Collaboration in Coworking Spaces: How to Navigate the New Office Landscape

Master's Thesis

Manuel Thomsen

Management of Innovation and Business Development
Copenhagen Business School 2016

Supervisor: Sigvald J. Harryson

May 11, 2016
STU Count: 177.078 (78 Pages)

Abstract

This paper explores the collaborative and co-creational processes taking place in coworking spaces. A case study of four coworking spaces across three countries is undertaken in order to understand the environments that coworking spaces provide, the networks that are formed in them, and how these factors influence the collaborative practices among the coworkers. The paper combines existing innovation and network theory with the emerging academic literature on coworking spaces. As a result of the analysis, five key dimensions differentiating coworking spaces are suggested: (1) Access requirements, (2) physical separation of sub-groups, (3) average length of membership, (4) size, and (5) degree of systematisation. All five dimensions have major implications for the ways in which the coworkers network and collaborate. The case study shows that temporary and transactional collaboration is very common in coworking spaces. Widespread co-creation, however, could only be observed in one of the four coworking spaces. In order for co-creation to truly thrive, a coworking space should (1) put in place access requirements that target entrepreneurs and ensure professional homogeneity, (2) provide physically separated areas for companies in different life cycle stages, (3) limit the length of a membership in order to ensure a constant flow of new expertise and ideas, (4) be large enough to let its members be truly explorative, and (5) have a high degree of systematisation.

Keywords: Coworking Spaces, Co-Creation, Network Theory, Innovative Environments, Office Design.

Abstract 1

Introduction 5

- **Importance** 9
- **Cases** 9
- **Research question** 10
- **Structure of the paper** 10

Literature review 11

- **Coworking spaces** 11
  - **Typology of coworking spaces** 12
  - **Societal context** 13
- **Innovation and co-creation** 14
  - **The importance of environments** 17
- **Network theory** 18
  - **Informal networks** 18
  - **The importance of network types for exploration and exploitation** 18

Method 19

- **How it started** 20
- **Research philosophy and theoretical approach** 21
- **Case studies** 21
- **Data collection** 22
  - **Interviews** 22
  - **Ethnographic observations** 23
  - **Secondary data** 24
  - **Time horizon** 24
- **Case descriptions** 24
  - **Coworking spaces** 25
  - **Interviewees** 30
- **Delimitations** 33

Analysis **34**

Which environments are provided by the coworking spaces? **35**

The Rabbit Hole **35**

CSE **38**

Minc **41**

Social Impact Lab **46**

Sub conclusion **48**

How are coworkers connected with each other? **49**

The Rabbit Hole **49**

CSE **52**

Minc **55**

Social Impact Lab **58**

Sub conclusion **59**

How do the coworkers collaborate and co-create? **60**

Collaboration and co-creation at The Rabbit Hole **61**

Collaboration and co-creation at CSE **62**

Collaboration and co-creation at Minc **65**

Collaboration and co-creation at the Social Impact Lab **66**

Sub conclusion **67**

Discussion **68**

The influence of coworking spaces on collaborative processes **68**

How to encourage co-creation **71**

Conclusion **73**

Implications for research **75**

Implications for practice **76**

Limitations and future research **76**

Acknowledgements **76**

References **77**

Appendix **82**

Appendix 1: Overview of selected coworking spaces in Copenhagen **82**

Appendix 2: Interviewguide for coworking space members **83**

Appendix 3: Interviewguide for coworking space proprietors **85**

Introduction

Since the introduction of personal computers in the late 1970s, the ways in which people around the world conduct business on a daily basis have changed in tremendous ways (Varian, 2010). Not only have computers transformed the products and services which we use and consume every day, their introduction also has had a substantial impact on the ways in which white-collar-workers solve their everyday tasks (Brynjolfsson & Hitt, 1996). Many professions, ranging from designers to researchers and business executives, rely heavily on general purpose computers. While computers with enough computing power to solve even basic problems were sparse and took up entire rooms a couple of decades ago (Computer History, 2016), many business professionals today depend on convenient laptops, tablets, or smartphones. This change from analogue to digital, and exclusive use to readily available computation power has had many consequences, one of which is the way offices look. Architects, engineers, researchers, insurance brokers, and other professionals, all use specialised software on their standardised computer of choice. This has caused many offices to look similar and interchangeable.

The widespread availability of Internet access has accelerated this transition (Briggs & Burke, 2010; Varian, 2010). Especially in developed countries, geographical boundaries have been deemed increasingly irrelevant, and information can be shared within seconds. Entire projects can be hosted and coordinated using cloud services, and in the industrialised countries, Skype meetings are part of many companies' daily routines. While the downsides of collaboration using technology instead of face-to-face interactions have been studied at length (e.g. Hansen, Nohria & Tierney, 1999; Keohane & Nye, 2000), the upsides seem to prevail for many companies in the digital age, and may even allow start-ups to *go global* from day one (Burton-Jones, 2001; Castells, 2003; Isenberg, 2008). These major changes in the ways in which results are achieved and communication is handled obviously also have huge influences on the geographical requirements for employees, contractors, and freelancers: They no longer need to be geographically close to the related organisation or its offices (Malone, 2004; Pohler, 2012). According to Varian (2010), *observability* allowed by computer mediated transaction has played a substantial role in the creation of new types of contracts. Internet platforms such as Fiverr, Upwork, and Freelancer allow independent freelancers and potential customers to set up temporary contracts which allow automated payments on reached milestone goals. As a result, companies have been outsourcing an increasing amount of

processes to remote freelancers or contractors and, therefore, can allow their employees to work from a home office or wherever they feel comfortable. This transition was predicted by Toffler (1980) more than 30 years ago: "[Employers] will not require 100 percent of the work force to be concentrated in the workshop" (p. 199). Instead, he argued, computers would allow employees to fulfil their work from a comfortable home office. Toffler (1980) did not, however, predict the downsides of not having an office. These downsides have recently been described by several other scholars (e.g. Pohler, 2012; Schürmann, 2013) and include social isolation, lack of support structures, and the non-existent separation of work and private life. In the period from 2002 to 2013, the amount of non-employer firms (companies that do not have any employees) in the US grew with more than 23% (U.S. Census Bureau, 2015). In 2013, the number of non-employers exceeded 23 million. Hence, the acknowledgement of the drawbacks of working from home is now more important than ever.

Paradoxically, the need for collaboration between organisations and stakeholders has seldom been higher (Schilling, 2008; Chesbrough, 2003). The importance of inter-organisational networks is described by e.g. Powell and Grodal (2006), who note that "interorganizational partnerships are now core components of corporate strategy" (Powell & Grodal, 2006, p. 57). Later, in the same paper, the authors write:

For organizations in rapidly developing fields, heterogeneity in the portfolio of collaborators allows firms to learn from a wide stock of knowledge. Organizations with broader networks are exposed to more experiences, different competencies, and added opportunities. (Powell & Grodal, 2006, p. 59)

These networks can differ from each other in a variety of ways. Networks may be contractual or informal, and links in the networks can be categorised as either weak or strong, just to name two of the many dimensions. The reason why the networks were established in the first place also has major implications for how the individual networks operate: Some are established only to accomplish a single task, while others are stable and outlive short-lived projects (Powell & Grodal, 2006, p. 59). In addition, Harryson (2008) argues that the appropriate network types dynamically change throughout the different stages of a company's lifecycle: During exploration focused stages, access to a network with predominantly weak network ties should be prioritised, while later stages require primarily strong ties in order to exploit the full potential of the company's

service or product. Networks exist on different levels and, hence, may be studied on for instance a personal, inter-organisational or even inter-industrial level. Often, a network of firms is held together by single individuals who connect departments or business units across companies. While the formal ties are usually readily acknowledged by senior management, there is a tendency to neglect informal ties (Cross & Prusak, 2002). Cross and Prusak (2002) studied the importance of informal networks in and among organisations and found a particular archetype of person to be very good at connecting different informal networks. The authors call these people boundary spanners. They found that boundary spanners are of particular importance "where people need to share different kinds of expertise" (Cross & Prusak, 2002, p. 109). In the case of freelancers and one person companies, most connections are of the external kind: They are boundary spanners almost by definition.

Closely related to the trend of more intertwined networks is the current focus on open innovation and co-creation. Even though he was not the first to introduce the concept, Chesbrough (2003) has become one of the most well-known advocates of open innovation which promotes a more "[porous] boundary between the firm and its surrounding environment […], enabling innovations to move more easily between the two" (p. 37). How come this *Era of Open Innovation*, as Chesbrough (2003) calls it, has come upon us just now? In his paper from 2003, Chesbrough (2003) offers his own explanation:

> Toward the end of the 20th century […], a number of factors combined to erode the underpinnings of closed innovation in the United States. Perhaps chief among these factors was the dramatic rise in the number and mobility of knowledge workers, making it increasingly difficult for companies to control their proprietary ideas and expertise. (Chesbrough, 2003, p. 36)

This quotation closes the circle and brings us back to our point of departure: the knowledge workers who have their office everywhere and nowhere at the same time. The question then becomes how to solve the issues related to working in isolation whilst, at the same, time fulfilling the need for more open innovation. One way entrepreneurs and researchers alike have attempted to answer this question is through the establishment of *coworking spaces*. Coworking spaces are just as heterogenous as their members. In the past, researchers had difficulties capturing the complexity of the phenomenon, offering several different definitions. In fact, it is even unclear what the *co* stands for. While some coworkers claim that it is an abbreviation of *collaboration*,

others interpret it as stemming from *community* or *cooperation*. Most researchers, however, agree on some basic characteristics that are commonly shared by the spaces: They usually provide workstations in large and shared offices, memberships are flexible, and the contractual arrangement can be compared with a fitness studio subscription. While some (usually publicly funded) spaces may be used free of charge, others can be very expensive. The average price for a desk in a coworking space in the US is around $250 (Spinuzzi, 2012). In Copenhagen, Denmark, the average price for a desk is a little higher, averaging approximately $300 (see appendix 1). Also, most spaces are built around the idea of community-building and sustainability (Pohler, 2012; Spinuzzi, 2012). Schürmann (2013) boils these characteristics down to five core values which, he argues, comprise the foundation of all coworking spaces: (1) *collaboration*, (2) *community*, (3) *sustainability*, (4) *openness*, and (5) *accessibility*. Spinuzzi (2012) uses a different approach to classify coworking spaces. During his interviews with different coworking space owners, he identified three common themes in the ways in which the proprietors described coworking spaces. More specifically, he found that the spaces could be divided into (1) *community work spaces*, (2) *unoffices*, and (3) *federated work spaces*. The ways in which these three types differ from each other are related to the degrees of formal and informal collaboration encouraged by their proprietors. In the same paper, Spinuzzi (2012) also identified how coworkers themselves define coworking, and these definitions did not always match the ones provided by the space owners. All of the theories and definitions will be explored in greater detail during the literature review section of this paper.

It is unclear, which coworking space was the first one to open its doors. While some researchers claim that The Hat Factory in San Francisco was the very first coworking space (Pohler, 2012), others claim that this title rightfully belongs to the San Francisco Coworking Space (Neuberg, 2015). Both spaces, however, were started in 2005. Just six years later, in 2011, approximately 760 coworking spaces were registered in the United States (US) (The Economist, 2011). Since then, the trend has continued, and the amount of coworking spaces around the world has grown exponentially. A recent survey conducted by Deskmag found that approximately 7,800 coworking spaces exist worldwide, with membership numbers totalling more than 510,000 (Foertsch, 2015).

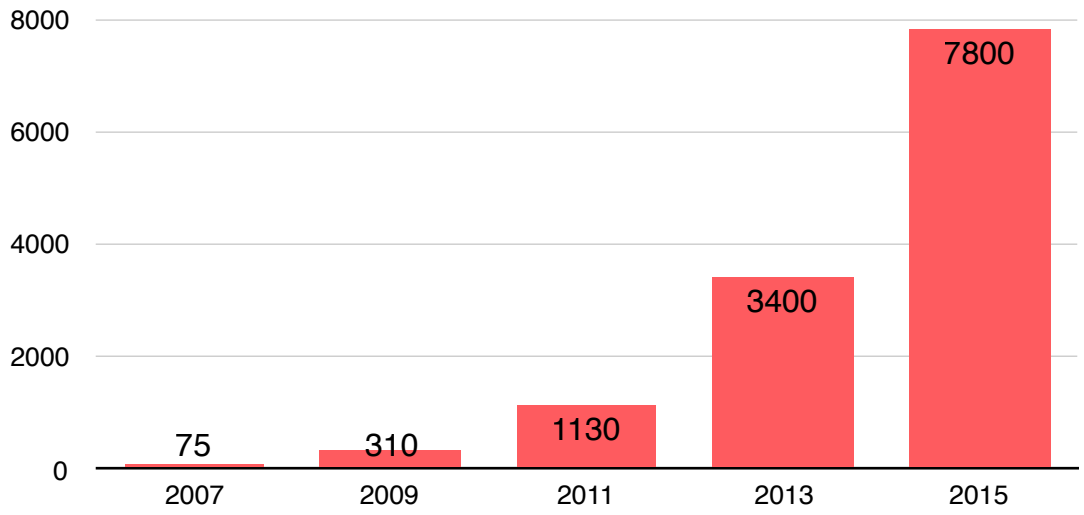

Figure 1. Number of coworking spaces worldwide. Adapted from "First Results Of The New Global Coworking Survey," by C. Foertsch, 2015, Deskmag.

Still, many questions remain: What exactly happens in these coworking spaces? How do they create environments which allow entrepreneurs, freelancers, and others to work efficiently? How do spaces enable their members to innovate together? In this paper, I provide answers to these questions by combining existing theory, and filling the research gaps by exploring the coworking space environment myself.

Importance

The brief historical overview should make the importance of this topic obvious: Both the relevant literature and real-life business environment have undergone profound developments. How should entrepreneurs and small start-ups handle the new surroundings they find themselves in? The requirements related to collaboration and large networks seem contradictory to the trend of working alone or in small teams. Knowledge workers and start-ups find themselves wondering how this tension may be handled. Should entrepreneurs focus on extending their network and explore various opportunities, or should they put on blinkers and focus on exploiting their current network, skills and innovation? These questions are more pressing than ever and, hence, this paper perfectly fits into current societal and theoretical developments.

Cases

In Copenhagen, more than ten coworking spaces allow their members to share desks, ideas and lifestyles. While some of these spaces are very small and cater a private community, others are

much larger and open for everyone (see Appendix 1). The Prototype (https://prototype.land) space, for instance, describes itself as a "members only coffee bar for hackers, designers, troublemakers and other disruptors" (Prototype, 2015), and has only room for a handful of people at the same time. On the other side of the spectrum, SOHO (http://soho.dk) offers over 350 working stations spread across 7000m^2 to everyone that may be interested.

For this paper, I explored and interviewed owners and members of four very distinctive coworking spaces: *The Rabbit Hole, School of Entrepreneurship (CSE),* both in Frederiksberg, Denmark, *Minc* in Malmö, Sweden, and the *Social Impact Lab* in Hamburg, Germany. While all of these coworking spaces provide office space to their members and have a lot in common, they are very different when it comes to size, access requirements, and culture. The spaces' individual characteristics and their members will be presented more thoroughly in this paper's methodology section, before being explored in the analysis.

Research question

On the previous pages, I described how technology has had a substantial impact on both business practices and white-collar work. One-person-companies are on the rise, and freelancers can work from wherever they are. At the same time, collaboration and networks are of higher importance than ever before. Coworking spaces promise to reconcile this tension, but how exactly does this theoretically black box work? In this paper, I seek out to answer the following research question: *How do coworking spaces influence collaborative processes?*

In order to answer this question, three sub-questions will be answered:

1. Which environments are provided by the coworking spaces?
2. How are coworkers connected with each other?
3. How do the coworkers collaborate and co-create?

Structure of the paper

The remainder of this paper will be structured as follows: Firstly, I will provide a review of the literature relevant to this paper and its broader academic context. Secondly, in the methodology section, I will describe the ways in which my research was conducted: I will present the interviewees and coworking spaces in detail, and I will outline the theoretical framework for performing the case study. Thirdly, with both the theoretical and methodological context defined,

the analysis will follow. In this section, the collected data will be investigated using the theories discussed in the literature review. The analysis will be split in three parts, representing the three sub-questions of the overall research question. After the analysis, a discussion of the findings will follow. At the end of this paper, I will wrap up and summarise the findings and their implications for both theory and practice in a conclusion.

Literature review

In this section, I will present the current research on this paper's three recurring topics: (1) Coworking spaces, (2) innovation and co-creation, and (3) network theory. While the literature on all three topics is extensive, I have chosen to present the work of researchers who offer holistic and up-to-date theoretical insights.

Coworking spaces

Academia is slowly picking up on the trend of coworking spaces. Schürmann (2013), Spinuzzi (2012), and Pohler (2012) were among the first to explore the emerging field. Together, they provide important insights into the coworking sphere and its societal context.

In his extensive research on the topic of coworking spaces, Schürmann (2013) explored a broad selection of topics relevant to the coworking space field, including the history of coworking spaces and their business model. Schürmann (2013) refrains from a strict definition of what constitutes a coworking space. Instead, he identified five core values which he found to be common for all spaces: Collaboration, community, sustainability, openness, and accessibility. As a result, he finds that even very small shared offices with only three or four people may be considered coworking spaces, as long as they incorporate these basic values. In this particular context, the five values are characterised as such: *Collaboration* embodies the wish to work together. According to Schürmann (2013), this is the most prominent of the five values. *Community* describes a group of likeminded people that both contributes and profits from the general community. *Sustainability* is a general theme for coworking spaces when it comes to handling both financial and other resources. *Openness* describes the willingness to share ideas and information, and to welcome new coworkers to the existing community. *Accessibility*, lastly, should ensure that the space is both financially and physically accessible for everyone.

In regards to their innovative capabilities, Schürmann (2013) sees clear advantages for entrepreneurs and freelancers working in coworking spaces: According to his research, interactions with a heterogeneous and inspiring community motivate coworkers to develop common ideas and to assist each other with experience, advice, and feedback (Schürmann, 2013, p. 56). Closely related to the internal interactions are the coworkers connections to the spaces' outside world. Schürmann (2013) emphasises the often close relationships between coworkers and large companies that are not typically found in coworking spaces. In some cases, he even found large companies to send small teams to the spaces, where they were able to work in a new and engaging environment.

For my research, understanding the values that drive the coworking spaces' daily operations is absolutely necessary. The values are integral to the environments that are created, and they differentiate the coworking spaces from regular office space. On top of this, the alleged benefits of (heterogeneous) networks established by the spaces will be investigated thoroughly in this paper.

Typology of coworking spaces

Despite the global surge in interest regarding coworking spaces, only few qualitative studies crossing several spaces have been published (Lumley, 2014). One of the first researchers to investigate the phenomenon on a larger scale was Clay Spinuzzi (2012). In his study, he followed nine coworking spaces in Austin for a period of 20 months and gained a large variety of insights. Spinuzzi (2012) was particularly interested in understanding the needs that cause the coworkers to rent a desk in a given coworking space. At the same time, Spinuzzi investigated how the coworking space proprietors described the service they provide. This allowed him to compare the two descriptions and uncover potential differences. Perhaps surprisingly, he found that "[the proprietors' and coworkers'] definitions of coworking differed significantly" (Spinuzzi, 2012, p. 11). Based on the interviews with the space owners, he was able to identify three types of coworking spaces: *Community work spaces*, *unoffices*, and *federated spaces*. Spinuzzi (2012) presents these three categories as distinct and independent types of coworking spaces. I, however, will use the categories as points along a continuum defined by the degree to which the spaces encourage cooperation and networking, since this is the differentiating factor among the categories. Community work spaces are defined "in terms of serving their local communities" (Spinuzzi, 2012, p. 409). This means that they simply offer easily accessible office space to the local community, allowing freelancers and entrepreneurs to pursue their careers in a dedicated work environment. The

spaces' proprietors are not, however, particularly interested in building a new community within the coworking space: Collaboration is neither required nor particularly encouraged, and many spaces that can be described as community spaces do not even allow talking in the main office area. Unoffices, on the other hand, try to encourage interactions among the coworkers, in order to mimic the social interactions many coworkers miss from regular office jobs. In general, the coworkers at these spaces do not necessarily work together: They merely share an office and enjoy each others presence (Spinuzzi, 2012). The third space type Spinuzzi (2012) was able to identify based on the proprietors' descriptions of their spaces are federated spaces. These spaces actively encourage both formal and informal cooperation among the coworkers. They often have a focus on entrepreneurship, and members may work together on projects from outside clients, which are too large to take on alone.

