Title of the thesis	**Work of people and the role of space in it: a research study of preferred spatial characteristics in a coworking space.**
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Chapter 1: Introduction

People have always worked, and they have always needed a place to accommodate their work activities. Since the beginning of human, history when manual work was prevalent, the nature of work changed gradually with the development of technological progress and spread of industrialization in the 18th and the 19th centuries. Moreover, globalization processes and particularly the development of Information and Communication Technologies (ICTs) in the 20th century influenced the types of work people were doing even more: new professions appeared, work tasks were no longer bound to one location, and the speed of change gained momentum. The changing nature of work called for new types of places to accommodate it.

1.1. Background of the topic

The thesis is concerned with studying the changing nature of work and a particular place that accommodates it – a coworking space. Although the first coworking space was officially opened in 2005, there were other earlier examples of places where people gathered together and worked on projects. For example, hacker places in the 1990s or artist ateliers in the beginning of the 20th century.[1] The starting point of the history of coworking spaces depends on the applied approach (and this thesis will make its own argument about the history of coworking spaces in the last chapter). Despite the various views in the search of routes of the phenomenon of coworking spaces, there seems to be a common agreement amongst academics about the new features of coworking spaces in the modern context. The combination of the two radically new elements differentiates a coworking space from any other shared work environment: first, the types of tenants that inhabit these spaces (individual entrepreneurs and freelancers), and second, the types of short-term contracts

[1] For hacker places see: Teodora Iulia Constantinescu & Oswald Devisch, "Portraits of work: mapping emerging coworking dynamics," *Information, Communication & Society* 21, no. 9 (2018): 1265, https://doi.org/10.1080/1369118X.2018.1459775; for artist ateliers see: Tadashi Uda, "What is Coworking? : A Theoretical Study on the Concept of Coworking" (Discussion Paper, Series A, 265, Graduate School of Economics and Business Administration, Hokkaido University, December, 2013. https://eprints.lib.hokudai.ac.jp/dspace/handle/2115/53982): 2-3.

(from one day to several months) that coworking spaces provide.[2] The combination of these factors never had a place in the history of work environments before coworking spaces.

Coworking spaces quickly acquired an ethos of a creative, independent, flexible place. This could be to a large degree related with the two distinctive features of coworking spaces mentioned above. Thus, early research about coworking spaces tried to comprehend the dynamics inside these places and focused on the topics of 'collaboration' and 'community', because they were perceived to happen persistently and ubiquitously in this type of shared work environment. For example, the first comprehensive and now the most cited study about the notion was conducted in nine coworking spaces in Austin, Texas by a researcher of networks and communications in workplaces Clay Spinuzzi.[3] The results were published in 2012 (more on that in section 2.2 of chapter 2). His research attracted the attention of academia, inspiring more research projects to have been conducted since then in attempts to deliver systematized answer on why and when collaboration and communication happened in coworking spaces. In pursuit of finding answers, many more 'soft' features of coworking spaces such as motivations of coworkers to join one, knowledge exchange between members, innovation spread, conflicts, and some others, were examined. This thesis presents an argument that while the 'soft' features were studied elaborately, the 'hard' features such as the role of furniture or the different facilities offered in a coworking space, represent an under-researched field (more on that in section 2.3 chapter 2). Therefore, this thesis follows the less researched direction and contributes to the development of the discussion about 'hard' factors in coworking spaces (more on that in chapter 4).

[2] For the new types of tenants see: Carsten Foertsch, "What Is Coworking And Its Cultural Background?" *Deskmag.com*, May 10, 2011, http://www.deskmag.com/en/what-is-coworking-about-the-changing-labor-market-208; for short-term contracts see: Janet Merkel, "Coworking in the City," *ephemera: theory & politics in organization* 15, no. 1 (February 2015): 124.

[3] Clay Spinuzzi, "Working Alone Together: Coworking as Emergent Collaborative Activity," *Journal of Business and Technical Communication* 26, no. 4 (2012), https://doi.org/10.1177/1050651912444070.

1.2. Research objective and questions

The main research objective of this paper was inspired by the gap in the academic literature about spatial characteristics in coworking spaces. The thesis intends to contribute in bridging this gap by answering the main research question:

How do tenants use a coworking space and what are their preferred spatial characteristics?

The main research question will be assessed through several sub-questions, which are divided into two parts. The first part will help understand the main discussions about coworking spaces in the academic literature, and also develop the theoretical framework:

1. *How is the spatial factor represented in the academic literature about coworking spaces?*
2. *What characteristics of spatial factors from earlier studies of space (and work environment) could be applied to coworking spaces?*

When borrowing the spatial characteristics from earlier studies about work environments, the research presents an assumption that if the theoretical framework is applicable to the modern context of coworking spaces, then the history of coworking spaces could be incorporated into the history of all workplaces. To test that assumption the second part of sub-questions is presented. They will be answered through findings of a case study conducted for this thesis in one of the coworking spaces in Rotterdam:

3. *What are the daily activities of the users of the coworking space?*
4. *What types of facilities do the tenants use to perform their daily professional activities, and what types of facilities do they lack?*
5. *How do people move inside the coworking space?*

Thus, the thesis contains several tasks. It aims not only to understand spatial characteristics of coworking spaces, but also to extend the perception of the history of coworking spaces.

1.3. Academic relevance

There are several reasons to account this thesis as academically relevant. First, by following the main research objective this thesis enriches the discussion about 'hard' factors in coworking spaces. Second, through developing the overlooked spatial dimension of coworking spaces, the thesis suggests that the creation of a definition of the notion of coworking spaces is possible (which does not exist yet, more on that in section 2.1. in chapter 2). The research in this thesis builds up on a few academic articles that pioneered in including the spatial dimension into their research. Namely, the thesis gets inspiration from the theoretical framework suggested by the researchers of coworking spaces from the Department of Architecture (Naresuan University, Thailand), and answers their call to study spatial characteristics of coworking spaces in different countries.[4] The thesis also responds to the call formulated by the researchers from the Department of the Built Environment (Eindhoven University of Technology, the Netherlands) to study spatial characteristics of coworking spaces in more depth and with application of a qualitative approach.[5] The suggested approach of applying earlier theories about work environments to the modern context of coworking spaces brings the innovative aspect to the paper.

1.4. Practical relevance

In 2018 there were 18,700 coworking spaces registered worldwide.[6] Together they represent a vast range of types, various scales and different specializations. However, many places that identify themselves as coworking spaces might in reality be something else. A clear understanding of what a coworking space looks like (through spatial characteristics) could help operators of coworking spaces construct a proper identity and run a place in the best possible way. The prediction by the end of 2019 is for 22,400 coworking spaces to operate

[4] Eric Prince Ondia, Sirimas Hengrasmee, & Sant Chansomsak, "Spatial Configuration and Users' Behavior in Co-Working Spaces," *YBL Journal of built environment* 6, no. 1 (2018): 20-39, https://doi.org/ 10.2478/jbe-2018-0002.

[5] Minou Weijs-Perrée et al., "Analysing user preferences for co-working space characteristics," *Building Research & Information* 47, no. 5 (2019): 534-548, https://doi.org/10.1080/09613218.2018.1463750.

[6] Deskmag.com, *2019 Coworking forecast* (2019 Global Coworking Survey): 4, https://www.dropbox.com/s/jjor71mecwqbxdy/2019%20Complete%20Coworking%20Forecast.pdf?dl=0.

around the world.[7] Their growth in number and in popularity speaks for a shift in the nature of work towards more independence in conduction of a person's own work activities. The increase in the number of users of coworking spaces employed by larger organizations proves that a preference for freedom to choose where and when to work is not limited to individual entrepreneurs. For example, large enterprises such as IBM, Facebook, Microsoft, Adidas, and Citi use the services provided by the largest coworking chain WeWork to accommodate their employees.[8] Thus, the topic is relevant to society in general.

1.5. Methodology and research methods

This thesis applies an inductive approach in its methodology. This means that the strategy of the thesis is to collect observations about spatial characteristics in one coworking space, analyse them in a systematic way and then suggest some important findings. The findings of this case study, along with more findings from future similar research will contribute to the development of a theory (or theories) about spatial characteristics in coworking spaces. The prominent environmental researcher Stokols argued that this approach was beneficial when performing a research in any new type of environment: '[…] efforts to develop behavioral theories are best postponed until a substantial body of empirical facts about a phenomenon has been amassed across several studies.'[9] However, despite the inductive reasoning, earlier theories developed in the similar fields (about other work environments) should not be disregarded. These theories should serve as suggestions, or guidelines for research. In following that assumption first, the research gap will be formulated through the review of the literature about coworking spaces. Then, the earlier literature about work environments will be revised to collect the guidelines for the case study. After that, the case study will be performed in order to showcase how the gap could be bridged. The study will intend to explore the social world, culture, shared beliefs and behaviors of the

[7] Deskmag.com, *2019 Coworking forecast* (2019 Global Coworking Survey): 4, https://www.dropbox.com/s/jjor71mecwqbxdy/2019%20Complete%20Coworking%20Forecast.pdf?dl=0.

[8] For IBM see: "How WeWork helped IBM fuel collaboration and innovation with key clients," WeWork, accessed June 22, 2019, https://www.wework.com/case-study/ibm; for the rest of the examples see: "Case Studies," WeWork, accessed June 22, 2019, https://www.wework.com/case-study.

[9] Daniel Stokols, "Conceptual Strategies of Environmental Psychology," in *Handbook of Environmental Psychology*, eds. Daniel Stokols & Irwin Altman (NY: John Wiley & Sons, 1987), 42.

tenants of the chosen coworking space, that is why the following three methods inspired by ethnographical research methods will be applied:

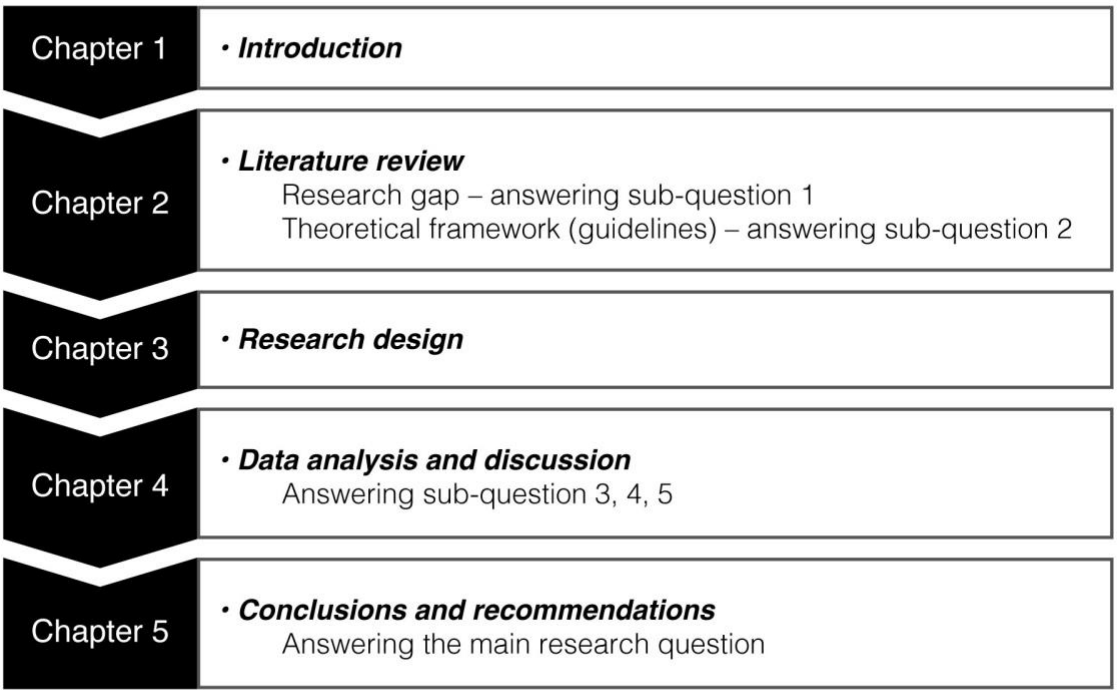
1. Observations;
2. Behavioral mapping;
3. In-depth semi-structured interviews.

Each method will be explained in detail in chapter 3.

1.6. Thesis outline

Chapter 1 introduced the subject of this study and supplied the reader with the main inputs on how to perceive this thesis. The rest of the paper will be organised as follows. Chapter 2 will provide a literature review about coworking spaces, detect a gap in the academic discussion and develop a framework on how this gap could be bridged. Much of the body of this paper is dedicated to that chapter, because it is important to explain how the research gap was detected, and why it inspired this research to apply an inductive approach. The following chapters deal with the case study and elaborate on how the data will be collected and analysed. Chapter 3 presents a research design for the case study that is performed in this thesis. Chapter 4 discusses results of observations in a systematic manner and then introduces some main findings. Chapter 5 deals with the research results, provides conclusions and suggests how they can contribute to the development of a new theory about spatial characteristics in a coworking space. The chapter wraps up with a discussion of limitations of the study and suggests directions for future research. The thesis outline is summarised in figure 1.1.

Figure 1.1. Outline of the thesis.



Source: own analysis.

Chapter 2: Literature review

Every good research project starts with the careful examination of what was written about a studied subject before. This allows a researcher to gain understanding of the main topics in a discussion, and more importantly – detect gaps in it. Thus, a researcher gets an opportunity to ask a relevant question, make a valuable contribution with a research project and further develop academic discussion in the chosen field. The purpose of this chapter is to understand the main topics in the academic discussion about coworking spaces and to identify its gaps. Thus, the history of coworking spaces will be provided in section 2.1. The overview of the main themes of the discourse about coworking spaces will be provided in section 2.2. Inspired by the gaps in the discourse identified in section 2.2 the research will answer the first two sub-questions in the following sections. Section 2.3 will answer the first sub-question 'How is the spatial factor represented in the academic literature about coworking spaces?' Section 2.4 will answer the second sub-question 'What characteristics of spatial factors from earlier studies of space (and work environment) could be applied to coworking spaces?' Conclusions will be provided in section 2.5.

2.1 History of coworking spaces

Coworking spaces as a 'historically new form of organizing' of human labor appeared only recently, in 2005 in San Francisco.[10] Many researchers of the coworking phenomenon (Spinuzzi, Gandini, Blagoev, Moriset, Capdevila, Waters-Lynch et al.) trace the beginning of it back to its self-pronounced creator – a software engineer Brad Neuberg.[11] Neuberg claims to

[10] For the quite 'historically new form of organizing see: Clay Spinuzzi et al., "'Coworking Is About Community': But What Is 'Community' in Coworking?" *Journal of Business and Technical Communication* 33, no. 2 (2019): 121, https://doi.org/10.1177/1050651918816357; for the date see: 'Brad Neuberg, "The Start of Coworking (from the Guy that Started It)," accessed June 22, 2019, http://codinginparadise.org/ebooks/html/blog/start_of_coworking.html.

[11] For Spinuzzi see: Spinuzzi, "Working Alone Together," 402; for Gandini see: Alessandro Gandini, "The rise of coworking spaces: A literature review," *ephemera: theory & politics in organization* 15, no. 1 (2015): 195; for Blagoev see: Blagoy Blagoev, Jana Costas, Dan Karreman, "'We are all herd animals': Community and organizationality in coworking spaces," *Organization* (January 2019): 3, https://doi.org/10.1177/1350508418821008; for Moriset see: Bruno Moriset, "Building new places of the creative economy. The rise of coworking spaces," (Paper, 2nd Geography of Innovation International Conference 2014, Utrecht University, Utrecht, January 23-25, 2013): 9, https://halshs.archives-ouvertes.fr/halshs-00914075; for Capdevila see: Ignasi Capdevila, "Knowledge Dynamics in Localized Communities: Coworking Spaces as Microclusters," *SSRN Electronic Journal* (January 2014): 3,

have invented the term 'coworking' by eliminating the hyphen in the word 'co-working'.[12] The word 'co-working' is now commonly accepted by the majority of the academics writing about coworking spaces as a word signifying an activity of 'working together on the same project', and not necessarily in the shared working facility a coworking space provides. [13] Thus, 'co-working' means an activity, and 'coworking' is used when describing a place. The rapid growth in the number and the vast international spread made the latter a buzzword.[14] That caused some confusion in the terminology. Some articles (especially non-academic ones) used the wrong version – 'co-working' when describing such spaces. For example, one of the early articles described the movement as 'co-working'.[15] Thence, it is important to maintain consistency in the academic literature and use the correct version – coworking space (not co-working space).

Some research was done about motivations of users of coworking spaces worldwide. The findings tend to repeat from one case to another: not to be alone while working, get motivation from the surroundings, learn new things from others, maintain a healthy work-life balance.[16] It is striking that all of them echo Neuberg's personal story. Before coming up with the idea of coworking, he tried working in a typical office for an employer, then quit and became a freelancer and worked from home. However, he noticed that when working for an employer in an office he lacked the opportunity to work on the projects that he liked, yet when working as a self-employed coder he missed the community that an office environment

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https://doi.org/10.2139/ssrn.2414121; for Waters-Lynch et al. see: Julian Waters-Lynch et al., "Coworking: A Transdisciplinary Overview," *SSRN Electronic Journal* (January 2016): 6, https://doi.org/10.2139/ssrn.2712217; for Brad Neuberg see: Neuberg, "The Start."

[12] Dan Fost, "They're Working on Their Own, Just Side by Side," *New York Times*, February 20, 2008, https://www.nytimes.com/2008/02/20/business/businessspecial2/20cowork.html.

[13] Constantinescu & Devisch, "Portraits of work," 1265.

[14] Gandini, "The rise."

[15] Aaron Cohen, "Four scenarios for co-working: sharing workspace offers potential benefits in an uncertain economy," *The Futurist* 45, no. 4 (July-August 2011): 8-10.

[16] For 'not to be alone while working' see: Gabor Nagy & Greg Lindsay, "Why Companies Are Creating Their Own Coworking Spaces," *Harvard Business Review,* September 24, 2018, https://hbr.org/2018/09/why-companies-are-creating-their-own-coworking-spaces; for the rest see: Alex Hillman, "6 Reasons to Start Coworking," *Mashable,* November 07, 2008, https://mashable.com/2008/11/07/reasons-to-start-coworking/?europe=true.

could provide. Eventually, Neuberg ended up renting his own office space and inviting other independent entrepreneurs to work together, share rental costs of the space, and compose a community for each other.[17] That later grew into the notion of coworking spaces.

Not every scholar agrees with the chosen starting point of the coworking phenomenon (2005, San-Francisco). For example, in their article *Portraits of work: mapping emerging coworking dynamics,* Belgian academics Constantinescu and Devisch (from the Spatial Capacity Building Department in Hasselt University) claim that the history of coworking spaces should include community-oriented places.[18] The authors claim that the notion could be traced as far back as 1995, to a first community-oriented place where people could work together – C-Base in Berlin.[19] Social scientists Foertsch and Cagnol support that point and also start the coworking spaces' timeline with the same hacker place.[20] Some authors take one more step back and first look at the development of the World Wide Web and the increase of telecommuting in the 1980s.[21] It could be argued that the Internet allowed more independence from a place of work, and therefore created a need and an economic niche for spaces where different people could come and work independently. Japanese researcher Uda (from the Faculty of Economics and Business in Hokkaido University) looks even further back and suggests tracing the history of coworking spaces to communal ateliers in Paris at the beginning of the 20th century.[22] The manifold of approaches to the starting point of the history of coworking spaces points to the lack of a clear definition of the notion.

