

1 New working spaces and COVID-19

Analyzing the debate through Twitter

Alessandro Gerosa and Irene Manzini Ceinar

Introduction

Coworking spaces are a relatively new phenomenon reflecting a broader change in the contemporary economy from predominantly traditional offices to a more fluid way of working based on networks and collaborations, wherein competitiveness and digitalization are key factors for the market. In 2015, Gandini stated that the coworking phenomenon in the context of the knowledge labour market is expected to become ‘the new model of work in the context of the collaborative and sharing economy’ (Gandini, 2015).

Nowadays social media, and new communication systems in general, are shaping our society (Valentine & Skelton, 2008) and broader working culture. Therefore, it is important to consider ‘online reality’ and subjective perception through social networks while investigating social science issues. New technologies and social networks are tied to new working spaces, and coworking spaces specifically (hereafter CSs). Indeed in 2020, COVID-19 twisted both the work culture and spatial perception in general, including the work environment (Kuebart & Stabler, 2020; Brinks & Ibert, 2020; Florida et al., 2021).

The relationship between CSs and COVID-19 has been examined by several scholars, as illustrated in the next section of this chapter. However, beyond some international surveys such as the *Deskmag* survey and the *coworker.com* survey, there is limited knowledge about users’ perception and subjectivity regarding coworking in 2020.

This chapter seeks to fill this gap by analyzing the social debate on CSs in 2020 by looking at how coworking managers, coworkers, and other stakeholders (i.e. members of the media, researchers, etc.) discuss these topics on Twitter. The study employs digital ethnography, analyzing social media posts on Twitter, a platform in which influential actors and stakeholders play an important role in setting cultural agendas and informal norms through their online discussions and posts (Chadwick, 2013; Neuman et al., 2014; Hemsley et al., 2020). Users use hashtags (Bruns & Burgess, 2011; Small, 2011) or provide topical context (Golder & Huberman, 2006; Marwick & Boyd, 2011), so the analysis of hashtags, keywords, and their mutual interactions unveils how cultural meaning is shaped (and reshaped) within social media (Blaszka et al., 2012; Cunha et al., 2011; Cui et al., 2012).

The main research question guiding the analysis is (1) *How did people perceive and debate the CSs situation during the COVID-19 pandemic and express it via Twitter?*

To address the main question, we defined two sub-questions aimed at disentangling the topic, which are (1a) *What are the main trends that CSs experienced in 2020, based on the existing literature, due to COVID-19 restrictions?* and (1b) *Is the ‘web perception’ overlapping with the real dynamics occurring in CSs during 2020?*

Based on these research questions, this chapter is organized into three main parts. The introduction is followed by a section devoted to a close investigation of the existing literature on CSs in 2020. The second section illustrates the method used to analyze the ‘web perception’ of CSs through Twitter and specialized magazines. In the third section, the main findings gathered from the digital analysis are presented with a focus on the main topics of the debate and their development over time. Lastly, the conclusion discusses the results of the overlap between the literature review and a digital analysis based on an ethnographic method; this is also done in comparative terms.

Trends experienced by coworking spaces in 2020

Among the different types of open workspaces worldwide, CSs (which represent one of the most well-known and predominant types) are flourishing and their number has grown significantly worldwide, from approximately 14 spaces in 2007 (Orel & Bennis, 2021) to 8,900 in 2015, to approximately 11,790 spaces worldwide by 2017 (GCUC & Emergent Research, 2017). Over 26,000 were predicted by the end of 2020 (Statista.com, 2020; Manzini Ceinar & Mariotti, 2021), with a forecast 2.6 million members (Deskmag, 2019). However, those numbers must be adjusted and resized due to the COVID-19 pandemic, which severely affected the coworking economy. Indeed, in 2020, the impact of COVID-19 transformed the work culture and also the spatial perception of the work environment, accelerating processes and dynamics that were already in place before COVID-19 (Avdikos & Merkel, 2020; Manzini Ceinar et al., 2021).

Social distancing, together with the uncomfortable feeling of being in indoor spaces, has changed how people work and perceive their surrounding work environment, raising the need to reshape individuals’ work methods (Hu, 2020; Manzini Ceinar & Mariotti, 2021) and working spaces. This perspective turns an emergency into an opportunity to accelerate and advance innovative work dynamics, where companies have more flexibility to choose between the ‘hybrid model’ and ‘Virtual First’ (Kosner, 2020; Hu, 2020).

Since March 2020, the relationship between CSs and COVID-19 has been examined by several scholars discussing mainly the following: (i) the taxonomy of CSs (Orel & Bennis, 2021); (ii) new forms of working modalities and urban spatial transformation (Manzini Ceinar et al., 2021); (iii) the use of CSs in 2020, along with how users experienced those spaces (Manzini Ceinar & Mariotti, 2021); (iv) work-life balance and new business models of CSs (Mariotti et al., 2021b); and (v) travel behaviour and preferred location (Mariotti et al., 2021a).

