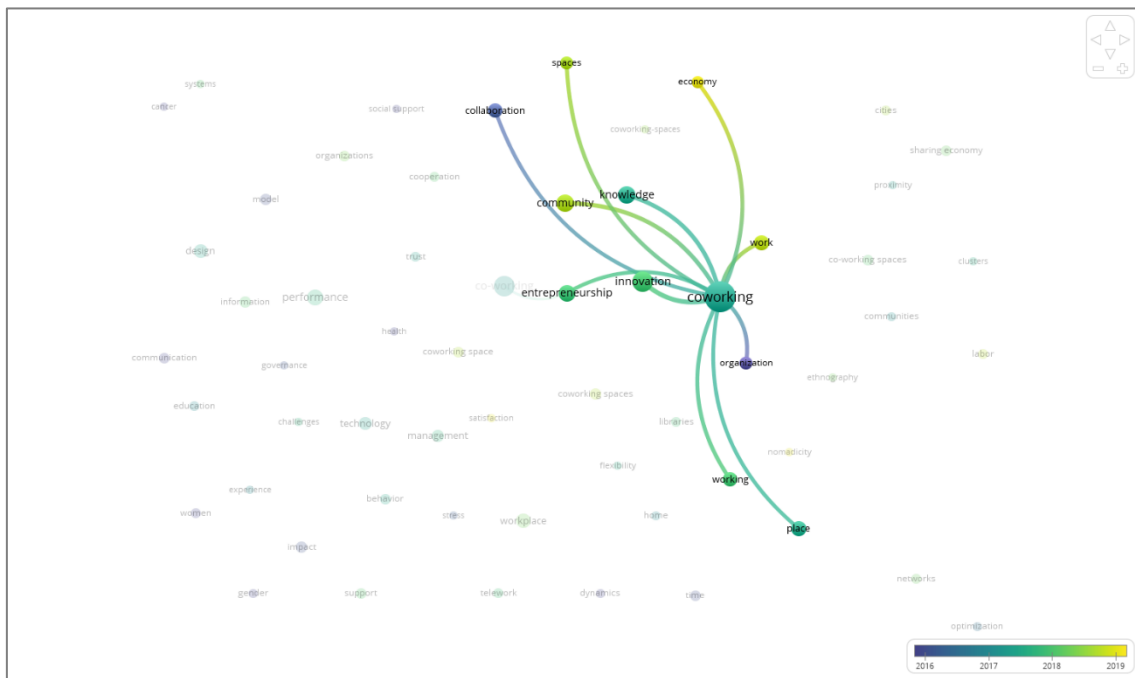


Source: 419 articles with keywords “coworking” or “co-working” from Web of Science (Thomson Reuters, 2020). Own elaboration from source.

Looking in detail, the emphasis on entrepreneurship is relatively recent, tracking that coworking trend a few years behind. To examine the emphasis on entrepreneurship, a networks graphic is created, using the VosViewer (2020) software performed on Web of Science (Thomson Reuters, 2020) data. This analyzing method creates a concepts map of most used keywords within the selected group of studies. The color of a term in the overlay visualization indicates the average publication year of the articles in which the term occurs. Within the data of previous 419 articles which is collected for including “coworking” or “co-working” keywords in abstract, the co-occurrence of the term “entrepreneurship” as a keyword is shown in the as shown in Figure 2. The lighter color of “entrepreneurship” points to the fact that, the approach on entrepreneurship is among the most updated and discussed topics, along with “innovation” and “community”.

In a more detailed view, the minimum strength of 7 articles co-occurrence offers a more concrete map of related keywords to coworking, which include “economy”, “innovation”, “collaboration”, “community”, “organization”, “knowledge”, “work”/“working”, “place”/“space” (Figure 3). These keywords are useful in gaining some idea about the contingent themes of coworking and entrepreneurship.

Figure 3: Coworking focus concepts map



Source: 419 articles with keywords “coworking” or “co-working”, minimum strength of 7 co-occurrence on data from Web of Science (Thomson Reuters, 2020). Own elaboration from source.

2.1. Selection of articles for review

This study which tries to give an overview of coworking and entrepreneurship by systematically exploring academic literature, is primarily based on a bibliographic research performed on Scopus (Elsevier, 2020), Web of Science (Thomson Reuters, 2020) and Emerald Insight (Emerald Publishing, 2020). These three sources use different mechanisms for search procedures, as illustrated in Table 1. In this initial step, search strings were introduced according to the interface suggestions of those databases, including the use of special characters like * or \$, which help to retrieve an extended set of data in one keyword. This method helps to use reduced certain keywords to their stem to consolidate different variants of the same word or words with similar meaning (Chatterjee & Sahasranamam, 2018), or balance the hyphen usage in “coworking”, for the two terms are often substituted with each other (Constantinescu & Devisch, 2018). No restrictions were applied on the date and journal sources, rather, keywords were used to refine the search in the targeted approach.

Scopus database is used as the first level of search. The relevant research studies were searched on May 14, 2020. The articles were searched with search terms as “coworking” or “co-working” or “collaborative space” in “Abstract” sections of the articles. The three

Table 1: Selection of articles for review

Data base	Scopus	Web of Science	Emerald Insight
Initial key words used	<p>Coworking OR co-working OR "collaborative space*"</p> <p>AND</p> <p>Entrepreneur* OR start-up* OR startup* OR "new venture*"</p>	<p>Co\$working AND Entrepreneur *</p> <p>OR</p> <p>"Collaborative space*"</p> <p>AND Entrepreneur</p> <p>OR</p> <p>Co\$working AND start\$up*</p> <p>OR</p> <p>"Collaborative space*"</p> <p>AND start\$up*</p> <p>OR</p> <p>Co\$working AND "new venture*"</p> <p>OR</p> <p>"Collaborative space*"</p> <p>AND "new venture*"</p>	<p>Coworking or co-working or "collaborative space*"</p>
Area in which the key words are searched	ABSTRACT	TOPIC	ABSTRACT
Number of papers found in this round	84	101	59
Filter 1: Document Type	Articles	Articles	
Number of papers found in this round	63	71	
Filter 2: Language	Spanish, English	Spanish, English	
Number of papers found in this round	58	58	
Filter 3: Refine keyword in abstract manually			Entrepreneur* OR start-up* OR startup* OR "new venture*"
Number of papers found in this round			8
Filter 4: Discarding repetitions		Discarded: 34	Discarded: 8
Number of papers found in this round		24	0
Downloading	Not found: 3	Not found: 2	
Number of papers downloaded	55	22	
Subjective reading for relevancy and journal type	Discarded: 12	Discarded: 14	
Number of papers included in data analysis	43	8	0
TOTAL	51		

Source: Own elaboration.

keywords were selected to increase the likelihood of finding as much as different articles regarding the topic. Although there are various acronyms and discourses used interchangeably for coworking such as hacker- or makerspaces, accelerators, fab-labs, and open workshops (Schmidt, 2019) only three cases were selected as keywords, with reference to the recent coworking typology introduced by Clayton et al. (2018).

Although coworking is connected to entrepreneurship by nature (Gandini, 2015; Fuzi, 2015; Bouncken et al., 2018a), not all articles in the sources concern entrepreneurship in first respect, as also reviewed earlier in the concepts map. Therefore, to clearly connect this search with the entrepreneurship literature, the coverage of the search was refined with inclusion of "startup*", "start-up*", "new venture*" and "entrepreneur*" keywords in the first step. The co-occurrence of these two groups were retrieved with the research string (ABS (coworking) OR ABS ("collaborative space*") OR ABS (co-working) AND ABS (entrepreneur*) OR ABS (startup*) OR ABS (start-up*) OR ABS ("new venture*")). Later, within the results of this first query, the "Articles" and those written in "English" and "Spanish" were selected. This conduct resulted in 58 articles found in Scopus database.

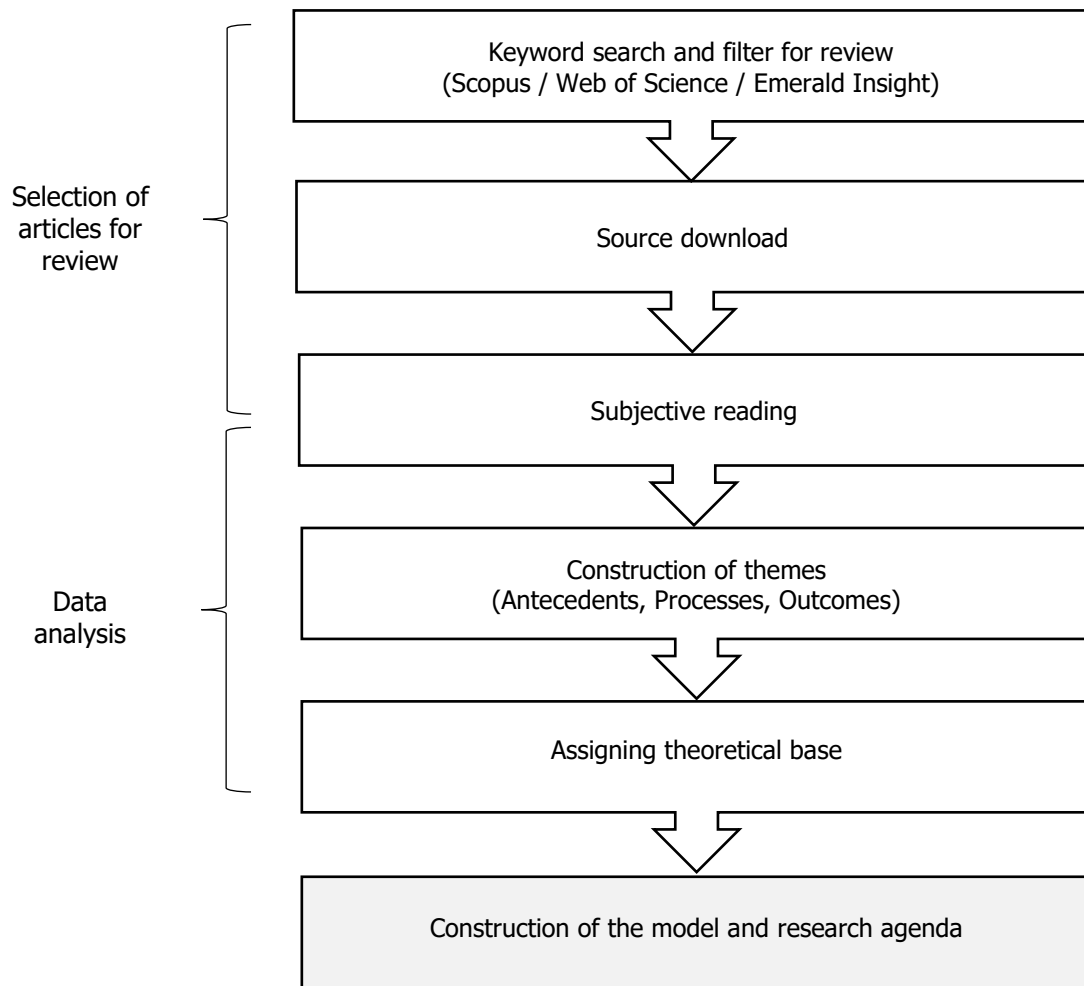
Working in Web of Science database, the same methodology was adapted to the source's intrinsic string building interface, with some changes as required by the system. AND / OR connections were rearranged for this reason and the string then was implemented as TOPIC: (co\$working) AND TOPIC: (ENTREPRENEUR*) OR TOPIC: ("Collaborative space*") AND TOPIC: (ENTREPRENEUR*) OR TOPIC: (co\$working) AND TOPIC: (start\$up*) OR TOPIC: ("Collaborative space*") AND TOPIC: (start\$up*) OR TOPIC: (co\$working) AND TOPIC: ("new venture*") OR TOPIC: ("Collaborative space*") AND TOPIC: ("new venture*"). The algorithmic functionality was tested beforehand, to end up in the same logic with the one applied in Scopus database.