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[17] Neuberg, "The Start."

[18] Constantinescu & Devisch, "Portraits of work," 1263-1278.

[19] Ibidem, 1265.

[20] It might be of interest for a user to know that Carsten Foertsch is the founder and editor of Deskmag.com, the most cited online magazine about coworking spaces. Descmag.com collects data about coworking spaces worldwide and publishes extensive reports on yearly bases. For his suggested timeline of the history of coworking spaces see: Carsten Foertsch & Remy Cagnol, "The History Of Coworking In A Timeline," *Deskmag.com*, September 02, 2013, http://www.deskmag.com/en/the-history-of-coworking-spaces-in-a-timeline.

[21] Conor Todd, "The History Of Coworking," *Free Office Finder,* September 11, 2018, https://www.freeofficefinder.com/article/the-history-of-coworking.

[22] Uda, "What is Coworking?" 2-3.

A clear understanding of the notion and its features would have helped narrow down the extensive search area of its roots.

Most of the authors generally characterize a coworking space as a shared working environment where independent entrepreneurs (mostly knowledge workers or people employed in creative fields)[23] come to work together (Spinuzzi et al., Constantinescu and Devisch, Gandini, Capdevila, Waters-Lynch et al.).[24] It might appear that this general description of a coworking space might as well serve as a definition of a hacker space, a library, a start-up incubator, or any other place where a group of people could gather for some period of time and perform their professional activities. However, it is not quite so, and the phenomenon of coworking spaces should be treated as a notion with radically new features that did not take place any time earlier in the history. The first distinctive feature of coworking spaces in the modern context was elaborated by Foertsch in 2011. He emphasized that it was the types of tenants that made this modern context different – coworking spaces at the time were mostly in use by independent entrepreneurs or freelancers.[25] The second distinctive feature of the modern coworking spaces was described by the urban sociologist Merkel (from the Department of Urban and Regional Economics in Technical University in Berlin) – the short-term duration of renting contracts which could vary from one day to several months.[26] And finally, most academics agree that it is the collaborative approach or a community spirit that sets coworking spaces aside from any other forms of the shared work environments.[27]

While the starting point of the phenomenon is still disputable, the academics seem to have reached a consensus on the main reason that have triggered the most recent rapid rise

[23] Waters-Lynch et al., "Coworking," 25.

[24] For Spinuzzi et al. see: Spinuzzi et al., "Coworking Is About Community," 113; for Constantinescu and Devisch see: Constantinescu & Devisch, "Portraits of work," 1265; for Gandini see: Gandini, "The rise," 194; for Capdevila see: Capdevila, "Knowledge Dynamics," 3; for Waters-Lynch et al. see: Waters-Lynch et al., "Coworking," 3.

[25] Foertsch, "What Is Coworking."

[26] Merkel, "Coworking in the City," 124.

[27] For 'collaborative approach' see: Merkel, "Coworking in the City," 124; for 'community spirit' see: Spinuzzi et al., "Coworking Is About Community."

of coworking spaces. The aftermath of the global economic crisis as the main trigger of fast spread of coworking spaces around the world is mentioned by Constantinescu and Devisch, Spinuzzi, Mariotti, Pacchi and Di Vita, Merkel and others.[28] The economic crisis of 2008 created two favorable conditions for the rapid spread of coworking spaces. First, there was a reduction in prices for real estate (especially in the North America and European countries).[29] Second, many companies had to reduce salary costs and laid off their employees to be able to maintain their businesses. This freed up a large part of workforce, many of whom were well-educated and had to seek new employment, sometimes turning to self-employment.[30] At the same time, briskly developing ICTs allowed the general separation of work from time and space.[31] Almost any work could be done from anywhere, at anytime, as long as there was a computer and access to the Internet.[32] This style of work especially suited creative workers such as designers, social-media specialists, architects, editors, programmers and so on. This rising class of 'creative economy' indeed was free to choose where and when to work.[33] However, in seeking for some order and routine in their daily lives these professionals started gathering and working together, sometimes collaborating on projects and sharing costs for renting a workplace. Thanks to the reduction of prices for properties caused by the global economic crisis, these groups of people could afford renting shared office spaces, despite the fact that their employment and therefore income became much more precarious. Thus, coworking spaces emerged as a bottom-up solution to economic recession, layoffs and the

[28] For Constantinescu and Devisch see: Constantinescu & Devisch, "Portraits of work," 1263; for Spinuzzi et al. see: Spinuzzi et al., "Coworking Is About Community," 115; for Mariotti, Pacchi and Di Vita see: Ilaria Mariotti, Carolina Pacchi & Stefano Di Vita, "Co-working Spaces in Milan: Location Patterns and Urban Effects," *Journal of Urban Technology* 24, no. 3 (2017): 48, https://doi.org/10.1080/10630732.2017.1311556; for Merkel see: Merkel, "Coworking in the City," 121.

[29] Moriset, "Building new places," 16.

[30] Ibid.

[31] Peter Ross & Susan Ressia, "Netither Office Nor Home: Coworking as an emerging workplace choice," *Employment Relationships Record* 15, no. 1 (2015): 42.

[32] Mariotti, Pacchi & Di Vita, "Co-working Spaces in Milan," 49.

[33] Suntje Schmidt, Verena Brinks & Sascha Brinkoff, "Innovation and creativity labs in Berlin," *Zeitschrift für Wirtschaftsgeographie* 58, no. 4 (January 2014): 234, https://doi.org/ 10.1515/zfw.2014.0016.

need of creative and individual entrepreneurs for a friendly and affordable work environment.[34]

The main metric that is typically used to show the relevance of the subject is the number of coworking spaces in the world, and especially the emphasis on its rapid growth. For example, Deskmag.com documents that in 2008 there were 160 coworking spaces worldwide.[35] However, 10 years later – in 2018 – the total number had grown to 18,700, and the estimation by the end of 2019 is for 22,400 coworking spaces to be operating around the world.[36] Such a rapid growth could not have escaped the attention of scholars and caused a flourish of a wide and diverse body of academic literature around the subject. One can easily find supporting statistics by looking at the number of publications per year containing the word 'coworking'. Table 2.1 provides the comparison of two libraries' search engines results presented by year: Erasmus University's Rotterdam engine sEURch, which combines results from all libraries in the Netherlands and elsewhere in the world and also includes online news magazine articles,[37] and 'the world's largest network of library content and services' WorldCat, which gives results only from academic literature, but includes articles in different languages.[38]

[34] Merkel, "Coworking in the City," 124.

[35] Descmag.com is generally recognized as an authoritative source of data about coworking spaces by the majority of the authors who write about the topic. For the article see: Foertsch & Cagnol, "The History."

[36] Deskmag.com, *2019 Coworking forecast.*

[37] "sEURch," Erasmus University Rotterdam, accessed June 21, 2019, https://eur.on.worldcat.org/discovery.

[38] "Advanced Search," WorldCat, accessed June 21, 2019, https://www.worldcat.org/advancedsearch.

Table 2.1. Number of papers containing the word 'coworking' per year.

Year of publication	***Erasmus University Rotterdam, sEURch; number of publications per year***	***WorldCat; number of publications per year***
(before June) 2019	400	136
2018	517	242
2017	450	229
2016	386	203
2015	233	142
2014	157	91
2013	144	88
2012	68	40
2011	47	29
2010	28	19
2009	14	11
2008	24	17
2007	15	13
2006	6	6
2005	3	3

Sources: own analysis through "sEURch," Erasmus University Rotterdam, accessed June 21, 2019, https://eur.on.worldcat.org/discovery," and "Advanced Search," WorldCat, accessed June 21, 2019, https://www.worldcat.org/advancedsearch.

It is noticeable from the table that although the first coworking space was opened in 2005, the theme had not received enough attention from academic writers until 2013. However, some significant events took place in the history of coworking spaces much earlier than 2013: Spinuzzi's first thorough research of coworking spaces in Austin started in July 2008, whereas the first coworking spaces' conference took place in Brussels in 2010.[39] Although since then the literature was enriched with the descriptions of various case studies, and contributions to the understanding of the subject were manifold, there is still no one final definition for a coworking space. That could be explained due to the fact that the notion of coworking spaces represents a multi-sided phenomenon and provides a fertile ground for

[39] For Spinuzzi's research in Austin see: Spinuzzi, "Working Alone Together," 405; for the conference in Brussels see: Todd, "The History."

many interdisciplinary studies about it. The next section will elaborate on the main academic discussions, and different approaches applied by academics in attempts to define the core of the phenomenon.

2.2. Main themes in the academic discussion about coworking spaces

This literature review will focus on the academic articles which were based on the real case studies performed by researchers in coworking spaces in different countries around the world. The classification per topic presented further in this section does not entail a strict character, on the contrary, many themes are inter-related and are bind together. For example, knowledge exchange in a coworking space is tightly connected to the level of collaboration that tenants of a coworking space maintain, innovation flow is directly connected to a type of community that developed in a coworking space (because sharing innovative knowledge implies close communication between people), and so on. Nevertheless, to ease the process of perception of the material, the main discussions and the case studies will be compiled around the core topics of 'collaboration', 'community', 'motivations', 'users of coworking spaces', and some others. This list is not exhaustive and could be expanded with time as more and more case studies are performed and published. The summary of the literature review presented in table 1.1 (see Appendix 1) included arguably every relatively often cited author and their case studies in the academic literature about coworking spaces published in English language.

The main finding of this literature review is the gap in the academic discussion about coworking spaces: the majority of the mentioned above themes could be assembled under an umbrella of 'soft' factors. It helps borrowing classification of 'soft' and 'hard' factors from earlier theories about organizational management. For example, in the literature about productivity management 'soft' factors are understood as everything related to intangible assets of an organization: people and their skills, culture, management style and so on.[40] Whereas 'hard' factors are understood as everything related to tangible assets of an organization: products, equipment, buildings, technology and so on.[41] When following that

[40] Joseph Prokopenko, *Productivity management*: A practical Handbook, 2nd ed. (Geneva: International Labour Office - ILO, 1998), 12-15.

[41] Prokopenko, *Productivity Management*, 11-12, 15.

classification, it appears that the majority of the studies about coworking spaces tackle the issues regarding 'soft' factors. The end of this section will present more conclusions about the gap in the literature and how this paper suggests bridging it. For now, it was important to provide a necessary perspective for understanding the forthcoming literature overview.

First study about coworking spaces

The first profound study of coworking spaces was conducted by a workplace researcher, Clay Spinuzzi, from Texas University in Austin.[42] Spinuzzi gathered material from nine coworking spaces in Austin from July 2008 to February 2011.[43] The study intended to understand what meaning the proprietors and the users of these places attributed to coworking spaces, who the users of these coworking spaces were, and why they decided to join these coworking spaces.[44] The study produced two very useful conceptual models for understanding relationships inside any coworking space. Spinuzzi called them 'good-neighbors configuration' where coworkers did not have professional relationships but were committed to the community they formed, and 'good-partners configuration' where coworkers used a coworking space as a backstage to find business partners for their projects.[45] Spinuzzi's article set the ground for many more studies to be conducted in order to expand the understanding of the phenomenon: how it functioned, why it expanded rapidly, what motivated tenants to work in coworking spaces, what synergies were created and so on. This rapid increase of interest is somewhat observed in the data provided in table 2.1. According to sEURch, the number of publications in 2012 containing the word 'coworking' was 68, and already the next year, in 2013 the number of publications almost tripled – 144 (the table does not summarize the publications per year, each next year represents the number of unique publications). Thus, Spinuzzi became arguably the most cited academic in the field, setting 'collaboration' and 'community' as the two core topics in the discussion about coworking spaces.

[42] Clay Spinuzzi is a professor of rhetoric and writing at The University of Texas at Austin, however his research focuses on workplaces, and specifically on coworking spaces.

[43] Spinuzzi, "Working Alone Together," 405.

[44] Ibidem, 409.

[45] Ibidem, 428-431.

Collaboration

In 2013 Capdevila (from the Paris School of Business in France) suggested a novel perspective when studying knowledge transfer and collaboration dynamics in coworking spaces. [46] Based on his research, conducted in five coworking spaces in Barcelona, Capdevila proved that they show many similar characteristics when compared to clusters. For instance, both clusters and coworking spaces share resources, entail collaboration and knowledge exchange between their members. Thus, the author suggested envisioning coworking spaces as microclusters.[47]

Collaboration: facilitators in coworking spaces

Coworking spaces very quickly reputed as places where collaboration was ubiquitous and communication flow between members was intrinsic. However, many researchers found quite the opposite. In her extensive study of coworking spaces in Milan (27) and in Barcelona (31), through interviews, site visits and participation in events in 2013, Parrino (from the Department of Sociology and Social Research, University of Milano-Bicocca in Italy) focused on the conditions for knowledge exchange in coworking spaces.[48] Her main finding suggested that geographical proximity by itself did not induce knowledge exchange, nor collaboration between coworkers in such places. But these processes happened inevitably in the places where the presence of facilitators (people or various organizational platforms) was reported.[49] That same year researchers Bilandzic and Foth (from the Urban Informatics Research Lab, Queensland University of Technology in Australia) came to similar conclusions.[50] Their findings from a 5-month ethnographic research in a public library (which also served as a coworking space) proved the crucial role of facilitators in order to foster collaboration activities, otherwise participants remained unaware and uninspired by other

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[46] Capdevila, “Knowledge Dynamics.”

[47] Ibidem, 10-12.

[48] Lucia Parrino, “Coworking: assessing the role of proximity in knowledge exchange,” *Knowledge Management Research & Practice* 13, no. 3 (2015/2013): 261-271, https://doi.org/10.1057/kmrp.2013.47.

[49] Parrino, “The role of proximity,” 269-270.

[50] Mark Bilandzic & Marcus Foth, "Libraries as coworking spaces: Understanding user motivations and perceived barriers to social learning," *Library Hi Tech* 31, no. 2, (2013): 254-273, https://doi.org/10.1108/07378831311329040.

users of the coworking space.[51] However, unlike Parrino who focused on people as facilitators, their suggestion was to develop a specific facilitation technology for that purpose. In their next article and in collaboration with one more author (Schroeter) the Australian researchers reported the use of a special public screen technology called Gelatine in the same coworking space.[52] This system allowed users of the coworking space to check in the system (create a profile), and leave some information about their skills or projects, thus giving others an opportunity to approach them. The experiment was reported to be successful, because after introduction of that public screen technology the number of collaborations in the coworking space increased, as well as the general awareness about who the users of this coworking space were and what skills they obtained.[53] The same problem (the need of facilitators) was discovered by researchers Fuzi, Clifton (from the Cardiff School of Management) and Loudon (from the Cardiff School of Art and Design) from the UK when looking at 19 coworking spaces across South Wales in 2015.[54] The survey looked at coworking spaces as places of support for entrepreneurship. It was found that facilitators were crucial when stimulating collaboration, interaction and networking in the studied sites.[55] Another research by Ross and Ressia (from Griffith Business School in Australia) in 19 coworking spaces in Australia and Canada in 2015 also presented a finding that collaboration did not happen spontaneously but could be stimulated.[56] Merkel further developed the discussion about facilitators in a coworking space and presented a useful classification on 'service providers' (focus on facilities management) and "visionaries" (focus on the collaborative aspect of coworking spaces).[57] Finally, in the study of nine coworking spaces across England in 2017

[51] Bilandzic & Foth, "Libraries as coworking spaces," 270.

[52] Mark Bilandzic, Ronald Schroeter & Marcus Foth, "Gelatine: Making Coworking Places Gel for Better Collaboration and Social Learning" (Proceedings of the 25th Australian Computer-Human Interaction Conference: Augmentation, Application, Innovation, Collaboration, Adelaide, Australia, November 25-29, 2013), https://doi.org/10.1145/2541016.2541027.

[53] Bilandzic, Schroeter & Foth, "Gelatine."

[54] Anita Fuzi, Nick Clifton, Gareth Loudon, "New spaces for supporting entrepreneurship? Co-working spaces in the Welsh entrepreneurial landscape" (Proceedings of the 8th International Conference of entrepreneurship, innovation and regional development, Sheffield, UK, June 2015).

[55] Fuzi, Clifton, Loudon, "New spaces for supporting entrepreneurship."

[56] Ross & Ressia, "Netither Office Nor Home," 52.

[57] Merkel, "Coworking in the City," 128.

Brown (from the School of Business, Law and Communications, in Southampton Solent University, UK) reported that facilitation of collaboration and curatorship of a coworking space could happen in many different ways: not only through facilitation of events, but even at earlier stages when selecting tenants for a coworking space.[58]

Collaboration: types of Interactions in coworking spaces

Gradually as the topic gained more and more attention, and more research was done, it became clear that collaboration in coworking spaces did not happen immediately as tenants started renting desks. Developing collaboration dynamics took time and an organized effort. After studying eight coworking spaces in Austria in 2016 a group of researchers developed a useful classification of types of interactions that might happen in such places.[59] The classification suggested a gradation from less involvement to more involvement between members: informal social interactions (minimum commitment), exchange of information (could be work related), instrumental support (more involvement: feedback for projects, brainstorming, and coaching), and direct collaboration (both paid and unpaid).[60] This classification goes in line with the findings suggested in 2012 by Spinuzzi: 'good-neighbors configuration' also requires minimum commitment, whereas 'good-partners configuration' characterizes examples of direct collaboration on mutual projects between tenants. However, the classification provided by the Austrian researchers in 2016 was more detailed and therefore helped to understand not only the types of collaborations taking place in a coworking space, but also to look at the stage of development of a particular community in a coworking space.

The combination of words 'serendipitous encounters' accompanied the notion of coworking spaces throughout 14 years of its recent history. It was used in marketing tools to promote coworking, promising that in a coworking space meaningful connections happen daily, unexpected conversations unleash a flood of creative ideas, and that success is

[58] Julie Brown, "Curating the "Third Place"? Coworking and the mediation of creativity," *Geoforum* 82 (2017): 121, http://dx.doi.org/10.1016/j.geoforum.2017.04.006.

[59] Cornelia Gerdenitsch et al., "Coworking Spaces: A Source of Social Support for Independent Professionals," *Frontiers on Psychology* 7 (April 2016): 1-12, https://doi.org/10.3389/fpsyg.2016.00581.

[60] Gerdenitsch et al., "Source. Of Social Support," 3-4.

impossible to avoid soon after joining such place. In 2012 Dutch academic Sebastian Olma even published a book *The Serendipity Machine*, where he presented the case of one of the coworking chains originated in the Netherlands Seats2Meet.com.[61] The author praised the operational system developed by the company: 'the dashboard screen visualizes the Seats2meet.com network at any given time, turning the open lounge into a veritable serendipity machine.'[62] Contrary to that, a critical study of assemblages in coworking spaces performed by social scientists Jakonen, Kivinen, Hirkman from Finland and Salovaara from the US in 2017 discovered the opposite.[63] Their findings proved that not only serendipitous encounters, but any encounters did not necessarily take place in a coworking space. Moreover, some coworkers avoided any encounters at all, because their primary interest was always on their own work and tasks they needed to perform at that moment.[64]

Community

First intake on understanding the types of communities in coworking spaces based on nature of collaboration between members was introduced by Spinuzzi in 2012 ('good-neighbors configuration' and 'good-partners configuration').[65] To develop the discussion further, Slovenian social scientists Rus and Orel documented a process of merger of several creative communities in Ljubliana into one collaborative workplace called Creative Centre Poligon.[66] The process entailed the gradual joining of new members, and several moves into new premises. The authors suggested four steps of community development. First, learning (how to build a community and whom to include), second, community building (first facilitated encounters, collaborations), third, ground testing (introduction of routines and other events), and finally the fourth stage – community creation (a community with strongly

[61] Sebastian Olma, *The Serendipity Machine. A Disruptive Business Model for Society 3.0* (Creative commons, 2012), https://www.seats2meet.com/downloads/The_Serendipity_Machine.pdf.