The existing literature reflects different trends and perspectives about CSs depending on the different phases of the pandemic. Phase I coincides with the lockdown phase experienced by most countries worldwide between March and June 2020, phase II corresponds to summer 2020, while phase III corresponds to fall 2020.

In phase I of the COVID-19 pandemic, the literature reported negative hopes about CSs. Surveys and reports highlighted concerns regarding open-plan offices that would now require huge dimensions to allow social distancing and greater investment of effort and resources to institute enhanced cleaning practices for daily sanitization (Coworker.com, 2020; European SocialWorkplaces survey, 2020). Additionally, scholars raised concerns about teleworking from a fixed location (e.g. CSs) and ‘less-trip chaining’ (de Abreu e Silva & Melo, 2018). In terms of location, it was hypothesized that coworking would decline and multi-location strategies increase (JLL Research Report, 2020; Manzini Ceinar et al., 2021). This was supported by the work-from-home transition during phase I and the lockdown, which, occurring over just three weeks, affected several companies worldwide which explored ‘dual-hub solutions’ and ‘back-up office strategies’ to relocate employees to more convenient locations.

However, positive aspects also emerged towards the end of phase I. A JLL study in May 2020 forecast that traditional office environments would continue to evolve and lose importance in favour of flexible workspaces such as CSs due to the opportunity to choose more efficient and flexible ways of working. Moreover, despite the benefits of metropolitan areas in terms of transport accessibility and urbanization economies (Florida, 2002), embracing new widespread work practices would be a good strategy to revamp suburban areas (Manzini Ceinar & Mariotti, 2021), reduce commuting, and downsize the capacity of companies (Hrehovà et al., 2021). This has been followed by other emerging trends, such as the use of public CSs in urban areas to densify public services such as primary schools and public administration offices (Mariotti et al., 2021b).

The recent Coworking Europe Survey (Deskmag, 2021) reveals that due to the pandemic, CSs lost on average one fifth of their leasable desk supplies compared to the first three months of 2020. Their capacity fell sharply, particularly in major urban areas. Overall, membership numbers at the end of 2020 were about a quarter lower than at the beginning of 2020.

In terms of use, the number of daily users on weekdays declined significantly since the beginning of the pandemic. In January 2020, 60% of members in Europe used their CS daily. By October–November, the number had dropped to 40% (Deskmag, 2021). Moreover, before the pandemic, individual members choosing and paying for CSs themselves were less likely to use them every day than members whose companies opted for a CS. Today, the latter attend their CS less frequently and presumably work more at home (Momoli & Pliakogianni, 2021). Overall, it should be noted that the average contractual occupancy rate for all CSs remained stable compared to the beginning of 2020. In January 2020, it was around 100%, as it was at the end of 2020.

Perceiving coworking spaces in 2020: methods

Since the beginning of the pandemic, the vast amount of information on CSs was also shared by companies, users, and trade magazines (i.e. *Coworking Insights* or *Coworker Global*) on social media, influencing the general view of CSs. To analyze this debate, this study relies on digital methods and digital ethnography in particular. Digital ethnography is a method inspired by the digital methods approach (Rogers, 2013) that aims to ‘map the practises through which Internet users and digital device structure social formations around a focal object’ (Caliandro, 2018). The focus of this chapter is the debate around CSs conducted online, considered ‘meta-fieldwork’, i.e. a temporary informational artefact resulting from the act of ‘following’ a keyword or topic (Airoldi, 2018).

This method can be adapted to various online spaces, including social networks (Caliandro & Gandini, 2016; Semenzin & Bainotti, 2020; Bainotti et al., 2020). The choice of the platform(s) is not casual or neutral. The researcher must always ‘follow the medium’ (Rogers, 2013). Every platform has its own digital and technological infrastructure, leading to specific modes of production and organization of the data and meta-data. The digital ethnographer needs to choose the most suitable platform based on the object of analysis. In terms of CSs, several authors have investigated those spaces in relation to social media, such as Twitter (see Table 1.1).

Table 1.1 Studies analyzing coworking spaces and social media.

| <i>Authors</i> | <i>Topic</i> | <i>Methodology</i> |
|------------------------------|--|---|
| Hemsley et al., 2020 | Intersection between new working spaces, social media, and physical mobility of users. | Data collected from Twitter’s streaming API using an open-source tool kit. |
| Uda, 2021 | Users’ experience of CSs during COVID-19. | Online text data from Twitter and a content analysis using NVivo software. |
| Manfredini & Saloriani, 2021 | Physical and digital proximity of both new working spaces and their users. | Social network analysis with Gephi using DMI-TCAT software and geo-localizing the followers of 11 cases studies. |
| Reuschke et al., 2021 | Locating creativity in the city using Twitter data. | Location analysis of tweets from creatives. Use of geodatabase of ‘Points-of-Interest’ and Census of Population residence and workplace locations to match tweets with types of places. |
| De Falco et al., 2021 | Users’ perception of COVID-19 in the Italian context. | Social network analysis of Twitter data combined with geo-location. |

Source: Authors’ elaboration.