In his interviews with the coworkers, Spinuzzi (2012) identified the following six reoccurring themes: Coworking as space, coworking as an inexpensive office alternative, coworking as a social hub, coworking as collaboration, coworking as heterogeneous and homogeneous, and coworking as work/home separation. It is noteworthy that most of the definitions revolve around different aspects of working with or around other people, emphasising the perceived importance of social interactions. As Spinuzzi (2012) also notes, the individual needs of the coworkers often seem to be related to their business or field.

In this paper, I build on the terminology introduced by Spinuzzi (2012), and categorise the studied coworking spaces as either community work spaces, unoffices, or federated workspaces. The categorisation is based on the proprietors' definitions and perception of the spaces, and reflect the degree of encouraged interaction among the coworkers. At the same time, I investigate how the coworkers' definitions and motivation regarding coworking shape the environments and interactions that can be observed.

Societal context

Nina Pohler's research from 2012 compliments both Spinuzzi's (2012) and Schürmann's (2013) research very well. Her research has a strong emphasis on how societal changes have created new forms of employment types and entrepreneurship. According to Pohler, these new work arrangements are characterised by an increased degree of freedom, flexibility, and self-responsibility. At the same time, spatial and social isolation, lacking safety nets and support

systems, missing opportunities for information exchange, varying working hours, and the mixing of private and professional life, are only some of the problems experienced by many independent entrepreneurs and freelancers (Pohler, 2012, p. 66). Pohler notes that this transformation has been particularly predominant in the fields of information and communication technologies, and creative industries. Further, and most important for this paper, she finds that "coworking spaces can be seen as a spatial manifestation of new work arrangements and the ways people approach them" (Pohler, 2012, p. 65). This implies that the coworking space residents rush towards the common spaces in order to mitigate at least some of issues related to working alone.

For this paper, the societal context is of paramount importance, since it is an indicator for why coworkers decide to work at coworking spaces in the first place. These prerequisites may have strong influences on the ways in which coworkers interact within the environments provided by the spaces.

Innovation and co-creation

For the past decade, various forms of open innovation have dominated the literature on innovation. In 1988, von Hippel (1988) was among the first to explore the importance of external sources of innovation. In his research, he found that users, competitors, and suppliers all could serve as valuable external partners for innovation. This contradicted the former ideal of tightly controlled and vertically integrated organisations which protect their intellectual property in order to outperform their competitors (von Hippel, 1988). The innovation strategy described by von Hippel (1988) still required a strong focal company. In many ways, innovation was still supposed to happen behind closed doors, with carefully hand-picked lead-users and other external partners participating in selected parts of the innovation process. About a decade later, Sawhney and Prandelli (2000) introduced the notion of closed versus open innovation. In their paper, the researchers argue that both the entirely open and the fully closed model of innovation are unfit for fostering and commercialising innovations. The authors find that "the closed model is efficient, because it reduces transaction costs that arise from coordination. However, it does not allow the firm to benefit from the creativity, diversity, and agility of its partners" (Sawhney & Prandelli, 2000, p. 24). The open model, which relies on the voluntary contributions of a given group of people, has a different problem: "[…] the lack of strong governance and the absence of coordination mechanisms tend to make such open systems unstable and susceptible to chaos." (Sawhney & Prandelli, 2000, p. 25). To

solve this issue, the scholars present a new way to organise the innovation process which resides between the two poles of entirely open and totally closed innovation. This new organisational structure was coined *community of creation*, and tries to solve the problem by combining the best parts of the two extremes. The model relies on "extended participation and distributed production" (Sawhney & Prandelli, 2000, p. 25), and is governed by a central firm which Sawhney and Prandelli (2002) call a *sponsor*. It is the sponsor's responsibility to overcome the issues associated with open forms of innovation.

Central for the notion of communities of creation is the concept of *ba*. A ba is a physical or virtual existing space, in which personal relationships among groups can be established and thrive. The space allows for knowledge development and sharing among the participants, resulting in novel knowledge generation and insights (Sawhney & Prandelli, 2000). This concept is similar to the theoretical framework provided by Peschl and Fundneider (2014), who researched the idea of enabling spaces, which will be discussed later in this chapter.

About three years later, Chesbrough (2003) proclaimed *The Era of Open Innovation*. Building on some of the same concepts as Sawhney and Prandelli (2000), Chesbrough (2003) argued that organisations would have to harness external sources of innovation in order to gain a competitive advantage. He found that the old model of closed innovation was no longer useful in the new societal context, in which knowledge workers were much more mobile, and organisations could not control their intellectual property to the same degree. The key differentiator of open innovation compared with its closed counterpart is the organisation's permeable boundary: Companies applying open innovation may utilise external ideas and share their own intellectual property in order to "profit from others' use of technology through licensing agreements, joint ventures, and other arrangements" (Chesbrough, 2003, p. 37).

The idea of open innovation has since been investigated by many scholars (e.g. Dahlander & Gann, 2010; Laursen & Salter, 2006), and has spurred a variety of other specialised research topics within the field. One of these topics is co-creation theory which traditionally investigates the value created by primarily including customers in the product development process, often in regards to personalisation. The concept was initially introduced by Prahald and Ramaswamy (2000). In their paper, they emphasise how transforming customers from a passive audience to active players may create additional value. In many ways, this definition of co-creation is similar to lead user methods

presented by e.g. von Hippel (1998). One major difference between the concepts is that co-creation is not *limited* to lead users, and that the external parties may be involved in other steps of the process. Co-creation may happen on a very low and somewhat limited level, for instance when shoe manufacturers allow their customers to choose a unique combination of colours for their next running shoe. It might, however, also occur on a higher level, where companies move away from traditional product centred business models, advancing towards becoming service providers which develop perfectly matching products in accordance with their customers. Both types of co-creation have a focus on *personalised experiences* (Prahald & Ramaswamy, 2000). The concept of co-creation has since evolved, and in 2013, Ind and Coates defined it as following: "Co-creation has become a widely used term to describe a shift in thinking from the organization as a definer of value to a more participative process where people and organizations together generate and develop meaning." (Ind & Coates, 2013, p. 86) In contradiction to most other scholars' definitions, this definition has a less explicit focus on customers as potential external partners and instead allows for a more holistic view of co-creation.

In this research, my understanding of co-creation is guided by the definition provided by Ind and Coates (2013): The process of co-creation is understood as a partnership between previously independent entities, working towards a mutual goal of value creation, often combining multiple disciplines. In the context of coworking spaces, independent entities may often be single persons, working either as freelancers or entrepreneurs. Collaboration, on the other hand, is understood as a transactional phenomenon, with less intervened partners and fewer common interfaces.

One of this paper's key hypothesis is that the coworking space residents interact with each other in various ways, and that these interactions may spur collaboration and co-created products or services. Hence, understanding these processes in the light of co-creation and related concepts will provide a theoretically sound foundation for the analysis. While co-creation has many different facets, this paper will not focus on innovation happening between organisations and its customers or its suppliers. Instead, the paper will focus on (1) the concept of permeable walls, allowing external ideas and stimuli from potential partners to penetrate the organisational boundaries of the coworking space residents, and (2) the resulting collaboration and co-creation.

The importance of environments

Under which circumstances can innovation thrive? Which variables play into the innovation process and how do they shape the outcome? These questions are fundamental to this study. Various answers have been provided (e.g. Franke, Poetz & Schreier, 2014; Schilling, 2013), but Peschl and Fundneider (2014) offer the most holistic and comprehensive framework, and it is loosely related to the concept of *ba* introduced earlier. In their research, they present what they coincidently have named *enabling spaces* (Peschl & Fundneider, 2014). Besides their similar name, these spaces do not necessarily have anything in common with the *physical* concept of coworking spaces. Instead, they represent a set of dimensions which enable "processes of collaborative knowledge creation and innovation" (Peschl & Fundneider, 2014, p. 1). The presented dimensions are (1) architectural, (2) technological, (3) social, (4) cognitive, (5) organisational, (6) cultural, and (7) emotional. All of the seven dimensions can be observed and described in coworking spaces. The architectural and technological dimensions, which refer to the physical surroundings and technological tools in use respectively, are rather tacit. The remaining dimensions, however, require an in-depth investigation of the space of interest. Obviously, the seven dimensions cannot be analysed in isolation. They are tightly intervened and dependent on each other. The organisational, cultural and social aspects are particularly tightly connected. Hence, I will follow Peschl and Fundneider's example and analyse these aspects together. Also, as Peschl and Fundneider note, "developing an Enabling Space is […] a design-task which does not have a 'single best solution'" (Peschl & Fundneider, 2014, p. 354). In order to foster innovation, different types of physical environments, social surroundings, etc. might be appropriate depending on a large variety of organisational and contextual variables. Ergo, coworking spaces will be unable to provide a one-size-fits-all environment, and the framework is ill-suited to assess how well the different spaces are performing. Instead, I will utilise the framework to analyse how the spaces' individual combination of the various dimensions enable different types of companies to be innovative at various points throughout their individual life-cycles.

Network theory

Informal networks

Network theory is a large academic field and spans across a vast amount of supplementary and contesting theories. In order to answer the question of how coworking spaces influence collaborative processes, it is important to understand the mostly informal networks within these spaces. Even though it is not my ambition to map the entire network of any given space, I will refer to and rely on the typology introduced by Cross and Prusak (2002). Based on their research, which focuses on informal networks (and how to manage them), they identified four different roles filled by the network players: (1) *The central connector* connects a large amount of different members in an informal network with each other, and can provide critical information or expertise relied on by the entire network. (2) *Boundary spanners* on the other hand connect two separate informal networks with each other, often crossing organisational boundaries. Smaller subgroups within any given informal network may be held together by (3) *information brokers*. The last role identified by Cross and Prusak (2002) is the one of the (4) pe*ripheral specialist*. These specialists only have few connections and reside on the networks' peripheries, often with very strong knowledge in a narrowly defined field which can be hard to access for other network members.

The importance of network types for exploration and exploitation

Building on the work of Powell et al. (1996), Sawhney (2001), Chesbrough (2003), and many other scholars in the fields of networks, organisational ambidexterity, and open innovation, Harryson (2008) presented a new framework combining and extending the theories. Based on his research, he argues that new ways of networking might allow organisations to mitigate the ongoing tension between exploration and exploitation (Harryson, 2008). In his paper, Harryson (2008) argues that phases of exploration require a large network composed of primarily weak network ties. At later stages, when companies need to exploit and commercialise their knowledge or innovation, strong ties with commercialisation partners should be preferred over weak ties (Harryson, 2008). Interestingly, this does not imply a decreased size of the total network. Instead, only the distribution between the weak and strong ties shifts. Harryson (2008) divides the different network configurations into three distinct types: *Creativity networks*, *transformation networks*, and *process networks*. Creativity networks tend to be "organically managed organisations with weak ties as

primary sources of specialised knowledge" (Harryson, 2008, p. 295), allowing for a large degree of exploration. Process networks reside on the opposite side of the spectrum. Consisting of primarily strong ties, these networks are usually hierarchically managed, with its members supporting the commercialisation and exploitation of a given innovation. Transformation networks, the third network type, are located in-between the two poles. With a balanced amount of both weak and strong ties, these networks tap into and utilise both creativity and process networks, allowing for the commercialisation of innovation.

For organisations, these insights have profound implications: Entrepreneurs need to hire the right profiles who encourage and mediate the appropriate network types at any given time. On top of this, the proposed framework may allow for simultaneous exploration and exploitation, by employing "managers with strong relationship building skills and rich social ties (know who) into both [academia and industry]" (Harryson, 2008, p. 306).

It is important to note that the organisations and networks Harryson (2008) focuses on tend to be larger than the ones that can be found in the coworking spaces studied for this paper. Harryson (2008) does, however, not specifically limit his framework to these types of organisations and networks, and I presuppose that the findings apply on the smaller scale of the coworking spaces as well. Hence, the research conducted by Harryson (2008) is of great value for this paper. Combined with the presented research regarding coworking spaces, innovation fostering environments, and co-creation, the framework may shed some light on why different coworking space types are in demand by different types of entrepreneurs and freelancers. Some spaces might be better suited to support creativity networks, while other are more focused on exploitative process networks, or even allow for the creation of transformation networks. Analysing the collaborative practice in these spaces with Harryson's (2008) framework in mind, will allow for a study of the dynamic interplay between explorative and exploitative innovation processes happening in these environments.

Method

In this section, I will outline the different steps of the research process. It begins with a short anecdote which inspired me to research this particular topic. It then continues with a thorough examination of the data gathering process and ends with a presentation of both the interviewees and their corresponding coworking spaces.

How it started

One evening, I was sitting at The Rabbit Hole, which is my local coworking space. The Rabbit Hole is quite a small space, with desks for only about 20 people at a time. I enjoy working in the coworking space, since it feels more inspiring than the library and features fewer distractions than my dorm room. On this particular evening, only a handful of people were left working in the space: Louise, a professional fundraiser for an NGO that builds hospitals in Sierra Leone, Maja, who is both a professional photographer and producer at Copenhagen's Theatre, and myself. At the time, I was developing a new homepage which had a deadline coming up soon. We had all spent the entire day working on our individual and very different projects, but now I started chit-chatting with Maja while relaxing my eyes and stretching my legs. Maja told me about her new project: A photo-series that was supposed to depict a cross section of the different refugees coming to Denmark. Her new project was just at the beginning of its lifecycle and she was trying to raise funds for her work. This process, she explained, felt like a necessary evil in order to make the art she cared about. She had contacted a handful of art organisations already, but financial backing came in slowly. That's when Louise pitched in and the magic happened: With her professional fundraiser knowledge in the back of her head, she started asking Maja a series of questions about the project's nature, its target group, her existing partners, and the funds required. After a bit of back and forth, Louise suggested three possible sponsors, all in the field of humanitarian help and outside of Maja's initial search range. This entire interaction struck me as very peculiar: Where else did self-employed professionals or remote-workers with such different backgrounds interact in this way? Neither my dorm room, nor the libraries, cafés, or my traditional office jobs had ever been environments that gave rise to this type of behaviour. While thinking about this topic, I was reminded of similar episodes I had experienced at other coworking spaces: At the Betahaus in Berlin, I met an iOS developer that helped me ship my first iOS app. At the Copenhagen School of Entrepreneurship (CSE), I had seen programmers being casually involved in conversations with business developers, talking about web-shop performance and the production of prototypes. Was I on to something? During the next days and weeks, I began my research and this paper began taking its form.

Research philosophy and theoretical approach

At the beginning of this research, I only had anecdotal evidence that pointed towards a special type of collaboration happening at coworking spaces. Only after investigating the environment and relevant literature, more theoretically sound hypotheses could be proposed. The guiding research philosophy and theoretical approach had to accommodate this ongoing emergence of relevant evidence. Hence, this paper is inspired by the pragmatic research philosophy. Pragmatists suggest that no single method or philosophy can be regarded as the one true way of conducting and interpreting research. Instead, pragmatism claims that "the most important determinant of the epistemology, ontology and axiology you adopt is the research question" (Saunders et al., 2008, p. 109). The pragmatists' acceptance of socially constructed phenomena and objectively existing environment is of particular value for this specific research topic. As we shall see later in this paper, the social dynamics among coworkers in their physical environment are of very high importance for understanding the processes happening in coworking spaces. After my initial hypothesis of special collaborative processes happening at coworking spaces, my method was characterised by a back-and-forth between inductive research-hypothesis building and deductive analyses of the coworking space environments using the data I gathered. This process of starting with an informed guess and building on it using a combination of induction and deduction, is an integral part of what has been described as *abduction* (Magnani, 2002). The very explorative approach to my research has had strong implications for the ways in which data was gathered and the paper was formed. In particular, the research question was continuously formed, while delving into the related theories and conducting initial interviews.

Case studies

In order to understand the environments that can be found in coworking spaces, I decided to conduct a multi case study. The upsides of conducting case studies are manifold. Most notably, however, they allow for an in-depth exploration that may uncover important details often lost in quantitative research. On top of this, they provide contextual understanding and paint a holistic picture of the given case. In contradiction to some researchers' believe, the case study approach does not necessarily come at the cost of generalisability: Flyvbjerg (2006) argues that even single-case studies may allow for generalisations and contribute to the knowledge within a given scientific

field. This is particularly true for cases that falsify existing theories or hypothesis (Flyvbjerg, 2006). For other types of scientific evidence, the case selection process is of major importance for the study's potential generalisability. In his paper, Flyvbjerg (2006) presents a total of six case selection strategies, all of which are appropriate under certain circumstances. For my own research, in which falsification is not the intent, the *maximum variation cases* strategy is most suitable. This strategy's purpose is "to obtain information about the significance of various circumstances for case process and outcome (e.g., three to four cases that are very different on one dimension: size, form of organization, location, budget)" (Flyvbjerg, 2006, p. 230). For this paper, I followed this exact strategy, and explored four very distinctive coworking spaces: The Rabbit Hole (Frederiksberg, Denmark), Copenhagen School of Entrepreneurship (Frederiksberg, Denmark), Minc (Malmö, Sweden), and Social Impact Lab (Hamburg). While these spaces are located rather close to each other geographically, they differ in many other regards, such as size, target group, costs, and entry requirements. As a result, the data I was able to gather was very diverse and allowed for a sound investigation of the research question.

Data collection

This paper relies on three types of data: (1) *Primary data* collected in interviews with coworking space members and owners, (2) *ethnographic observations* made at coworking spaces, and (3) *secondary data* in the form of news articles and statistics. In this section, I will describe all the three data types and the way they were utilised during my research.

Interviews

In spirit with the explorative nature of my research, I decided to conduct a series of semi-structured interviews. As noted by Staunæs and Søndergaard (2005), semi-structured interviews allow for nuanced and often surprising insights. These insights are not limited by the researcher's initial understanding of the subject, which often is the case when conducting structured interviews or questionnaires. As a researcher, I allowed the interviewees to put their experiences, thoughts, and emotions into their own words, instead of setting up artificial boundaries. That being said, the interviews were structured in a way that guided the interviewees to certain topics, namely their potential collaboration with other coworkers, their preferences when it comes to coworking spaces, and working habits. The interview guides for coworking space users and owners also differed

substantially from each other. In the case of the coworking space owners, I was more intrigued to investigate how they consciously or unconsciously shape the coworking spaces' environments in a way that either encourages or discourages collaboration. The detailed interview guides can be seen in appendix 2 and 3. The interviews were held at a variety of different locations, usually at the interviewee's coworking space or current office. This not only made the interview situation more relaxed: In many cases it also allowed me to observe how the interviewees acted in their corresponding work environments. Since I conducted this research on my own, no additional persons were present during the interviews who could take extended notes. Hence, the majority of the interviews were recorded and transcribed afterwards. The knowledge I gained during the interviews was absolutely essential for the abductive approach of this paper. The findings continuously broadened my own epistemological horizon, and shaped the content of future interviews and the framework of my research. In the case description section, all interviewees will be briefly introduced.

During my research, I also often found myself in unplanned but interesting conversations with residents or proprietors of the various coworking spaces. These conversations provided me with many insights, but were much less structured, with the interview guide only being in the back of my mind. After these conversations I made notes about their content, and they have had a substantial influence on the outcome of my research. All notes are available upon request.