[62] Olma, The Serendipity Machine, 27.

[63] Mikko Jakonen et al., "Towards an Economy of Encounters? A critical study of affectual assemblages in coworking," *Scandinavian Journal of Management* 33 (2017), http://dx.doi.org/10.1016/j.scaman.2017.10.003.

[64] Ibidem, 241.

[65] Spinuzzi, "Working Alone Together."

[66] Andrej Rus & Marko Orel, "Coworking: A Community of Work," *Teorija in Praksa* 52, no. 6 (December 2015): 1017-1038.

developed ties).[67] Although not every coworking space would necessarily undergo these steps, this article still brings value in understanding of the importance of community development and the time that it takes. The article also develops an argument against coworking spaces opened by local governments, because they often offer new and large premises, but fail to facilitate a community.[68] An extensive online survey performed in dozens of coworking spaces around the US in 2015 supports the argument about the importance of a community.[69] A majority of participants reported that one of the top three reasons why they felt thriving in a coworking space was because they felt as a part of a community.[70] In his research in 21 coworking spaces in Barcelona, Capdevila also showed how communities help spread innovation dynamics.[71]

To help develop strategies of fostering community building in coworking spaces, Dutch researchers conducted a study in two coworking spaces in Amsterdam in 2016.[72] As a result, four strategies were recognized: coworking space management as connector (which continues the discussion of the importance of facilitators presented earlier), regulating the mix of workers, interior design for interaction and tools for networking.[73] In 2017 after conducting a long-term ethnographic research in one of the coworking spaces in the US, the researchers found that a sense of community helped tenants satisfy their needs for social interactions, and therefore attracted them to continue working in that coworking space.[74] A group of Italian researchers found in 2018 that solidarity between coworkers developed as a

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[67] Rus & Orel, "A Community of Work," 1030-1033.

[68] Ibidem, 1034.

[69] Gretchen Spreitzer, Peter Bacevice & Lyndon Garrett, "Why people thrive in coworking spaces," *Harvard Business Review*, September 2015, https://hbr.org/2015/05/why-people-thrive-in-coworking-spaces.

[70] Spreitzer, Bacevice & Garrett, "Why people thrive."

[71] Ignasi Capdevila, "Coworking spaces and the localized dynamics of innovation in Barcelona," *International Journal of Innovation Management* 19, no.3 (May 2015): 21, https://doi.org/10.1142/S1363919615400046.

[72] Victor Cabral & Willem van Winden, "Coworking: An analysis of coworking strategies for interaction and innovation" (Conference paper, Regional Studies Association Annual Conference in Graz, Austria, April 3-6, 2016), https://doi.org/10.13140/RG.2.1.4404.5208.

[73] Cabral & van Winden, "An analysis of coworking strategies," 26.

[74] Lyndon Garrett, Gretchen Spreitzer & Peter Bacevice, "Co-constructing a Sense of Community at Work: The Emergence of Community in Coworking Spaces," *Organization Studies* 38, no. 6 (2017): 827, https://doi.org/10.1177/0170840616685354.

byproduct of their economic relationship, which strengthened connections in a coworking space.[75] One of the newest findings around the core subject 'community' is presented by a group of German researchers. With the findings from their long-term research conducted in one of the coworking spaces in Berlin in 2019, the researchers developed an argument that formal and informal connections between coworkers breed 'degrees of organizationality in coworking spaces' through not only a sense of community, but also through daily routines, rituals, and co-discipline.[76]

And finally, the discussion about communities in coworking spaces is brought back to Spinuzzi. In 2019 in co-authorship with the researchers from Italy and Slovenia, Spinuzzi published an article about an extensive research project conducted in six coworking spaces in the US, Italy and Serbia.[77] The group of researchers suggested a classification drawn from theories of firm organization. According to them, the first type of a community in a coworking space is 'Gesellschaft' (with organization or owner as a dominant actor, providing market-oriented service, and dominating commercial interest), and the second is 'Collaborative' (where everyone benefits equally, collaborative interdependence, networked based on shared interest in common project objectives).[78] It is clear that being a part of a community generates an added value for a coworker, however, it is not the only motivation that brings people to coworking spaces.

[75] Federico Bianchi, Niccolo Casnici & Flaminio Squazzoni, "Solidarity as a byproduct of professional collaboration: Social support and trust in a coworking space," *Social Networks* 54 (2018): 68, https://doi.org/10.1016/j.socnet.2017.12.002.

[76] Blagoev, Costas & Karreman, "We are all herd animals," 19.

[77] Spinuzzi et al., "Coworking Is About Community."

[78] Ibidem, 122.

Motivations to work in a coworking space

The motivations of users to join a coworking space were first presented by Spinuzzi in his 2012 article: a desire to separate home and work life, a need for social interactions, and a possibility to form business partnerships.[79] All of them became replicated in further studies as well. The same reasons were reported by an English researcher Brown (after surveying nine coworking spaces across England) and by Australian researchers (in a study of 19 coworking spaces in Australia and Canada).[80] However, the Australian researchers also documented a relative cheapness of rent as one of the main motivations to join a coworking space.[81]

Users of coworking spaces

The first comprehensive study by Spinuzzi documented four types of users in the studied coworking spaces (without any particular classification strategy): small-business owner (with a small number of employees), remote worker of a large organization, permanent employee of a coworking space, and an individual entrepreneur.[82] Parrino suggested a slightly different classification: freelancers, microbusinesses, employees or self-employed.[83] Further researches paid more attention to a 'freelancer' type of tenant. For example, a detailed survey (via online questionnaire) of 152 coworking spaces in Japan revealed that 40% of the users of coworking spaces were freelancers, whereas 30% were employees of larger organizations.[84]

[79] Spinuzzi, "Working Alone Together," 425.

[80] For the survey in England see: Brown, "Third Place," 120; for the survey in Australia and Canada see: Ross & Ressia, "Netither Office Nor Home."

[81] Ross & Ressia, "Netither Office Nor Home," 52.

[82] Spinuzzi, "Working Alone Together."

[83] Parrino, "The role of proximity," 265.

[84] Tadashi Uda & Abe Tomokazu, "A Descriptive Statistics on Coworking Spaces in Japan" (Discussion Paper, *Series A,* 297, Graduate School of Economics and Business Administration, Hokkaido University, December 2015.

Other themes

The first study that revealed the negative aspects of coworking spaces was based on an online questionnaire conducted by a group of Greek researchers with 813 Greek designers.[85] The study compared conditions of work of those designers who were employed by an organization and those who worked for themselves. The research found that coworking spaces could be enclaves of the shadow economy, where designers tend to overwork and are exposed to much more stress (connected with the necessity to organize everything in their professional lives).[86] Another perspective on the subject was provided by the urban sociologist Merkel. She looked at the role of management in a coworking space: 'service provider' vs 'visionary' (explained earlier in this section). [87] Japanese researchers Uda and Abe took a more detailed approach in portraying owners or management organizations of coworking spaces.[88] In their questionnaire of 152 coworking spaces in Japan the researchers asked if the owners considered a coworking space their main or side business, if they had more coworking spaces in chain or not, if they had any particular specialization (IT, design or else), how many staff members a coworking space had, how old an owner was, and how many years of experience managers had.[89] The same Japanese researchers were the first ones to look at the performance of coworking spaces: whether they were profitable or not.[90]

Merkel's study of coworking spaces in Berlin, London and New York was also one of the first ones to look at the role of coworking spaces in urban and economic development of the city. [91] In her article she argued that coworking spaces 'provide crucial coordinating functions for young start-up entrepreneurs, venture capitalists, and potential public policy

[85] Vasilis Avdikos & Athanasios Kalogeresis, "Socio-economic profile and working conditions of freelancers in co-working spaces and work collectives: evidence from the design sector in Greece," *Area* 49, no. 1 (2017), https://doi.org/10.1111/area.12279.

[86] Avdikos & Kalogeresis, "Design sector in Greece."

[87] Merkel, "Coworking in the City," 128.

[88] Uda & Tomokazu "Coworking Spaces in Japan."

[89] Ibidem, 34.

[90] Ibid.

[91] Merkel, "Coworking in the City."

interventions in cities'.[92] A Canadian researcher also found the role of coworking spaces in the city to be crucial for 'revitalizing downtowns and fostering local economic development'.[93] Thus, different authors tried to apply various approaches when studying coworking spaces. Each author looked at the notion through different lenses: culture, community, knowledge exchange in coworking places, motivations to join a coworking place, some look at the negative side of conducting one's business in a coworking place, and so on. Although these themes helped gain some understanding of the notion of coworking places, there is still room for development and some other sides of the notion that could be researched.

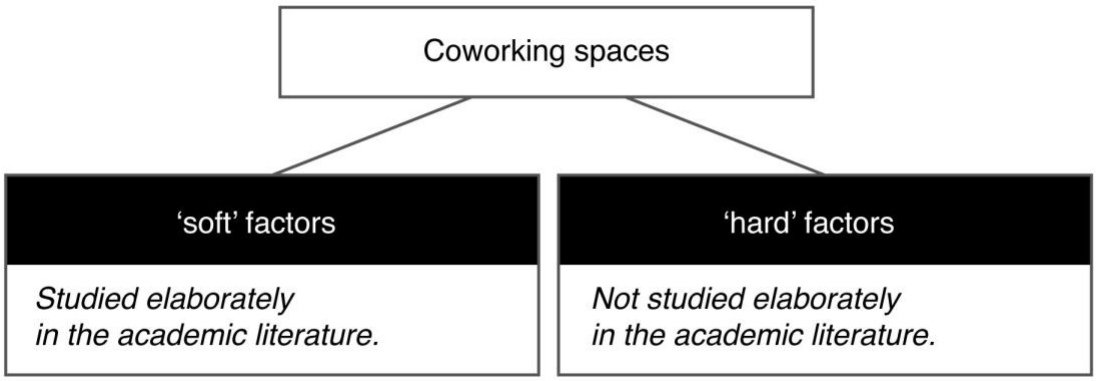
Research gap – lack of research about 'hard' factors

After conducting the literature review, it became clear that the majority of the subjects researched in the literature about coworking spaces regard to 'soft' factors. But just like any other organization, a coworking space is defined not only by that. It also has a 'hard' factor: everything that is related to the physical composition of a place such as a type of building, rooms, furniture, and so on. This thesis suggests furthering the understanding of the notion of coworking spaces by bringing these factors to spotlight and including them into the discussion. In other words, to look at not only 'how and what happens inside' ('soft' factors), but also 'what it looks like' ('hard' factors). The conceptual model presented in figure 2.1 suggests the according classification of the existing academic literature about coworking spaces. The conceptual model will be developed in the following sections (see table 2.2). Thus, the first research sub-question is presented: 'How is the spatial factor represented in the academic literature about coworking spaces?' The next section will look at a few existing articles about coworking spaces which include the 'hard' factors in the discussion.

[92] Merkel, "Coworking in the City," 133.

[93] Audrey Jamal, "Coworking spaces in mid-sized cities: A partner in downtown economic development," *Environment and Planning A: Economy and Space* 50, no. 4 (2018): 783, https://doi.org/10.1177/0308518X18760857.

Figure 2.1. Conceptual model 'soft' vs 'hard' factors.



Source: own analysis.

2.3. Discussion of 'hard' factors in the academic literature about coworking spaces

Some early articles about coworking spaces looked at different sites where coworking activities could be observed: creativity labs, libraries.[94] Besides them, there were only a few articles which paid attention to 'hard' factors in coworking spaces. For instance, in 2013 Parrino brought the notion of proximity (distance between coworkers' work stations in a room) into the discussion.[95] According to her research in coworking spaces in Barcelona and in Milan the fact that coworkers sit in one space did not facilitate collaboration. [96] Thus, her research was one of the first which looked at the relation between 'soft' factors (in this case, relationships between coworkers) and 'hard' factors (that their desks were situated close in relation to each other). In 2015 the Japanese researchers Uda and Abe tried to portrait studied coworking spaces through some general spatial characteristics such as: number of square meters that a coworking space occupied and a type of space a coworking space

[94] For creativity labs see: Schmidt, Brinks & Brinkoff, "Innovation"; for libraries see: Bilandzic & Foth, "Libraries as coworking spaces," and Risa Lumley, "A Coworking Project in the Campus Library: Supporting and Modeling Entrepreneurial Activity in the Academic Library," *New Review of Academic Librarianship* 20, no. 1 (2014), https://doi.org/10.1080/13614533.2013.850101.

[95] Parrino, "The role of proximity."

[96] Ibidem, 270.

provided (several rooms or open floor plan without any partitions).[97] In 2016 Dutch researchers suggested that 'hard' factors could be designed to foster interaction: purposefully designed shared facilities such as a coffee shop might bring people together and help tenants spark a conversation, some display opportunities such as a pin board with tenants' latest projects might also act as an excuse to start a conversation.[98] In 2019 a group of German researchers came to the similar conclusion, they argued that 'materiality' or how a coworking space was organized played an essential role in how a community organized itself.[99] Thus, these articles support the thought that 'hard' factors (spatial characteristics) of a coworking space are as important as 'soft' factors (community, collaboration, interaction, etc.). Although some 'hard' factors were mentioned in these articles, none of the papers made spatial characteristics their primarily subject of study. However, there are two exceptions in the recent literature about coworking spaces – the two studies published in 2018 and 2019 that bring the focus of their researches to 'hard' factors in coworking spaces.

The first study that aimed to examine if and to what extent 'hard' factors influence 'soft' factors in a coworking space was a study by a group of researchers from the Department of Architecture, in Naresuan University in Thailand.[100] The research evaluated how the spatial settings ('hard' factor) in two coworking spaces in Ching Mai influenced behavior ('soft' factor) of tenants in these coworking spaces. The data for the research was collected in December 2017, and the research was published in 2018. The study used ethnographic qualitative research strategy with the methods of direct observations and behavioral mapping. Behavioral mapping in this case meant recording patterns of users' behavior directly on the printed floor maps of the studied coworking spaces. The study looked at four types of activities that had been performed in the researched coworking spaces: focus, collaboration, socialization and learning.[101] And then evaluated them in relation to the different spatial

[97] Uda & Tomokazu "Coworking Spaces in Japan," 34.

[98] Cabral & van Winden, "An analysis of coworking strategies," 22-26.

[99] Blagoev, Costas & Karreman, "We are all herd animals," 19.

[100] Ondia, Hengrasmee, & Chansomsak, "Spatial Configuration."

[101] The classification of activities was borrowed from a survey report published in 2009 by an international design firm for office environments – Gensler. The particular Gensler survey used for the classification of work activities used by the researchers from Thailand was not available online when the author of this paper tried

settings offered by these coworking spaces (workstations, informal seating spaces, breakout spaces). The researchers argued that such approach helped gain better understanding of the effect of spatial configuration on users' behavior inside the coworking spaces. For instance, the main findings stated that focus activity primarily took place in a general workstations area, collaboration activity mostly happened in the general workstation area and in a breakout area, socialization activity mostly happened at the breakout and informal seating areas, and learning activities mostly took place in the breakout areas. The study drew its theoretical framework from earlier studies about space and behavior from anthropologist Edward Hall (from Northwestern University in the US) and environmental researcher John Zeisel (from Harvard Architecture School). Despite the strong theoretical framework, the article itself has some major flaws. For instance, it failed to explain how the four activities were differentiated between each other during observational stage. Particularly, the authors did not provide any explanations on how they managed to differentiate collaboration activity from learning activity based on their observations. Both activities could include people sitting next to each other, talking, and possibly making some sketches or looking at a laptop screen. Unless a researcher approaches an observed group of people and asks them directly what they talk about, it seems to be difficult to distinguish easily which activity exactly took place. Moreover, the article provided floor maps, but did not provide any descriptions of observed areas, thus making it difficult to build further research based on their findings. Nevertheless, the study represents a great value in opening the discussion about direct influence of the 'hard' factors in coworking spaces in relation to the 'soft' factors, and in suggesting a theoretical framework for that. The researchers point out to the limited generalisation capacity of their study, because it focused only on the two coworking spaces in Thailand, and their specific features. Thus, the article called for future researchers to perform similar case studies in other countries in order to get more general findings.[102] This paper answers that call and partially borrows theoretical framework from this research, more details will be provided in the next section of this chapter.

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to access it. Other surveys performed by the same company are available here: https://www.gensler.com/research-insight/workplace-surveys.

[102] Ondia, Hengrasmee, & Chansomsak, "Spatial Configuration," 35.

Another recently published (in the Spring of 2019) relevant study which looked at the relationship between 'hard' and 'soft' factors was a qualitative study performed by the Dutch researchers from the Department of the Built Environment from Eindhoven University of Technology.[103] The research could be accounted for somewhat answering the call from the previous study: it looked for the direct relationship between motivations to choose to work in a coworking space and this place's spatial characteristics. The article described the results of qualitative study which consisted of a questionnaire completed by 219 respondents from 25 coworking spaces across the Netherlands. The main finding of the study was that accessibility (by car, bicycle or tram) was voted to be the most important factor for tenants when choosing which coworking space to join. The atmosphere and interior aesthetics were voted the second most important factor, and the layout of the space (closed rooms, or semi-opened space) was voted the third most important factor. Although the study looked at 'hard' factors, it only evaluated the general spatial characteristics (location, layout), and did not touch upon specific facilities offered by a coworking space (types of rooms available). The latter was represented in the questionnaire under the broad term of 'diversity in supply spaces'. This limitation could be explained by the fact that the research used a qualitative approach in the form of a questionnaire, that is why certain aspects had to be generalised. Therefore, contrary to a qualitative approach in the form of an interview, the study by Dutch researchers could not afford diving into particular details. The researchers pointed to the lack of the detailed analysis of spatial characteristics of facilities (for example, a coffee corner, a relaxation area, a bar, etc.) in the limitations of their research, and called for future researchers to explore that side using different methods of research.[104] This thesis answers that call and performs a case study in one of the coworking spaces in Rotterdam using qualitative approach with the methods such as observations, behavioural mapping and interviews. More about that in chapter 3.

Thus, this section evaluated how the spatial ('hard') factor was represented in the academic literature about coworking spaces. Table 2.2 provides a summary of the authors and the main subjects of their studies divided into 'soft' and 'hard' factors. It is clear from the

[103] Weijs-Perree et al., "Analysing user preferences."