For location patterns specifically, Reuschke et al. (2021) used Twitter together with census data to locate creative economies in urban contexts, while Manfredini and Soloriani related the physical proximity of new working spaces to the digital proximity of their users, relying on both DMI-TCAT and Twitter to extract information. A recent publication by Uda (2021) investigated users' experience of CSs during COVID-19, extracting the online text data from Twitter and conducting a content analysis.

Based on the existing literature and the experimental nature of this study, Twitter emerged as the social network best suited to studying the online debate around a certain topic among members of connected communities of professionals. For data collection, this study used the Twitter API v2 for academic research. Indeed, in 2020 Twitter inaugurated a special product track for academic researchers that allows access to the full Twitter archive for approved, non-commercial projects. The API v2 was accessed through the search tweets Python library (Gonzales et al., 2020), querying for all tweets containing the words 'coworking' or 'co-working' posted from 1 January 2020 to 31 January 2021. This query led to collection of the initial dataset consisting of 359,302 tweets. The next step was to select only tweets written in English that had received at least one like and one retweet. This strategy was followed to ensure language consistency and that even voices with the minimum recognition would be analyzed, excluding as well at least some potential noise produced by bots. The resulting final dataset contained 39,070 tweets. Data analysis, which combined qualitative and quantitative approaches, was carried out using R, and the data visualization relied on RAWGraphs 2.0 (Mauri et al., 2017).

Findings: Twitter debate on coworking spaces in 2020

Before delving into the most significant empirical results, it is useful to observe some descriptive features of our debate. The distribution of the tweets over time does not highlight any unexpected gaps or peaks. In general, the first trimester (January, February, March 2020) had the highest number of tweets, with February – when the debate on COVID-19 related to CSs was still nearly absent – as the month with the most tweets (4,366). Instead, the months with the lowest number of tweets on CSs (below 2,600) were April, May, November, and December 2020 and January 2021.

An analysis of the most prolific authors tweeting on the topic was also useful for insights into who was animating the debate. This may therefore be considered an indirect proxy of the quality of the debate using digital methods techniques. A rich and varied set of voices contributed to the debate. The fifteen most prolific users published a total of 3,982 tweets, equal to 10.2% of the entire dataset. The most prolific user shared 773 tweets, while the fifteenth user shared 113, showing no disproportionate influence on the dataset.

A qualitative inspection of the profiles of this user subset revealed a diverse set of voices. They include 2 websites of CS-specialized news, 4 communities or organizers of specialized conferences on CSs, 3 platforms or websites providing

services to CSs, 3 CSs, 1 business space, 1 incubator, and 1 professional. Thus, the range of entities mirrors the most relevant players in the coworking scenario. Additionally, they represent important players: 10 out of 15 users have more than 1,000 followers, and the top three have, respectively, 9,110, 6,521, and 9,694 followers. Only the fourteenth most prolific user appears to be an outlier with 39 followers, being a new specialized information website. To analyze the debate, we used the metadata directly provided by Twitter API v2 and context annotations. Although Twitter does not release precise information about the methods used for the inquiry, simply stating that ‘annotations are inferred based on the Tweet text and result in domain and/or entity labels’ (developer.twitter.com, 2021), it has the typical features of a supervised machine-learning classification of topics (Kotsiantis, 2007). Such models analyze and classify the content of a string of text from among a set of topics predetermined by the researcher through machine learning techniques, training the algorithm to distinguish and classify the text into the correct topics.

Thus, to analyze the debate in the Twitter sphere, we considered all the topics – ‘entities’ in Twitter jargon – with a frequency higher than 400. To gain more analytical depth, a second level of entities associated with the first was also included.

In fact, every tweet may have more than one entity attributed to it. By linking the first-level topic with second-level topics, it is possible to obtain a more detailed outline of the topics debated in the dataset. Of the dataset, 18,113 tweets were not classified by the algorithm because they were not attributable to an entity. From the classification analysis of other tweets, a series of thematic debate categories emerge.

The first topic is ‘business and finance’, which appears as the most discussed (5,270 tweets). The most frequent sub-topic by far is ‘startups’ (2,107), followed by ‘personal finance’ (647), ‘entrepreneurship’ (647), ‘technology’ (373), and ‘small business’ (322). The predominance of business and finance is hardly a surprise. However, it is significant that the most frequent sub-topic is startups, which can also be paired with the less frequent (although similar) sub-topic of small business. This confirms that the potential role of firms as CS customers gained a lot of relevance in the 2020 debate.