As Emerald Insight interface permit only first order keyword introduction, first keyword group of (coworking) OR ("collaborative space*") OR (co-working) were retrieved first, and then the abstracts of the identified publications where scanned manually to identify those including the second order key words.

Finally, all article findings from three sources were integrated comparing for coincidence to discard repetitions, in the given database order. In this last round, about 60% of the

articles from Web of Science and all of those from Emerald Island were discarded. From this list, 5 papers could not be downloaded, and this resulted in a set of literature composed of 77 articles.

Figure 4: Research workflow



Source: Elaborated on the adapted methodology by Dabić et al. (2020), Gilal et al. (2019) and Paul & Rosado-Serrano (2019).

This initial sample of articles was then subjected to detailed subjective reading of the author to compile into a comprehensive literature review, as suggested by Hart (1998). Papers that concerned coworking with respect to entrepreneurship were included in this last round, as well as those that took coworking spaces as a case study environment. As a result of this criteria, 26 articles were discarded due to irrelevancy or not being published in a peer-reviewed academic journal. The reasons for irrelevancy were largely due to inclusion of keywords in abstract simply for the studies took place in coworking

spaces, but with no reference to the topic of this research. No restrictions were applied in terms of employed methodologies. In the end of this round, the data gathering resulted in a definition of relevant literature composed of 51 articles.

2.2. Data analysis

Data analysis was conducted by identifying, comparing and synthesizing the perspectives (Überbacher, 2014) of each article based on following research topics and their implications for the study, in a two-tier scheme for evaluation.

- i. Based on the previous methodology implemented by extant business research literature (Gilal et al., 2019; Paul & Rosado-Serrano, 2018; Dabić et al., 2020), data analysis in first tier is a systematical construction of themes, after reading the articles. In the brief review demonstrated in the beginning of this paper, the identifiable major themes concerning coworking literature were pointing out to the economic, social, personal, collaborative effects on innovation, creativity, and performance of entrepreneurial activities. However, following the data analysis conducted for this paper, a more complete structure emerges. After the synthesis of key topics discussed in the articles, it appears that, when coworking is the dependent variable, *development of coworking spaces* is a common theme with *demand* or *supply* perspectives. On the other hand, when the studies analyze the effect of coworking, the common themes are *proximity*, *tools in coworking spaces*, *spatial and organization patterns*, and *user identity preferences* as common independent variables. These variables in turn, have their own impacts, both in *firm* and *individual* level of entrepreneurship. Moving from structure of the mentioned methodology, those contingencies are put into a three component thematical model of "*antecedents*", "*processes*" and "*outcomes*", with an conceptual amendment made in the central component, which was originally used as "decisions" in the applied model (Gilal et al., 2019; Paul & Rosado-Serrano, 2018; Dabić et al., 2020).
- ii. As noted in earlier sections, the articles not necessarily include entrepreneurship theories to clarify and strengthen the views proposed. Thus, in the second tier, the contingencies labeled by themes in the articles were linked to

entrepreneurship theories (Landström et al., 2012; Carlsson et al., 2013). Tracing into the entrepreneurship literature, the most visited theories of entrepreneurship topics were examined and Institutional Theory (Baumol et al., 2009; Bruton et al., 2010), Innovation Theory (Schumpeter, 1934), Social Identity Theory (Stets & Burke, 2000), Network Theory, Personality Traits Theory (Shane & Venkatamaram, 2000), Causation and Effectuation Theories (Shah & Tripsas, 2007; Sarasvathy, 2001), Knowledge Spillover Theory (Acs et al., 2009) were selected as guides of this research, depending on the constructed themes. These theories were decided with regards to their consistency and coverage of causal relationships built between themes in the reviewed articles and strength in the field. Data analysis aim is to detect how each article relates its arguments in coworking with regards to these theories. Not all theories included in the study are essentially mentioned in the reviewed papers. Rather, discussed arguments were subjectively interpreted into the entrepreneurship field theories, based on the extant research methodologies (Gilal et al., 2019; Paul & Rosado-Serrano, 2018; Dabić et al., 2020). To relate, themes and variables used in the previous tier were analyzed in order to facilitate the interpretation of theories. Each theory is discussed with its definition with regards to entrepreneurship literature and the contingencies in reviewed papers, in the Results section.

The overall research workflow is depicted in Figure 4. The insights and findings attained from this hybrid analysis not only help to visibly understand the concept, but also assist clarifying the knowledge gaps to offer. Continuing to the findings achieved in this process, proposals for future research will then be suggested.

3. RESULTS

At first glance, the impression received from the resulting articles is the dispersion of publications among a variety of sources. Only five journals which also have the highest quartiles within the group have a frequency higher than 1: Sustainability (Switzerland) (3), European Planning Studies (2), Geoforum (2), Journal of Knowledge Management (2), Review of Managerial Science (2). Within, 17 cited journals get an H index factor (Scimago, 2020) above 50 and hence would be recognized by practitioners and academic researchers as influential (Table 2). The fact that publications in general management journals are ahead of the distribution is crucial since such sources appeal to a wider pool

of scholars, have greater citation counts, and subsequently have higher impact factors, and thus are more likely to set directions for future research in the field (Chatterjee & Sahasranamam, 2018).

Table 2: Distribution of sources

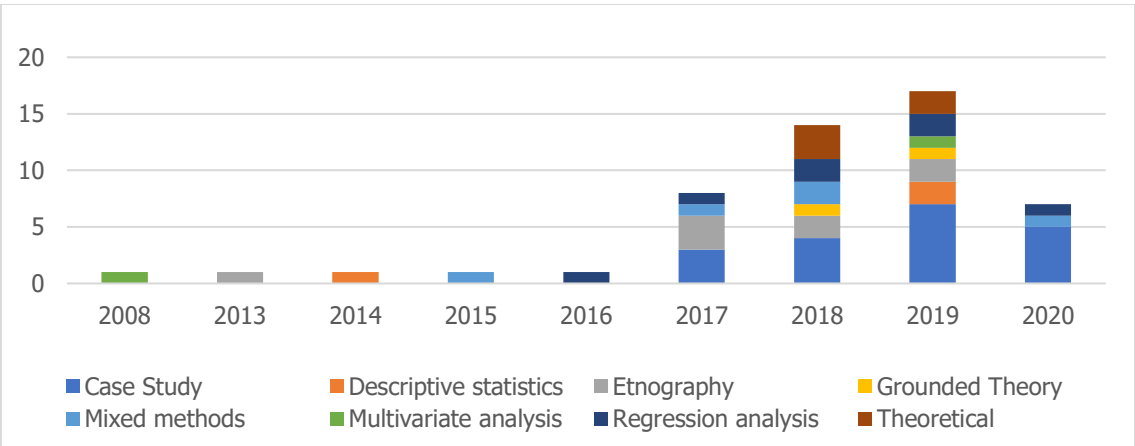
Journals	Freq	H	Journals	Freq	H
Sustainability (Switzerland)	3	53	Portal	1	34
Geoforum	2	98	Journal of Business and Technical Communication	1	33
Journal of Knowledge Management	2	95	Journal of Urban Technology	1	32
European Planning Studies	2	69	Knowledge Management Research & Practice	1	30
Review of Managerial Science	2	16	Information Technology for Development	1	29
Journal of Business Research	1	158	Review of Social Economy	1	29
Review of Financial Studies	1	157	Journal of the Knowledge Economy	1	20
Academy of Management Perspectives	1	115	Urban Research and Practice	1	16
Environment and Planning A	1	112	PACM on Human-Computer Interaction	1	14
Information and Software Technology	1	88	New Review of Academic Librarianship	1	13
Frontiers in Psychology	1	81	Journal of Entrepreneurship Education	1	11
Sociological Review	1	73	Polish Journal of Management Studies	1	11
Management Learning	1	69	Regional Studies, Regional Science	1	11
Theory and Society	1	67	Global Business and Economics Review	1	10
Information Communication and Society	1	59	Academy of Entrepreneurship Journal	1	9
International Journal of Technology Management	1	51	European Countryside	1	9
Geography Compass	1	50	Journal of Entrepreneurship and Public Policy	1	9
Cultural Studies	1	49	Entrepreneurship Research Journal	1	8
Clean Technologies and Environmental Policy	1	44	Advances in Library Administration and Organization	1	6
Work	1	44	Journal of Small Business Strategy	1	5
Rationality and Society	1	43	Italian Journal of Planning Practice	1	4
Economic Development Quarterly	1	41	Greek Review of Social Research	1	0
European Journal of Cultural Studies	1	38			
			Total	51	

Source: 2019 H index (Scimago, 2020). Own elaboration from source.

From a broader scope, the descriptive nature of previous research does not connect the arguments with a theoretical perspective, but rather represents an overutilization of similar contingencies leading to respective study results. Using the previous methodology implemented by extant research (Gilal et al., 2019; Paul & Rosado-Serrano, 2018; Dabić et al., 2020) those contingencies are put into a three component thematical model of *antecedents*, *processes* and *outcomes* and later, tied to a consistent theoretical base. To accomplish that, first, an overview of data collection and analysis methods in prior research are outlined with distribution by year. As year-wise trend of applied

methodologies reveals in Figure 5, the number of empirical articles using quantitative methods cannot beat the dominance of qualitative techniques and case studies in particular.

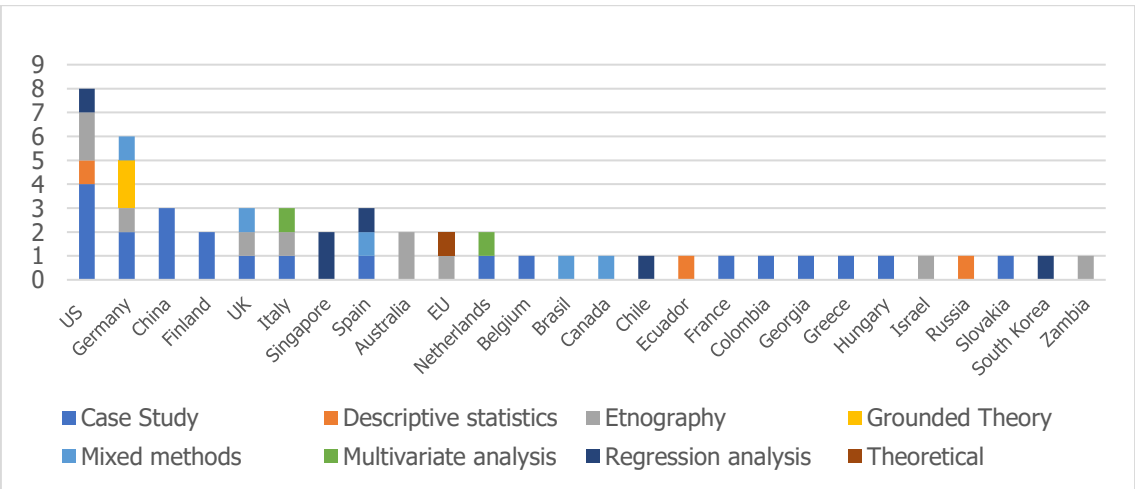
Figure 5: Widely used methods on research, distribution by years



Source: Own elaboration.

Next, global dispersion of coworking spaces is represented in the countries where the reviewed group of articles are conducted. The results point to the strength articles from United States in number and grounding the ideas on quantitative analogies through descriptive and regression analysis (Figure 6). As well, figure shows the wide range of countries included in the research, although more than half of them have been used only once as context.

Figure 6: Widely used methods on research, distribution by countries of conduct



Source: Own elaboration.

3.1. Causal relationships

In order to understand the analogies indicated in coworking studies with relation to entrepreneurship, first it is important to classify the causality in two directions:

- i. approaches that scrutinize the factors that have an impact on coworking concept,
- ii. those that explore the process factors within the use of coworking spaces with their impact on various outcomes.