Ethnographic observations

Most of this paper was written at the coworking space The Rabbit Hole on Frederiksberg, Denmark. This has not only allowed me to interview its members, but also observe the daily interactions happening in the place. Similarly, I recently spent several months at the Copenhagen School of Entrepreneurship, working at a start-up and interacting with various people within the space. According to Emerson and Fretz and Shaw (1995), ethnographic research "involves being with other people to see how they respond to events as they happen and experiencing for oneself these events and circumstances that give rise to them" (Emerson, Fretz & Shaw, 1995, p. 2). They also encourage researchers to not work covert, but instead let the people who are being observed know why the researcher is present. Either way, it is close to impossible not to influence the environment by the researchers present, so in order to mitigate potential ethical issues, an open approach is suggested (Emerson et al., 1995). For this reason, I was very open about my research

right from the start. To my advantage, it is not uncommon for master's thesis students to write their theses at coworking spaces, and with my MacBook I fitted right in. Whenever an interesting interaction occurred, I made jotted field notes about the event as soon as possible. Emerson et al. (1995) also emphasise the amount of time that is required to conduct scientific valid observational studies. Even though I spent many days working at both CSE and The Rabbit Hole for several months, some might argue that the time I spent in the environment is not sufficient. As a result, the observations themselves may not have been sufficient in order to justify a case-study approach, but they make for great anecdotal evidence that can supplement the data gathered in interviews.

Secondary data

This paper relies on a variety of different secondary data sources. These sources include the coworking spaces' websites, Facebook and LinkedIn pages. The social media sources in particular allowed me to gather information revolving around the coworkers' preferences and dislikes in regards to their associated coworking spaces. Other noteworthy secondary data includes the Deskmag Coworking Survey (Foertsch, 2015), and relevant articles published by The Economist and Harvard Business Review, among others.

Time horizon

Even though this case study concerns studying entrepreneurs and start-ups at different life-cycle stages, the data is of a primarily cross-sectional kind. This means that the same coworking spaces and (one-person) companies were not followed over an extended period of time. Instead, the data paints a picture of the current situation in the selected coworking spaces as it is right now. Obviously, the ethnographic observations imply that the same people were followed for at least a couple of months, but during this time, the observed environments or people acting in them did not change in any substantial way. No transformations or events would allow for a longitudinal study of a "before" and an "after". While this most likely would have been very interesting, the limitations of this research did not allow for an extended time horizon.

Case descriptions

In order to understand how collaboration and innovation happens at coworking spaces, a general understanding of the spaces and the coworkers studied for this paper is of paramount importance. On the next couple of pages, I will present the four spaces most closely studied for this

paper. Afterwards, the coworkers and coworking space owners I interviewed for this paper will be presented.

Coworking spaces

The Rabbit Hole. The Rabbit Hole is a small coworking space located in the semi-basement of a building in Frederiksberg, Denmark. The space only consists of a kitchen, a small meeting room, and the office space itself which can accommodate about 20 people. The Rabbit Hole was founded in the year 2013 (A. Bo, personal communication, January 6, 2016) and "originated from a serious need to jump out of the pyjamas, remove the papers from the dining table and get away from the cafés' screaming espresso machines" (The Rabbit Hole, 2016). The space is owned by Alice Bo and Mads Hovgaard, who emphasise that they do not run the space as a profit-oriented business. Instead, founder Mads wanted to create an environment in which creativity and business could thrive, and which could serve as a base for future projects. At the same time, he was intrigued by the idea of building a network of entrepreneurs and freelancers that could help him in the future (A. Bo, personal communication, January 6, 2016). Every Thursday morning, breakfast is served in the Rabbit Hole's kitchen, and the members get together to talk about whatever they feel like. Events are held at irregular time intervals, and while they were organised by Alice and Mads in the beginning, they are now primarily driven by members or outsiders who rent the facilities.

Photo 1: Kitchen area of The Rabbit Hole. From "The Rabbit Hole," by The Rabbit Hole, 2016 (http://therabbithole.dk/wp-content/uploads/2014/08/13.jpg).

The space is open for everyone and is clearly among the cheapest coworking spaces in Copenhagen: Prices start at 800.00 DKK ($116.00) per month for three days a week and top at 1,500.00 DKK ($218.00) per month for a full-week desk. The lack of entry requirements and the low price are exemplary for the space's laid back environment. During my initial interview with Alice Bo, she highlighted the absence of rules, and two coworkers on the opposite site of the table shrugged while proclaiming their common dislike for rules.

Copenhagen School of Entrepreneurship (CSE). CSE is part of the Copenhagen Business School (CBS). Its goal is to "create a community where entrepreneurial students, teachers, researchers business and organizations work closely together in creating entrepreneurship for society" (CBS, 2015). While a desk at CSE is provided free of charge, the entry requirements are not as loose as at traditional coworking spaces. Since CSE is a part of the Business School, CSE-residents need to be students at a university. Also, CSE is targeted towards early-stage start-ups and entrepreneurs. This makes the space inaccessible for many freelancers and other knowledge workers who are simply looking for an office. On top of this, potential residents have to apply with their business idea before they are allowed to join the space.

Photo 2: Launch event at CSE. From "Copenhagen School of Entrepreneurship," by Copenhagen School of Entrepreneurship, 2016 (https://www.facebook.com/csenews/photos).

CSE has created a *proof of idea* form, which has to be filled out by every entrepreneur joining the space. One of the CSE team members will then evaluate the idea and define some goals together with the applicant(s). If accepted, the applicant(s) are free to use the office facilities on the second floor of the building for up to three months. If the goals are reached within this period, the resident(s) are allowed to move to the first floor on which a fixed desk will be provided. After an additional six months, the start-ups have to leave CSE (CSE, 2016). Due to the program's nature, turnover in the organisation is quite high. CSE spans across two large floors, has several hundreds of desks available for its members, and provides a kitchen located on each floor. Both floors also feature three conference rooms, large TV screens, and whiteboards. While the second floor is intended for early-stage start-ups only, with non-fixed desks, the second floor is restricted to start-ups in later phases. On the first floor, each start-ups has one or more fixed desks, which allow them to set up own computer screens and fill the walls with post-its, newspaper articles, or the latest sprint-goals.

Social Impact Lab Hamburg. The Social Impact Lab Hamburg is part of a larger organisation called *Social Impact* which has branches in Switzerland, Austria and Germany. The organisation is supported by the three countries' governments and has various sponsors from the private sector. Its overall mission is to develop and encourage social innovation by providing a collection of services. These services include support, mentoring, networking events, and office space. For €250.00 per month, every person or start-up interested in social enterprises can rent one or more desks within the space. Only few *regular* coworkers, however, use the space. Instead, the Social Impact Lab Hamburg has a strong emphasis on its various scholarship programs, targeted towards special groups of entrepreneurs. One of these programs is the *Impact Starter* program. This particular scholarship allows social entrepreneurs in their start-up-phase to use the Social Impact Lab's services for free for up to 8 months. Entrepreneurs who are interested in the scholarship have to pitch their idea in a competition, in which an external jury rewards the winners with the scholarship. Other scholarships are rewarded to unemployed and young people who wish to start their own company, and social start-ups with a mission to improve the situation of refugees. Due to the different scholarship programs, the turnover of entrepreneurs and start-ups at the Social Impact Lab is rather high, providing an ongoing flow of new faces and ideas. The Social Impact Lab has space for approximately 30 entrepreneurs working at the same time, and provides a single meeting

room and free coffee for all residents. According to Daniel Lippke, program manager at the Social Impact Lab, approximately 25% of the start-ups are able to continue working on their company full-time, after their scholarship has run out. 50% are able to continue on a volunteer basis, and 25% of the start-ups close their doors after their time at the Social Impact Lab has ended (D. Lippke, personal communication, March 24, 2016).

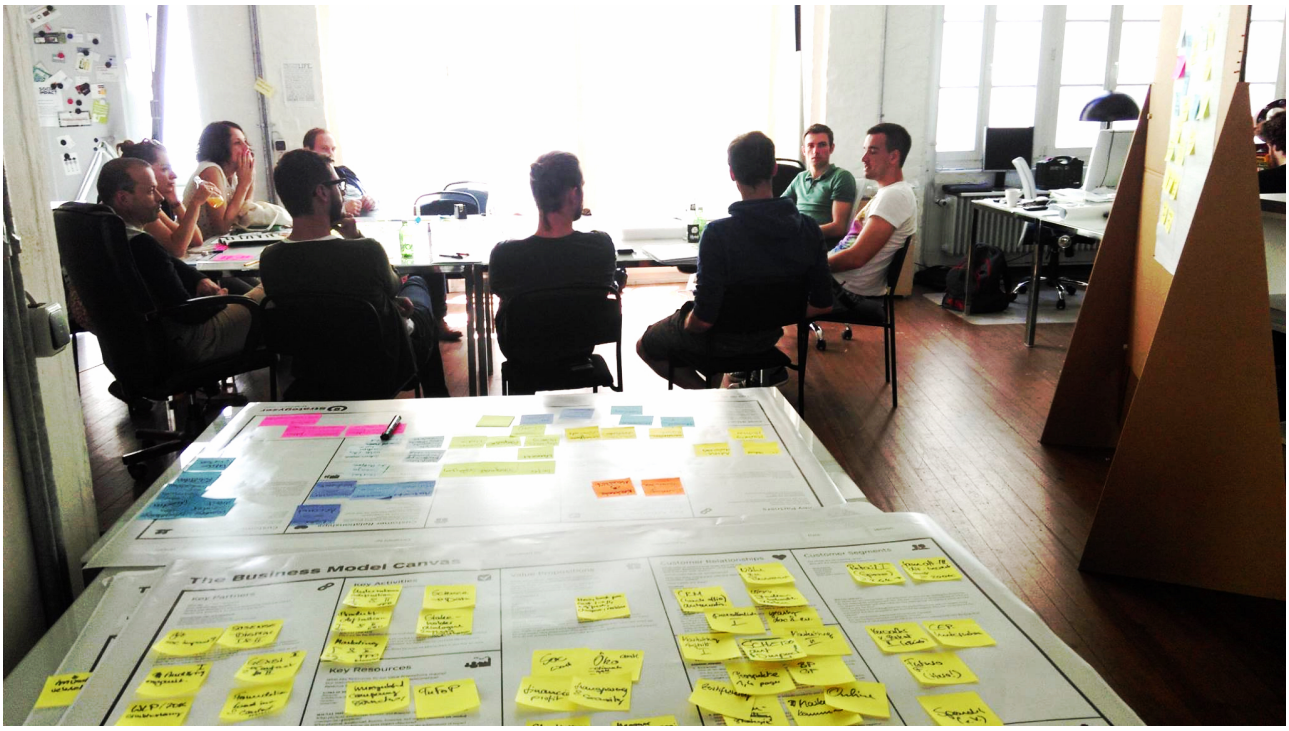

Photo 3. Work area at the Social Impact Lab Hamburg. From "Social Impact Lab Hamburg," by Social Venturers, 2015 (http://www.socialventurers.com/wp-content/uploads/2015/08/Aviary-Photo_130850933018548188.png).

Minc. Minc is a space owned by the municipality of Malmö. With more than 350 people working at Minc, it is one of the larger coworking spaces and the largest space of this study. Located near Malmö's city centre, it's the home of a large variety of companies. Its facilities are divided into three different floors, all of which are targeted towards different companies. The building's first floor is filled with early-stage start-ups and freelancers. The noise level is quite high, and both conversations and the sounds of the coffee machine can be heard at any given time. Many of the first-floor residents do not have the ambition to ever grow their businesses beyond the national level and are working as freelance journalists, accountants, or the like. Most people sit at long tables right next to fellow coworkers. The first floor is open for everybody and a seat is provided free of charge (even including free coffee) for up to six months. On top of the free use of

the space's facilities, a basic mentoring program is provided to the early entrepreneurs. After a resident has utilised the facilities for six months, Minc personnel has a chat with the corresponding person, evaluating future possibilities. In some instances, they are invited into Minc's incubator program which resides on the building's second floor. Here, teams are provided with dedicated but open office space. As part of the incubator program, which also is provided free of charge and without any equity being transferred, Minc supports the start-ups with business development and legal guidance. Weekly meetings between the parties are meant to encourage a continuous and sound development of the start-up. Throughout the years, many successful companies have come out of the Minc incubator, and CEO Mårten Öbrink assumes that approximately 70% of the companies continue to exist after their incubator phase has ended (M. Öbrink, personal communication, January 28, 2016).

Photo 4. Kitchen area at Minc. From "Minc," by RUMRUM, 2016 (http://rumrum.se/wp-content/uploads/rumrum_projekt_minc_01-960x400.jpg).

Compared to the first floor, the second floor is much quieter, and the companies are more clearly separated from each other. Closely related to the incubator is Minc's accelerator program which focuses on highly dedicated start-ups that require substantial amounts of funding in order to grow their business exponentially. On the third floor, Minc provides a more traditional office space. Here, offices have to pay rent, but are provided with a dedicated and closed office. This causes the atmosphere on the third floor to be very different from the ones on the first and second floor: The halls are very quiet, and no table football can be heard or seen. The companies allowed to move in

on the third floor are carefully selected by the Minc team, based on their product and innovative capabilities.

	Location	Size	Founded	Requirements	Price
The Rabbit Hole	Frederiksberg, DK	Small	2014	None	800 DKK
CSE	Frederiksberg, DK	Large	2008	Student, Entrepreneur	Free
Social Impact Lab	Hamburg, DE	Medium	2013	Scholarship winner (for free space), No requirements for regular coworkers	Scholarship or 250.00 EUR/month
Minc	Malmö, SE	Large	2002	Three areas with different requirements	Free

Table 1. Overview of coworking spaces

Interviewees

Anders Hasselstrøm (Coworker at CSE). Anders has recently finished his master's degree at the Copenhagen Business School. Being a truly entrepreneurial person, he has been involved in a variety of start-ups and has founded several companies himself. In the past four years, Anders started a total of three businesses: The first one was *Motivaction* (motivaction.dk) which has the mission to help Danish high-school students make better choices in life. This company accomplishes this by giving motivational speeches and conducting relevant workshops. In 2013, Anders co-founded *Personal Workflow* (personalworkflow.com), a consultancy company which helps organisations and their employees being more effective by teaching time management and productivity tools. Most recently, Anders was CEO and co-founder of *Startuptravels* (startuptravels.com), a platform for traveling entrepreneurs with members in over 160 countries. During all of his entrepreneurial adventures, Anders has not had any traditional office. Instead, he has been working in a variety of coworking spaces. Most notably, he spent about two years at the Copenhagen School of Entrepreneurship, far exceeding the usual limit of nine months. Here, he worked on both Personal Workflow and Startuptravels. Both companies consisted of small teams of

up to five people. Currently, Anders lives in Scotland, where he works at a new coworking space called *Collabor8te*.

Henrik Haugbølle (Coworker at CSE). In many ways, Henrik exemplifies the 21st century's freelance worker. As a web developer, he has been involved in a large variety of projects ranging from full-time employments to freelancing and owning his own start-up. He has just recently finished his master's degree in Software Engineering at the IT University of Copenhagen. According to himself, however, he spent most of his university time working on the various projects he has been involved in (H. Haugbølle, personal communication, February 9, 2016). Namely, he started his own consulting company called *Bonzai Development* (bonzaidev.com), was responsible for building a new booking platform for ski schools around the world, and was CTO of Startuptravels, the company founded by Anders Hasselstrøm. Many of the companies which Henrik has been involved with were located at the School of Entrepreneurship. Therefore, Henrik has intimate knowledge of the environment provided by the organisation. Since many of the CSE start-ups are tech start-ups or at least have a technical component, Henrik's expertise tends to be in high demand. Today, he spends most of his time working as a programming consultant and has a desk at a shared office with his partner. The remaining time is still spent at CSE, where he supports the ski school booking platform mentioned earlier.

Alice Bo (Co-founder of The Rabbit Hole). According to her LinkedIn profile, Alice is "working with co-creation in innovative processes and entrepreneurial environments" (Bo, 2016). In practice, this means that she is co-founder of the Rabbit Hole coworking space and just recently launched a company called *Me and Alice.* The start-up focuses on providing creative environments for companies that want to run workshops outside of their usual corporate surroundings. When I met Alice about half a year ago, it was simply for her to show me around the Rabbit Hole space. I was on the lookout for a new space to work in, but right from the start, Alice started talking about co-creation, networks, and the creative space that coworking spaces provide. These topics seem to be of fundamental importance for the projects and organisations she dedicates herself to. In 2013, Alice finished a master's degree in Organisational Innovation and Entrepreneurship at CBS. Alice also seems to be guided by a drive to give back to the community. On the side, she has been working in a soup kitchen serving the homeless and people with drug addictions. The Rabbit Hole is another way for her to give back: Start-ups and small organisations can rent the space for free,

and the renters' monthly fee is meant to just about cover the monthly expenses related to running the space. Due to her many involvements, Alice only spends a couple of days per week at the Rabbit Hole.

Michael Chompookas Hansen (Coworker at The Rabbit Hole). Michael is the co-founder of a small architectural firm called *Underdog Studio*. Together with his co-founder Kenneth and a part-time assistant, Michael offers interior design solutions that focus on using a limited amount of space as efficiently as possible. The company, which is just about half a year old, has had its office at The Rabbit Hole right from the start. With a team consisting of two full-time and one part-time employees, Underdog Studio is the largest company at the coworking space. Before starting the company in Denmark, Michael worked at various organisations in Thailand. Here, he also worked at several coworking spaces.

Daniel Lippke (Program Manager at Social Impact Lab Hamburg). Approximately three years ago, Daniel Lippke joined the Social Impact Lab in Hamburg with his start-up called *Landio* (http://landio.de). Today, Daniel is responsible for the daily operations at the location, and he has detailed knowledge of how the space operates. Daniel helps planning pitches, sets up new initiatives, and runs the Social Impact Lab's external communication, just to name a few of his responsibilities. With his unique insights into the social entrepreneurship scene, Daniel has been able to help many start-ups working at the Social Impact Lab. In particular, he can connect members with each other and potential external partners.

Lennart Beeck (Coworker at Social Impact Lab Hamburg). Besides pursuing his master's degree in Politics at the University of Copenhagen, Lennart has been working in a large variety of organisations. Since Lennart grew up in northern Germany, he has a strong network in that particular area, especially around the city of Hamburg. Here, he is currently involved in two organisations: *Wandnotiz* (wandnotiz.de), a company that designs and sells motivational posters, and *Talented* (talented.de) which organises band contests at schools around Germany. In 2013, Talented won the *Culture and Creativity Pilot Germany 2013 award* which allowed the company to move into the Social Impact Lab in Hamburg. Here, the company stayed for 8 months, before it moved into its own office space. Talented has, however, decided to share this new office space with two other companies: An event firm and an art company. Since Lennart studies and works in Copenhagen while working with different organisations in Hamburg, he travels a lot and works in a

variety of different environments. He does not currently work in a coworking space in Copenhagen, but enjoys working in a handful of different cafés in the area.

Mårten Öbrink (CEO of Minc). Mårten is CEO of the Minc space in Malmö. In his LinkedIn profile, Mårten describes himself as "a strong entrepreneurial spirit combined with enthusiasm and the ability to create powerful teams" (M. Öbrink, personal communication, January 28, 2016). This entrepreneurial spirit has been a recurring theme in his career thus far: As a co-founder and board member of *Acconeer* (acconeer.com), founder of *Precise Biometrics* (precisebiometrics.com), and board member of various other companies, he has a very strong background in the entrepreneurial scene of Sweden. For a total of three years, Mårten has been responsible for the daily operations of the Minc space. Being very open-minded, Mårten showed me around the space and readily answered all my questions. His office is located right in the middle of Minc's first floor, only a couple of meters away from the ever-buzzing coffee machine. This causes Mårten and the rest of the team to be very approachable for outsiders and residents alike. Since the interview with Mårten was much more informal and held while walking through the space, the conversation was much less structured and evolved naturally.

Delimitations

While this paper investigates innovation processes in coworking spaces, it may be hard to identify the processes that are unique for the coworking environment. Even though the coworking space environment in many ways is special, the resulting networks and collaborations may arise under other circumstances as well. Libraries, cafés, or even traditional offices may encourage similar interactions, but are nut suspects of this paper. Instead, this paper is only interested in exploring the particular environment that is created by coworking spaces, and leaves a comparison of various environments to future research.