The second most frequent topic can be identified in a series of entities related to the pandemics and its effects. The most prominent is ‘COVID-19’, which was identified in 3,199 tweets. Most (2,488) do not have a second, related sub-topic; the only exceptions are the 482 tweets also related to business and finance. COVID-19 is followed by ‘remote working’ (3,114 tweets), confirming its relevance in relation to CSs in 2020 in the professional debate. The direct link between remote working and the pandemic is confirmed by the fact that a large portion of tweets (2,557) are also associated with the COVID-19 topic. Lastly, the sub-topic of the ‘future of work’ can also be ascribed to this overall theme, with 755 tweets.

The third topic consists of ‘drinks’ (1,553) and ‘food’ (761). Upon more thorough inspection, they mark both the relevance of community and social

features of coworking spaces and the growing relevance of hybrid workspaces, i.e. cafés, pubs, and ‘third spaces’ in general that also present themselves as new (co)working spaces.

These three topics are followed by a set of topics related to the debate on CSs but of minor relevance for our discussion: ‘technology’, ‘home and family’ (which confirms the dimension of domestic work during the pandemic), ‘services’ (related to social networks in particular), and ‘travel’.

To further interpret the topics, we analyzed the most frequent hashtags in the dataset by comparing the most frequent ones in the whole dataset and in the three most relevant entities. The hashtags are shown in Table 1.2. For the analysis, hashtags with a very close meaning or wording were unified. For each column, the first 20 hashtags are reported and the hashtags that are unique to an entity are highlighted in bold.

Looking at the overall frequency, #startups and #remoteworking, which can also be associated with the #flexibleworkpace hashtag, emerge as the most relevant hashtags in the debate, confirming the importance of these trends. Another relevant trend is the growth of office spaces within CSs, which is demonstrated by the fact that #officespace appears as much as #workspace. The #futureofwork hashtag is relevant both in the overall list and in the ‘business and finance’ and ‘remote working’ topics, confirming how the debate in these two fields keeps a close eye on future scenarios. The frequency of #realestate and #cre (acronym for corporate real estate) confirms the interest that transformations involving startups and office spaces within coworking spaces has for these economic sectors.

Looking at the individual entities, it is interesting that beyond the sub-topics mentioned above, the business and finance sector shows relatively little attention for the world of freelancers, confirming that the focus of the debate possibly overshadowed traditional CS customers. The COVID-19 topic features many specific hashtags related more prominently to the pandemic that do not appear elsewhere. In the remote working topic, the #digitalnomads hashtag appears which is absent elsewhere.

Up to this point, the analysis focused on the contents of the debate in the Twitter sphere. However, to inspect the debate in relation to the pandemic, a diachronic analysis was critical for looking at the single entities in their development over time. Figure 1.1 reports the development of the topics by month, while Figure 1.2 shows the most frequent topics by trimester. Their combined analysis highlights the birth and development of individual topics as well as their salience during the different phases.

Figure 1.1 shows that the most significant results regard the ‘remote working’ and ‘future of work’ topics. The former seems completely absent from the debate on CSs before March, the latter before June. They enter the debate and immediately acquire greater relevance, remote working specifically. This is in line with the scientific literature analyzed in the previous section, highlighting that the debate on location factors, working from home, and multi-location strategies emerged during the phase I lockdown early in 2020.

Table 1.2 Most frequent hashtags for main entities.

| <i>total dataset</i> | | <i>business</i> | | <i>covid19</i> | | <i>remote working</i> | |
|--------------------------------|------------------|--------------------------|------------------|--------------------------------|------------------|--------------------------|------------------|
| <i>hashtag</i> | <i>frequency</i> | <i>hashtag</i> | <i>frequency</i> | <i>hashtag</i> | <i>frequency</i> | <i>hashtag</i> | <i>frequency</i> |
| #startup[s] | 3180 | #startup[s] | 1908 | #covid[_][19] [coronavirus] | 1013 | #remotework[ing] | 1524 |
| #remotework[ing] | 2338 | #entrepreneur[s] | 1128 | #flex[iblework]space | 233 | #w[ork][ing]f[rom]h[ome] | 1083 |
| #workspace | 1972 | #business | 615 | #startup[s] | 189 | #covid[19][coronavirus] | 425 |
| #entrepreneur | 1948 | #workspace | 470 | #workspace | 151 | #flex[iblework]space | 297 |
| #flex[iblework] space | 1894 | #officespace | 446 | #officespace | 136 | #futureofwork | 230 |
| #officespace | 1861 | #realestate | 444 | #stay[safe][home] | 127 | #entrepreneur[s] | 204 |
| #covid[_][19] [coronavirus] | 1766 | #futureofwork | 441 | #business | 121 | #digitalnomad | 187 |
| #business | 1598 | #flex[iblework] space | 425 | #cre | 104 | #business | 168 |
| #office | 1586 | #office | 412 | #office | 104 | #homeoffice | 153 |
| #futureofwork | 1578 | #smallbusiness | 338 | #entrepreneur[s] | 100 | #workspace | 152 |
| #community | 1515 | #community | 334 | #realestate | 90 | #startup[s] | 148 |
| #w[ork][ing]f[rom] h[ome] | 1407 | #freelancer[s] | 293 | #socialdistancing | 90 | #office | 143 |
| #cowork | 1301 | #entrepreneurship | 280 | #community | 86 | #officespace | 143 |
| #workplace | 806 | #workplace | 247 | #workingfromhome | 76 | #freelancer[s] | 109 |
| #realestate | 756 | #innovation | 213 | #workplace | 73 | #remoteoffice | 93 |
| #cre | 670 | #technology | 204 | #lockdown | 69 | #remotejobs | 92 |
| #smallbusiness | 665 | #cre | 196 | #work | 52 | #remoteworker | 91 |
| #digitalnomad | 587 | #virtualoffice | 193 | #pandemic | 51 | #community | 86 |
| #work | 577 | #tech | 192 | #coworkinglife | 44 | #workplace | 84 |
| #virtualoffice | 551 | #work | 160 | #coworkingcommunity | 42 | #flexibleworking | 83 |