The variables used in reviewed studies are tabulated in a framework which helps to synthesize the critical components used in the research so that they can be addressed to the underpinning theories of entrepreneurship. Given the volume of papers dealt, the identified contingencies are discussed with highest reference they receive within the field. For those that are not included in these sections, the readers are encouraged to explore the entire list in the Appendix 1 section.

3.1.1. Antecedents leading to coworking spaces development

Emergence of coworking spaces as a valuable business model attracted the researchers to question the reasons behind that, which is also represented in the set of data by 15 articles. Gathered information reveals the ideas about how the emergence of coworking spaces happened, and some recommendations that may have an impact on their functionality. Particularly, rather than the “coworking” phenomenon itself, the studies recognize the “coworking spaces” as an element to be scrutinized.

Putting coworking spaces into the center of dependency, it is found that a large group of researchers attempt to explain the emergence and development of coworking spaces. Hence, as the followed methodologies suggest, this stream of studies are marked as “development of coworking spaces”. The rise and evolution of coworking spaces may be analyzed in two dimensions: from the *suppliers’* perspective; as a component of neoliberal urban development process, and from the *demand* perspective; as the increasing number of freelancers and start-ups seeking community, interaction, learning or just soothing necessity.

The *supplier* perspective is a macro-economic discourse which is also sustained in the works of other articles reviewed in the study. The causes behind the growth of coworking

spaces are the emergence of 'open' urban economic projects promoting the transformative potential of social innovation and civic enterprise (Lorne, 2019), uses of urban space shaped around mobile workers mostly freelance who rented flexible office space on a short-term basis in the age of digitization (Grazian, 2019), focusing on multi-local strategies and working practices (di Marino et al., 2019). The evidence for such arguments may be found in the proximity to universities and other collaborated institutions which enable entrepreneurial groups to recruit new members and get customer experience (Wang & Loo, 2017). In a smaller or peripheral city, a living ecosystem must rely on its interconnectedness, network structure, team spirit, built social capital and permanent collaboration, in a way to boost entrepreneurial performance, (Lavčák et al., 2019) and the effect of public initiatives on launch of academic-related initiatives and entrepreneurial projects (del Moral-Espín & Fernández-García, 2018) which in the end adds to coworking activity.

Apart from that, we encounter use of academic libraries as coworking spaces as an antecedent of entrepreneurial education in coworking spaces, where Lumley (2014) analyzes the effects of proximity in silence versus conversation. In academic level, del Moral-Espín & Fernández-García (2018) analyze the effect of public incentives on launch of academic related initiatives and entrepreneurial projects. They find that most entrepreneurial initiatives belong to the spaces sector and especially in those provinces where universities are located, and technological business and startup concentrated urban environments.

In response to these dissertations, Luo and Chan (2020) reject the previous arguments which posit that rise of coworking spaces may be explained by neoliberal governmentality or knowledge spillovers (Capdevila, 2015; Gandini, 2015; Wang & Loo, 2017). Resulting from their case study in China, they contend that coworking movement is a complex process combining top-down and bottom-up forces, serving the national efforts of battling unemployment, economic restructuring, social mobility enhancement, and other social functions. The size of the city seems to determine as well the functions of collaborative spaces, as in medium-sized and accessible cities their primary focus usually is on supporting freelancers and small businesses, whereas in small communes and remote towns collaborative spaces can function as social hubs that deliver a number of wider social services to the local communities (Avdikos & Merkel, 2019). The example of Israel, where informal ties are institutionalized in the form of a dense ecosystem of

conferences, accelerators, meetups, social media, and coworking spaces implies the geographic, political and economic factor behind (Fraiberg, 2017).

Table 3: Studies that indicate the supply perspective on coworking spaces development

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	STUDY	METHODOLOGY	COUNTRY
Silence vs conversation	Use of academic libraries as coworking spaces	Lumley (2014)	Descriptive statistics	US
Institutionalization of informal structures	Startup ecosystem transformation	Fraiberg (2017)	Ethnography	Israel
Local strategy, entrepreneurship networks, public initiatives and market demand	Emergence of coworking offices for internet firms	Wang & Loo (2017)	Case Study	China
Public initiatives	Launch of academic-related initiatives and entrepreneurial projects	Del Moral-Espín & Fernández-García (2018)	Mixed methods	Spain
User Identity & preferences	Coworking space strategy	di Marino et al. (2018)	Case Study	Finland
Digitization	Urban spaces shaped around mobile work	Grazian (2019)	Ethnography	US
Entrepreneurial scope & functional services	Coworking space diversifications	Avdikos & Merkel (2019)	Theoretical	EU
Urban dynamics & Social innovation and civic enterprise	Post-Fordism, flexible infrastructure and serendipitous encounters.	Lorne (2019)	Case Study	UK
Ecosystem components	Entrepreneurial performance	Lavčák et al. (2019)	Case Study	Slovakia
Urban dynamics	Unemployment, economic restructuring, social mobility enhancement and other social functions.	Luo & Chan (2020)	Case Study	China

Source: Own elaboration.

On the *demand* perspective of micro level, increasing number of freelancers searching for a workplace where they can enjoy affordable membership programs and functional services are also important for boosting such places, especially in terms of physical infrastructure, business support (Štefko & Steffek, 2017), colocation, collaboration and interactions (Constantinescu & Devisch, 2018). Conjunctural grounds for the development of coworking spaces are characterized by instability and crisis in the economy, the formation of an open space for academic mobility and the expansion of opportunities for online learning, including entrepreneurial knowledge, skills and abilities, (Rutkauskas et al., 2019). Those findings obtained from Russian case, also finds reflections in Greece, where the emergence of “desperate optimists”, a workforce which

eagerly accepts its precarious conditions of work, undertakes the risk of acting entrepreneurially and help hub development (Papageorgiou, 2020). Another critique comes from Gandini and Cossu (2019) in their search for the appearance of coworking spaces and endeavors outside of the urban environment. For them, the emergence of such new places reveals the evolution in work models and signal the regained importance of socially embedded forms of coworking, as opposed to neoliberal practices, represented with the creative freelancer class in most of the coworking studies.

Table 4: Studies that indicate the demand perspective on coworking spaces development

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	STUDY	METHODOLOGY	COUNTRY
Membership programs and functional services	Demand of coworking spaces	Štefko & Steffek (2017)	Mixed methods	Canada
Colocation, collaboration and interactions	Spatial sharing	Constantinescu & Devisch (2018)	Case Study	Belgium
Geographical location	Resilient spaces	Gandini & Cossu (2019)	Ethnography	Italy and UK
Innovation development & Location strategy	Creation and development of new coworking projects	Rutkauskas et al. (2019)	Descriptive statistics	Russia
Precarious labor	The emergence of "desperate optimists"	Papageorgiou (2020)	Case Study	Greece

Source: Own elaboration.

3.1.2. Processes within coworking

Upon further review, it is found that majority of the articles take coworking spaces as the starting point to explain several phenomena relevant to entrepreneurship. After decomposing each article into their explanatory variables, those that share the parallel backgrounds are integrated into four main processes. Within the group of articles analyzed, the major themes pertaining to the noted research contexts were identified as *proximity*, *tools*, *spatial and organizational patterns*, and *user identities and preferences*.

Proximity: Coworking is an act of sharing workspace as opposed to working in a traditional office (Nichols et al, 2017). This independent working principle binds the concept into entrepreneurship and establishes a flexible work model in post-recession, urban knowledge economies. Coworking and colocation stimulate interactions and collaborations that potentially foster innovation and knowledge exchange in the creative industries (Wijngaarden et al., 2020; Barwinski et al., 2020; Bouncken & Aslam, 2019). Knowledge flows between individual businesses and the broader society foster

sustainability-driven practices (Chancé et al., 2018). Co-working spaces can promote entrepreneurship in regions with sparse entrepreneurial environments (Fuzi, 2015), and entrepreneurial education in universities (Nichols et al., 2017) by creating the hard infrastructure particularly designed in such a way that the soft infrastructure necessary for entrepreneurship can also emerge.

A great majority of the reviewed works deal with this process of human centered proximity by questioning collaboration. Coworking holds the potential to produce everyday practices that contest but do not confront entrepreneurial norm, ultimately leading to entrepreneurial learning by means of collaboration (Butcher, 2018; Bieraugel, 2019). When formal collaboration is limited, its contribution to radical innovative breakthroughs will also be so (Wijngaarden et al., 2020). New ventures in coworking spaces generate innovations using internal and external sources through sharing space with other businesses; building relationships and seek knowledge and information on different topics from the people coming from different social backgrounds (Bouncken & Aslam, 2019). That effect on the ventures' innovation search strategy changes according to the venture's stage and cover a range from radical to incremental with ambiguous outcomes (Barwinski et al., 2020). It is that innovation which empowers individuals to learn and become entrepreneurial actors, but also the process in coworking spaces by which people develop capabilities in multiple aspects of self-efficacy, inspiration, autonomy and well-being (Jiménez & Zheng, 2017; Bouncken, 2018). Community facilitators, level of collaboration, flexibility is a means of overcoming isolation of freelance home-based working, particularly for women (McRobbie, 2013).

Performance, especially entrepreneurial performance improves by the learning processes among coworking-users that take upon the individual efficacy, trust and community (Bouncken & Reuschl, 2018; de Ruijter et al., 2008). That is provided by the shared context in an entrepreneurial frame, where the actors can reveal useful information to decrease uncertainty, identify each other, mutually engage in activities that construct trust and enable cooperation in coworking spaces (Waters-Lynch & Potts, 2017).

Togetherness additionally promotes the idea of coopetition, which is another source of creating value. Bouncken et al. (2018b) explain different tensions of value creation and appropriation that occur within the coopetition the different forms of coworking-spaces, by variant level of friendship, community, social interaction, identification, trust, reward

Table 5: Studies that indicate the process as proximity

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	STUDY	METHODOLOGY	COUNTRY
Mutual trust in coworking with familiars	Business risk and governance structure	De Ruijter et al. (2008)	Multivariate analysis	Netherlands
Community facilitators, level of collaboration, flexibility, overcoming isolation	Creative economy and women employment	McRobbie (2013)	Etnography	Germany
Community facilitators, collaboration, and social events vs mentoring	Entrepreneurial activity promotion	Fuzi (2015)	Mixed methods	UK
Time pressure and self-efficacy in social interaction, social support	Performance satisfaction	Gerdenitsch et al. (2016)	Regression analysis	EU
Spatial sharing	Trust building	Waters-Lynch & Potts (2017)	Etnography	Australia
University libraries	Entrepreneurial education	Nichols et al. (2017)	Etnography	US
Community, privacy, ergonomic conditions, Working disruptions	Workplace health promotion	Servaty et al. (2018)	Grounded Theory	Germany
Community, self-efficacy, inspiration, autonomy and knowledge flow	Entrepreneurial education	Bouncken (2018)	Theoretical	n/a
Self-efficacy, trust, community building, learning process	Entrepreneurial performance	Bouncken & Reuschl (2018)	Theoretical	n/a
Knowledge exchange & Social interactions	Coworking spaces performance	Chancé et al. (2018)	Case Study	US
Social interaction and coopetition	Value creation	Bouncken et al. (2018a)	Case Study	Germany
Social interaction, networking, peer monitoring and flexibility	Entrepreneurial performance	Clayton et al. (2018)	Theoretical	n/a
Colocation, collaboration and interactions	Innovation	Barwinski et al. (2020)	Case Study	China
Innovation	Entrepreneurial activity	Jiménez & Zheng (2018)	Etnography	Zambia
Everyday practices	Colloboration learning	Butcher (2018)	Etnography	Australia
Social processes of creativity	Business Model	Cheah & Ho (2019)	Regression analysis	Singapore
Colocation, collaboration and interactions	Innovation	Bouncken & Aslam (2019)	Grounded Theory	Germany
Social interactions, knowledge and idea exchange	Knowledge Exchange			
Social processes of learning, exchanging, and interacting	Belonging, self-efficacy, work enjoyment and job performance	Cheah et al. (2019)	Regression analysis	Singapore
Social interactions, knowledge and idea exchange	Entrepreneurial performance	Schmidt (2019)	Theoretical	n/a
	Urbanization and economic development	Morisson (2019)	Case Study	France, Spain, Colombia
Creative thinking	Entrepreneurial performance	Bieraugel (2019)	Case Study	US
Colocation, collaboration and interactions	Innovation	Wijngaarden et al. (2020)	Case Study	Netherlands

Source: Own elaboration.

system, knowledge sharing, openness, flexibility, inertia, antagonists, modularity (taking but not giving), hierarchy, design, aggressive competition observed in these collaboration platforms. However, to enhance teamwork and thus employees' job performance, the collaboration of team members depends on cooperation rather than competition and mutual support (Cheah et al., 2019).