[104] Ibidem, 545.

table that 'soft' factors of coworking spaces are well researched and will most likely continue to attract researchers. This unequal division of interest could be explained with the fact that the two new features of the modern context of coworking spaces could be classified as 'soft' factors. First, coworking spaces accommodate new types of tenants – individual entrepreneurs and freelancers, and second, coworking spaces offer new types of renting contracts – ultra short-term ranging from one day to several months.[105] On the other hand, the 'hard' factors did not get enough attention. However, there is a lot of potential to enrich the academic discussion about coworking spaces exactly through studies that include spatial characteristics in their research, because they affect 'soft' characteristics. In other words, the built environment ('hard' factors) influences the behavior of people in that environment ('soft' factors). A type of building, furniture, a size of general working area, number of tables provided might significantly influence what type of collaboration and communication develops in a coworking space. For example, a pin board that showcases projects that tenants of a coworking space are working on might help spark more conversations, and therefore lead to more communication and potentially collaboration on projects. Whereas in the absence of a pin board such occasions of communications might not have happened at all. This is only one example of how a 'hard' factor can influence a 'soft' factor. This particular case was documented in the study conducted in the two coworking spaces in Amsterdam. [106] A field of study that is particularly helpful when looking at the relationship between 'soft' and 'hard' factors is called environmental psychology. One of the leading writers in the field of environmental psychology Stokols explained the importance of that approach: 'psychological phenomena should be viewed in relation to the spatial, temporal, and sociocultural milieu in which they occur'.[107] Thus, the second sub-question is presented: 'What characteristics of spatial factors from earlier studies of space (and work environment) could be applied to coworking spaces?' To answer it, the paper now turns to discuss previous studies about 'hard' factors of work environments.

[105] The two features were presented earlier in this chapter, discovered by Foertsch, see: Foertsch, "What Is Coworking" and Merkel, see: Merkel, "Coworking in the City."

[106] Cabral & van Winden, "An analysis of coworking strategies," 22-26.

[107] Stokols, "Conceptual Strategies," 42.

Table 2.2. Classification of main subjects by 'soft' and 'hard' factors.

'soft' factors	**'hard' factors**
1. Description of coworking spaces (Spinuzzi, Ross and Ressia) 2. Other places as coworking spaces (Lumley, Schmidt, Brinks and Brinkhoff) 3. Motivations to work in a coworking space (Spinuzzi, Ross and Ressia, Brown, Butcher, Jamal) 4. Users of coworking spaces (Spinuzzi, Parrino, Ross and Ressia, Uda and Abe) 5. Community (Capdevila, Rus and Orel, Spreitzer, Bacevice, Garrett, Cabral, van Winden, Bianchi, Casnici, Squazzoni, Blagoev, Costas, Kärreman, Spinuzzi, Bodrozˇic´, Scaratti and Ivaldi) 6. Collaboration (Spinnuzi, Parrino, Bilandzic, Foth, Schroeter, Fuzi, Clifton, Loudon, Ross, Ressia, Merkel, Gerdenitsch, Scheel, Andorfer, Korunka, Brown, Jakonen, Kivinen, Salovaara, Hirkman, Jamal) 7. Networking (Avdikos, Kalogeresis) 8. Knowledge exchange (Capdevila, Butcher) 9. Negative aspects (Avdikos and Kalogeresis) 10. Role of coworking places in urban and economic development of a city (Merkel, Jamal) 11. Owners of coworking spaces (Merkel, Uda, Abe, Brown) 12. Performance of a coworking space (Uda and Abe) 13. Innovation and community (Capdevila) 14. Entrepreneurship (Butcher)	1. Geographical proximity (Parrino) 2. How coworking places look (Uda and Abe) 3. Types of facilities (Cabral, van Winden, Blagoev, Costas, Kärreman, Weijs-Perrée, van de Koevering, Appel-Meulenbroek, Arentze, Ondia, Hengrasmee, and Chansomsak)

Source: own analysis.

2.4. Previous studies about spatial characteristics of work environments

The interdisciplinary field that contains both 'hard' and 'soft' factors as the units of its analysis is called environmental psychology – 'the discipline that studies the interplay between individuals and the built and natural environment'.[108] The discipline originated in the beginning of the 20th century but was not recognised as an independent branch of psychology until the late 1960s.[109] It was the scholars of this field from whom the researchers from Thailand (Ondia, Hengrasmee and Chansomsak) borrowed some theoretical concepts to study spatial characteristics of coworking spaces.[110] It could be hypothesized that the researchers managed to successfully apply some theoretical concepts from environmental psychology to the modern context of coworking spaces, because the theories they borrowed build up on simple blocks of analysis such as a shape of a building, lightning, room size, acoustics, walls, windows, furniture and other spatial characteristics. And therefore, were applicable to any environment, whether it was a house, a factory, a university building, an office, or a coworking space. Environmental psychologists also studied work environments even earlier. For example, in his book *Public Places and Private Spaces. The Psychology of Work, Play, and Living Environments* published in 1976, one of the prominent researchers in the field of environmental psychology Albert Mehrabian analyzed a typical office environment of the 1970s in the US.[111] The particular concepts from environmental psychology that were used in his analysis are presented in table 3.1. Building up on the legacy of the early writers in the field some modern researchers continued developing the concepts of environmental psychology and applying them to modern office environments. For

[108] Linda Steg, Agnes van den Berg & Judith de Groot, "Environmental Psychology: History, Scope, and Methods" in *Environmental psychology: an introduction 2nd ed.*, eds. Linda Steg & Judith de Groot (Hoboken, NJ: Wiley, 2019), 2. This paper uses the definition of environmental psychology from the book that was published in 2019, because as it tends to be the case with any new field of study – an integral definition develops significantly later, after some core theories were created.

[109] Steg, van den Berg & Groot, "Environmental Psychology," 2-3.

[110] For the study in Thailand see: Ondia, Hengrasmee, & Chansomsak, "Spatial Configuration."

[111] Albert Mehrabian, *Public Places and Private Spaces. The Psychology of Work, Play, and Living Environments* (New York: Basic Books, 1976), 140-151.

example, the *Handbook of Environmental Psychology and Quality of Life Research,* published in 2017, looked at the modern offices from the point of view of environmental psychology.[112]

Coworking spaces are referred to by some academics as a 'historically new form of organizing'.[113] However, it is important to remember that a coworking space first of all entails a working activity. Although coworking spaces' ethos is of a somewhat rebellious nature, where borders are blurred and more easy, friendly, community vibe is promoted, these spaces are still workplaces. For example, in his book *Cubed: A Secret History of the Workplace published* in 2014, workplace researcher Nikil Saval offers a pioneering analysis of the evolution of a workplace.[114] Saval started his analysis with the first offices in 1850s where clerks did accounting and some administrative work. In the last chapter Saval presented a transition from offices to coworking spaces as a natural development of work environments. Thus, following Saval's analysis of a workplace, a history of a coworking space becomes interwoven into the history of office, and therefore any other work environment. This inference allows this paper to borrow frameworks and concepts suggested by environmental psychology, and then apply them to study spatial characteristics of coworking spaces. This approach claims to be innovative, because it looks at the history of coworking spaces not as a phenomenon which started only in 2005 in San Francisco but incorporates the history of coworking spaces into the history of work environments. The thesis will test how well the theoretical frameworks and concepts that were coined by environmental psychologists in 1960s and 1970s are applicable in relation to the spatial characteristics of coworking spaces in chapter 4.[115]

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[112] Jacqueline Vischer & Mariam Wifi, "The Effect of Workplace Design on Quality of Life at Work" in *Handbook of Environmental Psychology and Quality of Life Research*, eds. Ghozlane Fleury-Bahi, Enric Pol & Oscar Navarro (Springer International Publishing Switzerland, 2017), 387-400.

[113] Spinuzzi et al., "Coworking Is About Community," 121.

[114] Nikil Saval, *Cubed: A Secret History of the Workplace* (New York: Doubleday, 2014).

[115] This period was chosen, because exactly in the works published at that time the focus of environmental psychology was more on built environments. In 1960s the discipline which was later called "environmental psychology" was first referred to as "architectural psychology". After 1970s the discipline included studies not only about built environments, but about all nature environments as well.

The first concept that could be well applicable to a study about spatial characteristics of a coworking space is 'behavior setting'.[116] The term was coined in 1960s by Roger Barker, a social scientist and a founder of environmental psychology. Behavior setting is understood as a unit of analysis that helps explain the relationship between a behavior pattern and an environment.[117] For example, Barker explained that some aspects of behavior of the same group of children (their behavior pattern) varied as they passed from one behavior setting to another during a day at school: the children were organised, mostly in serious mood, occupied with reading or writing in the academic class; the children were unorganised or partly organised, in playful mood, playing active games on the playground; the children were organised, in medium cheerfulness, occupied with singing in the music class. In these three examples the same group of children was observed in three different behavior settings: academic class, playground, and music class.[118] In relation to coworking spaces behavior settings could be defined by types of facilities that a particular coworking space provides. For example, a behavior setting such as 'skype call with a client' requires a quiet environment, sensitive to interruptions or any noise other than a noise created by participants of that call.

Another set of useful terms was developed around that time by the American anthropologist Edward Hall. Hall coined the term 'proxemics', which 'is used to define the interrelated observations and theories of man's use of space'.[119] Or, as defined by researcher of environmental design John Zeisel in his book *Inquiry by design. Tools for environment-behavior research* as 'the important spatial dimension to human communication'.[120] Hall assigned three aspects to proxemics: fixed-feature (buildings, walls, corridors, etc.), semifixed-feature (furniture) and informal (distances maintained in encounters with others).[121] The semifixed-features are of particular interest to this paper. In his book, Hall also

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[116] Roger Barker, *Ecological Psychology. Concepts and Methods for Studying the Environment of Human Behavior* (Stanford, California: Stanford University Press, 1968).

[117] Barker does not provide a direct definition in his book.

[118] Barker, *Ecological Psychology*, 28-29.

[119] Edward Hall, *The Hidden Dimension* (New York: Anchor Books, 1969), 101.

[120] John Zeisel, *Inquiry by design. Tools for environment-behavior research* (Monterey, California: Brooks/Cole Publishing Company, 1981), 111.

[121] Hall, *The Hidden Dimension,* 101-112.

presented two very important concepts regarding the semifixed-features: 'sociopetal' and 'sociofugal' spaces, which are sometimes mistakenly thought of to be coined by him. However, in his book Hall attributes the authorship to an English psychiatrist Humphry Osmond, who came up with these terms when observing specific behavior in his health and research center in Saskatchewan. Osmond noticed that some spaces (like railway waiting rooms) tend to keep people apart, whereas other spaces like tables at French sidewalk cafes tend to bring people together. He called the first types of spaces sociofugal, and the latter – sociopetal.[122] In coworking spaces these terms could be applied in relation to types of facilities provided in order to better understand a purpose of each facility. For example, a general working area could be thought of as a sociofugal space, because it aims to keep people apart and allow them to work on their own projects, whereas a kitchen area with coffee spot in it could be thought of as sociopetal space, because it tends to bring people together, conversations and encounters happen when people end up queuing for some coffee in the mornings.

Another leading writer in the field of environmental psychology Albert Mehrabian coined two pairs of very useful concepts about environments that help understand the nature of human behavior: environments that stimulate approach or avoidance behavior, and environments with high-load or low-load of information rates.[123] Environments that stimulate approach behavior were described by Mehrabian as 'a positive or desired sort of thing, having to do with movement toward, exploration, friendliness, improved performance, and voiced preference or liking', whereas the environment that stimulates an avoidance behavior is described as 'negative, having to do with movement away from, withdrawal, interpersonal coldness, defective performance, and voiced dislike'.[124] To describe the second pair of concepts Mehrabian gave two examples of a beach. An empty beach with a clean sand, a rhythmic sound produced by waves, and clean blue sky opposed to a crowded beach with crying children around, and some people tossing a frisbee back and forth, and a helicopter

[122] Hall, *The Hidden Dimension,* 101-112.

[123] For 'approach and avoidance behavior' see: Mehrabian, *Public Places and Private Spaces*, 5-6; for 'high-load or low-load information rates' see: Mehrabian, *Public Places and Private Spaces*, 12.

[124] Mehrabian, *Public Places and Private Spaces*, 6.

approaching closer. The first environment would be considered containing a low-load of information, whereas the latter which is 'more varied, complex, novel, large scale, contrasting, dense, surprising, heterogeneous, crowded, asymmetrical, moving, rare, random, or improbable' would be considered containing a high-load of information.[125] Both pairs of descriptions of an environment help comprehend a possible behavior a person might have in each case. Table 3.1 (see chapter 3) summarises all above-mentioned concepts. The concepts will be used in chapter 4 of this paper when analysing the case study.

2.5. Conclusion

The literature review in this chapter helped detect the main topics of the academic discussion about coworking spaces. The analysis revealed that the majority of the topics relate to the 'soft' factors in a coworking space: collaboration, communication, knowledge exchange, networking, innovation and so on. However, just like any other organization a coworking space consists not only of 'soft' factors, but it also has 'hard' factors (types of facilities provided, furniture, interior design, etc.). The answer to the first research sub-question 'How is the spatial factor represented in the academic literature about coworking spaces?' helped identify the gap for the research. The academic literature about coworking spaces lacked understanding of how 'hard' factors were used in coworking spaces, and how they might have influenced the 'soft' factors (for example, behavior of tenants). To develop the discussion in that direction, it is helpful to apply to the earlier studies that already researched 'hard' factors. Therefore, through answering the second sub-question 'What characteristics of spatial factors from earlier studies of space (and work environment) could be applied to coworking spaces?' the research looked at the field of environmental psychology. Several concepts developed by the leading environmental psychologists appeared particularly helpful: behavior setting, proxemics, sociopetal and sociofugal spaces, approach and avoidance behaviors, high-load and low-load environments. Chapter 3 will elaborate more on these concepts and how the research will use them to bridge the gap in the academic discussion regarding 'hard' factors in coworking spaces.

[125] Mehrabian, *Public Places and Private Spaces*, 12.

Chapter 3: Research design

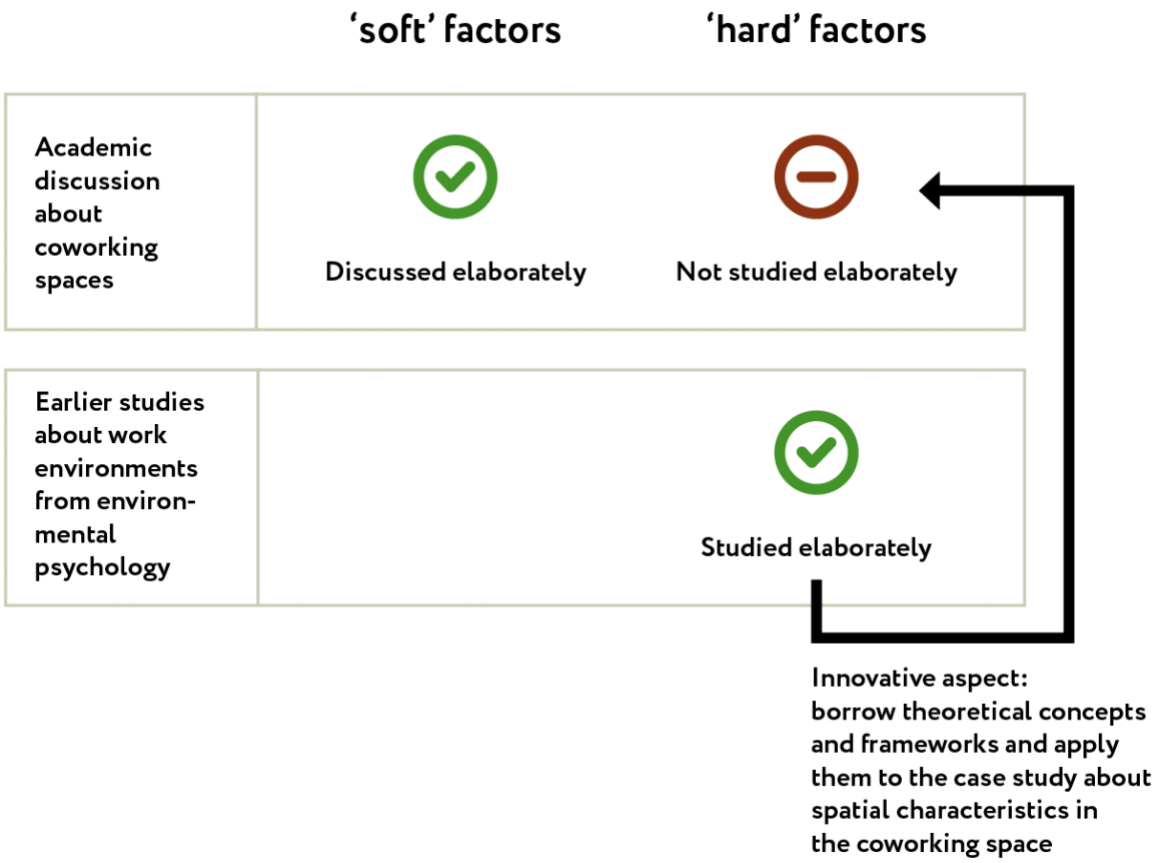
To create a comprehensive theory, many case studies with various inputs should be conducted. This approach is used in inductive reasoning: observations are followed by generalization, and finally lead to creation of a theory. Unlike in the deductive approach, where first a theory is constructed, then predictions are made, and finally an experiment is conducted to test the predictions. Following application of an inductive approach in the thesis, one case study (of many more to be conducted) is introduced. The case study performed for this thesis claims to be innovative, because it suggests a novel combination of two factors. First, the case study focuses on the aspects that were not researched in depth before, and second, it approaches them using the theoretical concepts that have been coined at least 30 years prior to the first mentioning of the studied phenomenon: the theoretical concepts were coined by environmental psychologists in 1960s and 1970s, whereas the first official mentioning of a coworking space is traced to 2005. Section 3.1. summarizes the theoretical framework and concepts that will be used in the discussion of the main findings form the case study. The following sections deal with the design of the case study itself: methods for data collection are discussed in section 3.2., data preparation is described in section 3.3., methods for data analysis are dealt with in section 3.4. Section 3.5. presents some conclusions and discusses reliability of the study.

3.1. Theoretical framework and concepts

The case study presented in this thesis is inspired by the gaps in the academic literature about coworking spaces. Thus, it focuses on 'hard' factors of one of the coworking spaces in Rotterdam through three research sub-questions: 'What are the daily activities of the users of the coworking space?', 'What types of facilities do the tenants use to perform their daily professional activities, and what types of facilities do they lack?', and 'How do people move inside the coworking space?' Next, the findings from the case study will be reflected upon with the applied concepts from environmental psychology (table 3.1 summarizes the framework developed in the literature review). In doing so, this thesis tests an assumption that the theories about spatial characteristics of work environments developed in 1960s and 1970s by the leading authors in the field of environmental psychology are applicable to the modern context of coworking spaces. Figure 3.1 illustrates that approach. This assumption was theoretically tested in the previous chapter. If the case study

is able to deliver the evidence in practice, then it will allow this thesis to argue that the history of coworking spaces should be indeed comprehended as a part of the history of all work environments with all the concepts and theories developed earlier in relation to it.

Figure 3.1. Conceptual model for theoretical framework.



Source: own analysis.

Table 3.1. Summary of the theoretical concepts from the field of environmental psychology.