Source: Authors' elaboration.

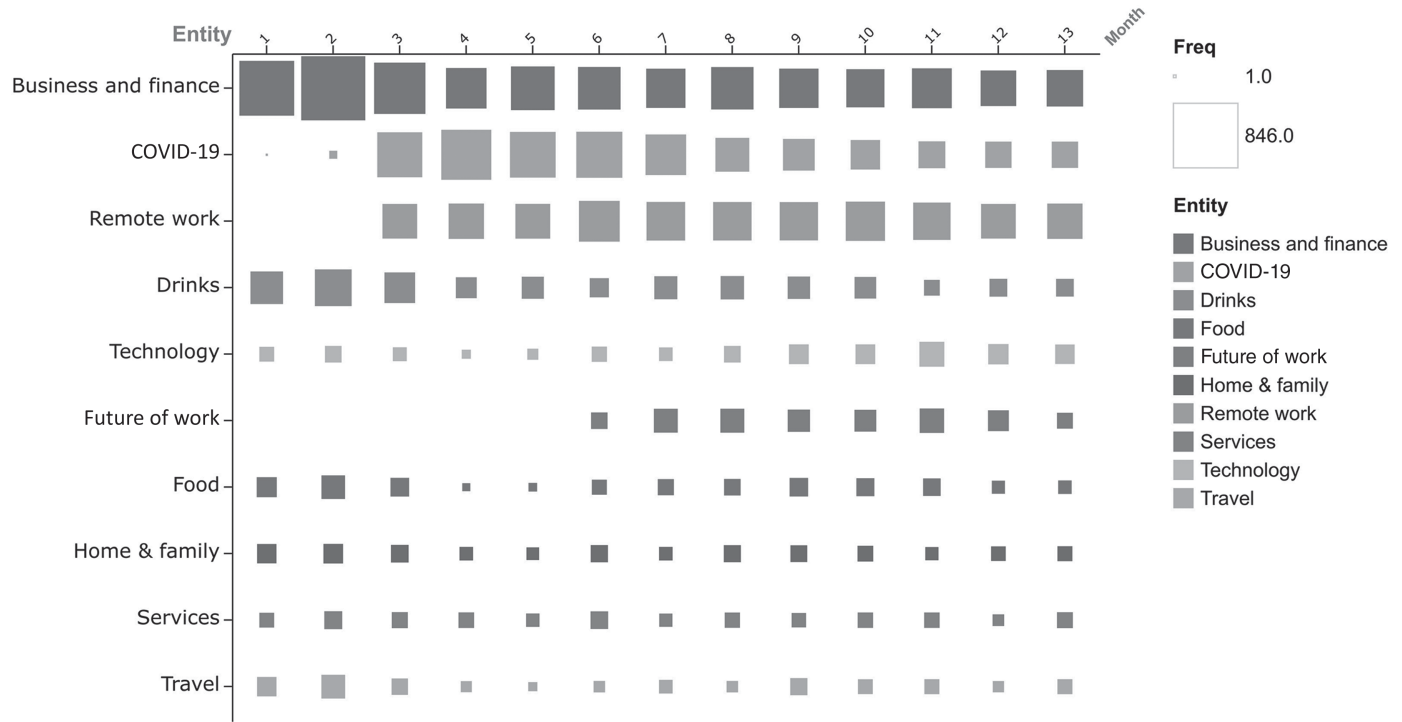


Figure 1.1 Topics by month.

Source: Authors' elaboration.