Fuzi (2015) defines coworking spaces as creative and energetic places where small firms, freelancers and start-ups, who have become tired of the isolation of their home offices and the distractions of their local coffee shops, can interact, share, build and co-create. Social interaction in coworking spaces can take the form of social support in coworking spaces (Gerdenitsch et al., 2016). When making a comparison between intermediary organizations that support entrepreneurship, Clayton et al. (2018) posit that coworking spaces facilitate networking and peer mentoring by offering a physical space that promotes proximity and interaction in a flexible and less structured programming. It is those face-to-face interactions that spread of tacit knowledge, which paves the way in the making of the knowledge city (Morisson, 2019). Also, not the coworkers within a space, but also those coworking spaces between each other have their own basis for communication and exchange that eventually helps to transform and adjust the socio-material assemblage in coordinating creativity and entrepreneurship (Schmidt, 2019). To make those findings more tangible, in a recent research in Singapore it is found that social climate of the coworking space has no direct effect on the business model innovation outcome of tenant firms but it is the opportunity recognition and exploitation that positively mediates this relationship (Cheah & Ho, 2019).

Tools in Coworking Spaces: Alongside with offering a communal workspace to new and established businesses, coworking spaces provide additional technical support (van Holm, 2017) to equip the coworkers with necessary entrepreneurship skills and education needed to create the right product-market fit (Tripathi et al., 2019). Studies show that entrepreneurship training bundled with the basic services of cash and coworking space leads to significant increases in venture fundraising and scale (Gonzalez-Urbe & Leatherbee, 2018), shortening the time period until new venture creation. Those services may be listed as startup mentoring activities, business courses, marketing meetups, and bootcamps in each of its campuses, consultation with mentors, and paired programming (Oliva & Kotabe, 2018; Mátyás et al., 2019).

Table 6: Studies that indicate the process as tools in coworking spaces

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	STUDY	METHODOLOGY	COUNTRY
Cultural change, service support, workforce training, workforce retention to support small business	Economic development by business generation and sustaining	van Holm (2017)	Case Study	Georgia
Practices, methods and knowledge management tools	Dynamic capabilities, agility and knowledge management	Oliva & Kotabe (2018)	Mixed methods	Brasil
Functional services and entrepreneurial schooling	Entrepreneurial performance	Gonzalez-Uribe & Leatherbee (2018)	Regression analysis	Chile
Teaching programs	Entrepreneurial performance	Mátyás et al. (2019)	Descriptive statistics	Ecuador
Entrepreneurship skills support	Product development	Tripathi et al. (2019)	Case Study	Finland

Source: Own elaboration.

Spatial and Organizational Patterns: Co-location within a common facility endows the entrepreneurs an advantage to share intermediate inputs such as conference space and administrative support, which lowers operating costs and provides opportunities of interaction (Hicks & Faulk, 2018). But simple co-location alone may not stimulate networking, interaction and collaboration. Fiorentino (2019) generates a taxonomy of these roles played by coworking spaces according to their educational role and closer links to local authorities, economic and technical support provided to the entrepreneurs-to-be and those that serve actually as a commercial product. Seo et al. (2017) identify success factors for sustainable business through analysis of users and hosts' demands and priorities about coworking spaces and find that relationship facilitation, service diversity, and price plan have the highest priorities for sustainable coworking space operation for both coworkers and hosts. The workspace design must also support entrepreneurs and self-employed working alone quietly in the presence of others, securing privacy or confidentiality (Kovacs & Zoltan, 2017). Formal and informal organization of the space and behavior of the users in time result in an institutional reorganization of the space and over time behaviors become shared and institutionalized (Bouncken et al., 2020). However, according to research conducted by Hicks & Faulk (2018) on facility incentives by state or local governments, no meaningful differences in the economic impacts of different types of facility incentives were found, in terms of proprietor's employment and the average wage per job.

Table 7: Studies that indicate the process as spatial and organizational patterns

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	STUDY	METHODOLOGY	COUNTRY
Location strategy, workspace design, privacy, community establishment	Development of rural entrepreneurship	Kovacs & Zoltan (2017)	Case Study	Hungary
Community, communication, functional services, networking activities and price plan	Sustainable coworking space operation	Seo et al. (2017)	Regression analysis	South Korea
Public initiatives	Economic development, employment, proprietor's employment and the average wage per job	Hicks & Faulk (2018)	Regression analysis	US
Coworking space typologies	Urbanization and economic development	Fiorentino (2019)	Case Study	Italy
Spatial pattern	Patent Registration	Barrales-Molina et al. (2020)	Regression analysis	Spain
Institutional Patterns	Work Satisfaction	Bouncken et al. (2020)	Mixed methods	Germany

Source: Own elaboration.

User identities and preferences: User inputs have also been diagnosed to find out which shared features lead to effective use of coworking spaces. Goermar et al. (2020) in a recent study comparing between German and American instances, show the importance of compatible, at least partly homogeneous social backgrounds of coworking space users as a precondition for successful participation in value co-creation. Scattoni et al. (2019) find that majority of startupper are people who previously worked as employees, professionals.

Critically, coworking spaces may suffer from unfavorable ergonomic conditions, working disruptions, miscommunications and missing privacy as a result of proximity (Servaty et al., 2018). Also as a result of interactions, location in coworking spaces seems to be associated with lower patenting, revealing the dark side of working side by side with other innovation players (Barrales-Molina et al., 2020). Participation in a distributed work team and in a distinct, colocated community has its own unique challenges in terms of managing multiple environments, connections, and contexts, which Swezey & Vertesi (2019) call "the coworking paradox." The insufficiency of policy and planning perspectives by managers to understand and internalize new multi-local strategies and

practices is as well another challenge that coworking spaces need to face (di Marino et al., 2018).

Table 8: Studies that indicate the process as user identities and preferences

INDEPENDENT VARIABLE	DEPENDENT VARIABLE	STUDY	METHODOLOGY	COUNTRY
Logistics, Previous profession, Social Relationships	Startup localization	Scattoni et al. (2019)	Multivariate analysis	Italy
Multiple environment strategy	Colloboration	Swezey & Vertesi (2019)	Case Study	US
Compatible, partly homogenous social backgrounds, direct socialisation, individual work behavior	Value creation	Goermar et al. (2020)	Case Study	Germany, US

Source: Own elaboration.

3.1.3. Outcomes stemming from coworking

The processes studied in the previous section lead to outcomes that form the third dimension of the employed framework. After defining the independent and dependent variables in the process themes, the assessment of outcomes becomes a more straightforward procedure, since they are ultimate results reached from the studies. The outcomes are studied in two themes; associated with the *individual* and *firm* aspects of entrepreneurship.

Clustering on the *individual* aspects, the outcomes are those related with the antecedents and processes in micro-level. In spatial and social proximity, the social interactions ease the hardships of everyday social interactions combined with knowledge and idea exchange, and that results in job performance (Cheah et al., 2019; Bouncken & Reuschl, 2018; Bouncken & Aslam, 2019). Also, sense of community can increase the work satisfaction level (Buncken et al., 2020).

Regarding entrepreneurs with their *firm* aspect, entrepreneurial performance is the most visited outcome of creating new business opportunities through strategic expansion of professional networks and job opportunities found by formalized collaborations (Fuzi, 2015; Clayton et al., 2018) in coworking spaces. Social processes of learning, exchanging, and interacting, community building while having a commercial value also result in entrepreneurial performance (Gerdenitsch et al., 2016; Mátyás et al., 2019;

Schmidt, 2019; Bouncken & Reuschl, 2018). Creative thinking process promoted in collective-based work practices of coworking spaces of campuses as well feeds the roots of entrepreneurship through education (Nichols et al., 2017; Bouncken, 2018; Gonzalez-Uribe & Leatherbee; 2018; Bieraugel, 2019).

Creative entrepreneurs realize the benefits of coworking spaces by innovating on their own business models (Cheah & Ho, 2019) and prospering on the social interaction processes to end up with value creation (Bouncken et al., 2018b; Goermar et al., 2020), innovation (Barwinski et al., 2020; Wijngaarden et al., 2020) and product development (Tripathi et al., 2019). Startups with higher maturity in innovation level, using the practices and methods dedicated to knowledge management can increase their dynamic capabilities (Oliva & Kotabe, 2018).

In the long run, these outcomes too, add up to the ecosystem and strengthen the urbanization and economic development conditions effecting the system behind coworking, by participating in the making of the knowledge city, creative economy and employment (van Holm, 2017; McRobbie, 2013; Hicks & Faulk, 2018; di Marino et al., 2018; Morisson, 2019; Fiorentino, 2019).

3.2. Underpinning theories of entrepreneurship behind coworking

The reviewed articles employ several theories to explain the proposed relationships in the studies. Evidently, each article develops the idea around a certain theory, if borrows one, and the constructs pertaining to dynamic capabilities (Teece, 2007), creative class theory of economic development and knowledge economy (Florida, 2002; 2005), collaborative innovation (von Hippel, 1987) are among the highlighted theories underpinning the narratives (Wijngaarden, 2020; Fraiberg 2017; Oliva & Kotabe, 2018; Bouncken et al., 2018b). Institutional theory which here will be dealt in detail, is also one of those most consulted (Bouncken et al., 2020; 2018b).

The existence of provided contingencies as well can be justified by referring to developed theoretical framework of entrepreneurship research. Following the review on academic literature by which the antecedents, processes and outcomes are diagnosed according to the applied methodology (Paul & Rosado-Serrano, 2018; Gilal et al., 2019; Dabić et al., 2020) when the constructions used in the articles are clearly synthesized, theoretical

frameworks become easier to identify. In this section, those theories that offer a background to these components will be discussed. Meanwhile, this exercise is expected to add value to each theory, since to the knowledge of the researcher, this is the first attempt to discuss the coworking themes within the realm of entrepreneurship theories. The interpretation of ideas into theories are not mutually exclusive, that is, for one article, more than one theory may be reserved, since each article also may be discussing a variety of themes, as already indicated in the previous section.

3.2.1. Institutional Theory:

A great majority of the articles intend to explain the arrival of coworking by means of changing environment in urban cities as culmination of economic dynamics. Institutional Theory discusses that culture, legal environment, tradition and history and economic incentives have an impact on industry and consequentially on entrepreneurial success (Baumol et al., 2009). Along with normative, cognitive, and regulative aspects of institutional profiles, these institutions have both positive and negative effects on entrepreneurship, such as legitimacy or embeddedness (Bruton et al., 2010). Studies that focus **on geographical localization factors** (Scattoni et al., 2019; Wang & Loo, 2017), **peripheral or disadvantaged areas** (Gandini & Cossu, 2019); **urban dynamics** (Lorne, 2019; Lavčák et al., 2019; Luo & Chan, 2020), **social economy** (Waters-Lynch & Potts, 2017; Jiménez & Zheng, 2018), **public incentives** (del Moral-Espín & Fernández-García, 2018; Hicks & Faulk, 2018) as dynamics that determine the flourishing of coworking spaces, can as well be regarded as taking Institutional Theory as a strong background. To add, coworking spaces **generate their own cultural, social and structural patterns** (Avdikos & Merkel, 2019; Bouncken, 2018; Bouncken et al., 2020; Bouncken et al., 2018b; Fraiberg, 2017) which in the end also have their own role in the making of the knowledge city and economic development (Morisson, 2019; van Holm, 2017; di Marino et al., 2018), with an algorithm which strengthens the institutionalist approach assessed in the studies.