Concepts	***Author, book***
Behavior setting – a unit of analysis that helps explain relationship between a behavior pattern and an environment	Coined by Roger Barker in Roger Barker, *Ecological Psychology. Concepts and Methods for Studying the Environment of Human Behavior* (Stanford, California: Stanford University Press, 1968).
Proxemics (help define spatial characteristics and how people perceive space between each other)	Coined by Edward Hall in Edward Hall, *The hidden dimension,* 1st ed. (New York: Anchor Books, 1969).
Sociopetal spaces – types of spaces that tend to bring people together ***Sociofugal spaces*** – types of spaces that tend to keep people apart	Coined by Humphry Osmond in Edward Hall, *The hidden dimension,* 1st ed. (New York: Anchor Books, 1969).
Environments that stimulate ***approach behavior*** (open to communication, ready to explore, establishing eye contact with others) Environments that stimulate ***avoidance behavior*** (ignoring communication with others, avoiding eye contact) ***High-load environments*** – types of environments that have high level of information rate ***Low-load environments*** – types of environments that have low level of information rate	Coined by Albert Mehrabian in Albert Mehrabian, *Public places and private spaces. The Psychology of Work, Play, and Living Environments* (New York: Basic Books, 1976).

Source: own analysis.

Some simpler concepts which are used in this thesis are explained more carefully in table 3.2. These concepts are assumed to be parts of everyday language and therefore should be understood accordingly.

Table 3.2. Summary of the simpler theoretical concepts.

Concept	***Explanation of how a concept is understood in this paper***
Coworkers, users, tenants	People who rent a desk and work in the studied coworking space
Daily activities, daily professional activities, professional activities	Actions performed on the daily basis that the users of the studied coworking space perform in order to fulfil the tasks related to their profession or employment
Needs, preferences	The needs and preferences of the users in particular spatial characteristics of the studied coworking space, in connection to their daily professional activities
Workplace	The studied coworking space

Source: own analysis.

3.2. Methods for data collection

In applying an inductive approach towards the studied subject (work-space relationship in the coworking space) the research focuses on the unspoken culture in the coworking space, its social world, shared beliefs and behaviors of the tenants. The methods that best cater these interests lay in the grounds of ethnographic research. In his book *Inquiry by design. Tools for environment-behavior research,* a sociologist from Harvard University, John Zeisel, provided extensive guidelines on several methods on how to conduct a research about any environment.[126] His thorough approach was built on expertise, many cases, typologies and examples of researches conducted by his predecessors in the field of environmental psychology (Roger Barker, Edward Hall, Robert Sommer, Erving Goffman and many others).[127]

[126] Zeisel, Inquiry by design.

[127] Ibidem, xiii.

This thesis explores the relationship between work of people and space that they use for it. Therefore, the environment here is the workplace (the coworking space Workspace in Rotterdam), and the behavior consists of all the work activities the tenants perform daily. Out of five methods suggested by Zeisel in his book (observing physical traces, observing behavior, focused interviews, structured questionnaires and archival methods), this research borrows the guidelines for observing behavior (through two methods – observations and behavioral mapping) in an environment and for interviewing. As there is no one standard way to conduct a research that follows inductive approach, the methods used in this research were inspired by the above-mentioned book yet were modified to better fit the particular sub-questions and the main goal of this research. It is important to point out that the combination of observations and interviews was purposefully chosen by the researcher, because these methods complement each other in a pursuit of understanding a new subject. Norwegian environmental researcher Dagfinn As referred to this two-sided approach as an 'outside-inside' question, or relationship of etic and emic standpoints, put in simpler words: data gathered about persons and data gathered from persons.[128] On one hand, observations of participants and their behavior represents the view from 'outside', or etic standpoint (external, alien), data gathered about persons (without their direct involvement). On the other hand, interviews with participants allow the view from 'inside', or emic standpoint (internal, directed to a studied subject and explained through interpretations of participants), data gathered from persons (with them being involved directly). The combination of the methods helps a researcher perceive relevant nuances, which would have been missed in case of application of only one method (only interviews or only observations).

It is also important to provide a comment regarding the particular order in which this case study applied the methods. It is possible to argue that this order allowed the researcher gradually build trust with the users of the coworking space. First, general observations took place. This allowed the tenants of the coworking space to get used to the presence of the researcher in the premises. Secondly, after two months of observations, the researcher performed active phase of observations through behavioral mapping. And finally, during the

[128] Dagfinn As, "Observing Environmental Behavior: The Behavior Setting," in *Behavioral Research Methods in Environmental Design*, ed. William Michelson (Stroudsburg, Pennsylvania: Halsted Press, 1975), 281-282.

last two weeks of observations the researcher conducted interviews with the tenants. By that time the tenants had grown accustomed to the researcher and supposedly felt more comfortable during the interviews. Should any other researcher wish to conduct the same case study applied to another coworking space and a different group of people, the following explanation of each of the chosen methods provides all the necessary details.

3.2.1 Observations

The researcher joined the coworking space Workspace for the duration of three months starting with 15.01.2019 and until 15.04.2019. The researcher was introduced to the tenants as an intern who would conduct a research project about the coworking space. However, thanks to a rather extended interval of the observations and the standard daily activities of the researcher (work on laptop), she was perceived by the users of the coworking space as. just 'any other tenant'. This allowed the research to avoid the notorious Hawthorne effect, which was first noticed in 1939 during the research about how lightning levels affected workers' productivity: every time a researcher changed lightning level workers inevitably increased their productivity. This happened because the researchers were recognized as outsiders, and every time they came to the research place workers became immediately aware of that fact and adjusted their behavior.[129] According to Zeisel, the classification of types of observer's roles are: secret outsider (when an observed group of people are not aware of the presence of a researcher), recognized outsider (when an observed group of people are made aware of the presence of a researcher, but she is not a member of the observed group), marginal participant (when a researcher is perceived by an observed group as an equal, for example, 'just another bus passenger' – when observing behavior in public transport), and full participant (when a researcher is an active member of an observed group of people).[130] In this case, the researcher was somewhere between a marginal participant and a full participant of the community in the coworking space, because she was perceived as a coworker and sometimes participated in the events organised for all the coworkers. Because

[129] Zeisel, Inquiry by design, 117.

[130] Ibidem, 112-120.

of this vantage point for observations the users of Workspace were not disturbed by the presence of the researcher, therefore did not change their behavior.

Zeisel described the qualities of this method as empathetic, direct, dynamic, and variably intrusive.[131] In application to this particular case study it meant empathy towards the users of Workspace, which allowed the researcher to understand the particular nuances of participants' behavior and the unspoken culture that stood behind it. The direct aspect of observations allowed the researcher get insights into participants' actual behavior, not only the one reported in interviews. The dynamic factor of the observations allowed the researcher to observe some cause-effect relationships (how the participants behaved if, for example, someone received a phone call, or if a group of people exited a meeting room and continued talking). And finally, the researcher had the benefit of being perceived as an equal – a coworker – and experience close participation without affecting the behavior of other coworkers.

The main goal of this method was to understand how the coworking space was used by its tenants, and contribute to answering the third ('What are the daily activities of users of the coworking space?') and the fourth ('What types of facilities do they use to perform their daily professional activities, and what types of facilities do they lack?') research sub-questions. The data was gathered on the daily bases in the format of field notes. The notes were indifferent to particular names of users and particular spots they occupied. Zones in the coworking space were referred by numbered blocks (for example, see map 4.1), and only the number of users (should they have sat in a group) has been recorded (a group of two, a group of three, and so on). This method helped the researcher gradually learn about the context and the unspoken rules of the behavior in the coworking space. Therefore, it was possible to adjust her own behavior accordingly. Application of this method helped set the stage to the next phase of observations.

3.2.2 Behavioral mapping

The method of behavioral mapping in this case meant recording the data about how coworkers move inside the place and where they choose to sit, directly on the floor maps of

[131] Zeisel, Inquiry by design, 112.

the coworking space (see maps 4.1 and 4.2 in chapter 4, and maps 3.1 – 3.33 in Appendix 3). As explained by one of the environmental psychologists: the process of recording an observed behavior on a map on a time-sampling basis is the core of behavioural mapping method.[132] For the two weeks starting with 04.03.2019 and until 15.03.2019, the researcher collected the data in the following way: the researcher walked around the two floors of the coworking space and marked the occupancy of the working desks every 30 minutes. The data was gathered during the most active office hours: 10:00 – 12:00, 13:30 – 17:00. The break between 12:00 and 13:30 was chosen, because of the lunch break. The data during this time was not representative regarding the occupancy of the working stations.

The first method (observations) helped set the stage for the second method (behavioural mapping), because by this time (second month of the observations) the users of the coworking space got acquainted with the researcher. Thus, during her observational walks she was not perceived as a stranger. It is important to mention here that two weeks before the collecting data through behavioral mapping, all the users of the coworking space were emailed about the research that the author of this thesis intended to perform. Each user received an email with explanation of the research and its goals and was asked to voice any concerns should anyone wished not to be observed. The researcher did not receive any concerns, but some encouraging emails stating that the users were willing to cooperate. This method intended to help understand the movements inside the coworking space and its overall occupancy, therefore contributing to answering the fifth sub-question of the research ('How do people move inside the coworking space?').

3.2.3 Interviews

Zeisel reflected on the importance of interviews when conducting an environment-behavior research: 'Only by asking the actors what their intentions are can researchers distinguish conscious intent from unintentional side effects.'[133] Following that reasoning, this research performed a number of interviews which helped gain deeper understanding of certain subjects and behaviors of the coworkers. The questions for the interviews were

[132] Robert Bechtel, "The Semantic Differential and Other Paper-and-Pencil Tests," in *Behavioral Research Methods in Environmental Design*, ed. William Michelson (Stroudsburg, Pennsylvania: Halsted Press, 1975), 61.

[133] Zeisel, Inquiry by design, 139.

developed in the later stages of the research and were based on the data that the researcher gathered earlier through observations and behavioral mapping. The researcher performed semi-structured interviews, which consisted of the two parts. The first part (see table 2.1 in the Appendix 2) consisted of 12 open-ended questions and a number of clarifying questions which varied per case. The second part (see table 2.2 in the Appendix 2) was in the form of a quiz: the participants were offered 26 different physical qualities (characteristics) of the coworking space and were asked to give a short or a long comment regarding each subject. There was no strict logic in narrowing the number of the questions to 12. The primary focus was to cover the main research questions and to comprehend the full picture of the studied phenomenon. The physical characteristics in the quiz part were limited to 26 items, because that number was sufficient to cover the features of the studied coworking space. Any other research about a different coworking space might end up with the different number of questions and physical characteristics.

The researcher interviewed total of 13 people: 10 tenants of the coworking space (independent entrepreneurs), two tenants of the coworking space who were employed by one larger organization (also a member of the coworking space), one intern hired by one of the tenants of the coworking space, and one employee of HNI who occasionally came to work in Workspace. Each interview lasted approximately 30 minutes, was recorded, transcribed and coded afterwards. It is important to mention that the researcher did not address the interviewees with the research sub-questions directly. Instead, the researcher developed a number of indirect questions in order to approach the main subjects of this survey from different perspectives. Structuring the interviews in such a way helped the researcher gradually inspire an interviewee to talk about the main subjects this research was concerned about, and at the same time reconstruct the general narrative for their answers. Table 3.3 explains the correspondence between the research sub-questions and the interview questions.

Table 3.3. Correspondence between the research sub-questions and the interview questions.

What the interview questions intended to contribute to	**Interview questions**
General understanding of the professional and demographic profiles of the tenants of the coworking space	1. Please introduce yourself. What do you do for work? 2. Could you please give me an estimation of how long have you been working? In years.
Research sub-question 3: 'What are the daily activities of users of the coworking space?'	3. Are you currently employed by someone? Do you work for yourself? Do you have any employees? Partners? 4. What is the geography of your business activities? (Do you travel for business often?) 5. Could you please talk me through your average working day? In case you have several types of working days, please describe them. I am interested in your average schedule, how many hours you spend on different types of activities.
General understanding of the motivations to work in this coworking space	6. Now I would like to discuss how this coworking space caters your needs. Why did you choose to work in a coworking place and particularly in this one?
Research sub-question 4: 'What types of facilities do they use to perform their daily professional activities, and what types of facilities do they lack?'	7. How often and for how long do you come to this coworking place? Would you prefer different working hours? 8. How many different zones do you see in this coworking place? How many of them do you use and for what type of activities? Are there any other types of facilities that you experience lack of?

(continuation of table 3.3, starts on p. 50) **What the interview questions intended to contribute to**	**Interview questions**
Research sub-question 4: 'What types of facilities do they use to perform their daily professional activities, and what types of facilities do they lack?'	9. Do you invite people here? Do you work with people here? 10. Do you interact with the space around your workstation now? (Do you use storage space? Do you put something on the table?) Do you feel the need to change something in the space maybe?
Research sub-question 5: "How do people move inside the coworking space?"	11. How do you choose where to sit? Do you ever change seats? Floors?
General understanding of the distractions in this coworking space	12. Are there any distractions around your workstation?

Source: own analysis.

The questions 3, 4, and 5 from the first part of the interview aimed to contribute to answering the third research sub-question ('What are the daily activities of users of the coworking space?'). The questions 7, 8, 9 and 10 from the first part of the interview aimed to contribute to answering the fourth research sub-question ('What types of facilities do they use to perform their daily professional activities, and what types of facilities do they lack?'). The question 11 from the first part of the interview aimed to contribute to answering the fifth research sub-question ('How do people move inside the coworking space?'). Despite the pre-designed interview questions and the correspondence to the research sub-questions, the actual answers to the research sub-questions would be derived from a much broader set of data. First of all, the second part of each interview elaborates on the physical characteristics of the coworking space, which is relevant to the research sub-question 4 (when describing common area, meeting rooms and calling rooms, see table 2.2 in Appendix 2). Secondly, the participants shared opinions which were found to be relevant to the research sub-questions in different parts of the interviews, not necessarily according to the pre-designed structure.

This was taken care of when creating codes for the transcribed interview answers (see Appendix 4). And thirdly, some additional questions (varied per case) were included into the interviews to help the researcher better grasp the profiles of the participants, and the context behind their answers (see transcription of the interviews in Appendix 4).

3.3. Data preparation

It is helpful to look at the data which was generated from the methods of data collection to better understand why certain methods for data analysis were chosen. Table 3.4 shows the type of data generated from each method of data collection.

Table 3.4. Correlation between methods for data collection and generated data.

Methods for data collection	Generated data for analysis
Observations	Field notes
Behavioral mapping	Behavioral maps Data recorded on the maps
Interviews	Text (transcribed interviews)

Source: own analysis.

The field notes are the observations that the researcher found helpful in understanding the culture and the norms of behavior inside the coworking space. The field notes were recorded on the daily basis. They could include any untypical behavior noticed by the researcher. Any events that took place in the coworking space and could potentially influence the way tenants used the space were also considered. The process of recording such field notes proved to be particularly helpful, because it allowed the researcher gradually build up the narrative of the place, and gain insights into participants' behavior.

The maps from behavioral mapping cover the two floors of the coworking space. One of the main benefits of using maps of a sight during a research is that they help grasp

understanding of how a whole place is used at once by all its inhabitants.[134] In this case, the researcher specifically used maps when recording occupancy of the coworking place for two weeks, but also to understand any other work activities that were performed by the tenants at each given moment. During the observations the researcher designed total of 260 maps of the sight with marked occupancy (per work desk) on each floor, and included different notes, routes, schemes and explanations of how the coworking space was used by its tenants. The research generated exactly 260 maps, because every day produced 13 maps per one floor (marked occupancy of work desks during general working hours: 10:00, 10:30, 11:00, 11:30, 12:00, 13:30, 14:00, 14:30, 15:00, 15:30, 16:00, 16:30, 17:00), there were two floors in the coworking space, and there are 5 working days in a week (the method was performed for 2 weeks, which resulted in 10 recording days). Thus, this results in a simple formula: 13 (maps per one floor per day) x 2 (floors) x 10 (recording days) = 260 maps. The maps were created using the professional design tools such as Adobe Photoshop and Adobe Illustrator. The examples of these maps could be found in Appendix 3 (see maps 3.1 – 3.13).

All the interviews were recorded with the consent of each participant. The audio files were later transcribed, and the resulting body of text was assigned different codes (more on that further in the methods of data analysis). The type of language used, possible spelling and punctuation mistakes accidentally or purposefully used by the participants were left unchanged. Therefore, a reader is warned that certain quotes from interviews used in this paper might contain unstructured sentences, as the audio files recorded the natural flow of human speech.

3.4. Methods for data analysis

The types of data gathered called for certain methods of data analysis. The most common method used to analyze interviews with open-ended questions is coding. It is also considered to be very typical for majority of qualitative researches, that the relationship between data and conceptual model is initially open.[135] This means that throughout a research project that uses various methods for data gathering a researcher gradually develops

[134] Zeisel, Inquiry by design, 122.

[135] Hennie Boeije, *Analysis in Qualitative Research* (London: Sage Publications Ltd, 2010), 83.

conceptual models of a studied subject. Because this research applies an inductive approach, it aims to deliver explanations, causal relationships and other details, so new theories could be drawn from and supported by this case-study. That is why the research provides the three methods of data analysis: coding, generating conceptual models and drawing behavioral maps.

3.4.1 Coding

To generate codes for this research first, all interviews were transformed from audio to text material. Then the process of coding took place. Coding simply means assigning a particular code (word, or hashtag) to a particular paragraph, sentence or segment in a body of text.[136] Coding could be done manually or using specific software. Because the interviews were performed during the later stages of observations, it was possible to generate a certain number of codes beforehand (assuming that they would be mentioned later in the interviews). This reduced the amount of work which could have taken place had the researcher chosen to start the research with interviews and not with observations. Thus, during the observations the researcher prepared the pool of potential codes (work activities) that the tenants performed in the coworking space and could have been mentioned in the interviews. Next, after transcribing all the interviews, the manual coding was applied using Microsoft Word program. Only then was the coding entered into the analytical software (Atlas.ti). The researcher intentionally first applied the manual coding, because it allowed for both preliminary conceptual models, and a map of codes to develop. As Dutch researcher Boeije (from the Department of Methodology and Statistics in Utrecht University) argues in her book *Analysis in Qualitative Research,* when coding, constant evaluation, comparison and analysis of gathered material is crucial to the final quality of the performed research and the products it develops.[137] That is why the author went through every gathered piece of material at least twice, performing different methods of data analysis.

[136] Boeije, *Analysis in Qualitative Research*, 95.

[137] Ibidem, 93-122.

3.4.2 Conceptual models

To generate a coherent conceptual model as an in-depth view of the studied phenomenon, many rounds of reassembling and constant comparison of data have to take place.[138] Such work results in conceptual models that document a studied phenomenon, identify relationships within synthesized blocks (studied subjects), allow for a classification of discovered units of research, and so on. As this research used the specific software (Atlas.ti) for coding, it also made benefits of certain visualization tools that the software offers. Based on generated codes it is possible to show relationships between groups of codes, relationships within a group of codes, etc. (for example, see figures 4.3 – 4.5).

3.4.3 Behavioral maps

The maps were used throughout the research on a regular basis and in multiple ways: to collect, to record and to analyze the gathered material. When a research is concerned with combined analysis of behavior and environment, maps seem to be the most convenient tool, which taps into each person's innate ability to perceive visual material. In addition to that, the maps will also be used to present the data. In relation to studies about physical environment, maps seem to have the strongest explanatory power, unlike other possible alternatives (graphs, charts, tables). The Swedish researchers Göran Lindberg and Jan Hellberg – early scholars in the field of behavioral research – described how there were multiple ways of collecting, recording and analyzing data using maps.[139] The researchers introduced new ways of using computer technologies for analyzing gathered material, and also predicted the rapid development of many computational tools. Despite the variety of available tools, they emphasized the importance of creating a specific methodology, and a unique set of tools that help answer the particular questions of each study.[140] The study described in this paper was no exception, therefore required its own unique methodology of analysis of gathered materials. The paper will now describe it in detail.