Also, As mentioned earlier, so far no single definition of coworking spaces has evolved in the literature. For this paper, I do not attempt to offer a new or improved definition, but instead decided to exclude spaces targeted towards larger and existing companies, that might be considered coworking spaces by other researchers. These spaces do not usually entail the core values described by Schürmann (2013), Pohler (2012), and the broader coworking space community (The Coworking Wiki, 2016). Since this paper is interested in the innovative processes happening among entrepreneurs, freelancers and small teams, these more traditional office space are deemed

irrelevant for this paper. Incubators, accelerators, and similar work spaces, however, fulfil all of the values very well, and I consider these types of organisations to be coworking spaces also.

Analysis

In this section, I will analyse the environments, networks, and co-creational processes observed in the various coworking spaces. The analysis will be based on the methodology and theories described earlier. Before we are able to understand the interaction, collaboration, and co-creational practice happening in the coworking spaces, we will have to analyse the networks in which they happen. However, in order for the network analysis to make sense, the environments in which the interactions happen need to be understood. Hence, this analysis will begin by a thorough analysis and categorisation of the different coworking spaces. The categorisation will be based on the theories provided by Spinuzzi (2012), Schürmann (2013), and Peschl and Fundneider (2014). Hereafter, the frameworks provided by Harryson (2008), and Cross and Prusak (2002) will allow me to map and classify the overall networks within the spaces. Finally, I will be able to explore how the environments and networks support or discourage the co-creational processes among the individual residents. This section will primarily be guided by Sawhney and Prandelli (2000), and Ind and Coates (2013). See figure 2 for a visualisation of this structure.

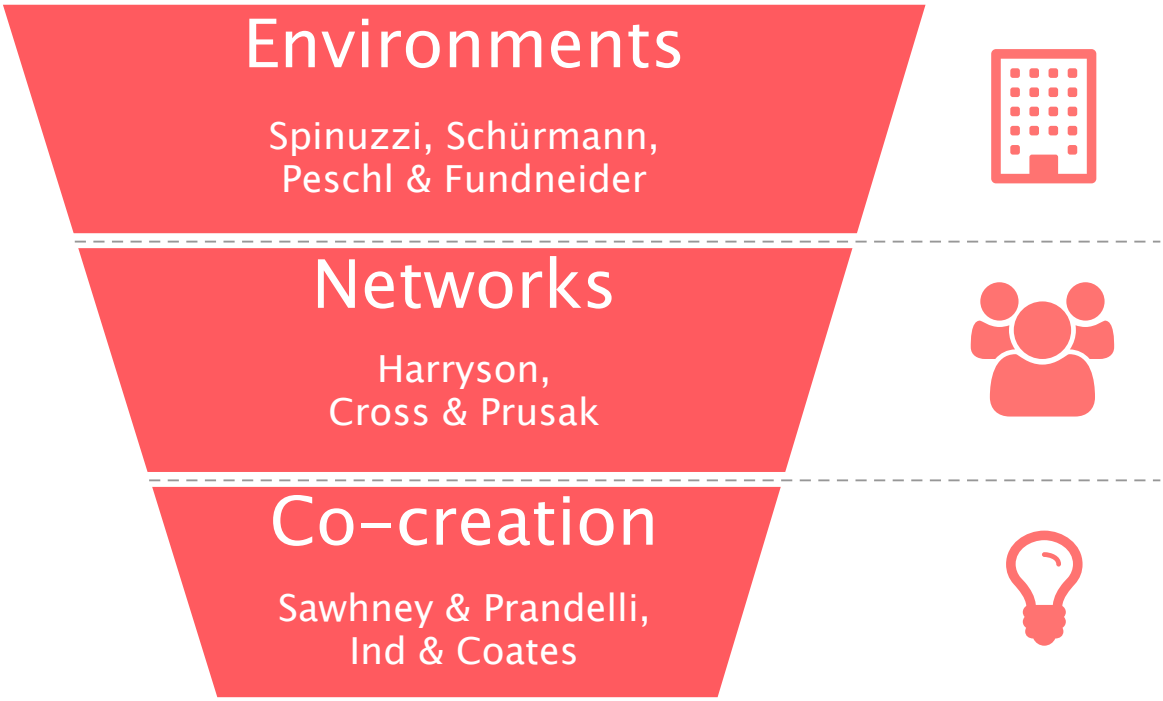

Figure 2. Structure of analysis.

Which environments are provided by the coworking spaces?

In this section, I will answer the question of which environments can be found in the four coworking spaces investigated for this paper. First, I will investigate their capabilities as enabling spaces in accordance with Peschl and Fundneider's (2014) research. Afterwards, I will categorise the spaces based on the framework provided by Spinuzzi (2012). Combined, the two theoretical lenses will allow us to understand the different facets of coworking space environments.

The Rabbit Hole

Architectural dimension. Alice Bo, co-owner of The Rabbit Hole, is very conscious about the physical environment provided by the coworking space. During her interview, she oftentimes emphasises the importance of this dimension. She notes: "We move the tables around constantly in order to see how people react and change their behaviour" (A. Bo, personal communication, January 6, 2016). Until recently, the space did not offer fixed desks, meaning that coworkers simply found a free seat at one of the five large tables or the kitchen area. However, according to Alice, this policy has been undergoing some subtle changes throughout the past year: "More people required large [fixed] computer screens for their work. How do these changing physical constellations influence the place?" (A. Bo, personal communication, January 6, 2016). Today, at least three of the full-time workers at The Rabbit Hole have fixed desks, set up with both computer screens and business plans on the wall. Even though the remaining coworkers do not officially have fixed desks, they tend to sit at the same spots, next to the same people, most of the days. One area of the space is commonly referred to as "Louise's corner" (M. Eriksen, personal communication, January 8, 2016), named after one of the coworkers.

The most differentiating physical dimension of The Rabbit Hole is its very small size. It is, by far, the smallest coworking space studied for this paper, and has a maximum capacity of approximately 25 people working at the same time. The kitchen area fills about 1/3 of the entire space. During her interview, Alice Bo said: "[The kitchen] is kind of a living meeting room. I often sit here and work, because I enjoy being in the kitchen" (A. Bo, personal communication, January 6, 2016). The small size, large kitchen, and cosy decor, makes the space feel very homely and fosters a small community in which people know each other by name and wave at each other when they arrive or leave the space.

Technological dimension. While The Rabbit Hole offers a solid Internet connection, a free-to-use printer, and three seldom used white boards, the technological dimension is of lesser importance at the space. The coworkers tend to bring in their own equipment (usually a laptop and a set of headphones) and do not require advanced machinery or utensils. Alice Bo dreams of running a space that provides a workshop suited for furniture, jewellery, and textile designers (A. Bo, personal communication, January 6, 2016), but the Rabbit Hole's residents do not currently represent any of these professions.

Social, cultural, and organisational dimension. On a social level, the interactions among residents of The Rabbit Hole are strongly influenced by the community's small size. Alice Bo notes:

> Size is of high importance in order to sustain an intimacy that causes people to feel a sense of community. If you have a space with 300 people, it can be really tough to keep up the intimacy that causes people to enjoy each other's company. (A. Bo, personal communication, January 6, 2016)

At the weekly common breakfast, the residents tend to primarily discuss personal and non-work related issues. At one of these breakfasts, a resident stated that she enjoys being at The Rabbit Hole due to the social interactions, which are non-existent in a traditional home-office setup (L. Ravn Christiansen, personal communication, February 11, 2016). The space's culture is characterised by an outspoken accessibility and professional diversity. Right from the beginning, The Rabbit Hole was intended as a space where different groups of people could meet, independent of their financial or professional background (A. Bo, personal communication, January 6, 2016). The low price was what initially made The Rabbit Hole very attractive for Michael C. Hansen: "If you compare the prices [of the coworking spaces in Copenhagen], then this place is the first one on the list" (M. C. Hansen, personal communication, January 26, 2016). At regular intervals, events are held by external (mostly small) interest groups. In most cases, The Rabbit Hole provides the facilities free of charge. The low entry barrier encourages the desired high diversity of the residents: "I think it is super important to have professional diversity at the space, because it allows for more interesting talks at the coffee machine" (A. Bo, personal communication, January 6, 2016). At the same time, the high degree of openness also goes hand in hand with a rather high degree of turnover. While a core of people has been at the space for many months, most residents only stay at

The Rabbit Hole for a limited amount of time. According to Alice Bo, the constant flow of new members creates a positive dynamic by introducing new knowledge and projects to the space (A. Bo, personal communication, January 6, 2016). That being said, most of the time residents tend to rather work next to each other than with each other. On an organisational level, the culture is supported by a very entry-friendly pricing structure and non-existent rule set. Again, the absence of rules strengthens the homely feeling, where mutual respect contributes to the space's open atmosphere: "We don't think that we should have any rules. The people here are adults and can talk about potential issues" (A. Bo, personal communication, January 6, 2016). Since an official ruleset does not exist, talking is allowed in the space's main area. In general, the work environment is rather quiet, but it is common for the coworkers to have short conversations across tables. Longer conversations are also very much accepted, but are less common and tend to be of a professional rather than a personal kind.

Emotional and cognitive dimension. Weekly journaling lunches were recently introduced at The Rabbit Hole in order to stimulate open-minded and reflective emotional states. In turn, these states are supposed to create a cognitive surplus. Figure 3 depicts the description of the journaling lunches that was posted in the corresponding Facebook event.

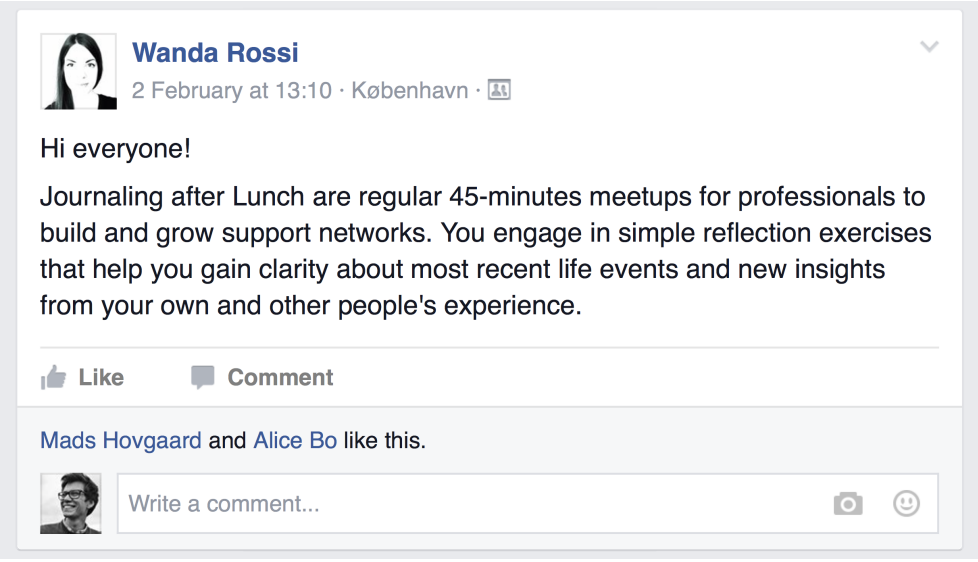

Figure 3. Description of *Journaling after Lunch* (Rossi, 2016).

These journaling exercises are a very explicit way of triggering productive emotional states. They are well aligned with Peschl and Fundneider's argument that "in some cases it is necessary to

push oneself into an emotionally uncomfortable situation in order to leave behind one's well-established and dear patterns of thought and perception" (Peschl & Fundneider, 2014, p. 354). Michael very much enjoys these sessions. When asked what he liked about working at The Rabbit Hole, he answered: "Brainstorming in the morning. Like this morning where we had the common breakfast. I think it's a good way to have a lot of different industries together in one place" (M. C. Hansen, personal communication, January 26, 2016). Besides these journaling lunches and the earlier mentioned general openness, however, little seems to be done by the Rabbit Hole team to consciously enable particular productive or inspiring states of mind. In some cases, the space's open culture might even be counter-productive. During a personal conversation, Michael expressed his wish for more rules regarding phone conversations and general noise in the common area (M. C. Hansen, personal communication, February 11, 2016). According to him, the occasional noise from personal and professional conversations tends to create distractions and break his workflow.

Categorisation of the space. Now, after analysing all of The Rabbit Hole's enabling space dimensions, we can properly categorise the space using the terminology provided by Spinuzzi (2012). Can The Rabbit Hole primarily be labelled as community work space, unoffice or federated space? While conversation, collaboration, and even co-creation definitely is *desired* by the space's founders, only relatively little is done to reach these goals. Instead, the culture of openness and the homely feeling combined with mainly personal conversation topics across multiple (often very unrelated) professional backgrounds, seem to foster an environment that can best be compared to that of an unoffice. Unoffices are defined as "flexible office spaces that allow workers to interact and to meet with clients; their object was to recreate characteristics of the traditional office environment that independent workers may miss" (Spinuzzi, 2012, p. 412). This description seems to fit The Rabbit Hole very well: Working alongside each other, but only seldom with each other, is the norm.

CSE

Architectural dimension. At CSE, the importance of the architectural dimension becomes particularly clear, since the space spans across two floors targeted towards two different groups of entrepreneurs. While these two floors share the same size and measurements, they very much differ in a variety of ways. Both Henrik Haugbølle and Anders Hasselstrøm pointed out how the environments deviate from each other, and how this has had substantial impact on the ways they

interacted with other residents. The second floor is dedicated to very early entrepreneurs. The second floor, on the other hand, is only open for entrepreneurs who have been at CSE for at least three months. Anders described the difference as follows:

You have a flex desk for the first three months, I believe, and then you receive a fixed desk on the first floor afterwards. The first three months are dedicated to that flex desk because they want you to meet as many people as possible. And I actually quite enjoyed that. But after three months you also enjoy getting to sit in your own little cubical that you'll have. (A. Hasselstrøm, personal communication, January 19, 2016)

In his interview, Henrik described the exact same phenomenon:

There was a more dynamic environment [on the second floor]. That probably also has a lot to do with the physical space. First of all, you don't have a permanent desk. There are not as many walls on the second floor as on the first floor. So you're more isolated from the other companies when you are at the first floor. On the second floor, you don't have this isolation of companies. You don't have a permanent desk. (H. Haugbølle, personal communication, February 9, 2016)

The importance of the flex and fixed desks is emphasised continuously throughout both interviews. The second floor's much simpler architectural features, combined with the open space environment, seems to have tremendous impact on the entrepreneurial processes. While both floors have "nice facilities with a nice kitchens and bathrooms" (A. Hasselstrøm, personal communication, January 19, 2016), the second floor definitely is a bit simpler and might even be described as less luxurious. At one point during the interview, Anders said: "I was feeling that the second floor had no windows and there was basically no sun light, and that honestly makes you depressed" (A. Hasselstrøm, personal communication, January 19, 2016). All of this makes it obvious that the physical design decisions taken on the second floor very much prioritise networking and exploration over long-lasting and exploitation-focused work. Both floors do, however, offer three meeting rooms each. The meeting rooms can be used by all of the residents, even across the otherwise separated floors.

Later in the analysis, we will dive deeper into the differences between these two floors, and how they influence the collaborative processes happening in the respective areas.

Technological dimension. Just as the other spaces, CSE offers a very solid Internet connection that is open to everyone. On top of this, most meeting rooms are equipped with either a whiteboard, a large TV screen, or both. A basic printing service is provided free of charge, just like coffee. While a strong Internet connection and rudimentary printing service are mostly taken for granted, whiteboards and meeting rooms are in high demand at CSE. Again, there is a clear distinction between the two floors: "You get to have your own white board, you have your own little office where you can put up posters. It becomes your own little office" (A. Hasselstrøm, personal communication, January 19, 2016). When visiting the first floor of CSE, it quickly becomes apparent that the individual small office areas are indeed used heavily. Whiteboards are used to keep track of current tasks, and many people use external screens to increase productivity. The importance of these screens should not be underestimated. As Henrik put it: "I was considering [working at a café] just this morning. I could have spent half of the workday at the café, but figured that I would miss my screens. So, I [abandoned the idea]" (H. Haugbølle, personal communication, February 9, 2016). To sum up, just as the architectural dimension, the technological dimension allows for more focused work on the first floor compared to the second floor of the building.

Social, cultural, and organisational dimension. On an organisational level, much is done to encourage a high degree of networking and idea generation. For instance, CSE organises and hosts a large variety of events aimed at early-stage start-ups. Examples of these events include *CSE Start-up Stories: "From Idea to Business"* (https://www.facebook.com/events/1676016222678614/), *CSE Investor Day & the Final Go Grow pitches* (https://www.facebook.com/events/1505006963137525/), and regular *Start-up Fridays* (https://www.facebook.com/events/1694204104198623/). During daily operations, both the networking and exploration is highly supported by the staff of the space. Since Henrik has a very strong technical skill set, Martin B. Justesen (founder of CSE) often introduces him to new residents of the space (H. Haugbølle, personal communication, February 9, 2016). Anders had a very similar experience in regards to Martin. When asked about the advantages of having an office space at CSE, Anders answered: "First of all, you meet one of the most prominent figures in the Danish start-up scene, at least in early stages, which is Martin. He can introduce you to a lot of people" (A. Hasselstrøm, personal

communication, January 19, 2016). Lastly, the organisational decision to only allow the entrepreneurs to stay at CSE for a limited amount of time results in an ever-changing community with high turnover and a constant flow of new expertise and skills.

On a cultural and social level, the same themes can be identified. Both Anders and Henrik very much enjoyed the networking at CSE, and they spent a lot of time engaging with the community of the space. This not only included daily sparring and minor collaboration, but also culminated in co-creational engagements and social events, which will be analysed later. While the events planned by CSE are mostly professional, residents often organise spontaneous events that revolve around "beers, talking, and having fun" (H. Haugbølle, personal communication, February 9, 2016).

Emotional and cognitive dimensions. Various physical artefacts and initiatives support the spawning of productive emotional states. Late in the evenings, upbeat music tends to dominate the floors, and energy drink cans fill the recycle bins. These physical manifestations of the dominating culture of the space are representative for the primarily young and early-stage start-ups and entrepreneurs. On an organisational level, reflective and explorative emotional states, and cognitive stimulation are induced during mentoring sessions and the various events mentioned earlier. These practices are particularly well structured and defined in CSE's own incubator program *Go Grow* (http://go-grow.dk). While the companies located at CSE are not obliged to enrol in the program, a membership ensures additional networking events, mentoring, and feedback sessions.

Categorisation of the space. The aspiration of CSE to connect early stage entrepreneurs on both a professional and personal level becomes clear on all the analysed dimensions. At the space, the residents do not only work beside each other, but very much help each other, and build a strong overarching community. These characteristics make CSE a perfect fit for the model of a federated work space. Spinuzzi (2012) defined these spaces "in terms of fostering business relationships in addition to personal ones; their object was to facilitate collaboration with others in formal and informal relationships" (Spinuzzi, 2012, p. 416). Both floors at CSE match this description very well, even though the first floor has a stronger focus on exploitation than the second floor.

Minc

Architectural dimension. Similarly to CSE, Minc is characterised by its separation of target groups across different floors. The floors are targeted towards freelancers, entrepreneurs, and start-

ups at different stages and sizes respectively. In comparison to CSE, however, the three floors are even more distinct and residents do not naturally move to the next floor after a couple of months. Instead, most residents remain on the first floor or simply rent an office space on the third floor. Mårten Öbrink estimates that about two percent of all the residents starting on the first floor become part of the incubator program that resides on the second floor (M. Öbrink, personal communication, January 28, 2016).

A large differentiator from most other coworking spaces is the rather large cafeteria of Minc. The cafeteria is open for everyone and forms an important common area. In this section of the space, residents may connect across organisational stages, and they are not limited to their own floor.

Architecturally, the three floors are rather different to each other: The first floor has room for 70 people working at the same time and contains a small scene which can be used for community organised talks or events. Next to the scene, small and cosy areas allow the residents to work in comfortable chairs and a relaxed environment. At its heart, the first floor features a very long table, where most of the coworkers sit and work. The table and chairs a spartan: One of the people interviewed at Minc had been at the space for close to six months, but now considered to move due to the unergonomic seating arrangements. The entire floor is a very open space, with only few walls and noise barriers. The only coffee machine of the space is located near the entrance of the first floor and right next to a table football setup. Several meeting rooms are located along one of the walls and open for residents of all three floors to use.