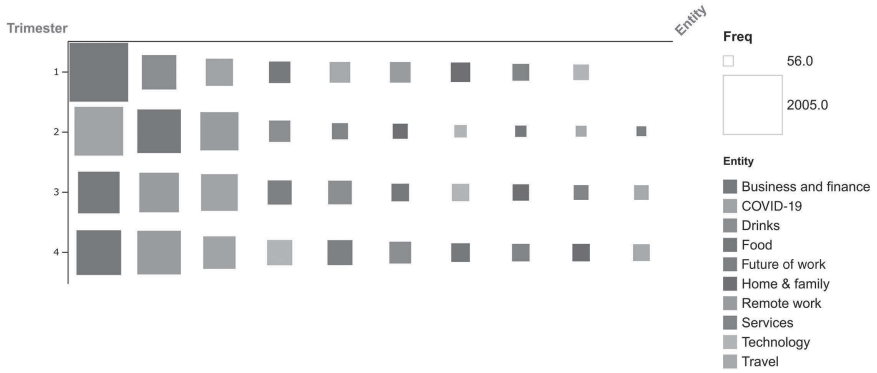


Figure 1.2 Most frequent topics by trimester.

Source: Authors' elaboration.

Remote working started to be debated in correspondence with phase I of the COVID-19 pandemic in March, while the reason for the rise of the future of work topic in June is less straightforward. One hypothesis, which should nevertheless be corroborated by other data, relates to the substantial drop in new COVID-19 cases in most European countries between the end of May and the beginning of June. This could have fostered development of the debate beyond present matters (COVID-19 and remote working) towards speculation on the future of the sector.

Figure 1.2 instead focuses on the predominance of the topics in the debate. The first trimester provides a glimpse of the structure of the debate before the pandemic. Excluding the COVID-19 theme which surged in March, business and finance is by far the first topic, followed by drinks, food, and travel. The surge of the pandemic in Western countries caused a sharp renewal of this topical hierarchy in the debate. In the second trimester, COVID-19 became the most debated topic, followed by business (whose relevance is reduced), and remote working. Traveling almost disappears, while drinks and food also lose importance. The third and fourth trimesters show a more settled context under the 'new normal'. After the phase I lockdown measures in most Western countries, the debate directly regarding COVID-19 and lockdown measures progressively loses relevance. The debate shifts towards other topics regarding the future of CSs: business and remote working topics become the most discussed (nearly equal in importance) and the future of work gains relevance, together with technology (particularly in the fourth trimester). This process aligns with the numbers and scientific literature. In fact, remote working in the fourth trimester was embraced by most CS users. In October, November, and December 2020, the number of members in Europe attending their CS dropped to 40% compared to January 2020 (Deskmag, 2021). Moreover, new

remote working modes for both companies (Hrehovà et al., 2021) and freelancers (Manzini Ceinar et al., 2021) emerged.

Conclusions

This chapter summarizes the main topics of the debate on the coworking environment during the COVID-19 pandemic and its development during different phases through a literature review and digital ethnography of the debate on Twitter.

From an empirical point of view, the results from the literature review and digital ethnography are consistent and suggest that after the first trimester of 2020 (January, February, and March; see Graph 2), when the debate focused on the direct impact of the COVID-19 pandemic on CSs and the possibility of an abrupt crisis in the entire ecosystem, this risk seemed less and less concrete over time. Interestingly, this is in line with data on the average contractual occupancy rate, which remained stable. In phase II, the debate rapidly shifted to the opportunities for CSs that opened due to the pandemic given the spread of remote working and the role that CSs could play in the future of work. From this point of view, the COVID-19 pandemic can be seen as a blueprint for accelerating the shift of the work culture towards a more flexible way of working. This is due to the fact that what was previously considered an exception could potentially become the new normal, even though large companies such as Google are more likely to bring employees back to the office (Kelly, 2021).

From a methodological point of view, this chapter contributes to the existing literature by advancing a novel framework that could be explored further. It highlights how the data gathered through digital methods can potentially enhance and enrich the framework deriving from the review of the scientific literature, creating synergies and strengthening the accuracy of the analysis.

Furthermore, this chapter opened a discussion about the use of data collected from social media in qualitative research complementary to traditional sources such as official data, reports, censuses, etc. The positive aspect of this method is the enormous amount of data that is constantly available, although one limitation is that data is subjective and cannot be checked in terms of reliability. In addition, some restrictions raised by Twitter highlight the fact that results based on a social media dataset need to be evaluated carefully (Manfredini & Saloriani, 2021).

References

- Airoldi, M. (2018) 'Ethnography and the digital fields of social media', *International Journal of Social Research Methodology*, 21(6), pp. 661–673.
- Avdikos, V., & Merkel, J. (2020) 'Supporting open, shared and collaborative workspaces and hubs: Recent transformations and policy implications', *Urban Research & Practice*, 13(3), 348–357.
- Bainotti, L., Caliendo, A., & Gandini, A. (2020) 'From archive cultures to ephemeral content, and back: Studying Instagram stories with digital methods', *New Media & Society*, pp. 1–21.