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[138] Boeije, Analysis in Qualitative Research, 79-86.

[139] Goran Lindberg & Jan Hellberg, "Strategic Decisions in Research Design," in Behavioral Research Methods in Environmental Design, ed. William Michelson (Stroudsburg, Pennsylvania: Halsted Press, 1975), 20-28.

[140] Lindberg & Hellberg, "Strategic Decisions in Research Design," 20-28.

As a result of application of the second method of data collection described in this paper (behavioral mapping), the researcher created total of 260 behavioral maps, which were then analyzed and transformed into 20 maps that showed which work desks were occupied more often during the two weeks of behavioral mapping (see maps 3.14 – 3.33 in the Appendix 3). The following example shows the algorithm how one of these 20 maps was created. For example, the 13 maps generated on the last day of the observations through behavioral mapping (15.03.2019) on the fifth floor of the coworking space could be found in Appendix 3 as maps 3.1 – 3.13. Each map documented how many people were in the general working area sitting behind or standing next to any of the working desks. Then, the number of times that each working desk was occupied was counted. The results ranged from 0 to 13 (see picture 3.2 in Appendix 3). The value '0' was assigned to the places that were not once occupied during this day's observations. If a place was noticed to be occupied from 10:00 till 12:00, that would result in the value '5' assigned to this place, because there were five rounds of observations during these hours (10:00, 10:30, 11:00, 11:30, 12:00). The maximum number that a place could be assigned was '13', which meant that the desk was occupied throughout the day, meaning thirteen rounds of observations during that day (10:00, 10:30, 11:00, 11:30, 12:00, 13:30, 14:00, 14:30, 15:00, 15:30, 16:00, 16:30, 17:00). After each place was assigned a number, the data was converted into circles (see map 3.23 in Appendix 3). Each dot has the exact number of rings around it equal to the number assigned to it earlier. This helped create very clear visual representation of occupancy of the place. A reader intuitively grasps that the bigger the circle, the more frequently a working desk was occupied. Thus, performing the same sequence of actions in relation to each set of maps (per floor, per day) the researcher generated 20 maps (see 3.14 – 3.33 in Appendix 3). In combination with the first phase of observations, these maps will help answer the fifth research sub-question (more on that in the chapter 4).

While superficially similar results could have been achieved through creating an Excel spread sheet, where each taken place (work desk) could have been given a separate name (Desk 1, Desk 2, and so on) and assigned values '0' (vacant) or '1' (occupied), this data representation would have lacked the important visual component that the maps can deliver. Moreover, the research was not exclusively interested in the most frequently occupied desks but was also interested in a general character of how often and exactly which places were

occupied. Although the coworking space was designed in such a way that one working desk was supposed to be occupied by one person, the tenants of the coworking space were noticed to escape the predesigned structure by moving chairs and approaching the working desks from different sides depending on the activity that they were performing at a given moment (having a short meeting, approaching a colleague to ask a question, moving a chair from direct sunlight, and so on). Such nuances could have escaped analysis, should the data been documented through an Excel spread sheet and not on maps. The tables in the coworking space are organized in different ways within the blocks. Having all data documented on the maps allowed to detect and what is more important – to deliver the certain patterns appearing in the behavior of coworkers (which blocks tend to be occupied to their full capacity, and which blocks tend to have only one or a few users sitting there) to a reader. Although the maps used in this paper are conceptual, meaning that they represent only approximate relations of objects towards each other and the whole perimeter of the coworking space, they should be more than sufficient for a reader to follow the narrative of this paper. The research sub-questions 3, 4 and 5 will draw their answers to a different extent from all the methods of data analysis mentioned in this section. Sections in chapter 4 will elaborate more on which conceptual models and maps were used in order to help answer each of the sub-questions.

3.5 Conclusions and the reliability of the study

The theoretical framework developed through the literature review is summarized in the first section of this chapter (see table 3.1). One of the tasks of this research is to test the applicability of the suggested theoretical framework on the findings derived from the data collected in the case study. The theoretical framework consists of the following concepts: behavioral setting, proxemics, sociopetal and sociofugal spaces, environments that stimulate approach or avoidance behavior, high-load and low-load environment. Each concept is related to physical characteristics (‘hard’ factors) of space and the behavior of people that inhabit it. Data in the case study will be collected through the three methods: observations in the coworking space for three months (15.01.2019 – 15.04.2019), development of behavioral maps for two weeks (04.03.2019 – 15.03.2019), and open-ended interviews. The data from the first stage of observations will be collected in the forms of field notes. The goal is to build up the narrative of the place, and gain insights into participants’ behavior. During the second

phase of observations the behavioral maps will be created, that means that for two weeks every weekday during the most busy work hours (10:00-12:00, 13:30 – 17:00) the researcher will track the occupancy of the general working areas on two floors of the coworking space by recording the data on the maps of each floor. The audio data gathered from the open-ended interviews will be transformed into text format and coded. Next, some conceptual models will be developed based on the generated codes.

A reliable study is conducted in such a way that any other researcher must be able to repeat it and come to similar conclusions.[141] This would prove that results of a study did not happen occasionally but have systemic character. In a quantitative study a representative data set should be gathered, and then relevant analysis should be performed. This would prove its reliability. However, the case study documented in this paper is concerned with only one example – one coworking space and performs qualitative methods. Thus, by its design the study could not be representative for the whole field, and the findings would be hardly applicable for generalization. Moreover, as explained by Boeije, in a qualitative research project every researcher might come up with a different explanation to the same event.[142] Despite that, it does not make this study any less reliable due to two reasons. First, it is still possible to replicate it for any other coworking space following the design explained in this chapter. Second, the conclusions of the study are concerned with the applicability of the developed theoretical framework, and not only with the findings themselves. Thus, this study could be considered reliable, and its strength is in the depth of the performed analysis. However, it is important to conduct many more case studies with the similar research design. In doing so, certain patterns in analysis could be revealed on scale. Finally, a theory could be developed completing the cycle of analysis initiated by this thesis.

[141] Martyn Shuttleworth, "Validity and Reliability," *Explorable*, October 20, 2008, https://explorable.com/validity-and-reliability.

[142] Boeije, *Analysis in Qualitative Research*, 82.

Chapter 4: Data analysis and discussion

This most intriguing part of a research is arguably the part that deals with comparing the ideas of what was intended to be found with the actual findings. This is exactly what this chapter will deal with. Section 4.1. will provide some supporting data to create a richer narrative of the conducted case study. The following sections will answer the three research sub-questions with the attention to the concepts borrowed from the field of environmental psychology. Section 4.2 will provide findings for the question: 'What are the daily activities of the users of the coworking space?' Section 4.3 will discuss findings for the question: 'What types of facilities do the tenants use to perform their daily professional activities, and what types of facilities do they lack?' Section 4.4 will elaborate on the findings for the question: 'How do people move inside the coworking space?' Section 4.5 will provide some conclusions and elaborate more on whether the assumption that the concepts in the theoretical framework were applicable in relation to the findings of the conducted case study.

4.1. Supporting data

It is important to provide the context of the coworking space where the research was conducted, because the context will influence the answers to the research sub-questions, and therefore will affect any conclusions suggested in this thesis. Any future research that wants to repeat this study might have some variations in findings, and the reasons for some of these variations might be explained through different context of application of the same research methods. The coworking space which was chosen for this case study was opened in early 2018 and was an experimental project of the bigger cultural institution in Rotterdam called Het Nieuwe Instituut (HNI). The cultural institution combines in itself a museum (for architecture, design and digital culture), an exhibition space, a study centre, an archive, a library and its new endeavour – a coworking space Workspace, that was allocated on the 5th and the 6th floors of the main building (see pictures 3.3 and 3.4 in Appendix 3). The idea behind that project was to attract creative entrepreneurs to the coworking space and explore collaboration opportunities in order to enrich the cultural program that HNI offers to its visitors (exhibitions, lectures, movies viewings related to various design disciplines). Therefore, this coworking space stands out amongst other coworking spaces because of its unique offered specialization – close connection to the bigger cultural institution (Het Nieuwe Instituut), this is also used as a unique selling point for this coworking space. This coworking

space is of medium-size, which allows the tenants to create a close community. The maximum number of tenants that it can accommodate is 37 people. The coworking space is management led (as opposed to a community led coworking space), which goes in hand with its specialization (affiliation to a bigger cultural institution). Workspace could share its experience with other cultural institutions and develop a special kind of coworking spaces, being the first one to develop such a project.

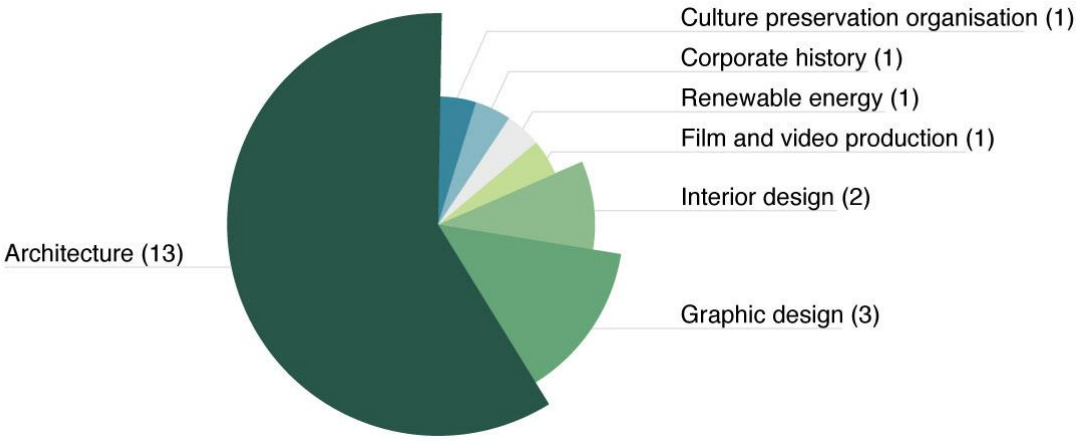
This particular coworking space was chosen for the research, because at the time when the researcher approached the cultural institution, the coworking space existed for about a year, and the cultural institution was interested in evaluating its performance. Thus, the agreement was established between the cultural institution and the external researcher (the author of this thesis). The researcher was allowed to gather data for her thesis, but also share her findings with the cultural institution. This was a solution that the both parties benefitted from, as the interests and the questions of the research project for the cultural institution, and the research questions of this thesis overlapped significantly.

It is important to understand the profiles of Workspace's inhabitants in order to build the narrative about the coworking space. There were 22 active users of the coworking space at the moment when the research was conducted. The maximum capacity implied by the number of offered workstations was 37. Although according to the numbers, the coworking space seemed to be filled up only up to two thirds of the full capacity, it could be much more crowded on the daily basis. That was due to the fact that the employees of HNI also used certain premises within the coworking space (meeting rooms and the calling room). Graph 4.1 shows industries the tenants were employed in. The data was derived from the observations and the interviews. Out of 22 active users of the coworking place 21 were employed in the Creative or Cultural Industries, as defined in the 'Creative economy report' by UNESCO and UNDP.[143] Therefore, Workspace could be considered as a coworking space for creative entrepreneurs. Graph 4.2 shows how long have the tenants been active in their work lives. Majority of the tenants had at least 10 years of work experience. The second largest group consisted of entrepreneurs with at least 20 years of experience. There were

[143] UNESCO, UNDP, *2013 Creative economy report. Special edition. Widening local development pathways*, http://www.unesco.org.eur.idm.oclc.org/culture/pdf/creative-economy-report-2013.pdf.

some representatives of a younger generation who worked only for a few years since graduation, as well as units of those who worked at least for 30 years. This shows that the general profile of a tenant of Workspace was an individual employed in the Creative or Cultural industries with at least 10 years of experience.

Graph 4.1. Industry of employment of the users of Workspace.



Source: Own calculations based on the data from the interviews.

Graph 4.2. Years of experience of the users of Workspace.

Source: Own calculations based on the data from the interviews.

Some questions in the conducted interviews were about the motivations for choosing to work in a coworking space (and particularly in this one instead of any other alternative), a professional status of an interviewee (self-employed, member of a larger organisation, or other), business relationships (employees, partners, etc.), and a geography of their business activities (local, international, how often they travelled for work). However, these questions were not directly connected with the main research questions of this paper, therefore this data was not included into the main analysis that is presented in the further sections of this chapter. Nevertheless, these questions helped create the background context for the research. Now that a reader understands the general context of the studied place and the

profiles of its tenants it is appropriate to provide analysis of the gathered data systematised according to the research sub-questions.

4.2. What are the daily activities of users of the coworking space?

Following the fashion of research in environmental psychology, it is convenient to start with comprehending what types of activities take place in a studied environment. That will help evaluate how well an environment suits a group of people that inhabits it, or why a certain pattern of behavior takes place. This approach was emphasized by the environmental psychologist Albert Mehrabian in his book *Public Places and Private Spaces* published in 1987. Mehrabian argued that 'many failures in environmental design […] can be attributed to simplistic and all-encompassing notions and traditions which fail to draw upon psychological facts to fit persons, their personalities, and their many diverse daily activities, to places.'[144] In other words, it is important to understand the daily activities of members of a coworking space in order to be able to evaluate to what extent the facilities provided by this particular coworking space are suited to them. Based on the interviews the research found a number of daily activities that the tenants performed, the results were divided in two groups: the professional activities that normally take place inside the coworking place (see figure 4.3.), and outside of the coworking place (see figure 4.4.). The classification of activities is not strict, meaning that potentially each activity mentioned could be performed inside and outside of the coworking space (excluding travelling). However, the classification is still important in order to reflect the participants' perception regarding the activities they perform inside or outside the studied coworking space. As this research is interested in the professional activities inside the coworking space, the analysis will disregard the activities performed outside of it. Next, the data from figure 4.3. was divided according to the level of distraction a particular type of professional activity could tolerate, and a type of environment this activity required (see figure 4.5.). It is now appropriate to use several concepts introduced in the second chapter of this thesis, namely 'behavior setting', 'high-load environment' and 'low-load environment', because they will help explain how the activities were grouped.

[144] Mehrabian, *Public Places and Private Spaces*, 8.

The research could distinguish the for main types of work activities that users perform inside the coworking space (see table 4.1). Each group could be understood as a behavior setting:

1) 'Highly concentrative activity'
2) 'Desk/laptop work'
3) ''Loud' communication'
4) 'Creative "dirty" work'

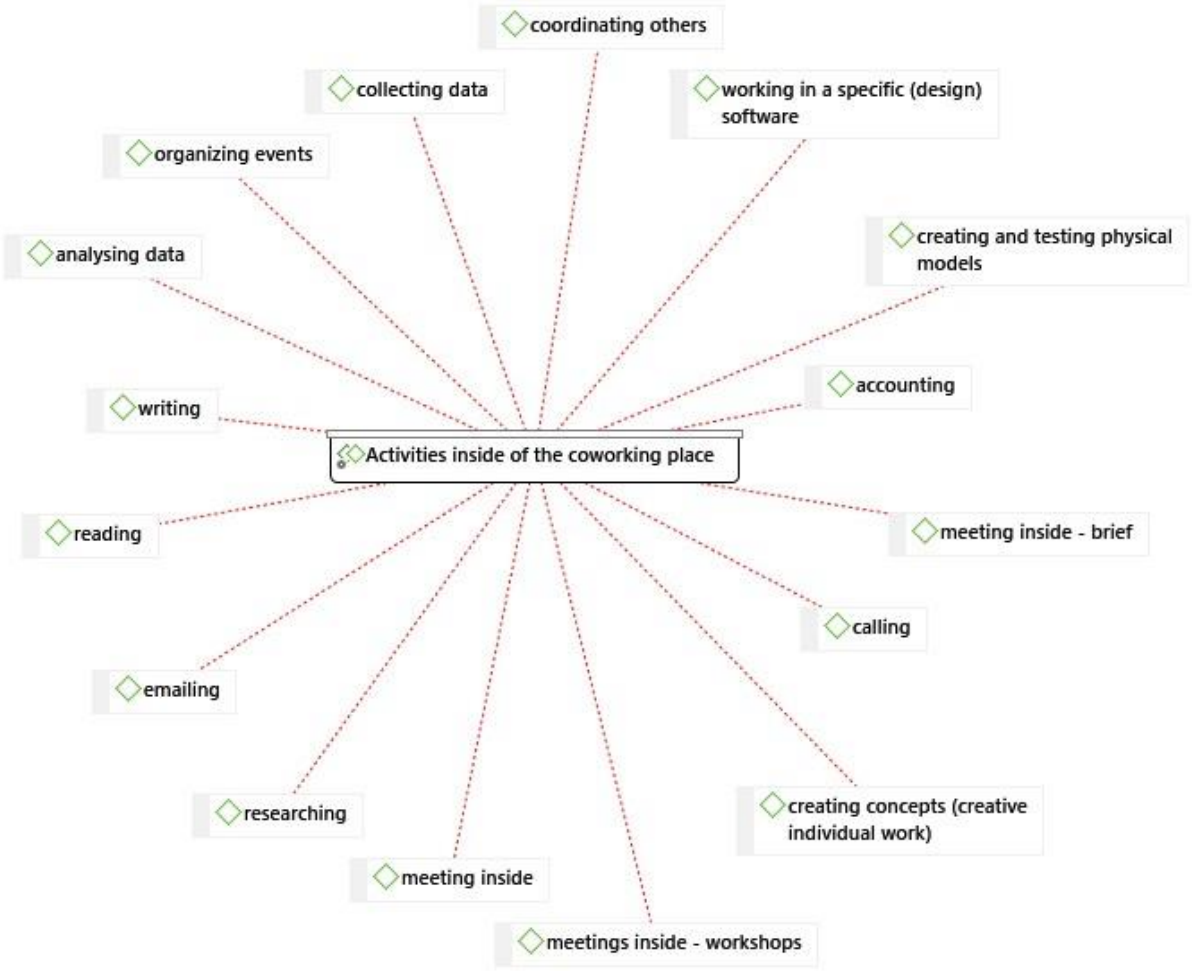
For example, daily activities such as writing, reading and developing creative concepts were grouped under a behavior setting 'highly concentrative activity', because all three activities require the same type of environment. Just like in the example presented in the second chapter where children needed an organised quiet environment for a behavior setting 'an academic class', the tenants of the coworking space need a quiet environment without many distractions. In other words, they need an environment with the low-load of information for a behavioral setting 'highly concentrative activity'. The second type of behavior setting discovered in this research was titled 'desk/laptop work'. This behavior setting allowed to group activities such as analysing and collecting data, accounting, coordinating others, organizing events (through online correspondence), researching, working in a specific design software, and writing emails. These activities are not highly sensitive to any distractions, they tolerate general noise, therefore could be performed in a common room next to other colleagues. The type of environment required for the behavior setting 'desk/laptop work' could be more loaded with information than an environment needed for the behavior setting 'highly concentrative activity'. The third type of the behavior setting ''loud' communication' grouped activities such as making phone calls or having meetings with other people in the coworking space. Calling or meeting other people (and discussing) generate relatively high level of noise (create a high-load environment), and therefore could disturb others in case they are performed in a common working area. But at the same time calling and meeting other people requires privacy, because the participants do not want to be overheard nor interrupted. Therefore, they require a low-load environment to be performed. This type of activities requires a separate room or at least a secluded nook, because people who perform these activities do not want to disturb others, nor be disturbed by the 'outside world'. The fourth type of the behavior setting discovered in this research was

titled 'creative "dirty" work' and included activities such as creating and testing physical models. This type of behavior setting requires a special studio setting with more room and opportunity to do 'dirty' work (using paint, glue, carton, paper, and so on), which would not be well accepted by other members of the coworking space if performed in the common working area. The behavior setting 'creative "dirty" work' could generate some noise (create a high-load environment), but at the same time it tolerates certain levels of noise, which means it is could be performed in the environments with a rather high load of information.