The second floor has a very different architectural philosophy. Instead of being one large and open space, the floor is divided into smaller areas, comparable to small offices. The walls dividing the rooms are very thin and do not isolate noise particularly well, but still create a much more closed atmosphere compared to the first floor. A couple of teams may share a separated space, but the residents have fixed desks, fill the walls with post-its, and many teams use external computer screens.

The third floor then, is almost the absolute opposite of the first floor when it comes to the architectural design. Residents of this floor rent small offices that can be locked and are noise isolated. A long corridor stretches itself through the floor with offices located on its right and left

side. On this floor, no table soccer can be heard, and only few people can be seen walking around outside their respective offices.

It quickly becomes obvious that the architectural design of the three floors has tremendous implications for the ways in which their residents work. On the first floor, people extend their network while at the same time exploring various business opportunities. The second floor facilities a more structured and focused work approach while still being open to outsiders and new ideas. The third floor, lastly, enables its residents to focus on their work without major distractions that may be encountered on the other two floors.

Technological dimension. On the homepage of the coworking space, Minc describes the appeal of the first floor in the following way: “Sometimes fast wifi, coffee, a network of other entrepreneurs around and a place to sit for a shorter period of time is just what you need to test if your business idea will work“ (Minc, 2016a). This quotation shows that the Minc team believes in providing a simple but accessible infrastructure, in which young businesses can thrive and grow. The technical infrastructure supplied by Minc is very similar to the one provided by CSE in this regard. The Internet connection is flawless, but taken for granted. Whiteboards and room for personal equipment is only provided to more established companies located on the second and third floor, while coworkers on the first floor tend to simply sit in front of their laptops. What differentiates Minc a little from the other coworking spaces studied for this paper, is their high activity level on various social media channels. Every day, members and staff post pictures and discuss events held at the space on Twitter, Facebook, and Instagram. This has caused the community to not only be active and connected in the physical, but also in the digital world.

Social, cultural, and organisational dimension. The fact that Minc is owned by the municipality of Malmö has substantial implications for the space. According to Mårten Öbrink (personal communication, January 28, 2016), being owned by a public institution makes the space predominantly focus on helping the local entrepreneurial community to flourish, instead of being primarily money-driven. It also causes the space to be very welcoming to newly started freelancers and entrepreneurs. The designated goal of Minc for this group of people is to let them “meet people in similar situations and those who have gone ahead with their business ideas and who will gladly share their network and perhaps some advice” (Minc, 2016a).

Residents can stay at the space for free for up to six months, before they are charged a monthly fee of 1.200 SEK. Minc does not have any special requirements that need to be fulfilled in order to gain access to the first floor. This results in very diverse set of residents comprised of journalists, programmers, entrepreneurs, and the like.

Minc's other two floors, however, increase in specialisation from floor to floor. On its homepage, the focus of the Minc incubator is described as follows: "We focus primarily on media, design, tech and ICT companies due to regional expertise within these areas and the strong growth in these businesses" (Minc, 2016b). With a monthly cost of at least 1,5000 SEK per month, this floor is also slightly less accessible than the entry level membership. On the third floor, the restrictions are even more stringent: A fully furnished and closed office costs 6,000 SEK per month, and is clearly targeted towards more established teams. On top of this, Mårten Öbrink emphasised that only few companies are allowed access to the highly demanded closed offices (M. Öbrink, personal communication, January 28, 2016). While Minc does not focus on a certain industry when it comes to deciding who may move into the dedicated offices, only the most innovative start-ups are granted access.

On a cultural and social level, the varying degree of professionalism is manifested in the varying degree of noise. During an initial tour through the Minc space, Martin Öbrink's voice became lower and lower for each floor we climbed. Among the early entrepreneurs and freelancers, it is very much allowed to talk and make a little noise. Residents talk, play, and work together, without being afraid of disturbing other residents. If someone needs silence, most people tend to simply use headphones or find a quiet spot somewhere on the first floor. If residents from the second or third floor need to have longer meetings or conversations, they usually make use of the meeting rooms.

Emotional and cognitive dimension. All of the residents at Minc, even the members using the first floor free of charge, are offered ongoing mentoring and support. The intention with these structured meetings is to help start-ups overcome the most common hurdles encountered by new companies (A. Ådahl, personal communication, January 28, 2016).

On top of this, several physical artefacts at Minc are representative for the ways in which the Minc staff tries to engage the members of the space in open conversations. Photos 5 and 6 show two pictures taken at the space. Photo 5 is a picture of text with seven funny conversation starters,

written to encourage residents to “make a new friend” while waiting for their coffee. The other picture (Photo 6) depicts a sign which asks residents to disturb others in order to meet new people.

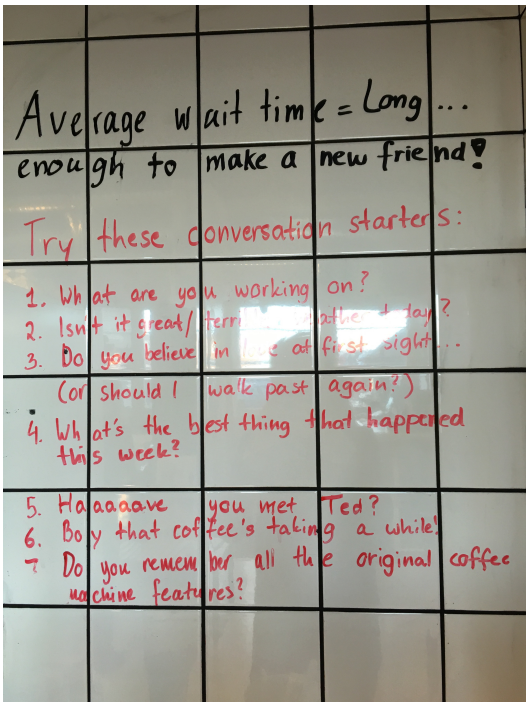

Photo 5. Conversation starters at Minc. From “Average wait time,” by Thomsen, M., 2016

Photo 6. Please disturb sign at Minc. From “Mincstartuplabs,” by Mincstartuplabs, 2016 (https://www.instagram.com/p/BB5YFsYs-BQ/).

Categorisation of the space. The three floors are located on different points on the spectrum of no interactions to highly encouraged networking. The third floor of the space can be found on the low end of the spectrum, and can most appropriately be categorised as an unoffice: The dedicated offices are located in the context of a large entrepreneurial community, but the degree of interaction outside of the common areas is low. It is only due to the fact that the third floor is embedded in Minc’s overall organisation that it can even be regarded as a coworking space: Neither openness nor accessibility (two of the five core values shared by coworking spaces identified by Schürmann (2014)) are prevalent on the third floor. If it was not embedded in Minc’s broader organisational context, the third floor could easily be considered a traditional office space. Both the first and second floor, however, encourage a rather high degree of interaction, and can hence be labelled as federated workspaces. While the first floor resembles the archetype of a federated workspace, the second floor is a bit less open and therefore closer to the unoffice type.

Social Impact Lab

Architectural dimension. The Social Impact Lab in Hamburg spans across a single floor in an old industrial building near the centre of Hamburg. The fact that the space is very much targeted towards social start-ups and most residents gained access through the scholarship of Social Impact has several implications for the architectural design of the space. Since no freelancers work at the Lab, and most start-ups are composed of a hand full of people, the seating arrangement is adjusted accordingly: In stark contrast to all the other spaces studied for this paper, the Social Impact Lab only offers fixed desks. These desks fill most of the room and are gathered in small groups representing the different teams working at the space.

A large meeting room with glass walls is located on one side of the floor, and the space offers a simple kitchen to its residents. The meeting room is used for many of the events organised by the Social Impact Lab, but can also be used for private events organised by the residents. For instance, Lennart Beeck mentioned that he had used the room not only for team conferences, but also for social media seminars held by himself (L. Beeck, personal communication, January 12, 2016).

Sitting in isolated small groups, the teams can focus on their individual projects. At the same time, other teams are only an arm's length away, and both the kitchen and conference room invite the residents to network and share ideas and knowledge with each other.

Technological dimension. On a technological level, the Social Impact Lab Hamburg covers the basics required for the teams to be innovative and productive. Whiteboards are available to all teams, and the fact that all desks are fixed means that the residents are free to use and leave their own equipment. Overall, however, the technological equipment made available seems very basic. This represents the overall philosophy of the space very well: On its homepage, the Social Impact Lab states that the space is made "for social entrepreneurs" and "the overall theme dictates the content" (Social Impact Lab Hamburg, 2016). The space seems to be very conscious about the resources used, and less might actually be more at the Lab.

Social, cultural, and organisational dimension. During my interview with Lennart Beeck, he made a profound observation relevant for the social, cultural, and organisational dimension of the environment found at the Social Impact Lab. When asked if his start-up was able to cooperate with other teams in the space, he answered:

Actually, it was much harder when we were at the Social Lab, because the organisations that were there were very heterogeneous. You had like small refugee projects sitting there that were, you know, designing flyers with Microsoft Word. And then we got us, layouting flyers with inDesign, Photoshop, and Illustrator and they were like: “With what?” (L. Beeck, personal communication, January 12, 2016)

This quotation is particularly interesting, since on several measurements, the Social Impact Lab attracts the most narrowly defined group of people of all the spaces studied: social early-stage entrepreneurs. Daniel Lippke (Program Manager at the Social Impact Lab) even emphasised that the space tends to not accept student entrepreneurs, in order to create a more professional environment (D. Lippke, personal communication, March 24, 2016). Still, Lennart experienced the residents to be a very heterogeneous group with which he and his team had only little in common. It was clear that the experience of dissimilarity was due to different levels of professionalism when it came to working with aspects outside the companies’ core competencies. Later during the interview, this was made particularly clear:

We […] had co-working synergies with about 20% of the organisation sitting there. From the other 80% we didn’t gain much, but they took a lot out of the cooperation with us, because they gained insights on how you could, just as an example, layout flyers with different software or how you could structure marketing concepts. (L. Beeck, personal communication, January 12, 2016)

On an organisational level, the proprietors of the space have made a number of decisions that have profound impact on the work happening at the space. Start-ups are only allowed to stay for up to 8 months, and new residents are primarily chosen based on competitions held by the umbrella organisation. According to Daniel Lippke, only few start-ups are allowed to stay a couple of months longer, and only about 15% of the applying companies are accepted (D. Lippke, personal communication, March 24, 2016). This causes not only a rather high turnover, but also ensures that the joining companies are a good match for the space, have ideas of high quality, and are potentially interesting for the other residents to engage with.

Emotional and cognitive dimension. When teams join the Social Impact Lab on one of their scholarships, they agree to a basic set of rules that is meant to ensure that the teams are effective and build a sustainable business. These rules include that the team must (1) work at least 20 hours a

week from within the coworking space, (2) participate in regular progress check-up meetings, (3) join systematic coaching sessions, and (4) work towards the goals agreed upon with the Social Impact Lab staff. It is noteworthy that two of these rules involve mandatory services provided by the Social Impact Lab. Hence, the rules are clearly not defined in order to limit the start-ups, but instead create a work atmosphere in which progress and hard work is valued. This observation is confirmed by Daniel: The Social Impact Lab tends to favour start-ups started by non-students who are able to dedicate a high proportion of their time to their company, and who can be an active part of the space's community (D. Lippke, personal communication, March 24, 2016).

On top of this, regular events are held at the space, revolving around both networking and professional development. Again, these events are supposed to trigger productive emotional states and enhance cognitive capabilities.

Categorisation of the space. At first glance, the Social Impact Lab might appear to be a federated workspace: Many young companies and entrepreneurs work in the same physical environment, and everyone seems to be eager to extend their network. The teams are encouraged to join common events and everyone works within the field of social innovation. All of this may indicate that Spinuzzi (2012) would categorise the Social Impact Lab as a federated workspace. However, when taking a closer look, it becomes apparent that the teams very much operate within their own sub-areas within the space. The Social Impact Lab encourages the teams to focus on their own projects and reach the goals that have been agreed on. This is enforced by the fact that the residents are granted access based on the specific project they pitched during the scholarship competition. Hence, the space is much closer to being an unoffice than a federated workspace, where coworkers share a same environment, primarily interact on a non-professional social level, and most of the time work independently.

Sub conclusion

The analysis made it clear that the spaces provide very diverse and distinctive environments, encouraging different types of interactions and collaborative practices. This does not come at a surprise, since the cases were chosen based on Flyvbjerg's (2006) maximum variation cases strategy. In particular, the spaces vary in: (1) access requirements, (2) the degree to which they systemise the interactions among members, (3) size, (4) physical separation of sub-groups, and (5) average length of membership. The different access requirements in particular are of extraordinary

importance for the environments provided by the spaces. They are based on two different dimensions: (1) Exclusivity, limiting access to the space based on professionalism or group membership, and (2) target group, making the space more attractive to entrepreneurs, freelancers, or larger teams.

Only allowing the residents to stay at a space for a given amount of months also has drastic effects on the environments provided by the spaces. CSE, the Social Impact Lab, and to some degree even Minc, all have rules limiting the time entrepreneurs are allowed to stay at the coworking spaces. This policy creates a high turnover of members, allowing for a higher degree of networking, and exploration. All spaces studied use networking events to connect members, and most proprietors have the intention of encouraging co-creational practices.

Both CSE and Minc span across more than one floor, allowing them to create separate environments suited for specific target groups. In both cases, the differences among the floors are made particularly obvious by the availability of either fix or flex desks, emphasising the focus on either exploration or exploitation. As a result, both spaces cannot only be categorised as one type of coworking space: Instead, the spaces offer unoffices and federated work spaces, attracting companies of various forms and stages.

How are coworkers connected with each other?

In order to fully understand in which ways the coworkers collaborate and co-create, we still need to depict the networks created in the environments just presented. I do this, by first exploring the individual positions of the coworkers in their networks. This part of the analysis will be based on the typology provided by Cross and Prusak (2002). Afterwards, the networks and their implications will be investigated in the light of the framework provided by Harryson (2008).

The Rabbit Hole

Mapping the network. As found earlier, The Rabbit Hole is characterised by a very open and welcoming atmosphere which could potentially have caused a high degree of turnover and continuous flow of new faces. In practice, however, due to its small size, new members enter the network seldom, and the coworkers all know each other relatively well on a personal level. Common for unoffices such as The Rabbit Hole is that the residents primarily value each other's social company rather than relying on each other professionally. Earlier, I also found that The

Rabbit Hole has a professionally very heterogeneous set of residents. In the informal network of the space, almost every resident is a specialist in his or her own field, may it be acting, fund raising, web development, or architectural design. The fact that the residents often are not aware of each other's skills makes many of them *peripheral* experts in the informal network, and increases the need for a central connector or information broker who can make the network be effective.

At the same time, most of the residents at The Rabbit Hole have extensive networks outside of the coworking space. In this regard, they fulfil the role of boundary spanners who (potentially) connect the informal network of the space with external networks. Examples include Maja, who is tightly connected with Copenhagen's art scene (M. Nydal Eriksen, personal communication, February 25, 2016), Michael, who has strong ties to other architect companies (M. Chompookas Hansen, personal communication, February 11, 2016), and Louise, who is well connected within the Danish health sector (L. Ravn Christiansen, personal communication, January 6, 2016). Spinuzzi (2012) calls this particular setup of a network within a coworking space *the good neighbours configuration*. This particular type of network setup is characterised by "an outward-facing front stage that supports individual's work efforts" (Spinuzzi, 2012, p. 429).

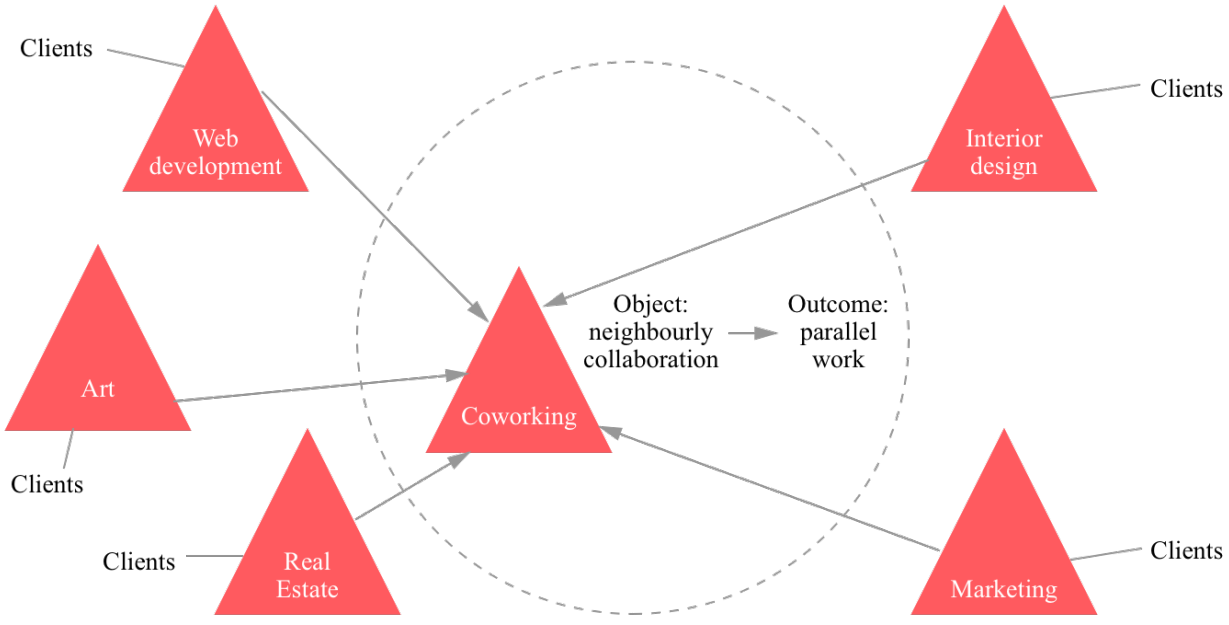

Figure 4. The good neighbours configuration of coworking. Adapted from "Working Alone Together: Coworking as Emergent Collaborative Activity," by C. Spinuzzi, 2012, SAGE.

A digital artefact of the residents' extended network can be found in a special (closed) Facebook group, called *The Rabbit Hole Network*. The description of the Facebook group is as follows:

This group is not only for the daily members of The Rabbit Hole, but for every one who engages with the place and the people who work here. We can use this group for asking for each other's help, sharing good ideas and tips about events, articles etc. (The Rabbit Hole Network, 2016)

This extended networking group currently entails 82 members, which is more than four times the member count of the internal Facebook group of the space. But how are these groups managed? The framework provided by Cross and Prusak (2002) has its analytical focus on businesses, and as a result it suggests how executives should administer the informal network within these organisational frames. According to the scholars, the managers should "focus their attention on a handful of key role-players in the group" (Cross & Prusak, 2002, p. 105) in order to increase the effectiveness of the network. Obviously, the coworking spaces behave very differently and have other goal sets and power dynamics than traditional corporations. Still, an effective informal network is highly desired. At The Rabbit Hole, Alice and Mads, the owners of the space, have taken on the responsibility of managing the network, by being very active central connectors. Both have detailed insights into what people do professionally, spend a lot of time interacting with the various residents, and care for their needs. The role of the owners of the The Rabbit Hole is of paramount importance for the network setup and potential collaboration. This is particularly true, since collaboration does not easily arise naturally: When asked how residents are encouraged to work together, Alice noted that "we have experienced that it is much harder than we anticipated" and that it requires a consistent effort from the founding duo (A. Bo, personal communication, January 6, 2016). Not only do they have the role of central connectors, they also mediate who gains access to the networks in the first place. In the specific case of The Rabbit Hole, both founders value a high diversity in the space's residents. Alice, for instance, mentioned that "there was a period where a lot of journalists joined [The Rabbit Hole], so at some point we simply could not accept any more journalists" (A. Bo, personal communication, January 6, 2016). In general, however, The Rabbit Hole is very open to everyone who would like to join the space.