- Blaszka, M., Burch, L.M., Frederick, E.L., Clavio, G., & Walsh, P. (2012) ‘#WorldSeries: An empirical examination of a Twitter hashtag during a major sporting event’, *International Journal of Sport Communication*, 5(4), pp. 435–453.
- Brinks, V., & Ibert, O. (2020) ‘From Corona virus to Corona crisis: The value of analytical and geographical understanding of crisis’, *Tijdschrift voor Economische en Sociale Geografie*, 111(3), pp. 275–287.
- Bruns, A., & Burgess, J. (2011) *New methodologies for researching news discussion on Twitter*. Proceedings of the 3rd Future of Journalism Conference 2011, Cardiff University, Cardiff, pp. 1–11.
- Caliandro, A. (2018) ‘Digital methods for ethnography: Analytical concepts for ethnographers exploring social media environments’, *Journal of Contemporary Ethnography*, 47(5), pp. 551–578.
- Caliandro, A., & Gandini, A. (2016) *Qualitative research in digital environments: A research toolkit*, 1st ed. Milan: Taylor & Francis.
- Chadwick, A. (2013) *The hybrid media system: Politics and power*. Oxford University Press. Available at: <https://papers.nips.cc/paper/3700-reading-tea-leaves-how-humans-interpret-topic-models> (accessed: 14 February 2020).
- Coworker.com (2020) *SURVEY: How coworking spaces are navigating COVID-19*. Available at: www.coworker.com/mag/survey-how-coworking-spaces-are-navigating-covid-19 (accessed: 14 April 2021).
- Cui, A., Zhang, M., Liu, Y., Ma, S., & Zhang, K. (2012) *Discover breaking events with popular hashtags in twitter*. Proceedings of the 21st ACM International Conference on Information and Knowledge Management, pp. 1794–1798.
- Cunha, E., Magno, G., Comarela, G., Almeida, V., Gonçalves, M.A., & Benevenuto, F. (2011) *Analyzing the dynamic evolution of hashtags on twitter: A language-based approach*. Proceedings of the Workshop on Language in Social Media (LSM 2011), pp. 58–65.
- de Abreu e Silva, J., & Melo, P. (2018) ‘Does home-based telework reduce household total travel? A path analysis using single and two worker British households’, *Journal of Transport Geography*, 73, pp. 148–162.
- De Falco, C.C., Punziano, G., & Trezza, D. (2021) ‘A mixed content analysis design in the study of the Italian perception of COVID-19 on Twitter’, *Athens Journal of Social Sciences*, 8(3), pp. 191–210.
- Deskmag (2019) *The 2019 global coworking survey*. Available at: <https://www.deskmag.com/en/2019-global-coworking-survey-market-research-study> (accessed: 6 June 2021).
- Deskmag (2021) *The ultimate coworking space data report*. Available at: www.deskmag.com/en/coworking-spaces/covid19-pandemic-impact-on-coworking-spaces-market-report-corona-statistics (accessed: 14 February 2020).
- European SocialWorkplace (2020) *SocialWorkplace survey: Impact of COVID-19 on coworking spaces*. Available at: <https://socialworkplaces.com/product/survey-impact-of-covid-19-on-coworking-spaces/> (accessed: 14 February 2020).
- Florida, R. (2002) ‘Bohemia and economic geography’, *Journal of Economic Geography*, 2(1), pp. 55–71.
- Florida, R., Rodríguez-Pose, A., & Storper, M. (2021) ‘Cities in a post-COVID world’, *Urban Studies*, 00420980211018072.
- Gandini, A. (2015) ‘The rise of coworking spaces: A literature review’, *Ephemera*, 15(1).
- GCUC & Emergent Research (2017) *Number of U.S. and global coworking spaces and members (DECEMBER, 2017 FORECAST) 2017–2022*. Available at: <https://kellerstreetcowork.com/wp-content/uploads/2019/07/GCUC-Global-Coworking-Stats-2017-2022.pdf> (accessed: 28 January 2022).
- Golder, S.A., & Huberman, B.A. (2006) ‘Usage patterns of collaborative tagging systems’, *Journal of Information Science*, 32(2), pp. 198–208.