3.2.2. Personality Traits Theory:

Alvarez and Barney (2010) emphasis the uniqueness of "opportunity recognition" in constructing the core of entrepreneurship. According to the theory, some people are more competent to recognize and exploit opportunities than others, since they can have better access to information and knowledge (Shane & Venkatamaran, 2000). These

individual differences, including greater **need for achievement** (McClelland, 1965), **willingness to bear risk** (Brockhaus & Horwitz, 1986), **self-efficacy** (Chen et al., 1998), locus control (Rotter, 1966), **and tolerance for ambiguity** (Begley & Boyd, 1987) feed the idea that outcomes of actions are contingent on what they do and effects the entrepreneur's success. In accordance, Scattoni et al. (2019) make distinctions between people who cowork by investigating their common backgrounds and nurture the study in the theory realm of personal traits. Articles by Bouncken (2018), Gerdenitsch et al. (2016), Bouncken and Reuschl (2018) determine the personal factors common to the coworking groups mainly around the themes of self-efficacy and trust.

3.2.3. Innovation Theory:

J. Schumpeter (1934) proposes that the entrepreneur is basically an innovator. The task of entrepreneurs in the development process is to maintain the economic growth. Thus, economic growth is based on improvement of entrepreneurship and innovation. Acs (1984) **argued that small firms had an innovative role in the economy as agents** of change. Notably, innovation as a certain product of creative urban economy, is a common theme that is used within the constructs that concern entrepreneurship and coworking, as innovation supporting intermediaries through use of potential in entrepreneurs (Tripathi et al., 2019; Fiorentino, 2019; Schmidt, 2019; Rutkauskas et al., 2019; Cheah & Ho, 2019; Morisson, 2019; Chancé et al., 2018; Jiménez & Zheng, 2018; Barwinski et al., 2020).

3.2.4. Network Theory:

Aldrich and Zimmer (1986) claim that entrepreneurship is embedded in networks of continuing social relations. Those complex relationships either facilitate or constrain the opportunistic success of entrepreneurs, by providing communication, exchange, and norms. Key to success is to be found in the ability to develop and maintain a personal network (Johanisson, 1988) which provides the entrepreneur with potential sources like **strategic information** (Nahapiet & Ghoshal, 1998; Markman & Baron, 2003); **tangible and intangible resources** (Johanisson, 2000), **access to new customers and suppliers** (Brüderl & Preisendörfer, 1998), **reputation and trust** (Zahra et al., 2006) **and emotional support** (Brüderl & Preisendörfer, 1998). The theory distinctly delineates how networks affect the entrepreneurial process and lead to positive outcomes for the entrepreneur or their firms and how entrepreneurial processes and

outcomes in turn influence network development over time (Hoang & Antoncic, 2003). With that regard, highlighted concepts of **social interaction and peer mentoring** (Luo & Chan, 2020; Papageorgiou, 2020; Seo et al., 2017; Fuzi, 2015; McRobbie, 2013; Clayton et al., 2018; Gerdenitsch et al., 2016); collaboration (Bieraugel, 2019; Wijngaarden et al., 2020; Barwinski et al., 2020; Bouncken & Aslam, 2019; Swezey & Vertesi, 2019; Fiorentino, 2019; Constantinescu & Devisch, 2018; Bouncken et al., 2018b); sharing (Oliva & Kotabe, 2018; Lorne, 2019; Waters-Lynch & Potts, 2017; Bouncken et al., 2020); **learning from others** (Morisson, 2019; Cheah & Ho, 2019; Rutkauskas et al., 2019; Schmidt, 2019; Butcher, 2018; Nichols et al., 2017; Lumley, 2014; Gonzalez-Urbe & Leatherbee, 2018; van Holm, 2017); **community building** (Bouncken, 2018; Wang & Loo, 2017; Fraiberg, 2017; Kovacs & Zoltan, 2017); **strategic information gathering** (Servaty et al., 2018; di Marino et al., 2018; Barrales-Molina et al., 2020; Chancé et al., 2018); **building trust** (de Ruijter et al., 2008; Bouncken & Reuschl, 2018) are the augmenting ideas behind Network Theory of entrepreneurship, sustained within the content of the reviewed articles.

3.2.5. Social Identity Theory:

Identity, if individualized, is defined as a general framework for understanding oneself formed and sustained via social interaction (Gioia, 1998). An answer to the fundamental human question of "major role played in the society", social identity is the individual's knowledge that s/he belongs to certain social groups together with some emotional and value significance to her/him of this group membership (Tajfel, 1972). As a fundamental component which explains the roots of founding a firm, entrepreneurship research capitalizes on both theories in order to express the identities, behaviors and actions of entrepreneurs in pursuing their goals (Stets & Burke, 2000). This theory helps to discuss the aspects of learning to be part of that **social community through sharing the same place and interacting** (Butcher, 2018; Bouncken et al., 2018b; Lumley, 2014; Goermar et al., 2020); **mutual support and social belongingness** (Papageorgiou, 2020; Cheah et al., 2019; Cheah & Ho, 2019; Grazian, 2019; Fuzi, 2015; Gerdenitsch et al., 2016); inspiration (Bouncken, 2018) and **building trust** (de Ruijter et al., 2008; Bouncken & Reuschl, 2018). Social proximity of multiple aspects of well-being, catering **practical and emotional needs of freelancers, overcoming the isolation of freelance home-based working** (McRobbie, 2013; Jiménez & Zheng, 2018) are observed ideas which could be narrated under the umbrella of Social Identity Theory, in

a coworking environment where social values are nurtured (Avdikos & Merkel, 2019; Waters-Lynch & Potts, 2017).

3.2.6. Knowledge Spillover theory:

According to Acs et al. (2009) creation of new knowledge expands the set of technological opportunity. Agents with new knowledge endogenously pursue the exploitation of knowledge which is strongly linked to **entrepreneurial activity** (Acs et al., 2009). In relation to the theory, the reviewed articles explain the processes and **amenities of knowledge sharing** among spatially co-located independent professionals (Bouncken & Aslam, 2019; Cheah et al., 2019; Morisson, 2019) and how co-location stimulates interactions, collaborations and innovation in the creative industries (Wijngaarden et al., 2020).

3.2.7. Causation and Effectuation theories:

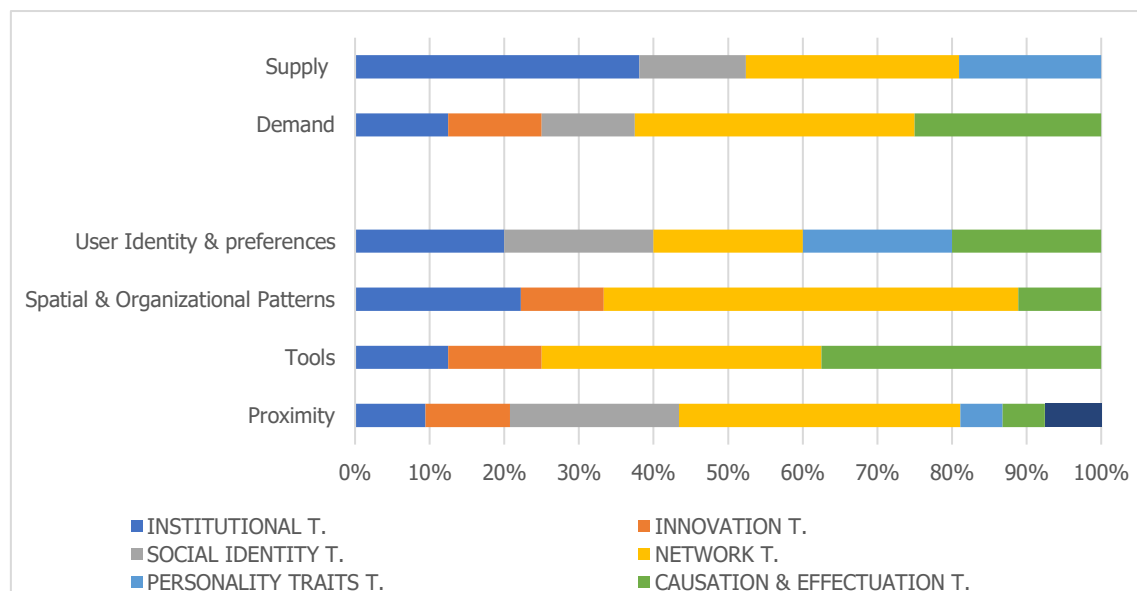
Entrepreneurial behavior examines the human behavior involved in finding and exploiting entrepreneurial opportunities through creating and developing new organizations (Bird & Schjoedt, 2009). Causation, Effectuation and Bricolage Theories attempt to answer the question of how entrepreneurs are motivated to use the resources when they have to start the business or take decisions. Moving from the classical approach, Causation Theory contends that entrepreneurs decide on a desired outcome and **try to consolidate the means to achieve that end on their own initiative** (Shah & Tripsas, 2007). Whereas, recent publications posit that the reverse is the case, where the entrepreneurs rather look for the prevalent opportunities and given set of means to start their actions by applying the **affordable loss principle and establishing and leveraging strategic relationships** (Sarasvathy, 2001). Bricolage Theory blends the two approaches on working out with what is at hand and creating something from nothing (Baker & Nelson, 2005). The reflections of Effectuation Theory in the reviewed articles may be found where the network of entrepreneurs surrounding the individual make him/her see the potential resources like previous professions and social relationships (Scattoni et al., 2019), underlining the necessity driven factors of entrepreneurship (Papageorgiou, 2020; McRobbie, 2013). On the contrary, when entrepreneurial intentions are active, a search for resources (Fuzi, 2015; Tripathi et al., 2019; Seo et al., 2017; Štefko & Steffek, 2017), learning opportunities (Gonzalez-Urbe

& Leatherbee, 2018), and entrepreneurial motivations on achieving success (Schmidt, 2019; Mátyás et al., 2019) may be adhered to foundations of Causation Theory.