Typifying the network. Having mapped the overall informal network structure of The Rabbit Hole, we are now well suited to investigate how the network supports the explorative and exploitative activities of the individual companies.

Based on my findings thus far, The Rabbit Hole can rather clearly be defined as a closed network. As an unoffice, it relies on *social exchange, trust and shared norms,* which are essential for closed networks (Harryson, 2008, p. 296). Membership within the network is clearly defined, and even though outsiders are welcomed by the members of the network, resident turnover is low at the space. Untypical for closed networks, the ties within the network appear to be rather weak. Formal, permanent, and potentially contractual ties do not exist among the residents. The residents often use the loose nature of the ties to quickly share non-complex knowledge with the other members of the network.

While weak connection ties might suggest that the residents at The Rabbit Hole are focused on exploration over exploitation, it is very important to note that the members are embedded in networks that are external to The Rabbit Hole as well. As I found earlier, most residents are well connected in their particular industry and have strong ties within their individual professional fields. In my observations it became clear that the majority of the residents at The Rabbit Hole had rather clear routines and were focused on running their existing business, instead of building new ones. Internally, the network ties were primarily loose and of a personal kind. Externally, professional and strong external ties dominated.

This somewhat odd combination of a rather closed network with primarily weak ties neither fully supports exploration or exploitation. According to the model proposed by Harryson (2008), the space is neither particularly suitable for creative networks, transformation networks, or process networks.

CSE

Mapping the network. As a federated workspace, CSE is fostering both professional and personal relationships. Compared to The Rabbit Hole, CSE is much larger and the informal network contains many more members. Due to the clearly defined access requirements of the space, the majority of its members are rather homogenous and shares a similar educational background. This only increases the importance of peripheral experts, who possess valuable knowledge not commonly available in the network. Henrik, one of the few IT experts at the space, said that “there

is such a great lack of technical people within the early stage start-up field" (H. Haugbølle, personal communication, February 9, 2016). As a result, Henrik is often approached by a lot of the CSE residents, who are asking for help on technical issues. Anders experienced a similar situation:

I think we were one of the most experienced teams sitting there. At least we had some competences in our team at a lot of different levels that we could help with. People who had sales questions - I've been in sales before - [approached me] so I could help with that. (A. Hasselstrøm, personal communication, January 19, 2016)

In order to connect the peripheral experts manifested in both Anders and Henrik among others to the rest of the network, central connectors need intimate knowledge of the capabilities and skills possessed by the members within the network. Just as in the case of The Rabbit Hole, this important responsibility lies on the shoulders of the space proprietor. At CSE, it is the CEO Martin B. Justesen who connects the different residents and start-ups with each other. As mentioned earlier, Anders called Martin "one of the most prominent figures in the Danish start-up scene" (A. Hasselstrøm, personal communication, January 19, 2016). Later, when asked what Anders enjoyed the most about working at CSE, he answered:

Probably Martin, the guy who founded and ran the place, because he would introduce [you to] everybody he knew. He did a great deal to help us as at Startuptravels, where we made a few sales in the beginning, and all of them were because I got instructions from Martin. (A. Hasselstrøm, personal communication, January 19, 2016)

In this quotation it becomes apparent that Martin not only connects the different internal parts of the network, but that he also connects residents with external actors and contributes to the potential commercial success of the start-ups at CSE. Similarly, Henrik describes his experiences with Martin as follows:

At least on the second floor I was the only technical person. So every time a new company joined wanting to do something IT related, the director of CSE [Martin B. Justesen] would pick me out and say: "Hey can you spend five minutes with them?" So I got to know a lot of people. (H. Haugbølle, personal communication, February 9, 2016)

Due to the entry requirements of CSE, almost no freelancers with external clients reside at CSE. Instead, the entrepreneurs and start-up teams tend to stick to themselves and each other, causing the informal networking to generally only be loosely connected to external groups. This

situation is only reinforced by the fact that many of the residents are first-time entrepreneurs who do not yet have extensive networks themselves. Many of these people join CSE in part to become a member of Copenhagen's entrepreneurial scene and network.

As I found earlier, a distinction has to be made among the two floors at CSE. While what I have found so far is true for both the first and second floor of the space, some differences have to be pointed out as well. Since teams on the first floor have their own dedicated desk areas, the individual start-ups may often represent small and potentially isolated network groups that are embedded in the larger informal network. This is different to the second floor, on which the entrepreneurs blend together in one large informal network, and the boundaries among the individual companies are much less noticeable. In order for the small sub-networks of the first floor to become an integrated part of the overarching network, the individual teams need one or more members to fulfil the role of boundary spanner or information broker. This way, even the peripheral experts hidden from Martin or other central connectors can become an active part of the network.

Typifying the network. As we have just found, CSE is comprised of a rather large network in which the network members readily share information, but are not all directly connected with each other. Even though CSE actively mediates the networking process, the managerial hierarchy of the network is very much organic and the ties usually arise naturally. Especially on the second floor, the ties among the network members are rather weak, and residents are exposed to a large variety of business ventures, ideas, and technologies. These conditions are the perfect breeding ground for creativity networks, in which members experiment with, try out, and co-create entirely new products and services. It is important to note that these networks are almost exclusively social, and do not rely on any contractual or other formal agreements.

On the first floor, the situation is a little different. Here, the network structure is representative for a transformation network that bridges the gap between purely explorative and exploitative network structures. A potential tension that can arise in this situation is described by Anders, who explained his frustration of Henrik (CTO of Startuptravels at the time) being interrupted by other residents almost daily:

It was annoying, often very annoying. And I often felt like it took a lot of our precious time, especially back in the days when Henrik was the only developer in our team. It was difficult, because people always came and asked him questions, because Henrik was good at answering them.

That would take away maybe one hour or two in a day when we were supposed to spend [all our time] on developing our product. (A. Hasselstrøm, personal communication, January 19, 2016)

Some of the companies residing on the first floor are results of co-creations among previous second-floor residents, who did not know each other before joining the space. The network in which the start-ups are embedded during this organisational stage, which slightly shifts the focus from pure exploration towards exploitation, is neither fully open nor fully closed. In the majority of the cases, formal agreements regulate the relationship among the co-creators.

In correspondence with the earlier analysed physical, sociocultural, organisational, and emotional dimension of the space, the second floor clearly supports a primarily exploration driven approach and networking process, resulting in a creativity network. The first floor, however, allows the teams to be more focused and creates a transformation network that allows members to tap into both creativity and process networks.

Minc

Mapping the network. My analysis of the Minc coworking space showed that the differences among the three floors are tremendous. Not only do they vary in the physical environments they provide, they also have conflicting unwritten rule sets and cultures, making the individual floors attractive to different types of companies. At the same time, Mårten noted that even the established companies on the third floor in part wish to become part of Minc because of the environment and network which the space provides (M. Öbrink, personal communication, January 28, 2016). Every floor has its own little informal network, defined not only by the physical ramifications, but for some companies also by a membership in the incubator or accelerator program of Minc. This begs an obvious question: How are the three levels connected, while at the same time providing appropriate structures for each of the three target groups? This essential question will be answered in the upcoming pages.

The first floor, where all the early stage entrepreneurs and freelancers reside, inhabits the largest of the three informal networks. According to Mårten Öbrink, the floor has room for “more than 70 loosely coupled entrepreneurs” (M. Öbrink, personal communication, January 28, 2016), with members joining and leaving the space all the time. Since the space is not limited to entrepreneurs or freelancers, and residents have backgrounds in a large variety of industries, there is a high degree of professional heterogeneity on the floor. This heterogeneity can be observed both in

regards to profession and professionalism. Similar to the informal network of The Rabbit Hole, this causes the informal network of Minc to inhabit many peripheral experts who are very knowledgeable in their specific field, but connected to only few of the other members within the network. Alexandra Ådahl exemplifies this group of peripheral experts: As a freelance translator, she is fluent in English, Swedish, Danish, and German, and she uses the space primarily as an alternative to her home office (A. Ådahl, personal communication, January 28, 2016). During a casual conversation, Alexandra mentioned that she enjoys the social aspects of working at Minc, but rarely interacts with the same residents more than once.

The second floor, which I earlier found to contain more clearly defined physical boundaries between the teams, houses substantially fewer people than the first floor. This is not only because the amount of square meters per person is higher than on the first floor, but also because Minc wishes to provide the teams with a more stable environment. The second floor can very much be compared to the first floor of the Copenhagen School of Entrepreneurship: The companies on the second floor of the Minc space are much more homogeneous than their first-floor counterparts. They are focused on building and commercialising their product, and enjoy the more defined boundaries between them and the other teams (M. Öbrink, personal communication, January 28, 2016).

The residents of the third floor clearly are the most isolated sub-group within the overall informal network that can be found at Minc. They seldom interact with each other or residents from other floors professionally, but instead maintain strong connections to external networks and specific experts relevant to their field. Most of the residents on this floor do not have a strong intrinsic motivation to build connections with the remainder of the space. The Minc administration, however, wishes to involve these companies in the overall network, in order to encourage knowledge sharing and exchanges between new and established companies (M. Öbrink, personal communication, January 28, 2016). It does so in various ways, which brings us back to the question of how the sub-groups within the network are connected with each other.

Just as in the other coworking spaces I have analysed so far, the administration of the space is of paramount importance for the network to run smoothly. Due to the large amount of turnover on the first floor, it is difficult for the administration to have intimate knowledge of each of the coworkers personal skill set, but since the companies on both the second and third floor change less

often, Mårten and his team are rather aware of their individual competencies. Their roles as central connectors are even supported by the physical setup of the space analysed earlier: Their desks are located right in the centre of the first floor. This forces the members of all floors to walk past them, and allows the residents to easily approach the administration with their questions and concerns. Mårten's extensive experience in the Swedish entrepreneurial scene makes him a perfect fit for the role as both central connector and boundary spanner. It allows him to put the members of the space in touch with each other and even external companies or people.

The administration is, however, not the only entity connecting the different floors with each other. According to Mårten, the administration made a very conscious decision to have many facilities located only on the first floor (M. Öbrink, personal communication, January 28, 2016). The kitchen, eating area, football table, and coffee machine all are placed on the first floor, causing the residents to naturally blend together and having casual conversations across floors. Similarly, the regular events are all held on the stage found on the first floor, inviting all residents to share their knowledge with the other coworkers. Inspired by Actor Network Theory (Law, 2006, 2009a; Mol, 1999, 2002), these physical artefacts could themselves be considered central connectors or information brokers, facilitating many exchanges among the residents of Minc.

As a result, the first and second floor are relatively well connected with each other. Despite the continuous effort, however, the third floor is noticeably less connected, with fewer information brokers connecting the sub-network with the overall informal network (M. Öbrink, personal communication, January 28, 2016).

Typifying the network. On the first floor, members are only loosely coupled, and even though they very much are willing to share information and grow their network, they only know a subset of the other residents. In most cases, the network ties are informal, with no contract or otherwise formal agreement set in place. Hence, the network can be describes as a creativity network "which stresses the indirect linkage, has mainly weak relationships and is loosely coupled" (Harryson, 2008, p. 296). Based on the previous section, I argue that the second floor is exemplary for a transformation network. The companies on this floor interlink the creativity network found on the first floor with external process networks and the process network observed on the third floor. These companies clearly have a stronger focus on exploitation than their first-floor counterparts, but still participate in the common knowledge sharing sessions held on the first

floor. Thus, they contribute and gain from the overall network of the space. The third floor, where the most established companies reside, clearly provides an environment that is well suited for the commercialisation of the inventions, products, or services of its residents. The network observed on this floor is rather closed, and the companies in the network very much rely on their trust and strong network ties, making it inhabit all the characteristics of a process network.

Social Impact Lab

Mapping the network. When asked what his team gained the most from working at the Social Impact Lab, Lennart said:

First of all there were contacts, a lot of them. Especially from the entrepreneurship scene in Hamburg. So a lot of, you know, different contacts that could introduce you to third parties that could provide funds or who could help you gain contacts for some event or something. (L. Beeck, personal communication, January 12, 2016)

This quotation shows the importance of the direct and extended network provided by the Social Impact Lab. We earlier found that the Social Impact Lab supports the networking processes on an organisational level by hosting a variety of networking events. At the same time, we found that the individual teams are very focused on their own projects, primarily working within the boundaries of their desk island. On top of this, the level of professionalism differs tremendously among the teams, many of which have no earlier experiences establishing companies or other organisations. This increases the pressure on the few peripheral experts that can be found in the network. However, as noted by Cross and Prusak (2002), many *peripheral* experts actually enjoy operating on the outer edge of a network, where they do not have to interact with other network members as much. Often, this is due to time constraints, or the fact that they cannot stay up-to-date in their field, when they continuously find themselves in meetings or advisory roles. Similarly, the team surrounding Lennart felt that they did not directly gain much on a professional level by interacting with the other teams (L. Beeck, personal communication, January 12, 2016). On a positive note, however, the other teams proved to be boundary spanners who were able to put the Talented team in touch with external experts:

I would argue [the other teams] were only gateways because they themselves were [not as interesting professionally]. For us they were not that interesting because they weren't active in the areas we actually were operating in. But through them we got in touch with other organisations. We got put in touch with a member of the Hamburg Business Club for example, and the Hamburg business Club is like essential to what we do, because we do a lot of, you know, networking and fund raising there. (L. Beeck, personal communication, January 12, 2016)

Just as observed at the other spaces, the role of the proprietors is of paramount importance for the overall network and its efficiency. Several times throughout his interview, Daniel noted that he still remained in touch with several of the start-ups that have long left the coworking space. He interacts with all the members of the space on a daily basis, and has intimate knowledge of their skills and weaknesses (D. Lippke, personal communication, March 24, 2016). On top of this, the start-ups seem to be held together by a strong common value set that follows the residents from when they first are accepted until they leave the space up to eight months later.

Typifying the network. The fact that the exclusive informal network of the Social Impact Lab is only accessible to a small and defined group of people, and to a large degree is held together by the strong common value set of the members, makes it the most closed network found among the four coworking spaces. At the same time, the very high turnover causes most of the connections among the members to be of a rather weak type, and every batch of start-ups has to start building the network from scratch. Similarly to the network found at The Rabbit Hole, this leaves the network in a somewhat awkward position when it comes to supporting creativity, transformation, or process networks. The start-ups residing at the Social Impact Lab clearly are only in the beginning of their lifecycle, where a lot of exploration seems appropriate. Due to the setup of the Social Impact Lab and the stringent application process which encourages the members to focus on their project, exploration can only happen within the narrow boundaries defined by the initial project. At the same time, the ties within the network are too weak to support exploitation in a meaningful way.

Sub conclusion

In order to understand how the coworkers are connected to each other, I analysed the overall informal networks of all four coworking spaces. At all spaces, the proprietors were found to be of paramount importance for connecting the members with each other. This is not only true for large

spaces, but also for smaller spaces, since proprietors tend to have in-depth knowledge of the individual skill sets of the residents.

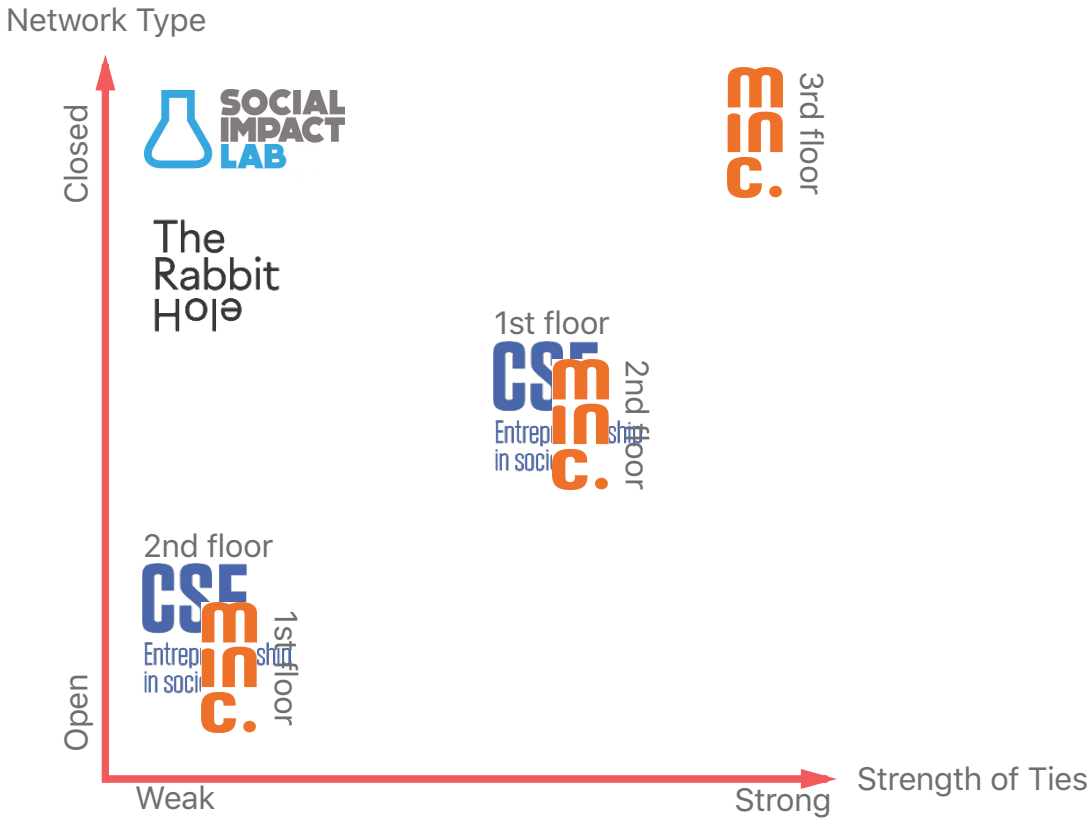

Figure 5. Coworking spaces in two dimensions based on network type and strength of ties.

The analysis also showed that freelancers often can be characterised as peripheral experts, with strong connections to external networks. In coworking spaces that include freelancers, the informal internal networks have a tendency to consist of more weak ties, without promoting exploration. Transformation networks could only be observed at CSE and Minc, where dedicated floor space was provided to companies that need to explore and exploit concurrently, providing access to both creativity and process networks.

How do the coworkers collaborate and co-create?

At this point, we have a deep understanding of the environments and network structures of the coworking spaces. Next, I will investigate *how the coworkers collaborate and co-create* in these milieus, based on my earlier findings. Combined with the first two sections of this analysis, answering this third sub-question will allow me to answer the overarching question of *how*

coworking spaces influence collaborative processes. In accordance with the past two sections, this last section of the analysis investigates the practices at each of the four coworking spaces individually. A consolidation of the results and their implications will be undertaken in the subsequent discussion.