- Gonzales, F.P., Kolb, J., & Montague, A. (2020) *Searchtweets: Wrapper for Twitter's premium and enterprise search APIs*, 1, 7, 6 [Computer software]. Available at: <https://github.com/twitterdev/search-tweets-python>.
- Hemsley, J., Erickson, I., Jarrahi, M.H., & Karami, A. (2020) 'Digital nomads, coworking, and other expressions of mobile work on Twitter', *First Monday*, 25(3). Available at: <https://doi.org/10.5210/fin.v25i3.10246> (accessed: 25 July 2021).
- Hrehova, K., Sandow, E., & Lindgren, U. (2021) *Firm relocations, commuting and relationship stability*. CERGE-EI – The Center for Economic Research and Graduate Education – Economics Institute, Prague. Working Paper Series No. 694.
- Hu, R. (2020) 'COVID-19, smart work, and collaborative space: A crisis-opportunity perspective', *Journal of Urban Management*, 9(3), pp. 276–280.
- JLL Research Report (2020) *COVID-19: Global real estate implications*. Available at: www.jll.it/it/tendenze-e-ricerca/research/covid-19-global-real-estate-implications (accessed: 28 July 2021).
- Kelly, J. (2021) 'Google wants workers to return to the office ahead of schedule: This looks like a blow to the remote-work trend', *Forbes*, April. Available at: www.forbes.com/sites/jackkelly/2021/04/01/google-wants-workers-to-return-to-the-office-ahead-of-schedule-this-looks-like-a-blow-to-the-remote-work-trend/?sh=6a59133b1575 (accessed: 28 July 2021).
- Kotsiantis, S.B. (2007) 'Supervised machine learning: A review of classification techniques', *Informatica*, 31, pp. 249–268.
- Kosner, A.W. (2020) *The crucial difference between remote work and distributed work*. Available at: <https://blog.dropbox.com/topics/work-culture/the-crucial-difference-between-remote-work-and-distributed-work> (accessed: May 2020).
- Kuebart, A., & Stabler, M. (2020) 'Infectious diseases as socio-spatial processes: The COVID-19 outbreak in Germany', *Tijdschrift voor Economische en Sociale Geografie*, 111(3), pp. 482–496.
- Manfredini, F., & Saloriani, S. (2021) 'Exploring new workplaces with social network analysis', in I. Mariotti, S. Di Vita, & M. Akhavan (Eds.), *New workplaces – location patterns, urban effects and development trajectories: A worldwide investigation*. Milano: Springer Publisher, pp. 33–49.
- Manzini Ceinar, I., & Mariotti, I. (2021) 'The effects of COVID-19 on coworking spaces: Patterns and future trends', in I. Mariotti, M. Akhavan, & S. Di Vita (Eds.), *Shared workplaces in the knowledge economy*. Milan: Springer Publisher, pp. 277–297.
- Manzini Ceinar, I., Pacchi, C., & Mariotti, I. (2021) 'Emerging work patterns and different territorial contexts: Trends for the coworking sector in pandemic recovery', *Professionalita Studi*, 4(III).
- Mariotti, I., Akhavan, M., & Rossi, F. (2021a) 'The preferred location of coworking spaces in Italy: An empirical investigation in urban and peripheral areas', *European Planning Studies*, pp. 1–23.
- Mariotti, I., Di Marino, M., & Akhavan, M. (2021b) 'The emergence of coworking models in the face of pandemic', in J.R. Bryson, L. Andres, E. Aksle, & L. Reardon (Eds.), *Living with pandemics: People, place and policy*. Cheltenham: Edward Elgar Publisher.
- Marwick, A.E., & Boyd, D. (2011) 'I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience', *New Media & Society*, 13(1), pp. 114–133.
- Mauri, M., Elli, T., Caviglia, G., Uboldi, G., & Azzi, M. (2017) *RAWGraphs: A visualisation platform to create open outputs*. Proceedings of the 12th Biannual Conference on Italian SIGCHI Chapter, pp. 1–5.
- Momoli, R., & Pliakogianni, K. (2021) 'The home/office hybrid: How the coliving and coworking sectors have been impacted by COVID-19', *Coliving Insight – Impact & Sustainability in Coliving*, 3. Available at: www.spatial-experience.com/spx-lab-article/the-home-office-hybrid-and-the-impact-of-covid-19 (accessed: 12 August 2021).

- Neuman, W.R., Guggenheim, L., Jang, S.M., & Bae, S.Y. (2014) 'The dynamics of public attention: Agenda-setting theory meets big data', *Journal of Communication*, 64(2), pp. 193–214.
- Orel, M., & Bennis, W.M. (2021) 'Classifying changes. A taxonomy of contemporary coworking spaces', *Journal of Corporate Real Estate*, 23(4), pp. 278–296.
- Reuschke, D., Long, J., & Bennett, N. (2021) 'Locating creativity in the city using Twitter data', *Environment and Planning B: Urban Analytics and City Science*, 48(9), pp. 2607–2622.
- Rogers, R. (2013) *Digital methods*, 1st ed. Cambridge: MIT Press.
- Semenzin, S., & Bainotti, L. (2020) 'The use of Telegram for non-consensual dissemination of intimate images: Gendered affordances and the construction of masculinities', *Social Media + Society*, 6(4).
- Small, T.A. (2011) 'What the hashtag? A content analysis of Canadian politics on Twitter', *Information, Communication & Society*, 14(6), pp. 872–895.
- Statista.com (2020) *Number of coworking spaces worldwide from 2018 to 2020 with a forecast to 2024*. Available at: <https://www.statista.com/statistics/554273/number-of-coworking-spaces-worldwide/> (accessed: 6 June 2021).
- Uda, T. (2021) 'Expressing experiences of coworking spaces: Insights from social media', in M. Orel, O. Dvoulety, & V. Ratten (Eds.), *The flexible workplace coworking and other modern workplace transformations*. New York: Springer Publisher.
- Valentine, G., & Skelton, T. (2008) 'Changing spaces: The role of the internet in shaping deaf geographies', *Social & Cultural Geography*, 9(5), pp. 469–485.