It would be interesting to compare the classification of the daily activities of the tenants in the coworking space based on the unit of analysis – a behavior setting, which was presented above, to a different typology of work activities. For example, a classification developed by Clay Spinuzzi.[145] However, given the limited scope of this thesis, this task was deliberately not performed. Moreover, performing this particular task would not have had a direct relevance in answering the research sub-question 'What are the daily activities of the users of the coworking space?' This sub-question is more interested in the daily activities of a particular selected group of people and asking them directly seemed to be the fastest and the most efficient way of answering that question. With a comprehensive understanding of the scope of daily activities performed by the tenants in this coworking space and the types of behavior settings that they form it is now possible to turn to the next step of the research and evaluate how and what types of facilities the coworkers use to perform their daily professional activities.

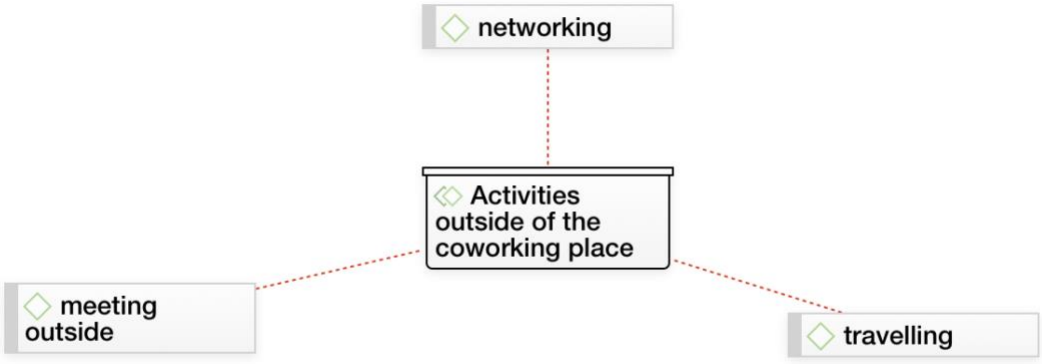
[145] Clay Spinuzzi, "Toward a Typology of Activities: Understanding Internal Contradictions in Multiperspectival Activities," *Journal of Business and Technical Communication* 29, no. 1(2015), https://doi.org/10.1177/1050651914548277.

Figure 4.3. Professional daily activities of the users of Workspace inside the coworking space.



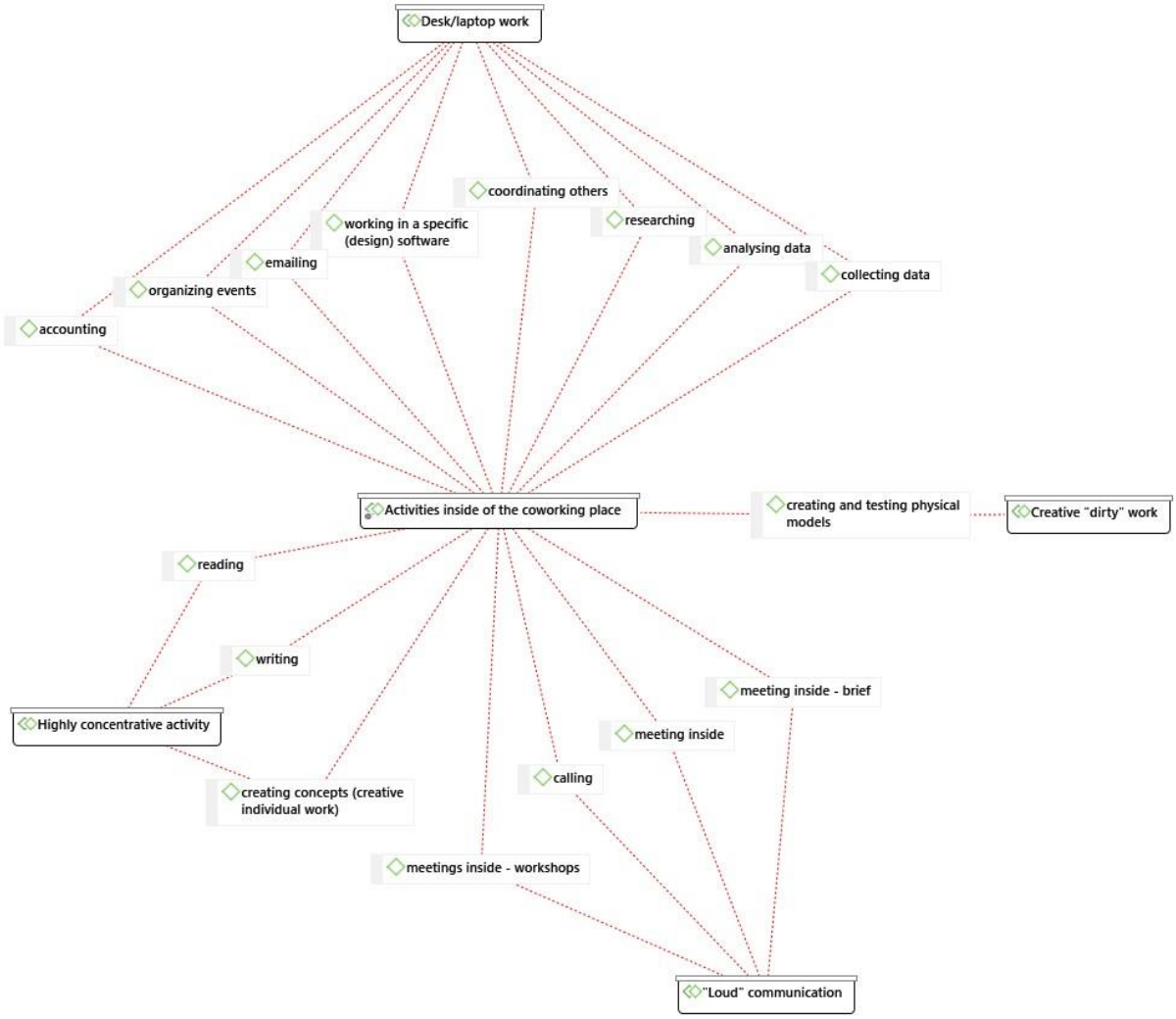
Source: own design based on codes generated in professional coding software Atlas.ti.

Figure 4.4. Professional daily activities of the users of Workspace outside the coworking space.



Source: own design based on codes generated in professional coding software Atlas.ti.

Figure 4.5. Behavior settings.



Source: own design based on codes generated in professional coding software Atlas.ti.

4.3. What types of facilities do the tenants use to perform their daily professional activities, and what types of facilities do they lack?

The coworking space where the research was conducted was situated on the two floors of the building. Maps 4.1 and 4.2 represent the facilities as they were viewed by the tenants. Generally, the layouts of the both floors of the coworking space were perceived as an open-plan office. Such a layout is called open-plan if an office has no walls nor partitions in its structure.[146] This is exactly the case of Workspace due to the absence of any separating

[146] Alan Hedge, "The Open-Plan Office. A Systematic Investigation of Employee Reactions to Their Work Environment," *Environment and Behavior* 14, no. 5 (September 1982): 520.

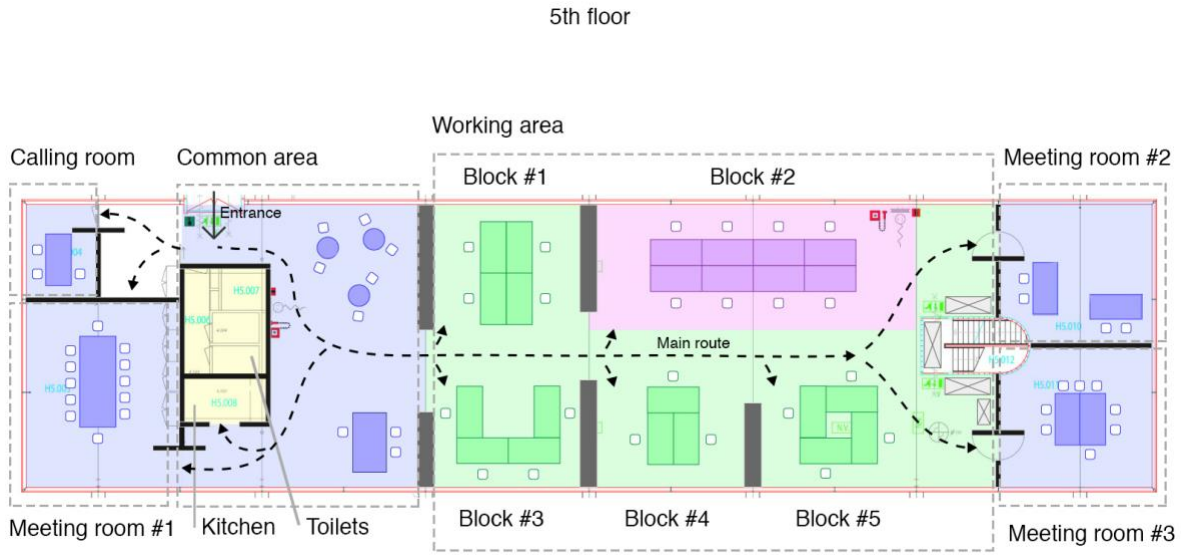
walls in the coworking space, the blocks are separated by not very high bookshelves or artworks (see picture 3.4 in Appendix 3). Each floor has a main route in the center, which divides a floor in two parts. To get to any seat a person needs to enter a floor, get to the main route, and walk pass several blocks before reaching a desired spot. The research found that there were six types of spaces in the participants' perception of the zones of the coworking space:

1. The working areas on the 5th and on the 6th floors (green and pink colors on the pictures). The working areas offer sets of work desks organized in different ways. The working areas consist of several blocks, each divided either by bookshelves (dark grey narrow rectangles on the maps), or by artworks (light grey figures on map 4.2). The tenants with a 'flexible' work desk (not assigned seat) are allowed to choose any place to sit inside the green areas. The 'flexible' work desk implies that the seat could be changed on a daily basis, and that a work desk has to be cleared by the end of a working day (no objects left on a table). Whereas pink areas signify the places where tenants with 'fixed' work desks seat. Those tenants are allowed to leave any objects on their working desks, and each place is assigned to a particular person.
2. The meeting rooms on the both floors are secluded areas with doors. Blue color means that everyone is allowed to use this area (including the tenants of the coworking place and HNI employees).
3. The calling room is a secluded area (on the 5th floor) with an opportunity to close the door. Blue color means that everyone is allowed to use this area (including the tenants of the coworking place and HNI employees).
4. The lunch area is a semi-secluded area (has 2 entrances and no doors), available for use for the tenants of the coworking place and HNI employees.
5. The common area on the 5th floor is a semi-secluded area, separated from the working area by some bookshelves. The area offers several tables organized in such a way that a short meeting could be conducted there. The tables in that area are smaller than the working desks provided in this coworking space. Blue color means that everyone is allowed to use this area (including the tenants of the coworking place and HNI employees).

6. The 'theatre' area on the 6th floor is a semi-secluded area, separated from the working area by some bookshelves, and separated by the kitchen and the toilet block from the lunch area. Blue color means that everyone is allowed to use this area (including the tenants of the coworking place and HNI employees). The 'theatre' area offers rows of chairs and a platform for presentations. This area is mostly used for HNI's cultural program (lectures, open talks) on Thursday nights.

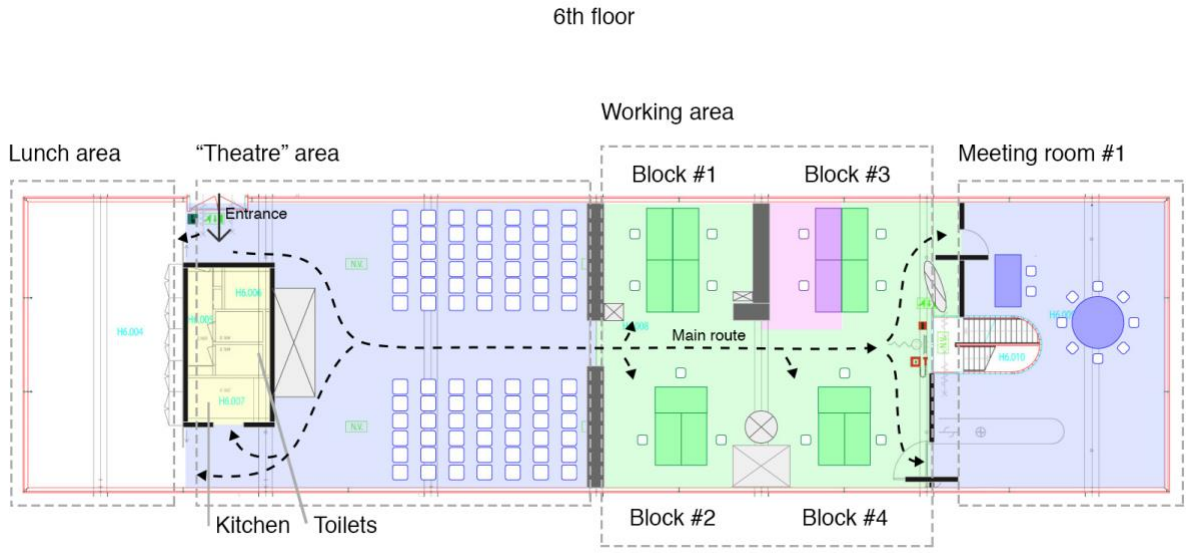
   Kitchens and toilet areas are coloured with yellow on the maps.

Map 4.1. Behavioral map of the 5th floor of Workspace.



Source: own design.

Map 4.2. Behavioral map of the 6th floor of Workspace.



Source: own design.

Thus, the research found the four types of behavioral settings that the coworkers would need based on their daily professional activities, and the six types of zones (or environments) that Workspace offers. Using these findings, it is now possible to evaluate how the facilities serve the interests and the needs of the tenants. Although each professional activity mentioned in the previous section might require a certain type of the spatial setting (for example, calling room for making phone calls), not always a desired room or area was available. Therefore, certain patterns and solutions were developed by the tenants of the coworking space. These solutions were revealed through the interviews and the observations. The following discussion is based on the four types of behavioral settings and includes more concepts introduced in the second chapter of this thesis, namely 'sociopetal places', 'sociofugal places', 'approach behavior' and 'avoidance behavior'.

The behavioral setting 'highly concentrative activity'. 9 out of 13 interviewed tenants explicitly reported performing at least one of the highly concentrative activities such as writing, reading or creating concepts inside the coworking place. These activities have high sensitivity to any distractions (require low-load environment), which is why the tenants prefer to perform them either in the secluded areas such as the meeting rooms or the calling room. However, these rooms require prior registration, and therefore the tenants are forced to perform these activities in the general area and in the common area. This becomes possible

only with the condition that it is quiet in these areas, or if no one else is sitting there (in case of the common area). Otherwise, the tenants might prefer to stay at home in order to be able to maintain high level of concentration on a task:

> Participant 1. *[…] sometimes I have to go home when I have to read a lot in those days.*[147]

The behavioral setting 'desk/laptop work': all of the interviewed reported performing some type of desk/laptop work. These activities mostly imply that a person sits behind a desk and uses a computer/laptop:

> Participant 12. *Either I have a[n] office working day - either sitting by my laptop and researching stuff that I have there, or writing or reading or... So, this is all desk research and desk work.*[148]

Desk/laptop work is mostly performed in the general working areas on the both floors. It makes sense, because these areas were designed exactly for these purposes. The tasks that require this behavior setting are not too sensitive to noise and tolerate some level of distraction, therefore could be performed when sitting next to the others. The tenants do not experience the need to find a different, secluded zone to be able to perform any of these activities. The general working areas could be compared to some extent to the railway waiting rooms which were given as the example to illustrate sociofugal places in the second chapter. Although it might seem that everyone who sits in a general working area could be easy approached, the reality is quite the opposite – the avoidance behavior is expected. This environment is maintained as a sociopetal place by an unspoken agreement between the users. That condition allows the coworkers focus on their work and successfully perform it in the general working areas.

The behavioral setting ''loud' communication': all of the interviewed reported performing at least one type of ''loud' communication on the regular basis – either making a phone call or conducting a meeting. The research discovered that the participants ended up

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[147] For the quotation and the assigned code see: Participant 1, *Appendix 4*, 125; for the full text of transcribed interview see: Participant 1, *Appendix 4*, 169.

[148] For the quotation and the assigned code see: Participant 12, *Appendix 4*, 159; for the full text of transcribed interview see: Participant 12, *Appendix 4*, 228.

using all of the available facilities in the coworking space in order to perform these tasks. This is due to three factors. First of all, there is only one calling room for all the users of the coworking space, and it requires reservation. Secondly, the tenants cannot always schedule their phone calls to be able to reserve a room for that in advance according to its availability. More often than not, a tenant receives a phone call unexpectedly, or has to organize a last minute meeting. Thirdly, as the general plan of the coworking space is open, there are not enough secluded areas designed to provide a more private or sound-proof environment. Because of that when receiving a call, the tenants end up walking towards any direction or into any facility that seems available at the given moment. The purpose is not to disturb other tenants working in the general area, where the default mode is a low-load environment.

> Participant 11. *[…] I don't use it [the "theatre" area] much only for … um … for phone calls because it's not the most dividing area, not very functional furniture.*[149]

Sometimes the tenants also walk into any available meeting room that is closer to them at the moment of receiving a phone call. Tenants' last resort for conducting phone calls is the general working areas. This option is least desired, although rather regularly used. Such precedents are the subjects for conflicts and disagreement between the tenants who happen to be sitting next to each other at the moment of receiving a phone call.

> Participant 7. *And if it's not available I call in the space. So, I feel […] a bit annoying for the others, because it's also not nice […].*[150]

The behavioral setting 'creative "dirty" work': as the interviews stated, at least 3 out of 13 interviewed tenants reported the need to perform some sort of creative manual work.

[149] For the quotation and the assigned code see: Participant 11, *Appendix 4*, 157; for the full text of transcribed interview see: Participant 11, *Appendix 4*, 227.

[150] For the quotation and the assigned code see: Participant 7, *Appendix 4*, 144; for the full text of transcribed interview see: Participant 7, *Appendix 4*, 201.

> Participant 8. *[…] I would like to have a place where for example if I want to make a small model. Simple. I'm not talking about building something, but where I can do something with some glue, you know, spraying it or some paint and so on, to […] be able to do that.*[151]

However, the studied coworking space does not offer any facilities that would provide a required area and tools. Therefore, the tenants are forced to perform that task at home.