3. DISCUSSION AND DIRECTIONS FOR FUTURE RESEARCH

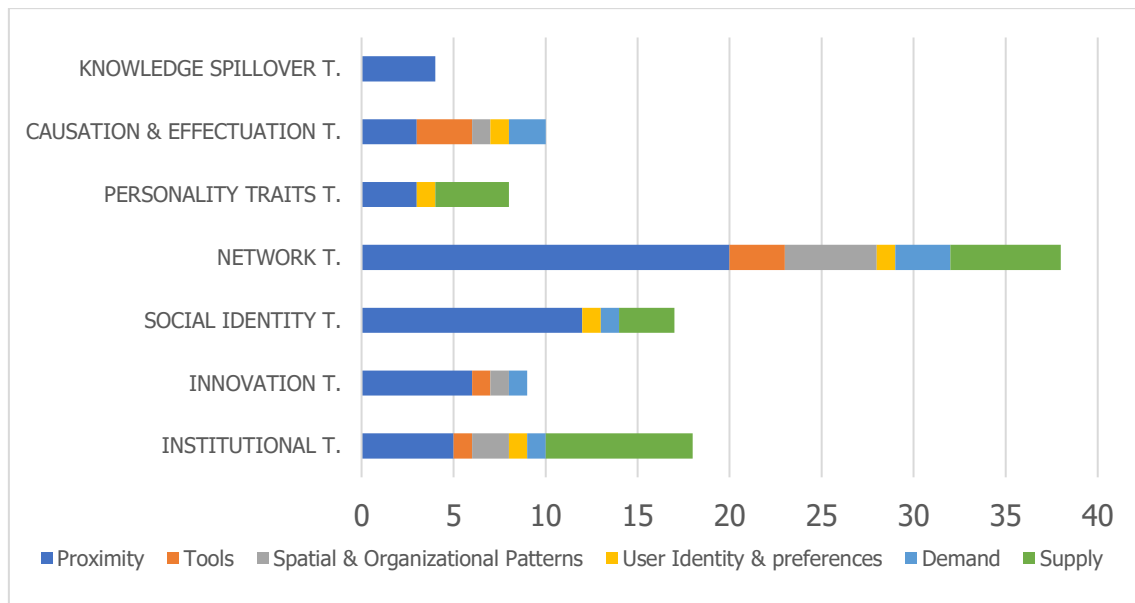
The review justifies that the majority of studies have been applied on the ideas of an institutional view, pointing out to the economic and urban dynamics that resulted in proliferation of coworking spaces. Figures 7 and 8 make a short summary of the theme and theory distribution which reveals the dominance of Network Theory in almost all themes.

Figure 7: Distribution of Theories on Themes extracted from data analysis



Source: Own elaboration.

Figure 8: Distribution of Theories and Themes extracted from data analysis

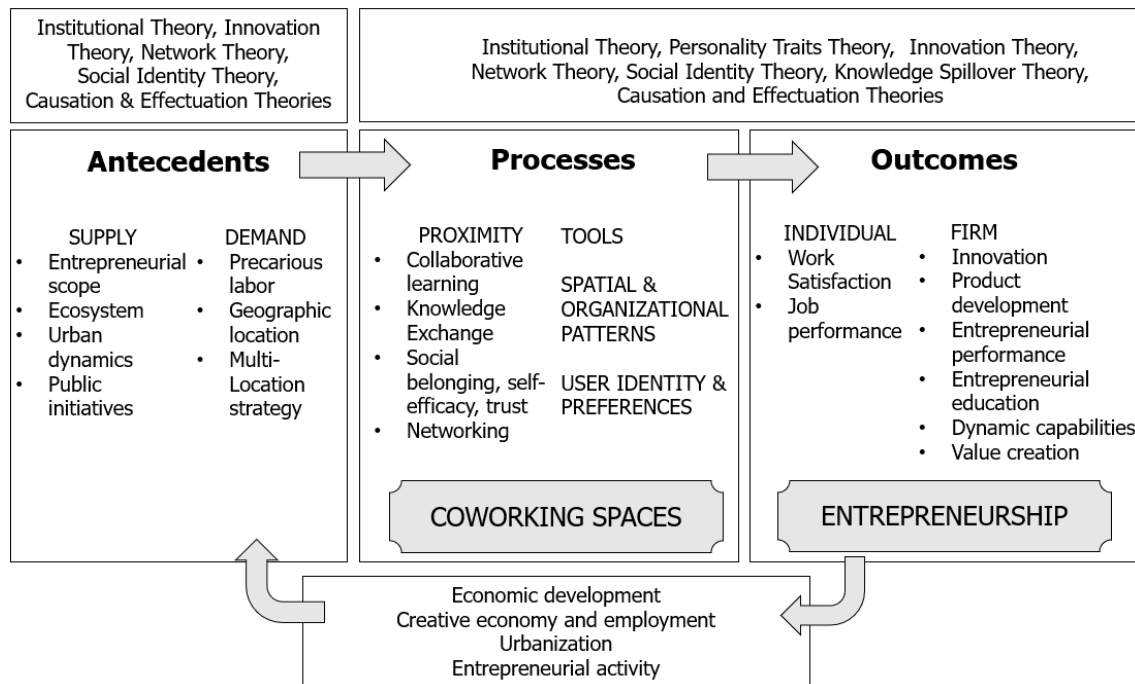


Source: Own elaboration.

In relation, the entrepreneurs that make use of those spaces take the advantage of social interaction, community building, knowledge exchange, cooperation, competition, and networking functions while equipping themselves with psychological fortifications like belongingness, trust and individual efficacy. The ultimate outcome of that step is knowledge spillover and entrepreneurial learning, which triggers innovation, start-up performance and entrepreneurial activity.

Using this framework, the results generated so far are mapped in the model, shown in Figure 9. To sum, due to triggers both from the *supply* and *demand* side, the coworking spaces continue their development and as a result of the *proximity, tools, spatial and organizational patterns, user identity and preferences* processes, have an impact on entrepreneurship both in *individual* and *firm* aspects. In the long run, improvement on the entrepreneurship will feed the system back and have positive impact in rising demand and supply for more coworking spaces.

Figure 9: Proposed conceptual model



Source: Own elaboration.

4.1. Methodology

One of the most remarkable outputs of this research has been the demonstration of qualitative study dominance over quantitative methodologies. Those efforts generated usually around the ethnographic narratives and case studies have provided a nuanced and generalized understanding of coworking spaces, with samples taken from a variety of country contexts. It appears that, the findings mostly corroborate each other and justify the contingencies already put forward in this paper. On the other hand, the use of quantitative methods is very primitive, almost 30% deriving from descriptive statistics.

Coexistence of similar contingencies in the literature review may be tied to that dominance of intuitive research, a result of similar results achieved after collecting qualitative data from similar coworking environments and users. Nevertheless, as the number of publications increase, expectedly the large-scale quantitative studies might have more strength in the field, while the qualitative papers evolve into longitudinal and inductive studies.

The findings reveal that there is still need for more grounded theories and particularly, developed analyses drawn from quantitative data. In a very short period of time, almost 10 years, the ideas that are argued in the studies seem to have reached a point of saturation around the concepts of social interaction, collaboration, knowledge sharing

and spillover which result in intensifying factors for innovation and improvement. But still, some papers explain that not all factors proposed are corroborated (Hicks & Faulk, 2018) and most of the ideas even have not been tested on quantitative methods, i.e., the organizational performance, and entrepreneurial success, two most visited resorts of dependencies in qualitative studies. Reorganizing research on such methodology, would also increase the number of publications in high impact journals.

4.2. Context

The contexts where the reviewed articles belong to are notably the urban cities, with high frequencies of New York, Berlin, and London. It is very acceptable that these cities are the ones where coworking spaces are located, but still, contexts not particularly characterized by urbanization and knowledge economies would add to the exploration of antecedents, processes and outcomes of coworking. Examples that devote effort on such approach comes from peripheral areas (Gandini & Cossu, 2019; Kovacs & Zoltan, 2017) and comprise foresight for future studies. Underlining the underrepresentation of countries other than the developed ones, studies that take place in emergent countries would again serve that cause. Meanwhile, as Brown (2017) had noted, the need for research in “ordinary” cities continue as well.

The samples are mostly taken from the coworking spaces in one country, and only four papers make comparisons between different country cases. This calls for more comparison studies with a blend of various countries. Further contextual comparisons can concern offices, factories, homes and public places, so that the issues where coworking distinguishes itself become more apparent.

4.3. Theoretical Framework

The reviewed articles incorporate major streams of theories to strengthen their knowledge base, however, the theoretical framework of contingencies is weak in explaining the entrepreneurial background consistently. Future research should resolve the arguments proposed with more emphasis put on theories that explore entrepreneurship, as this study has also suggested with Institutional Theory, Innovation Theory, Social Identity Theory, Network Theory, Personality Traits Theory, Causation and Effectuation Theories, Knowledge Spillover Theory and other theories that are not covered here. Depending on the context, more emphasis can be given to women entrepreneurs, social or immigrant entrepreneurship in order to advance theoretical

development of studies. Limiting coworking spaces only to the creative class today would be erroneous, moving from the recent data of Global Coworking Survey provided by Deskmag (2020), one of the most comprehensive websites dedicated to information about the development of coworking spaces worldwide, which signals the presence of self-employed business-people from a variety of professions, with wide membership of women and immigrant entrepreneurs.

Moreover, theoretical background from the entrepreneurship view will help the researchers see the negative aspects of coworking and be critical. The resolution of inconsistencies in the contextual factors would make a key contribution to literature in this area, just as in the example well laid in “dark side of the entrepreneurship” perspective of Bouncken et al. (2018a). With that regard, not only the contingencies fostering entrepreneurship, but also amenities that help to mitigate the entrepreneurial problems may be dealt with objectivity.

Inclining more on the theoretical framework will clear the paths to see the missing points about the deficient contingencies. For instance, although a formidable number of papers have explained their arguments through the lens of institutions, there is no sign of cultural or informal institutions within the content of the reviewed articles, which was also a call made by Bruton et al. (2010). Combined with the contextual comparison, normative, and cognitive aspects will uncover many issues overlooked, in addition to the overemphasized regulative ones. Likely, new ideas will probably sprout from studying the legitimacy or embeddedness patterns in these spaces. Such devising examples may be adapted to all theories issued in this study.

4.4. Practical issues

The global phenomenon of coworking spaces has been continuously growing since the late 2000’s and is actively adapting itself to the necessary conditions of time. It includes a considerable flux, with sites changing rapidly as coworking models mature and labor conditions change (Spinuzzi et al., 2019). Although some functional topics like internal services, learning programs or membership typologies are already visited by academics, the dynamics are always prone to change, and new factors may emerge to make differences in the relationships proposed. For example, today the coworking spaces are offering more divergent services such as massages or law consultancy, some concepts

that the reviewed articles' content did not include. The changing designs in the coworking spaces, might be as influential as changing localities.

Most important of all, the weakening of sharing economy due to Covid -19 crisis would be both a drastic challenge and even a disruptive innovation opportunity. Schumpeter (1934) contends that innovation sometimes could be regarded as a creative destruction of the old economic system. As the world is going through a very unique challenge of changing all old models, the redirections in sharing economy will be the focus of the empirical articles on entrepreneurship for future studies, and they will expectedly cover the practical essentials of coworking spaces as well. As now coworking has become a beneficiary industry, against the threat of closing, the tools, spatial and organizational patterns will be more important than before.

5. CONCLUSION

This paper reviews existing coworking literature in order to map out the major streams of research and interpret the contingencies in terms of widely used theories, methods, and contexts with an entrepreneurship perspective. The growing supply and demand which transformed coworking into one of the fastest growing type of workplace activities may be adhered to social (Swezey & Vertesi, 2019; Cheah et al., 2019) and economic factors (Waters-Lynch & Potts, 2017) that paved the way for the postindustrial, information, network, and knowledge society (Grazian, 2019). Fuzi (2015) contend that, among other factors, coworking spaces are context-dependent workspaces. Intensified by economic conditions, that is, the necessity of office environments that provide economies of scale (Waters-Lynch & Potts, 2017; Lorne, 2019; Luo & Chan, 2020) and at the same time, by the constant evolution into knowledge society (Grazian, 2019) a growing class of knowledge and creative workers mostly on the form of independent freelancers found themselves in search for such places different from homes, to break free from isolation (Jimenez & Zheng, 2018). The grassroots of coworking took place in coffee shops or neighborhood environments and eventually with growing contemporary innovation economy the servicing environments for entrepreneurial labor force turned into a multi-billion-dollar industry of urbanized cities (Swezey & Vertesi, 2019).

However, coworking is not only about the physical place, but more about establishing the community who want to work together (Garrett et al., 2017; Bouncken et al., 2018b).