Collaboration and co-creation at The Rabbit Hole

At The Rabbit Hole, having residents work together to achieve common goals has been a driving ambition right from the start. Alice even expressed co-creation theory to guide her actions and perception in regards to the space (A. Bo, personal communication, January 6, 2016). At the same time, she acknowledges that it has been harder than expected to encourage people to work together and profit from each other's professional skill set. In addition, she found that many of the synergies are intangible, and collaboration often happens very spontaneous:

We have found that [encouraging co-creation] is not as easy as we have thought. And then there's all the stuff we cannot measure: People talking in the corners, and people who do not have a permanent collaboration, but instead only help each other out from time to time or put each other in touch with externals. (A. Bo, personal communication, January 6, 2016)

Michael's experience in regards to collaboration at The Rabbit Hole is rather positive:

I think it's nice that like today, where we had a problem, we can just ask if there's someone who can help. There's always someone who is able to help with something. It's good to have people from different industries sitting together and I think it's opening up for more creative ways of thinking about business. (M. C. Hansen, personal communication, January 26, 2016)

Even though they are somewhat different from each other, both Alice and Michael's observations are very much in line with my own experiences at the space. The residents sporadically help each other with minor tasks, and in some cases do contractor work, but new ventures or projects are not built in co-creation within the space. Examples of collaboration, on the other hand, are manifold: Tom, a video producer working at the space, has recently filmed the launch event of Alice and Mads' new company, Luise helped Maya find appropriate funds for her latest photo project, and I was approached by Michael myself, who needed help with his company's homepage. In turn for fixing the website, I could interview him for my research. When asked about

his relationship with the other coworkers at The Rabbit Hole, Michael mentioned another collaboration: " There was one where there was a Belgium guy. We used him to do some pictures and some graphics" (M. C. Hansen, personal communication, January 26, 2016). Again, the collaboration was of a rather temporary and transactional kind. A longer lasting collaboration has been established between Michael's architecture firm and Jeanette, a freelancer also working at The Rabbit Hole. Alice described the collaboration as follows:

Jeanette works with all sorts of advertising and marketing. She's self-employed and has been freelancing for several companies. She was gone for a while, but now she is back working with Kenneth and Michael. […] They were looking for someone who could do some marketing for them, and I told them that they should ask Jeanette, and that's what they did. (A. Bo, personal communication, January 6, 2016)

Michael expressed that he was very excited to have Jeannette help him and Kenneth running a successful marketing campaign. He noted that "[Jeanette] has some skills that both Kenneth and I don't have. We regularly work with her now, and she has been awesome so far" (M. C. Hansen, personal communication, January 26, 2016). Even though the collaboration is of a longer lasting kind, I would very much argue that the interaction should be categorised as a collaboration: It is very transactional in its nature, and Jeanette is more of a consultant than a partner. In fact, all of the collaboration witnessed at The Rabbit Hole have in common that they are rather transactional in their nature, with a clearly distinguishable giving and receiving party. In many cases money is exchanged, and there is only a single interface connecting the collaborators. The informal network's structure with its many loosely coupled ties seems to support this ad-hoc collaboration: The peripheral experts all have valuable expertise which they are happy to make available to the rest of the network, but while the organisational walls of the individual freelancers and entrepreneurs may be permeable, they are never fully teared down.

Collaboration and co-creation at CSE

As we have found earlier, residents at CSE are very much encouraged to help each other. Many of the residents have similar interests, and especially very young companies located on the second floor are very exploration-driven. Start-ups on the space's second floor are exposed to many different people and ideas, some of which might stick, while most of them are quickly forgotten. In

most instances, interactions on both the first and second floor are of a collaborative manner. As we found earlier, peripheral experts are put in touch with residents requiring their respective expertise, and both Henrik and Anders often were on the giving end of the transaction. It is important to note that the majority of the ad-hoc collaboration does not include any monetary dimension. Instead, residents trade favours. As we also found earlier, sharing knowledge for free is deeply ingrained in the culture of the space. Examples of these small and mostly short-lived acts of collaboration are many: MatchMyThesis (matchmythesis.com) was very intrigued by Startuptravels' sign up flow, and the Startuptravels development team gave the neighbouring start-up advice on how to build and structure their own sign up system. Similarly, a fashion start-up residing at CSE was interested in building a web shop, and asked Anders for his expertise.

There is, however, a very important difference between the two floors when it comes to the nature of the residents' collaborative practices: On the second floor, interactions tend to be rather coincidental. Henrik described his first encounter with Anders as follows: "Basically, Anders was just sitting at a table and I came in and hadn't seen him before, so one of us greeted the other" (H. Haugbølle, personal communication, February 9, 2016). Anders described the same situation in the following way: "So I said: 'Welcome, if there is anything I can do for you, let me know.' […] And then we sat down together for lunch, and I explained about my project. Good things happen at lunch" (A. Hasselstrøm, personal communication, January 19, 2016). Both quotations exemplify the somewhat random and highly explorative interactions on the second floor of CSE, and also make it clear how coincidental encounters can create very valuable outcomes. On the first floor, the amount of totally random contacts are less common. On this floor, the residents are somewhat aware of the competences their peers have and target specific teams or persons, if they have questions regarding a certain topic. On top of this, new contacts are introduced by CSE personnel who put coworkers in touch based on their particular skills and requirements. This is very much in line with my earlier study of the space's informal network's structure which can be characterised as a creativity network on the second floor, and a transformation network on the first floor.

When it comes to co-creation, CSE is the space that encourages and enables this specific form of interaction the most when compared to all the spaces researched for this paper. Both Henrik and Anders were founding team members of several companies throughout their time at the CSE, and in all cases, they met their future business partners at the space. Anders started out establishing the

company MyWorkflow together with a couple of other people. The company had its office at the coworking space and taught employees of larger corporations how to increase their productivity. A few weeks later, Henrik joined CSE with his recently established IT consultancy firm Bonzai Development, and had the proclaimed goal of meeting new people (H. Haugbølle, personal communication, February 9, 2016). He quickly found that "there isn't that much to do for a consultant in an incubator space" (H. Haugbølle, personal communication, February 9, 2016), because the residents did not charge each other for their services. He did, however, get involved with Anders' company MyWorkflow. Besides Anders, the team behind MyWorklow consisted of a designer and an industry expert, and soon Henrik was considered a technical co-founder. This is the first example of a co-creational process happening among several individuals and companies, joining forces to build a common service. Henrik started working with the rest of the team just around the time MyWorkflow moved from the second to the first floor of the space. Several months later, Anders approached Henrik with a new idea: "Anders had been traveling, […] and he got the idea of Startuptravels. Then we started talking about it and we got more and more involved in that project instead of MyWorkflow" (H. Haugbølle, personal communication, February 9, 2016). After another couple of weeks, the new company was established together with a third founder, who had been working for a major consultancy firm until then (A. Hasselstrøm, personal communication, January 19, 2016). The team worked together for about half a year, before Henrik decided to leave the start-up due to low growth numbers (H. Haugbølle, personal communication, February 9, 2016). Only a couple of weeks later, however, Henrik was back at CSE, developing a new booking platform for skiing schools together with the company Snowminds, who had established itself as a trusted ski instructor school in Scandinavia. The company had been sitting on the opposite wall of Startuptravels, and again, Henrik was brought in as a technical co-founder.

By now, it should be obvious that there is a high degree of joint experimentation and co-creation happening at the space. After being introduced to a large and random group of people on the second floor, residents at CSE use the knowledge of who-knows-what to co-create and run businesses on the first floor. Both the highly explorative processes engrained in the culture of the space, and the establishment of more stable and strong ties among the members are of paramount importance for the residents' collaborative practices. The transformative nature of the first floor's informal network has tremendous impact on the start-ups, since it allows them to be selectively

explorative while commercialising their service or product. Several persons with distinctive professional skill sets work together to jointly create something new, in a non-hierarchical, and non-transactional way.

Collaboration and co-creation at Minc

Based on the prior environmental and network analysis of Minc, it should be clear that the collaborative and co-creational processes at the space vary a lot depending on the floor. Only about 2% of the first floor's residents ever move on to the second floor (M. Öbrink, personal communication, January 28, 2016). This is rather different to CSE, where it is common for companies to change floor after only a couple of months. This does, however, not come as a surprise: When compared with CSE, Minc has a rather different target group that entails many more freelancers who do not naturally experience the growth in team size, nor the need for larger office space that would justify a dedicated office. The two spaces do, however, also have a lot in common. In particular, both spaces provide physically separated areas that cater the needs of their respective residents very well.

Alexandra Ådahl, who has a flex-desk on Minc's first floor, explained to me how she had had a casual conversation with a previously unknown coworker at the coffee machine. The coworker turned out to be a freelancing web developer. Since she was in need for a website herself, they started talking business and the developer set up a site for her (A. Ådahl, personal communication, January 28, 2016). Analogously, Alexandra mentioned that she has helped a substantial amount of the coworkers translate their marketing material from Swedish to Danish, English, German, and vice versa. All the contacts were made in the space's common area or at events (A. Ådahl, personal communication, January 28, 2016). Mårten Öbrink confirmed that this type of collaboration is very common at the space (M. Öbrink, personal communication, January 28, 2016). Again, it is important to note that these interactions are of a rather temporary and transactional kind, and do not represent co-creational practices observed at other spaces. While co-creation most likely does happen at Minc, it is not as commonly observed as at CSE. The reasons for this will be considered at length in the discussion section of this paper, but the high amount of freelancers studied earlier is a major factor.

The second floor, on which companies which are part of Minc's incubator program reside, strikes a balance between exploration and exploitation in a way that is similar to the one observable

on CSE's first floor: The start-ups work right next to other teams with diverse and professional skill sets. The coworking space administration are very well aware of the companies' focus areas, and competencies, which allows them to put the companies in touch with first floor's residents, or each other. Again, this practice is very similar to the one observed at CSE. It allows the companies of Minc's second floor to leverage the strong social ties of the transformation network, and to turn their invention into a commercially viable innovation. On the third floor, where exploitation is very much encouraged and isolated office space is at the heart the floor's conceptual setup, neither collaboration nor co-creation with the rest of the space seems to thrive. As I found during the categorisation of the third floor's environment, it might even be arguable whether the floor fulfils the criteria of being a traditional coworking space. While it does seem likely that the companies have strong ties to networks outside the space, analysing these connections would be outside this paper's realm.

Collaboration and co-creation at the Social Impact Lab

Earlier I found that the Social Impact Lab's strict rules about the length of memberships have tremendous impacts on the networking as well as the cultural and social aspects of the space. Most importantly, the member organisations are exposed to a vast amount of new contacts as soon as they join the space. That being said, my network analysis showed that the teams are relatively isolated and only interact with each other sparingly. Since start-ups join the space in batches, all members arrive and leave together. This creates a unique potential for networking, but highly limits the timeframe of potential collaboration or co-creation. On top of this, the space is characterised by a high degree of professional heterogeneity. This seems to diminish the potential of co-creational practices even more, and limits interactions to temporary collaboration. Examples of these short-term acts of collaboration, again, are manifold: The teams help each other designing flyers, setting up CRM systems, and running social media campaigns. Daniel recalled how the former Impact Lab member Sofa Concerts (https://www.sofaconcerts.org) was booked for several of the other start-ups' events, and how one company advertised their app in another start-up's portable and eco-friendly toilets (D. Lippke, personal communication, March 24, 2016). Lennart described his team's motivation for helping the other residents as follows:

We were still trying to contribute to the whole [community], because we thought that they might have a contact or give us ideas that we might not be aware of [ourselves]. We actually provided them with help with everything from layouting and database setups, to information technology, to you name it. Project management for example. So [even though] we didn't see sufficient [immediate professional or personal] gain from it, we still tried to contribute to the whole process. It might trigger new ideas and it might be fun. (L. Beeck, personal communication, January 12, 2016)

Later in the interview, Lennart added: "There were two highly different standards of operating or standard operating procedures" (L. Beeck, personal communication, January 12, 2016). Both quotations makes it obvious that the interactions among the different teams are limited by their varying professional expertise and focus areas. On top of being short lived, the interactions have a distinct giving and receiving part, making them very transactional in their nature. It is, however, important to note that no money is exchanged at the space. Instead, the residents trade favours in a way that is comparable to the practices observed at CSE and Minc. When asked whether the Talented team ever paid for another team's services, Lennart replied: "No, because the other firms and the other organisations ask us for favours as well. So it's a give and take: You give something, you take something" (L. Beeck, personal communication, January 12, 2016).

To sum up, the Social Impact Lab's particular environment and network structure only encourages very basic forms of collaboration. The time constraints, professional heterogeneity, and the teams' rather isolated sub-networks within the larger informal network makes the residents focus on their own projects. All of this contributes to an environment which prohibits interactions that goes beyond anything but minor acts of collaboration.

Sub conclusion

My analysis showed that only entrepreneurs at CSE engaged in truly co-creational practices. The existence of both a creativity and transformation network, combined with the residents' strong hunger for entrepreneurship, fosters co-creational projects and lets the members work together on a large variety of projects. The other spaces stimulate varying degrees of collaboration: Members are very happy to help each other solving small tasks, and sharing information. Only among freelancers

is money exchanged during these acts of collaboration. At spaces housing a majority of entrepreneurs, trading favours is preferred over monetary exchanges.

	Type(s)	Well Supported Networks	Interaction Type
The Rabbit Hole	Unoffice	None	Formal and informal collaboration
CSE	Federated Workspace	1st floor: Transformation Network 2nd floor: Creativity Network	Informal collaboration and co-creation
Social Impact Lab	Unoffice	None	Informal collaboration
Minc	1st floor: Federated Workspace 2nd floor: Unoffice	1st floor: Creativity Network 2nd floor: Transformation Network 3rd floor: Process Network	Formal and informal collaboration

Table 2. Coworking spaces and their corresponding types, well supported networks, and common interaction types.

Discussion

We now understand the environments, networks, and collaborative practices that can be observed in the spaces. In the following section, I will discuss these findings in a broader theoretical context and outline how spaces should be set up in order to encourage co-creation among their members. I will end the section by discussing the implications of my findings on future research, theory, and practice.

The influence of coworking spaces on collaborative processes

The analysis leaves no doubt that coworking spaces in their various forms have tremendous impacts on the ways in which entrepreneurs and freelancers of the 21st century conduct business. They mitigate most of the downsides of working alone and allow their coworkers to establish valuable personal and professional networks. At all the spaces studied in this research paper, coworkers exchange information and collaborate on a regular basis. Sawhney and Prandelli's (2000) concept of ba thrives, and the collaboration among people and organisations would not commonly have come into existence outside of the coworking space environment. At the same time, I found that the spaces are very different to each other in a variety of ways. Based on the definitions of space proprietors, Spinuzzi (2012) divides the spaces in the categories of community work spaces,

unoffices, and federated workspaces. I found these categories to only have limited explanatory value in my analysis, and I therefore argue that they do not capture the full complexity of the spaces and the collaborative practices that can be observed in them. For instance, both The Rabbit Hole and the Social Impact Lab were found to be unoffices, which according to Spinuzzi (2012) provide an office-like environment with loosely coupled coworkers. Based on my analysis, however, it is obvious that the spaces only share a few similarities and differ in at least two fundamental ways: (1) their size and (2) their degree of systematisation. These differences have tremendous implications for the networks and interactions that can be observed. At the same time, all of the spaces' proprietors expressed their desire for a high degree of collaboration and co-creation among their coworkers, which is what differentiates community work spaces, unoffices, and federated work spaces.

Based on my analysis and the relevant dimensions presented by Peschl and Fundneider (2014), I suggest a new categorisation of the coworking spaces based on the following dimensions: (1) Access requirements, (2) physical separation of sub-groups, (3) average length of membership, (4) size, and (5) degree of systematisation. These five dimensions are not only found to have tremendous impacts on the working environments provided by the spaces, but they also describe the networks that can be found in them: All five dimensions influence the structure, openness, managerial hierarchy, strength of ties, and size of the network. These network characteristics were found to be essential for describing networks according to for example Cross and Prusak (2002) and Powell and Grondal (2005), and they later guided the creation of Harryson (2008) framework.

The collaborative processes taking place within the spaces highly depend on the networks provided by the spaces. On a basic level, all spaces allow for a profound amount of networking among their members, simply due to the fact that residents sit next to each other and share a common space. The resulting networks are, however, very different to each other depending on the space's dimensions mentioned in the above: Creativity networks allow their members to explore a vast amount of ideas together with the ever changing group of other members within the space. Process networks allow their members to fully exploit the commercial potential of their innovation, but are seldom found in coworking spaces. Finally, transformation networks allow their members to combine the power of creativity and process networks.

The importance of *access requirements* cannot be stressed enough: In particular, spaces that provide access to freelancers are rather different to those spaces that do not. As was made clear by my network analysis, freelancers tend to have many strong external network ties to clients, partners, and other stakeholders, but they are not as interested in pursuing a strong network in the coworking space as their entrepreneurial counterparts. Counter-intuitively, my analysis revealed that targeting a certain industry does not necessarily increase the amount of co-creation in a coworking space: In the Social Impact Lab, the residents share a common interest in social entrepreneurship, and there are no freelancers. Still, the amount of joint projects is low.

Based on the analysis of the space, it seems that the main factor preventing closer cooperation among the members is their difference in professionalism. This is potentially conflicting with the findings of Schürmann (2013) who found heterogeneity to be a major upside of working at a coworking space: According to Schürmann (2013), a heterogeneous and inspiring community motivates the coworkers to develop common ideas and to support each other with experience, information, and feedback (Schürmann, 2013, p. 56). Similarly, Spinuzzi (2012) found that both coworkers and space proprietors see heterogeneity as a defining factor of coworking spaces. He did, however, also find that many coworkers defined coworking "in terms of working with people like themselves" (Spinuzzi, 2012, p. 418). My analysis shows that the statements are not mutually exclusive: While I do agree with Spinuzzi (2012) that heterogeneity in skill sets is very beneficial, my analysis makes it obvious that in order for the heterogeneity to result in meaningful and longstanding cooperation, the coworking space residents need to have a common ground. Examples of the lacking common professional ground were plenty in my analysis: Lennart's team was able to guide other start-ups at the Social Impact Lab in their design processes, but their lack of common ground on a professional level made the collaboration less interesting for Lennart and his colleagues. Similarly, Henrik and Anders often paused their current work in order to help out less experienced coworkers, but they only ended up building new projects with people that were on a professional level comparable to their own. Interestingly, both Henrik and Lennart now share private offices with other small companies, all of which are diverse in terms of skills but professionally homogeneous.

At spaces that *physically separate* their members who are at different stages in their organisational life cycle (by assigning them to different areas), residents seem to gain particular

much value from the overall network that is provided by the space: These spaces are able to provide companies with access to the various network types, allowing the organisations to combine and utilise the benefits that each type may provide. Obviously, a separation into different areas requires the space to be of a certain *size*, which in itself is a governing factor of the network. As I found earlier, an immediate and obvious difference between The Rabbit Hole and Minc is the sheer physical difference in space available to the coworkers. This important characteristic goes hand in hand with the average length of membership: A large coworking space with a high degree of turnover creates a rather dynamic environment (as observed at Minc), while a smaller space with low turnover results in a very homely atmosphere (as observed at The Rabbit Hole).

Lastly, the degree of *systematisation* also has substantial influence on the spaces' environments. As I found in each section of the analysis, the space owners are of paramount importance for shaping the network, culture, and collaborative processes at their respective spaces. The degree of systematisation at the space very much depends on their active engagement, and their role is similar to the role of *sponsors* in a community of of creation, as described by Sawhney and Prandelli (2002). It is the sponsor, who defines the rules of the overall organisation, and who governs the interactions among all members of the network. While most spaces allow their members to use their facilities for community events, it tends to be the space owner who plans most of the events, schedules check-up meetings, and, most importantly, puts the unconnected members in touch with each other. It is also the space owner who determines access requirements, target groups, potential length of membership, etc.

Spaces with little systematisation, meaning no obligatory events, rules, mentoring, or networking sessions, allow the members to focus more on their own projects, instead of meeting other people. On the opposite end of the spectrum, spaces with a high degree of systematisation tend to influence collaborative processes in a positive manner, encouraging members to meet, and share ideas and knowledge.

How to encourage co-creation

As was made apparent by the analysis, all space owners interviewed during my research proclaimed their wish for extensive collaboration and co-creation among the residents of their respective coworking spaces. Similarly, coworkers see the potential for not only short-term collaboration, but also long lasting co-creational ventures.

On top of both coworking space proprietors and residents, academia has experienced an indisputable trend in the field of co-creation. With all parties being strong proponents of co-creation, how come that co-creation is common in only one out of the four spaces studied for this paper? What makes the Copenhagen School of Entrepreneurship so different to its competitors? Going back to the five characteristics presented in the previous section, I argue that CSE's success in encouraging co-creation can be traced back to its unique combination of the five dimensions. It (1) has access requirements that target student entrepreneurs and ensure professional homogeneity, (2) provides physically separated floors to companies at different stages, (3) has a constant turnover of members, but is flexible when it comes to membership length, (4) is large enough to let its members be truly explorative in the space, and (5) has a high degree of systematisation that enables effective networking and cooperation processes. It is this combination of characteristics that fosters the very co-creation friendly environment found at CSE.