Table 4.1 summarizes which premises the users of the coworking space could and have used for each type of their professional activities. It is easy to notice from the table that one behavior setting that is fully satisfied by the offered facility of this coworking spaces is the 'desk/laptop work'. This is because the general area is maintained by the collective effort as a sociopetal place where avoidance behavior is encouraged. Contrary to that, the behavior setting ''loud' communication' is poorly satisfied. It might seem from the table that it is allowed to perform this type of task in every available facility, it is in fact the opposite. If the tenants are forced to resort to every available option to perform this activity – it is a sign of a mal-designed space where secluded areas are scarce. The behavior setting 'highly concentrative activity' is satisfied only to some extent. The tasks of that sort are mostly performed in the general area, but that is possible only if the mutual agreement for avoidance behavior and low-loaded information level in the environment is maintained. Otherwise, the coworkers might use some secluded areas to perform this type of task, but because those are scarce, they sometimes have to perform these tasks at home. Finally, the behavior setting 'creative "dirty" work' is not satisfied at all, because there were no facilities offered in that coworking space that would successfully accommodate these tasks. The analysis concluded that some needs were satisfied to a bigger extent than others, but in order to get the full picture, it is important to understand which facilities are lacking from the point of view of the coworkers (see figure 4.6).

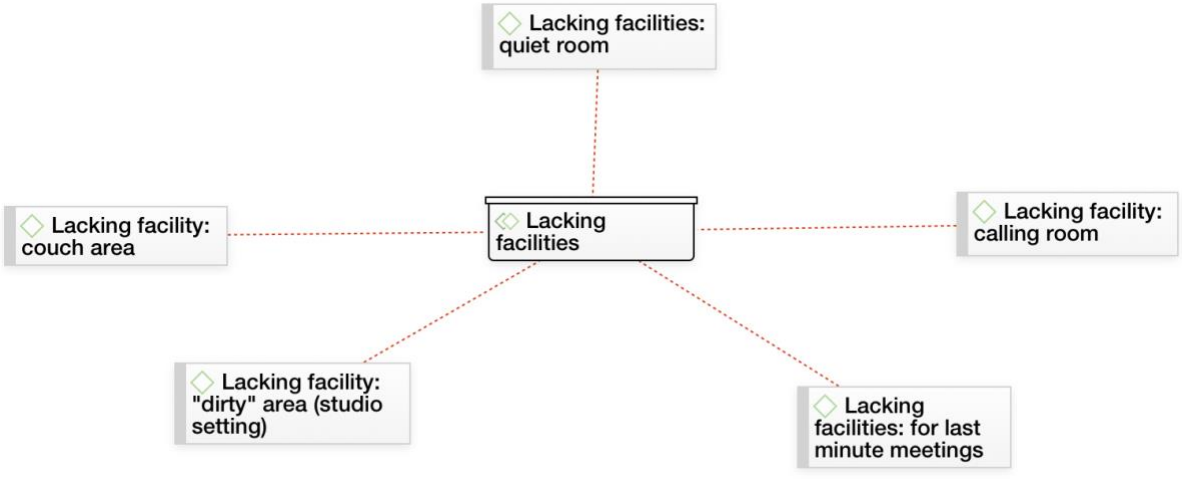
[151] For the quotation and the assigned code see: Participant 8, *Appendix 4*, 149; for the full text of transcribed interview see: Participant 8, *Appendix 4*, 207.

Table 4.1. Correlation between the types of working activities and the types of spaces.

Type of environment / Behavior setting	General area	Meeting rooms	Calling room	Lunch area	Common area	'Theatre' area
Highly concentrative activity	Yes, if quiet	Yes	Yes	No	Yes, if no one else is there	No
Desk/laptop work	Yes	No	No	No	No	No
"Loud' communication	Yes, if everything else is occupied	Yes	Yes	Yes	Yes	Yes
Creative 'dirty' work	No	No	No	No	No	No

Source: own analysis.

Figure 4.6. Lacking facilities.



Source: own design based on codes generated in professional coding software Atlas.ti.

Lacking facility – quiet room: as the analysis described earlier the majority (9 out of 13) of the interviewed perform some sort of highly concentrative activity in the coworking space. Due to the open layout of the coworking space and a lack of secluded areas, some participants reported a need for a quiet room. This room does not necessarily require privacy, but it does require a rule that restricts any conversations or activities that create noise inside that area (to maintain a low-load environment).

> Participant 1. *[…] these quiet spaces that I really lack, when you are working together with people […] sometimes I have to go home when I have to read a lot in those days….*[152]

Lacking facility – a couch area: this type of facility that the participants of the research lack is not directly related to a working activity, but supports recreation, which is not any less important than the work itself. 3 out of 13 participants mentioned that they would enjoy having a couch to sit at and relax for a short time, and also socialize with other coworkers. This finding emphasizes the need for a sociopetal place in Workspace. It makes sense, because the general area is perceived and maintained by the mutual effort as a sociofugal place so everyone could maintain their focus on the work tasks. However, it is important to keep in mind that many coworkers in general choose to come to a coworking space because it satisfies these individual entrepreneurs' need for socialization and a sense of community. Thus, it is of a vital importance for a coworking space to foster a community development. This could be done to a certain extent through providing sociopetal places like a couch area where coworkers can take a break from their main working activities and have a small talk with each other. The research found that this particular coworking space lacked such places.

[152] For the quotation and the assigned code see: Participant 1, *Appendix 4*, 125; for the full text of transcribed interview see: Participant 1, *Appendix 4*, 169.

> Participant 7. *[…] to meet other the other coworkers, because although we stay in the same place we have little opportunity to really interact I feel, and that's missing, […] coffee's nice, but there is no proper place to have the coffee or […] there is almost never a chance to just have a little chat. It's come-sit-work-leave.*[153]

Lacking facility – 'dirty' area (studio setting): some participants reported their need for a 'dirty' area in the coworking space so they could create and test physical models. The analyzed coworking space did not offer any facilities where this task could be performed.

Lacking facility – area for last minute meetings: 2 out of 13 interviewed reported lack of physical settings designed for last minute meetings. Although the coworking space offered total of four meeting rooms, they were considered not sufficient, because they required prior reservation. This is contrary to the nature of last minute meetings, which implies that they cannot be planned well ahead. The layout of this particular coworking space failed to accommodate this need.

> Participant 2. *[…] there's not enough space or not […] enough zones where you can just go sit on last minute meetings.*[154]

Lacking facility – a calling room : all participants of the survey reported that they had to make phone calls on a daily basis. The coworking space offered only one calling room. Thereafter, 7 out of 13 interviewed reported that they lacked extra calling rooms. The research discovered that the tenants developed a habit of using meeting rooms for calling, when they happen to be not occupied by meetings.

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[153] For the quotation and the assigned code see: Participant 7, *Appendix 4*, 145; for the full text of transcribed interview see: Participant 7, *Appendix 4*, 203.

[154] For the quotation and the assigned code see: Participant 2, *Appendix 4*, 128; for the full text of transcribed interview see: Participant 2, *Appendix 4*, 173.

> Participant 2. *Meeting rooms? Nice. But I use them for calling or skyping*.[155]
>
> Participant 2 (other part in the interview). *I go often into the meeting room and sometimes I just try to search for that and when I know I have to make a couple of phone calls.*[156]

Overall, the level of satisfaction with the facilities offered by a coworking space depends on which types of activities the tenants mostly wish to perform in it. If the tenants mostly comprehend this coworking space as an environment for desk/laptop work, then their needs are fully satisfied, because the general working areas are maintained as sociofugal places and therefore are perfectly suited for this type of work. However, in this particular case the research found that the participants also experience the need for socializing with the coworkers in the coworking space. This need is not satisfied, because the coworking space did not provide enough of sociopetal places.

4.4. How do people move inside the coworking space?

The idea of a coworking space implies freedom of mobility inside the premises, the biggest coworking spaces network in the world WeWork still uses that enticement when advertising their 'hot desk' (not assigned working desk in any of the available common areas).[157] Therefore, it was particularly interesting to document to which extent the freedom of mobility was present inside the studied coworking space. However, the myth was very quickly dispelled. The observations proved the opposite: changing a seat was always an exception than a rule. When asked if and when the tenants move inside the coworking space, 9 out of 13 reported that they rarely change their seats.

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[155] For the quotation and the assigned code see: Participant 2, *Appendix 4*, 145; for the full text of transcribed interview see: Participant 2, *Appendix 4*, 204.

[156] For the quotation and the assigned code see: Participant 2, *Appendix 4*, 147; for the full text of transcribed interview see: Participant 2, *Appendix 4*, 206.

[157] "Hot Desk," WeWork, accessed June 22, 2019, https://www.wework.com/workspace/hot-desk.

> Interviewer. *How do you choose where to sit? Do you ever change seats or floors?*
>
> Participant 7. *No. I changed a couple of times in the evening but its […]. Depending on the other people who are sitting. […] Habit is habit. And I feel sometimes it's bad, because I feel […] I acquired the desk, you know, and it's really not the meaning.*[158]
>
> Participant 10. *No, I'm not. I never worked down here on the 5th. Well, I prefer the place where I'm sitting right now, which is something that is […] how people apparently behave. You choose a table and it becomes your table. So I changed a little bit, but not much.*[159]
>
> Participant 12. *No. Usually, I am an animal of habit as we say in Dutch. I sit […] in the same place.*[160]

The research discovered that the tenants tend to choose the same desk to work at every day. Only 10 desks (less than a half of the tenants) are registered as 'fixed' working desks (pink areas on maps 4.1 and 4.2), which means that the rest are subscribed to 'flexible' working desks and are free to switch a work desk on a daily basis. Despite that fact the research revealed that the freedom and flexibility to sit and work in a new location is not exercised in Workspace. Gradually everyone learned which seat is normally occupied by which person, and the unspoken culture dictated not to intrude into someone's habitat, taking a place that is known to be occupied by someone else. According to the observations each block (see maps) developed its own micro community. That is mostly due to the fact that the way in which the tables are organized situates people on the edges of their personal distances. This proxemics connects people. The bookshelves that separate the blocks were sufficient barriers to separate one micro-community from the other. But at the same time,

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[158] For the quotation and the assigned code see: Participant 7, *Appendix 4*, 145; for the full text of transcribed interview see: Participant 7, *Appendix 4*, 202.

[159] For the quotation and the assigned code see: Participant 10, *Appendix 4*, 156; for the full text of transcribed interview see: Participant 10, *Appendix 4*, 225.

[160] For the quotation and the assigned code see: Participant 12, *Appendix 4*, 161; for the full text of transcribed interview see: Participant 12, *Appendix 4*, 234.

when a tenant walks through the coworking space (using the general route of any of the two floors), the person is able to see and greet every micro community. The bookshelves are not big enough to block the view completely and therefore allow connection between these micro communities and those who walk at the general route. The traces of that behavior could be observed on the 20 final maps that the researcher designed (see maps 3.14 – 3.33 in the Appendix 3). It is easy to notice that there were no dramatic changes in the data. Each block tends to be filled in a similarly way every day. For example, the seats that are the closest toward the general route in blocks 2 and 4 on the 6th floor tend to be empty. Another pattern – blocks 1 and 5 on the 5th floor tend to be empty or occupied only by one person. The most important finding that could be derived from these maps is that the same desks in each block tend to be filled up in the same way. This means that the same people choose to come to the same working desks every day.

4.5. Conclusion

This chapter discussed the findings of the case study and answered the second part of the research sub-questions. To answer the question 'What are the daily activities of the users of the coworking space?' the daily professional activities of the tenants of Workspace were distilled in the form of codes from the interviews. Then, based on these codes the four types of behavior settings were discovered: 'highly concentrative activity', 'desk/laptop work', ''loud' communication', and 'creative "dirty" work'. Each type of the discovered behavior setting required a certain physical setting. The research identified six types of zones (physical settings) that the coworking space provided: general working area, meeting rooms, calling room, launch area, common area, and 'theatre' area. Next, the question 'What types of facilities do the tenants use to perform their daily professional activities, and what types of facilities do they lack?' was answered through the analysis of how well the offered facilities correspond with the desired behavior settings. It was revealed that the needs of the tenants of this particular coworking space were satisfied only partially. Namely, the behavior setting 'desk/laptop work' was satisfied fully, because the general working area where these tasks were usually performed was maintained by the tenants as a sociofugal place with low-load of information in the environment and where avoidance behavior was encouraged. On the other hand, the behavior settings 'highly concentrative activity' and ''loud' communication' were satisfied only to a certain extent. The research revealed that this coworking space lacked

secluded areas where the tasks of these types could be performed. Although the behavior setting 'creative "dirty" work' was not satisfied at all with any facilities provided by the researched coworking space, this was found to be not the main issue. One of the unexpected findings of the research was connected to the non-work activities performed in the coworking space. The tenants reported their desire for more sociopetal places, where they could have a break from work, meet other tenants, and fulfil their needs for socialization. Finally, answering the sub-question 'How do people move inside the coworking space?' the analysis revealed that despite the offered flexibility to choose to sit at any of the offered working stations, the tenants tend to choose the same places and create micro communities with the people who sit at the neighbouring tables. The analysis successfully applied all the theoretical concepts presented in the second chapter. Thus, the assumption that the theories about spatial characteristics of work environments developed in 1960s and 1970s by the leading authors in the field of environmental psychology were applicable to the modern context of coworking spaces was proven to be true.

Chapter 5: Conclusions and recommendations

This thesis looked at the 'hard' characteristics in coworking spaces, because as the literature review discovered, the academic discussion in the field lacked an understanding of the role of spatial dimension in coworking spaces. Despite the fact that there were some case studies that included 'hard' factors in their analysis, none of these research projects made them their primarily focus of interest. Therefore, these case studies mostly provided only general descriptions of facilities in coworking spaces. That is why in order to cover that gap and gain deeper insights into the studied phenomenon the research in this thesis applied inductive approach with the qualitative methods such as observations, behavioral mapping and interviews. The theoretical framework for the analysis was inspired by the earlier studies about work environments from the field of environmental psychology. Section 5.1 will answer the main research question 'How do tenants use a coworking space and what are their preferred spatial characteristics?' and will deliver the conclusions. Section 5.2 will elaborate on the limitations and suggestions for future research. Section 5.3. will discuss practical implications of the conducted research.

5.1. Research results

In order to answer the main research question of this thesis the extensive overview of the literature about coworking spaces and other work environments was conducted and the gap in the discussion about spatial characteristics was revealed. Based on the review of the studies in the field of environmental psychology the theoretical framework was developed and applied to the findings delivered by the case study. The findings revealed that the users of this coworking space seek to fulfil three types of behavior settings in it: first, 'highly concentrative activities' such as reading, writing, creating concepts, second, 'desk/laptop work' such as sending emails, researching information, working in a specific design software, and third, ''loud' communication' such as making phone calls and sometimes conducting meetings. The analysis revealed that the coworkers were satisfied with the sociofugal configuration of the general working area provided by the coworking space. However, they lacked more secluded areas where the low-loaded environment of the general working area would not be disturbed when performing a phone call or meeting with other people. The analysis also delivered two unexpected findings. The first one was concerned with non-work activities but was found to be equally important to be fulfilled in the coworking space: the

tenants lacked sociopetal spaces where they could connect with other coworkers and satisfy their needs for socialization. And second, unlike the popular ethos of freedom and flexibility provided in coworking spaces, the users of this coworking space very rarely changed their choice of work stations. The analysis of the spatial characteristics in the studied coworking space was successfully performed with the application of every concept from the developed theoretical framework. Thus, the assumption that the concepts coined by the leading authors in the field of environmental psychology could be appropriately applied to the modern context of coworking spaces was confirmed.

Four main contributions were made by this thesis. First of all, the gap in the academic discussion about spatial characteristics in coworking spaces was revealed. The 'hard' factors were proved to be as important as the 'soft' factors, because the spatial characteristics of the coworking space influenced behavior of the tenants. The prediction could be made that as more research about spatial characteristics of coworking spaces would be done, a final definition of a coworking space might be developed. At the moment it does not exist, and the reason why could be exactly because the 'hard' factors in coworking spaces were under researched. Secondly, the paper contributed to the academic discourse about coworking spaces with one more case study. The findings enriched the discussion about 'hard' factors in coworking spaces and proved that the theoretical frameworks and concepts from earlier studies about work environments were perfectly applicable in the modern context. Thus, following the research design presented in this paper even more theories from earlier studies could be discovered and tested. Thirdly, the findings of this thesis contributed to the development of a new theory about how spatial dimension could be arranged in coworking spaces. For instance, the proper combination of sociopetal and sociofugal spaces should be taken into consideration when a place decides to identify itself as a coworking space. Thus, following the findings from this thesis that the general working area is perceived as sociofugal, a management team should take care of creating enough of sociopetal spaces for coworkers, so communication dynamics are facilitated through spatial configurations. However, this finding might vary in a coworking space with different specialization, other than a coworking space with the 'creative profile' (which was the case reported in this paper). That is why it is crucial to continue performing case studies in various coworking spaces around the world. Thus, more data will be generated, analyzed and then a theory will be crystallized based on

these findings. Finally, the paper contributed to the understanding that the history of coworking spaces is tightly interwoven into the history of all workplaces. Therefore, the history of coworking spaces does not necessarily start in 2005, but could be traced back to earlier work environments.

5.2. Limitations of the study and suggestions for future research

Although the research conducted in this paper delivered some important findings and conclusions, it has a few limitations. First of all, the case study itself entailed the limitations. It was performed in a medium-sized coworking space, where the tenants were mostly individual creative entrepreneurs. The scope of the modern coworking spaces ranges from very small locally organized places to large international chains such as WeWork, Spaces, Tribes, CIC, and also includes many more formats of coworking spaces between these extremes. The professional profiles of tenants of these coworking spaces could also vary and include not only creative entrepreneurs, but even larger organizations such as banks or IT companies with hundreds of employees. The results of the same research conducted in these coworking spaces might vary drastically from the ones delivered in this paper. The other limitation connected with the performed case study is connected to the time constraints. The observations lasted for three months in total. While that period of time was sufficient for delivering some findings, it would have been interesting to follow the development of this coworking space for a longer period of time. For example, there could be more than one round of interviews. The same participants could be interviewed one more time after some changes in the spatial settings of the coworking space were implemented. This would have allowed the research include a different time perspective, and not limit itself to one static portrait of the researched place. Future research could deliver results from a different type of coworking space and apply a different timeline.

Secondly, this research was limited by the available resources. It is important to admit that the sources used in this research were reduced to those published in English language. However, the academic discussion about coworking spaces is not limited to English-speaking communities. For example, Japanese researcher Tadashi Uda cited in this paper, published some of his works in English, but most of them were in Japanese. In his publications in English he also referred to some studies conducted by other Japanese researchers. Same applies to the German researcher Suntje Schmidt, who was also cited in this paper, and published some

of her works in German and referred to other German publications. Both languages were not available for the author of this paper. Future research about coworking spaces that takes into consideration different languages, and contains a case study conducted in a different cultural context might bring interesting results. Although this research was limited in several aspects, it should not be connotated in a negative way, because in following an inductive reasoning chosen in this thesis, more case studies with different inputs have to be performed. Various findings delivered by future research will then help construct a new theory about spatial characteristics of coworking spaces. Therefore, the limitations discussed in this section should be perceived as opportunities for future research.

5.3. Practical implications

The utility of this paper is not limited to enriching the academic discussion about coworking space. This thesis proved that it was important to pay attention not only to what processes happened inside a coworking space, but also how these processes might be shaped by the insensible spatial dimension. Understanding that dimension and embracing the knowledge gained by earlier studies of work environments about it will help a coworking space operator, local government or anyone who wishes to run a coworking space to do it successfully.

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