These people not only found a well-designed and equipped place to work within the city, but also a source to feed their needs of social interaction (Clayton et al., 2018), collaboration (Bieraugel, 2019; Wijngaarden et al., 2020; Barwinski et al., 2020), networking (Bouncken, 2018; Wang & Loo, 2017; Fraiberg, 2017) and learning by knowledge spillover (Bouncken & Aslam, 2019; Cheah et al., 2019; Morisson, 2019). The sense of community advanced with psychological factors of belongingness, trust and self-efficacy (de Ruijter et al., 2008; Bouncken & Reuschl, 2018), assisted the coworkers to continue taking advantage of this new warm environment. In consequence, coworking converted itself into a phenomenon that is both intensified by the economic conditions, but also supporting the system of urbanization and knowledge economy with its own fruitful offers like increasing innovation and entrepreneurial success (Morisson, 2019; van Holm, 2017; di Marino et al., 2018). From the broader perspective, with all the competencies it transmits, coworking feeds the society and the system it is incorporated in by contributing to the creativity of the city, economic growth, sustainable productivity and innovation (Cheah & Ho, 2019; Cheah et al., 2019) and promoting entrepreneurship (Fuzi, 2015; Tripathi et al., 2019; Scattoni et al., 2019). By elaborating a framework of the observed contingencies in the literature that deals both with coworking and entrepreneurship, this paper supplies for four main conclusions.

First, despite the increasing trend, the research made on the topic is relatively young, stemmed from the recency of the coworking phenomenon itself, that dates to merely a decade. As a result, the researchers are still in the phase of constructing models that elaborate on meaningful discussions, mostly by deployment of qualitative methods.

Second, the contextual distribution of the studies is determined by the environments where the phenomenon is observed most, in general. Still, there are some other attempts to compare the effect of coworking in diverse conditions depending on the context like Shanghai, Tokio, Dubai, and Abu Dhabi referring to the industrial reports (Instant Group, 2017).

Third, the articles reviewed, although having grasped a theoretical background to rest on while explaining approaches, fall short of coinciding in a theory of entrepreneurship. This research, as one of the first few attempts to review the articles with such focus, highlights the need for theoretical approaches that touch the entrepreneurial framework of the coworking phenomenon. In light of the previous studies in the field, supported

ideas can be built on Institutional Theory (Baumol et al., 2009; Bruton et al., 2010), Innovation Theory (Schumpeter, 1934), Social Identity Theory (Stets & Burke, 2000), Network Theory, Personality Traits Theory (Shane & Venkatamaran, 2000), Causation and Effectuation Theories (Shah & Tripsas, 2007; Sarasvathy, 2001), Knowledge Spillover Theory (Acs et al., 2009), or other relevant entrepreneurship based theoretical framework, depending on the forthcoming idea or model.

Practical implications derived from this research reveal how vital the coworking spaces have been for the modern day, not only since there is an evident increase in the numbers of these places, but also due to their implications in enhanced innovation and entrepreneurial activity (Fuzi, 2015). Nevertheless, coworking spaces are a component of the shared economy and are under the same threat of losing their clients, as a result of people's loss of belief in this system after the outbreak of Covid-19 pandemic. This research, written during the escalation days of the crisis, is also intended to find the basic sources of information to prescribe remedies for sectoral reinvention in the aftermath of the crisis. Based on the proposed research agenda, a schedule for further PhD study has been arranged, available in Appendix 2 section.

By development and adoption of different theoretical frameworks to the area of coworking research, this study contributes to the field of entrepreneurship. In making a comprehensive review of dominant contingencies highlighted so far, indications found in antecedents, processes and outcomes framework have been combined in a theoretical approach as also suggested earlier by Shane and Venkatamaran (2000). The use of this methodology also proves an integrative approach to reveal major research themes while underlining the focal theoretical foundations.

This research also has proven the entrepreneurial focus of the studies in coworking field with an added value by proposing a model which incorporates coworking and entrepreneurship in the ecosystem. With that regard, this paper also answers the call by Landström et al. (2012) dedicated to more systematically analyzing previous efforts and to attempt identifying the main intellectual contributions within the field.

This research may not be exempt from limitations, due to methodological choices pursued. In a context where coworking spaces cannot be discussed separately from entrepreneurship, refining the article search methodology with key terms of

"entrepreneurship", "startup" and "new ventures", may have led to exclusion of some important and most cited articles that could have a concrete impact on study, and simultaneously inclusion of some with least impact factor. To relate, the Introduction section of the paper is designed to mitigate that probable loss and add value to the findings obtained from the group of reviewed articles gathered from the bibliometric search. In addition, the download unavailability of five articles may have led to a loss of valuable information, which could not be compensated for, by any manner.

This study underlines the need for more research that clarify the relationship between entrepreneurship and coworking, resting on a variety of methodologies, contexts, and practical items to include. Adoption of advanced quantitative analyses, with data or samples collected from developing or emergent countries and adjusting the research topics into the changing typologies and practical environment of coworking spaces will surely complement more causalities and thus expand the knowledge base created in the field.

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APPENDICES

APPENDIX 1. Three component thematical model distribution on theories

This part gives detailed information about theoretical base attribution of the reviewed studies about coworking spaces (CWS). Column headers hereafter read as: INSTITUTIONAL THEORY (INSTT), Personality Traits Theory (PERTT), Innovation Theory (INNTT), Network Theory (NETWT), Social Identity Theory (SOCIDT), Knowledge Spillover Theory (KNWSPT), Causation and Effectuation Theories (CAUEFT)

Table A1: Antecedent supply perspective on coworking spaces development

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNTT	NETWT	SOCIDT	KNWSPT	CAUEFT
Lumley (2014)	To invite local independent entrepreneurs, contract workers, and self-employed members of the community to use the academic library as a coworking space	"Community Work Space" model allows for dedicated time to concentrate and accomplish tasks within a community, rather than as a place that encourages discussion and interaction between coworkers.				Learning from others	Sharing the same place and interacting		
Fraiberg (2017)	To explore how Start-Up Ecosystem is geographically, economically, and politically situated in Israel high-tech industry made up of a dense ecosystem of conferences, accelerators, meetups, social media, and coworking spaces.	Startup ecosystems are deeply intertwined or knotted with wider social, cultural, and ideological contexts.	Generate own cultural, social and structural patterns			Community building			
Wang & Loo (2017)	To examine the geographical factors, reasons, and processes behind the emergence of coworking offices for these Internet start-up firms	Supported by favorable government policies and strong market demand, coworking offices have evolved as hubs of Internet entrepreneurs in China.	Geographical localization factors			Community building			
del Moral-Espín et al. (2018)	To analyze almost 140 Collaborative Economy experiences in the region of Andalusia and the role of public actors as potential drivers of those initiatives	Two kinds of collaborative economy experiences exist in Andalusia: academic- related initiatives and entrepreneurial projects launched in this region.	Public incentives						
di Marino et al. (2018)	To analyze the ways in which multi-locality is addressed within the urban regions.	While policy makers and city planners have not addressed the complexity of multi-locality, both private and public organisations are focusing on more concrete multi-local working practices.	Generate own cultural, social and structural patterns			Strategic information gathering			

Source: Own elaboration.

Table A1: Antecedent supply perspective on coworking spaces development. (CONTINUED)

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNTT	NETWT	SOCIDT	KNWSPT	CAUEFT
Grazian (2019)	To show how coworking participants make use of these spaces as social and spatial resources for mobile work and how digitization reshaped the use of urban space around mobile work in new economy.	The rapid expansion of coworking in places like Manhattan exemplifies how digitization has reshaped the uses of urban space around mobile work in the new economy.					Mutual support and social belongingness		
Avdikos & Merkel (2019)	To analyze new policy principles that acknowledge the social and the economic values that shared workspaces generate and promote	The diversification of coworking is driven by two interrelated dimensions: a) the scope b) the functional dimension.	Coworking spaces generate their own cultural, social and structural patterns				Social values		
Lavčák et al. (2019)	To identify the distinct qualities of emerging start-up ecosystems in two types of cities	In a smaller or peripheral city, a living ecosystem must rely on its interconnectedness, network structure, team spirit, built social capital and permanent collaboration.	Urban dynamics						
Lorne (2019)	To examine the emergence of 'open' urban economic projects that promote transformative potential of social innovation and civic enterprise.	Openness is a guiding principle for engineering laboratory-like incubators that speed up and intensify informal encounters and blur the boundaries between start-up social enterprises, businesses, and local government.	Urban dynamics			Sharing			
Luo & Chan (2020)	To investigate the urban dynamics in the production of coworking spaces in China	The coworking movement is a complex process combining top-down and bottom-up forces, serving the national spatial fix endeavors of battling unemployment, economic restructuring, social mobility enhancement, and other social functions.	Urban dynamics				Social interaction and peer mentoring		

Source: Own elaboration.

Table A2: Antecedent demand perspective on coworking spaces development

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNNT	NETWT	SOCIDT	KNWSPT	CAUEFT
Štefko & Steffek (2017)	To explore the key start-up facilitation services of the incubation and coworking market in Toronto that are most in demand by individuals from creative industries services.	The services are most demanded in terms of physical infrastructure and business support.							Search for resources
Constantinescu & Devisch (2018)	To discuss how the integration of a visualization tool in a participatory process can reveal a new spatial scale of coworking dynamics	The proprietors/shops become individual workers that share the street, the street becomes the collectively driven, networked co-working space.				Collaboration			
Rutkauskas et al. (2019)	To find the bases which contribute to emerging and developing of coworking spaces in regions of Russia while using entrepreneur, innovative and civil potential of the youth	Innovation process is especially important for understanding of the nature of creation and development of new coworking projects and improving of existing ones.			Innovation supporting intermediaries	Learning from others			
Gandini & Cossu (2019)	Aimed at gaining an in-depth understanding of how individuals involved in these communities interact, collaborate and culturally conceive social and economic exchanges within and beyond them.	There is increasing evidence of the presence of resilient spaces outside the boundaries of the global creative city.	Peripheral or disadvantaged areas						
Papageorgiou (2020)	To illustrate what it means for young start-uppers to manage a start-up working life in non-fixed workplaces	The emergence of "desperate optimists, a workforce which eagerly accepts its precarious conditions of work, undertakes the risk of acting entrepreneurially and help hub development.				Social interaction and peer mentoring	Mutual support and social belongingness		Driven factors of entrepreneurship

Source: Own elaboration.

Table A3: Proximity process distribution on theories

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNTT	NETWT	SOCIDT	KNWSPT	CAUEFT
de Ruijter et al. (2008)	To explain whether partners and other family members cwork in entrepreneurs business and explain the governance structure of the firm.	Coworking with familiars is risky since they may lose income in case of seperation. But it is beneficial because it reduces the trust problems.				Building trust	Building trust		
McRobbie (2013)	To offer reflections, in a period of austerity and cuts to public spending, and high unemployment for young women, on the possibilities for localized practice within a neo-artisanal frame	Creative economy, with its wide array of disciplinary technologies entails a reconfiguration of work and employment for specific sectors of the population.				Social interaction and peer mentoring	Overcoming the isolation		Driven factors of entrepreneur-ship
Fuzi (2015)	To provide an empirical exploration of whether co-working spaces can promote entrepreneurship in regions with sparse entrepreneurial environments by creating the hard infrastructure particularly designed in such a way that the soft infrastructure necessary for entrepreneurship can also emerge.	Community facilitators create different engagement modes to stimulate encounters and collaborations inside the trust-based community-oriented environments.				Social interaction and peer mentoring	Mutual support and social belonging-ness		Search for resources
Gerdenitsch et al. (2016)	To explore social interaction in coworking spaces and reports the results of two studies on social supports	Social support from both sources was positively related to performance satisfaction. A mobilization of social support seems necessary in coworking spaces.		Self-efficacy and trust		Social interaction and peer mentoring	Mutual support and social belonging-ness		
Nichols et al. (2017)	To explore the evolution and role of makerspaces in academic libraries, with a particular focus on how libraries are using innovation spaces in support of entrepreneurship and digital humanities on campus	Makerspaces, digital humanities centers, and coworking spaces advance entrepreneurial education. CWS provide a shared context, an entrepreneurial frame, in which actors can reveal useful information to decrease this uncertainty, identify each other and mutually engage in activities that construct trust and enable cooperation against uncertainty.				Learning from others			
Waters-Lynch & Potts (2017)	To test some specific predictions about the organizational and institutional form of successful coworking spaces.		Social economy			Sharing	Social values		

Source: Own elaboration.