It is made apparent that some sort of homogeneity seems to be required in order for co-creation to become viable in a network. An explanation for this may be found in Cross and Prusak's earlier discussed description of peripheral specialists whose time and resources are limited. They found that "integrating peripheral specialists may distract them from staying ahead in their fields; they can't stay on top of what they want to do if they are forced to sit on committees" (Cross & Prusak, 2002, p. 111). In the context of coworking spaces, committees may be less of a concern, but continuously being asked questions by less knowledgeable peers can have the same effect. Professional homogeneity may decrease the amount of unnecessary interruptions and increase the perceived value of interactions, collaboration, and co-creation.

Proof for professional homogeneity being a high concern for coworkers can be identified in the actions of Henrik, Anders, and Lennart: As mentioned previously, both Henrik and Lennart now primarily work in private offices that they share with a handful of companies from different industries. In both offices, the companies not only use each other's competencies in a collaborative manner, but also join forces on non-temporary projects, co-creating entirely new services or products. In a similar fashion, when asked about the characteristics of his favourite coworking space (located in San Francisco), Anders answered "First of all the level of the competence. When these guys talk you know that they know what they talk about" (A. Hasselstrøm, personal communication, January 19, 2016).

The separation of its members across two floors, with early entrepreneurs on the second floor, and more established companies on the first floor, also benefits CSE tremendously. It mitigates the issues of varying professionalism across companies of different stages, and allows new network ties to be established in dedicated areas. More settled companies working on the space's first floor may tap into the creativity network, in order to start co-creating new ventures with previously unknown parties. This is why co-creation flourishes in the transformation network that can be found on CSE's first floor.

The rather large size of CSE, combined with a relatively high turnover of members, ensures a constant and sizeable flow of new members joining, and previous members leaving the space. This exposes the space's network to new knowledge, information, and competences, building a strong creativity network for the transformation network to tap in to. Lastly, the high degree of systematisation, personified in Martin B. Justesen, guarantees the network to make full use of its potential: Interactions among all network members is actively encouraged, and allows even new members to be put in touch with the right potential partners. For more established companies at the space, this also means that they can rely on the proprietor to establish meaningful contacts, and do not have to waste valuable time building unprofitable new network ties.

Controversially, the characteristics required for co-creation to flourish might not be in line with a coworking space's best commercial interest: Strict access requirements, a high turnover of members, and favouring explorative companies that might not be very profitable, may potentially decrease the profit generated by these spaces. A financial analysis of the spaces involved in this study is clearly beyond the realm of my paper, but some important conclusions can be drawn from this observation nonetheless: Spaces owned by public institutions, accelerators, and incubators, may be the best contestants when it comes to encouraging co-creation, since their immediate value tends to not be derived by renting out desk space.

Conclusion

This paper examined how coworking spaces influence collaborative processes. It did so by (1) exploring the environments that coworking spaces provide, (2) investigating how coworkers are connected with each other, and (3) analysing how the residents of coworking spaces collaborate and co-create. In order to answer my research question, I investigated four different coworking spaces in three different countries and interviewed a variety of both coworking space proprietors and

residents. The environmental analysis, guided primarily by Spinuzzi (2012) and Peschl and Fundneider (2014), uncovered the differences and similarities of the coworking spaces on organisational, cultural, and physical dimensions. I found that all of the coworking spaces create environments that enable at least basic forms of interaction and collaboration. In line with Spinuzzi's (2012) research, I found that some spaces encourage collaboration and co-creation more than others. I did, however, find that Spinuzzi's proposed categories were rather limiting: Some spaces inhabited characteristics of two, or even three, of the proposed categories. This was especially true for spaces that physically separated their residents based on their organisational life cycle stages. When assessing the likelihood that collaboration and co-creation is realised, the degree to which space proprietors actively encouraged collaboration and co-creation was definitely not the only relevant dimension. Instead, I identified five dimensions that substantially differentiate the coworking spaces from each other: (1) Access requirements, (2) physical separation of sub-groups, (3) average length of membership, (4) size, and (5) degree of systematisation. Depending on the spaces' individual compositions of these organisational, cultural, and physical dimensions, some spaces encouraged a more explorative environment, while others created surroundings that allowed residents to fully focus on exploiting the commercial potential of their service or product.

The five dimensions had tremendous influences on the acts of collaboration and networks that could be observed at the spaces: At coworking spaces with *access requirements* that favoured a large proportion of freelancers, networks with primarily weak links could be observed. Transformation networks could only be observed in two of the four coworking spaces. These two spaces were also the only spaces that *physically separated sub-groups* depending on their organisational needs, hence encouraging the development of two or more different network types (creativity networks, transformation networks, or process networks). In my analysis of the spaces, I also found that the spaces' *sizes* and rather short *average membership lengths* were positively correlated to the existence and diversity of creativity networks. By mapping the networks using the framework provided by Cross and Prusak (2002), it became apparent that all of the spaces' proprietors to varying degrees were functioning as central connectors and had in-depth knowledge of the respective residents' competences. They were particularly helpful when connecting peripheral experts (often freelancers) with other network members, increasing the degree of *systematic* network management.

I found that only CSE consistently spurred co-creation. At the other spaces, temporary collaboration were much more common. At coworking spaces with a high proportion of entrepreneurs, the coworkers tended to help each other pro bono. At The Rabbit Hole and Minc, both of which had a high proportion of freelancers, monetary transactions were common among the members. The fact that co-creation could only be observed in one out of four spaces was particularly interesting, since all proprietors interviewed expressed a desire to increase co-creation. In order to increase the degree of co-creation, I found that proprietors need to be aware of all five dimensions identified earlier. In order for co-creation to truly thrive, a coworking space should (1) put in place access requirements that target entrepreneurs and ensure professional homogeneity, (2) provide physically separated areas for companies in different life cycle stages, (3) limit the length of a membership in order to ensure a constant flow of new expertise and ideas, (4) be large enough to let its members be truly explorative, and (5) have a high degree of systematisation. These characteristics may be especially well suited for public non-profit spaces, such as CSE or Minc. Traditional coworking spaces, on the other hand, may find that the characteristics are incompatible with the spaces' business models.

Implications for research

This case study has profound implications for the very new academic field surrounding coworking spaces. Spinuzzi's (2012) overall categorisation of coworking spaces based on the space proprietors' and residents' definitions still has tremendous value for understanding the desired outcome of working in a coworking environment. However, my research shows that they do not capture the complex reality of the coworking spaces studied for this paper. On top of this, my research made it clear that the desired outcome not necessarily reflects the reality that can be observed. Despite the rather different unit of analysis, in general, my observations were very much in line with Harryson's (2008) findings. The needs of the coworking space residents changed drastically depending on their organisational stage, and the transformation networks identified in two of the four spaces helped ease the tension between the need for exploration and exploitation. My research may contribute to the framework provided by Harryson (2008), by studying how different physical, cultural, and organisational environments may contribute to establishing the different network types.

Implications for practice

For practitioners, namely coworking space proprietors, my study may be of particular interest: Since all the proprietors expressed a wish for increased co-creation, understanding the relevant five dimensions identified in this study might help them achieve this goal. The study might also make some proprietors find that the adjustments needed in order to increase co-creational practices at their spaces do not fit their respective individual business models. Freelancers, entrepreneurs, and start-ups working at coworking spaces might also find this study to be of high interest, helping them assess which office type or coworking space fulfils their individual needs the best.

Limitations and future research

Despite the fact that this paper builds on a sound theoretical framework, and the four cases studied were chosen in order to ensure diversity, investigating additional cases would strengthen the generalisability of the five dimensions proposed in this paper. Additionally, a mixed method approach would have increased the validity and reliability of the study even more. Hence, a quantitative study investigating the effects of the five dimensions on a large scale would be of high value. Similarly, my study was a cross-sectional and did not follow the residents or spaces for an extended amount of time. Future research might investigate how the requirements of residents change throughout their membership, and how coworking spaces undergo change over time. Also, in order to fully understand how environments encourage collaboration and co-creation outside of the coworking space sphere, a framework with more universally applicable dimensions may be developed. This would be of high interest and bring forward the concept of enabling spaces proposed by Peschl and Fundneider (2014).

Acknowledgements

I would like to thank all the people involved in making this paper a reality. In particular, I would like to thank the coworking space residents and owners who were willing to answer all of my questions. Your inputs were tremendously helpful and form the backbone of my study. Thank you Josephine for your inexhaustible support and love. Thank you friends and family for your help and kindness. Thank you Sigvald for guiding me in my research and writing process. Thank you to all the giants on whose shoulders I stand.

References

Briggs, A. & Burke, P. (2010). *Social History of the Media: From Gutenberg to the Internet.* John Wiley & Sons

Brynjolfsson, E. & Hitt, L. (1996). *Paradox Lost? Firm-Level Evidence on the Returns of Information Systems Spending.* Management Science/Vol. 42

Burton-Jones, A. (2001). *Knowledge capitalism*. New York, NY: Oxford University Press.

Bo, A. (2015). *Alice Bo Killemose | LinkedIn.* Retrieved January 21, 2016, from https://www.linkedin.com/in/alicebokillemose

Castells, M. (2003). *The Internet galaxy*. New York, NY: Oxford University Press.

CBS (2015). *Copenhagen School of Entrepreneurship.* Retrieved January 12, 2016, from http://www.cbs.dk/en/knowledge-society/business-in-society/education/copenhagen-school-of-entrepreneurship

Computer History (2016). *Timeline of Computer History.* Retrieved March 5, 2016, from http://www.computerhistory.org/timeline/1944/

CSE (2016). *How to join CSE – The Proof Program*. Retrieved January 12, 2016, from http://cse.cbs.dk/student-entrepreneurs/how-to-join-cse-the-proof-proces/

Chesbrough, H. W. (2003). *The Era of Open Innovation*. MIT Sloan Management Review

Cross, R. & Prusak, L. (2002). *The People Who Make Organizations Go - or Stop.* Harvard Business Review

Dahlander, L. & Gann, D. M. (2010). *How open is innovation?* Research Policy 39 (6)

Emerson, R., Fretz, R. & Shaw, L. (1995). *Writing Ethnographic Fieldnotes.* The University of Chicago Press

Flyvbjerg, B. (2006). *Five misunderstandings About Case-Study Research*. Sage Publications

Foertsch, C. (2015). *First Results Of The New Global Coworking Survey*. Deskmag. Retrieved from http://www.deskmag.com/en/first-results-of-the-new-global-coworking-survey-2015-16/2 on 08.01.2016.

Franke, N., Poetz, M. K., Schreier, M. 2014. *Integrating problem solvers from analogous markets in new product ideation*. Management Science, 60 (4)

Hansen, M. T., Nohria, N. & Tierney T. (1999). *What's your strategy for managing knowledge?* Harvard Business Review

Harryson, S. J. (2008). *Entrepreneurship through relationships – navigating from creativity to commercialisation*. R&D Management 38. Blackwell Publishing Ltd.

Isenberg, D. J. (2008). *The Global Entrepreneur.* Harvard Business Review

Keohane, R. O. & Nye, J. S. Jr. (2000). *Globalization: What's new? What's not? (And so what?).* Foreign Policy

Laursen, K. & Salter, A.J. (2006). *Open for Innovation: The role of openness in explaining innovative performance among UK manufacturing firms*. Strategic Management Journal 27 (2)

Law, J. (2006). *After method: Mess in the social science research*. London: Routledge.

Law, J. (2009a). *Actor network theory and material semiotics*. In B. S. Turner (Ed.), New Blackwell companion to social theory (pp. 141—158). Oxford: Blackwell.

Lumley, R. M. (2014). *A Coworking Project in the Campus Library: Supporting and Modeling Entrepreneurial Activity in the Academic Library.* Routledge Taylor & Francis Group

Malone, T. W. (2004). *The future of work*. Boston, MA: Harvard Business School Press.

Magnani, L. (2002). *An Abductive Theory of Scientific Reasoning*. Springer US

Minc (2016a). *Minc Incubator*. Retrieved from http://www.minc.se/incubator on 23.02.2016

Minc (2016b). *This is Minc Workspace*. Retrieved from http://www.minc.se/workspace on 23.02.2016

Mol, A. (1999). *Ontological politics: A words and some questions*. In J. Law & J. Hassard (Eds.), Actor network theory and after (pp. 74—89). Oxford: Blackwell.

Mol, A. (2002). *The body multiple: Ontology in medical practice*. Durham, NC: Duke University Press.

Neuberg, B. (2015). *The Start of Coworking (from the Guy that Started It)*. Coding in Paradise. Retrieved from http://codinginparadise.org/ebooks/html/blog/start_of_coworking.html on 06.01.2016.

Peschl, M. F. & Fundneider, T. (2014) *Designing and Enabling Spaces for collaborative knowledge creation and innovation: From managing to enabling innovation as socio-epistemological technology.* Computers in Human Behaviour

Pohler, N. (2012). *Neue Arbeitsräume für neue Arbeitsformen: Coworking Spaces [New work environments for new work forms]*. Österreich Z Soziol

Powell, W.W. & Grondal, S. (2005). *Networks of innovators*. In Fagerberg, J., Mowery, D.C. and Nelson, R.R. (eds.), *The Oxford Handbook of Innovation*. Oxford: Oxford University Press

Powell, W.W., Koput, K.W. & Smith-Doerr, L. (1996). *Interorganizational collaboration and the locus of innovation: networks of learning in biotechnology*. Administrative Science Quarterly, 41

Prahald, C. K. & Ramaswamy, V. (2000). *Co-opting Customer Competence.* Harvard Business Review

Prototype (2015). *Prototype.* Retrieved January 9, 2016, from https://prototype.land

Rossi, W. (February 3, 2016). *Journaling after Lunch, https://www.facebook.com/events/ 172982126403921/*

Sawhney, M. & Prandelli, E. (2000). *Communities of Creation: Managing Innovation in Turbulent Markets.* California Management Review

Sawhney, M. (2001). *Don't homogenize, synchronize*. Harvard Business Review, 79, 7

Schilling, M. (2013). *Strategic Management of Technological Innovation.* McGraw-Hill Higher Education, 4thedition

Schürmann, M. (2013). *Coworking Space - Geschäftsmodell für Entrepreneure und Wissensarbeiter [Coworking Space - Business Model for Entrepreneurs and Knowledge Workers].* Springer Gabler

Social Impact Lab (2016). *Heimat für Sozialunternehmen*. Retrieved from http://hamburg.socialimpactlab.eu on 05.03.2016.

Spinuzzi, C. (2012). *Working Alone Together: Coworking as Emergent Collaborative Activity.* SAGE

Staunæs, D. & Søndergaard, D.M. (2005). *Interview i en Tangotid*. Hans Reitzel

The Coworking Wiki (2016). *Our Values*. Retrieved March 15, 2016, from http://wiki.coworking.org/w/page/16583831/FrontPage

The Economist (2011). *The Rise of Coworking - Setting the desk jockeys free*. Retrieved from http://www.economist.com/node/21542190?fsrc=scn/fb/wl/ar/anotheralternativetotheoffice on 06.01.2016.

The Rabbit Hole (2016). *The Rabbit Hole.* Retrieved January 12, 2016, from http://therabbithole.dk

The Rabbit Hole Network (2016). *The Rabbit Hole Network*. Retrieved April 19, 2016, from https://www.facebook.com/groups/610666192317009/

Toffler, A. (1980). *The third wave*. New York, NY: Bantam Books.

U.S. Census Bureau. (2015). *Nonemployer Statistics*. Retrieved January 9, 2016, from http://censtats.census.gov/cgi-bin/nonemployer/nonsect.pl

Varian, H. R. (2010). *Computer Mediated Transactions.* American Economic Review

von Hippel, E. (1988). *Sources of Innovation*. Oxford University Press

Öbrink, M. (2016). *Mårten Öbrink | Linkedin*. Retrieved February 6, 2016, from https://se.linkedin.com/in/martenobrin

Appendix

Appendix 1: Overview of selected coworking spaces in Copenhagen

Space	Price range	Access	Target Audience	Size (m2)	Members
Republikken	Flex desk: DKK 1.875 Fixed desk: DKK 3.090 Private office: > DKK 4.500	Open for all	Not specified	1.500	125
CSE	Free	Only students	Entrepreneurs and early stage start-ups	2.000	250
Founders House	Not specified (non-profit)	Invite only	Tech start-ups	750	80
Rocket Labs	Flex desk: DKK 1.500	Open for all	Tech entrepreneurs and start-ups	1.500	100
Rainmaking Loft	Flex desk: DKK 1.950 Fixed desk: DKK 2.450 Private office: DKK 15.000	Open for all	Entrepreneurs	3.000	320
SOHO	Flex desk: DKK 1.500 Fixed desk: DKK 3.500 Private office: DKK 4.000 p.p	Open for all	Freelancers, start-ups and small companies	7.000	400
The Rabbit Hole	3 days/week: DKK 800 Full time: DKK 1.200-1.500	Open for all	Freelancers	100	25

Appendix 2: Interviewguide for coworking space members

- **Introduction**
  - Thank you
  - What do I do here?
- **Background**
  - Can you tell me a little bit about yourself?
  - What do you do here at the coworking space?
    - What are you working on?
    - Skill set
  - How many employees does your organisation have?
  - Do you normally work on your own?
- **Coworking Spaces**
  - Have you worked in other coworking spaces or is this your first?
  - How did you get in here?
    - Why did you choose it in the first place?
    - Is it open for anyone or are there limitations?
    - How important was the price for you?
  - How often are you here?
  - Why do you come here?
  - How would you define a coworking space?
  - Is there something particular, you like at this place?
  - Are there any facilities, which you find to be very important?
    - Meeting rooms, good kitchen, work bench, etc.
  - Do you prefer larger or smaller spaces?
  - What alternative work places do you have?
    - Why did you choose a coworking space as your base?

    - How come you don’t want to work from home or a café?
  - Innovation
    - How does sitting here at the coworking space change the way you work?
- **Collaboration / Open Innovation**
  - Do you prefer a quiet working atmosphere or is it fine with people talking?
  - Do you know many of the people around your coworking space?
  - Have you ever been approached by someone, who asked you for help because of your particular skills?
    - How often does this happen?
  - Have you every asked someone for help? Why?
    - How often does this happen?
  - What are the people here good at?
  - Have you ever asked other’s for help?
    - Maybe they reviewed something you made?
  - Have you ever worked on projects with other people, who you met at coworking spaces?
    - If yes
      - Can you tell me more about these projects? How did the collaboration come up?
      - How did it end? Are you back to normal now?
    - If no
      - Could you see yourself working on projects with the other people here?
        - Do you have time to do that?
  - Do you know of anybody else, who was involved in such a collaboration?
  - Do you participate in any events organised by the coworking space?

Appendix 3: Interviewguide for coworking space proprietors

- **Introduction**
  - Thank you
  - What do I do here?
- **Background**
  - Can you tell me a little bit about yourself?
  - What do you do here at the coworking space?
    - How long have you been here?
    - Were you part of the team who started the space?
  - How large is your team?
- **Coworking Spaces**
  - Have you worked in many other coworking spaces before starting this one?
  - What made you decide to start your own coworking space?
  - From your point of view, what makes this space special?
  - What does coworking mean to you?
  - Can anyone join the space?
  - How long do people tend to stay here?
    - A couple of weeks, months or years?
  - What do you want to achieve with your space?
    - What do you do to achieve this?
  - Can you tell me a little bit about how the coworking space is designed?
    - What kind of things did you consider in designing the place?
  - Innovation
    - How would you describe the work environment around here?
- **Collaboration / Open Innovation**
  - Do you prefer a quiet working atmosphere or is it fine with people talking?
  - What are the people here good at?
    - What do they do?
    - Do you do anything to attract a special type of person?
  - Do you know how much your members interact with each other?

- How would you describe the relationship between the members?
- Do members ever approach you and ask if you know someone with a particular skill set?
  - Do you connect people with each other?
- Do you ever ask people from the space for help yourself?
  - Maybe they reviewed something you made?
- Do you organise any events here at the coworking space?
  - How often?
  - Which kind?
- Have you ever worked on projects with other people, who you met at coworking spaces?
  - If yes
    - Can you tell me more about these projects? How did the collaboration come up?
    - How did it end? Are you back to normal now?
  - If no
    - Could you see yourself working on projects with the other people here?
      - Do you have time to do that?