Table A3: Proximity process distribution on theories (CONTINUED)

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNTT	NETWT	SOCIDT	KNWSPT	CAUEFT
Bouncken (2018)	To discuss how university CWS can enrich universities using new venture community, self-efficacy, inspiration, autonomy, and knowledge flows	Suggestions for the implementation of university coworking-spaces concern space, course structure, admission, external linkages and governance.				Strategic information gathering			
Bouncken et al. (2018a)	To analyze the coopetitive tensions in different types of coworking-spaces.	Influencers on coopetition tensions in CWS are friendship, community, social interaction, identification with CWS, trust, reward system for CWS improving behavior, knowledge sharing, openness, flexibility, inertia, antagonists, modularity, hierarchy.	Generate own cultural, social and structural patterns			Collaboration	Sharing the same place and interacting		
Bouncken & Reuschl (2018)	To deliver an understanding of coworking-spaces and identify key factors which lead to a conceptual model.	A conceptual model is created on key factors on performance influenced by trust, community, learning, self-efficacy that are affected negatively by opportunism.		Self-efficacy and trust		Building trust	Building trust		
Butcher (2018)	Conceptualize of learning everyday coworking practices, and learning through coworking practices	Coworkers learn to become collaborative, intentional, and to perform contestation through co-created situated learning.				Learning from others	Sharing the same place and interacting		
Chancé et al. (2018)	To discuss the challenges of measuring the sustainability performance of Third Places using conventional sustainability audit tools	New auditing protocols should reward flexibility and adaptability and favor new and sustainability-driven practices.			Innovation supporting intermediaries	Strategic information gathering			
Clayton et al. (2018)	To explore how various intermediaries function and provide complementary and related services in support of scientific commercialization through entrepreneurship	University technology transfer and licensing offices; physical space (incubators, accelerators, and co-working spaces); professional services providers; networking, connecting, and assisting organizations; and finance providers (including venture capital, angel investors, public financing, and crowdfunding) impact on entrepreneurial performance.				Social interaction and peer mentoring			
Jimenez & Zheng (2018)	To explore the relationship between innovation and development and argue not moving beyond the focus on competitive advantage and growth	Innovation is not just a process to empower individuals to become entrepreneurial actors, but also the process by which people develop capabilities in multiple aspects of their agency and well-being.	Social economy		Innovation supporting intermediaries		Overcoming the isolation		
Servaty et al. (2018)	The most mentioned reason for using coworking spaces are the community alternative to home office. To investigate reasons and motives for working in coworking spaces and working conditions under health related aspects.	Negative job demands are unfavorable ergonomic conditions, working disruptions, missing privacy and miscommunications. Time flexibility, social surrounding and increased productivity are resources.				Strategic information gathering			

Source: Own elaboration.

Table A3: Proximity process distribution on theories (CONTINUED)

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNTT	NETWT	SOCIDT	KNWSPT	CAUEFT
Bieraugel (2019)	To analyze the types of spaces to spaces to foster your entrepreneurial students.	Libraries can market unique spaces to students (e.g. "Here are spaces to help you think creatively"), support Creative Campus initiatives, and promote library spaces fostering entrepreneurial thinking				Collaboration			
Bouncken & Aslam (2019)	To explore the processes of knowledge sharing among co-located independent professionals and explain how traditional organizations can learn from CWS.	The physical and cognitive proximity within shared spaces facilitate the exchange of tacit knowledge among users arise from diverse functional backgrounds.				Collaboration		Knowledge sharing	
Cheah & Ho (2019)	To analyze the relationship between coworking space and innovation, particularly business model innovation (BMI) for sustainable performance	Space creativity of coworking spaces is positively related to the BMI outcome of tenant firms through tenant firms' opportunity recognition and exploitation process positive mediation.			Innovation supporting intermediaries	Learning from others	Mutual support and social belongingness		
Cheah et al. (2019)	To explain how daily mutual support influences daily job performance	Social climate of coworking spaces can promote a sense of belonging, self-efficacy, work enjoyment and job performance					Mutual support and social belongingness	Knowledge sharing	
Morisson (2019)	To define innovation centres and investigate their role in the making of the knowledge city	Innovation centres ultimately aim to recreate the sense of 'local buzz' that is found in competitive industrial districts.	Making of the knowledge city and economic development		Innovation supporting intermediaries	Learning from others		Knowledge sharing	
Schmidt (2019)	To provide an overview of recent interdisciplinary perspectives on the functions of labs in coordinating creativity and entrepreneurship, and user motivations.	Open creative labs can be regarded as social innovations contributing to social processes of learning, exchanging, and interacting, while having a commercial value in working and entrepreneurial labs.			Innovation supporting intermediaries	Learning from others			Entrepreneurial motivations on achieving success
Barwinski et al. (2020)	To investigate new ventures dealing with the challenge of generating innovations from a limited resource base.	The effects of CWS on the ventures' innovation search strategy changes according to the venture's stage with ambiguous outcomes.			Innovation supporting intermediaries	Collaboration			
Wijngaarden et al. (2020)	To explore whether and how co-working and co-location could stimulate interactions and collaborations that potentially foster innovation in the creative industries.	Formal collaboration is limited, as is its contribution to radical innovative breakthroughs				Collaboration		Knowledge sharing	

Source: Own elaboration.

Table A4: Spatial and Organizational Patterns in coworking spaces process distribution on theories

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNTT	NETWT	SOCIDT	KNWSPT	CAUEFT
Kovacs & Zoltan (2017)	To analyze how enterprise hubs could help the development of entrepreneurship in the 21st century from physical and from social dimensions	One of the greatest challenges facing both hub owners/managers and hub occupiers is forming productive networks.				Community building			
Seo et al. (2017)	To identify success factors for sustainable business through analysis of users and hosts' demands and priorities about coworking spaces.	Relationship facilitation, service diversity, and price plan have the highest priorities for sustainable coworking space operation for both coworkers and hosts.				Social interaction and peer mentoring			Search for resources
Hicks & Faulk (2018)	To examine the county-wide impact of business incubators, makerspaces and co-working spaces on employment, proprietor's employment and the average wage per job.	There is no statistically significant impact of these facilities on total employment or average wage per job during this period but impact of co-working spaces on proprietor's employment, which can be interpreted as shifting employment from traditional employment to proprietorship employment.	Public incentives						
Fiorentino (2019)	To shed light on the connections and the impact that different typologies of CWSs have on local economic development and urban regeneration. To test the intermediate role of CWS by analysing their role and location.	CWS have an intermediary role for local economic development both in the process of economic renovation and urban regeneration.			Innovation supporting intermediaries	Collaboration			
Barrales-Molina et al. (2020)	To evaluate the role of size, location, collaboration partners and financial means in patenting activity	Working culture in these spaces based on rules such as trust, rapport and collegiality promote open knowledge flow influencing lower patenting likelihood.				Strategic information gathering			
Bouncken et al. (2020)	To analyze institutional patterns in CWS and show how their configurations relate to work satisfaction	High work satisfaction can occur in three different configurations related to agility, knowledge housing, and social spatial configurations.	Coworking spaces generate their own cultural, social and structural patterns			Sharing			

Source: Own elaboration.

Table A5: Tools in coworking spaces process distribution on theories

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNTT	NETWT	SOCIDT	KNWSPT	CAUEFT
van Holm (2017)	To explore makerspaces and how they contribute to economic development through business generation and sustainment	While makerspaces can encompass elements of coworking spaces and incubators, extensive access to tools and open membership differentiate the three models.	Making of the knowledge city and economic development			Learning from others			
Gonzalez-Uribe & Leatherbee (2018)	To investigate the question of an ecosystem accelerator about: basic services of funding and coworking space, and additional entrepreneurship schooling on new venture performance	The first quasiexperimental evidence of the effect of accelerator programs is the importance of entrepreneurial capital on new venture performance.				Learning from others			Search for learning opportunities
Oliva & Kotabe (2018)	To present the main barriers, practices, methods and knowledge management tools in startups that are characterized as agile organizations with dynamic capabilities to meet the demands of a business environment of high volatility, uncertainties, complexity and ambiguity.	Startups are characterized as agile organizations with dynamic capabilities to meet the demands of a business environment of high volatility, uncertainties, complexity and ambiguity. Kauffman Index can be utilized for mapping up the efficiency of smaller ecosystems too such as the aca-demic startup mentor projects.				Sharing			Entrepreneurial motivations on achieving success
Mátyás et al. (2019)	To measure entrepreneurial activity on national level to measure startup activities in a university framework.								
Tripathi et al. (2019)	To identify the effect of the six ecosystem elements (entrepreneurs, technology, market, support factors, finance, and human capital) on minimum viable product (MVP) development	supporting factors, such as incubators and accelerators, can influence product development by providing young founders with the necessary entrepreneurship skills and education needed.			Innovation supporting intermediaries				Search for resources

Source: Own elaboration.

Table A6: User Identities and preferences process distribution on theories

STUDY	OBJECTIVE	RESULT	INSTT	PERTT	INNTT	NETWT	SOCIDT	KNWSPT	CAUEFT
Scattoni et al. (2019)	To analyze the features of Italian innovative startups, focusing on localization factors and considering the case of the city of Rome and to test current thinking on the birth and evolution of innovative startups empirically	Logistics are the main determinant of innovative startup localization. Majority of startupperes are people who previously worked as employees, professionals. Social relationships, family and universities are the main two environments in which people's entrepreneurial spirit develops.	Geographical localization factors	Common personality traits					Potential resources like previous professions and social relationships
Swezey & Vertesi (2019)	Using a sociomaterial approach, to identify and explore core tensions visible in the site between participation in a distributed work team and in a distinct, collocated community, which we label the co-working paradox.	Coworking has much in common with teleworking and remote collaboration, it poses its own unique challenges in terms of managing multiple environments, connections, and contexts.				Collaboration			
Goermar et al. (2020)	To explain which factors influence the value co-creation in coworking-space	In coworking-spaces, there is an optimal degree of diversity regarding individuals' social background and the knowledge bases.					Sharing the same place and interacting		

Source: Own elaboration.

APPENDIX 2. PhD Thesis Proposal

Coworking is a trusted working practice by millions of knowledge workers, freelancers, entrepreneurs, new ventures, but also employees of incumbent firms are using coworking spaces in global cities. Resulting from the upsurge of Covid-19 crisis, the new economic framework is awaiting to be discovered, and this collaborative working phenomenon will have to reinvent its new own business models to stand against the isolationist approaches in economy and individuals' reluctance to share. The objective of this research is to make an empirical analysis of the crisis impact on the coworking business models, with an intention to reformulate opinions and insights by the entrepreneurs. The methodology will be built on information gathered from expectedly 500 startups active in Spain. Data will be collected by channeling the coworking spaces in Barcelona to reach target entrepreneurs and analyzed with appropriate econometrical techniques. Significance of relationships drawn from the data will help to build constructs that distinguish and foresee alternative business models for coworking spaces to continue their collaborative activities and practical input in knowledge exchange through new modes of sharing.

Table A7: PhD Thesis Schedule

	Month 1	3	5	7	9	11	13	15	17	19	21	23	25	27
RESEARCH DESIGN: Identifying research areas, designing aim and objectives														
PLANNING: Writing hypothesis and research questions														
DATA COLLECTION: Exploring literary sources, Designing research methodology (Formulating research strategy and selecting methods), Literature Review, Collecting data from primary sources														
DATA ANALYSIS														
WRITING UP														