

Lived and perceived space during lock-down in a sensitive map approach

Laurence Jolivet^{a, *}, Catherine Domingues^a, Éric Mermet^b, Sevil Seten^c

^a LASTIG, Univ Gustave Eiffel, ENSG, IGN, F-94160 Saint-Mandé, France, laurence.jolivet@ign.fr; catherine.domingues@ign.fr

^b Centre d'analyse et de mathématiques sociales (CAMS), École des hautes études en sciences sociales (EHESS), eric.mermet@ehess.fr

^c Laboratoire Ambiances Architectures Urbanités (AAU), doctorante, École doctorale Sociétés, Temps, Territoires (STT) de Nantes, sevilseten@gmail.com

* Corresponding author

Abstract: The first lock-down in France due to the Covid-19 pandemic happened during spring 2020. It meant restrictions for everyone regarding reachable space and possible time length outside home. The seminar of sensitive mapping taking place in *École des hautes études en sciences sociales* (EHESS) went online and proposed an exercise to investigate the consequences of these statutory restrictions on individual lived and perceived space. The defined protocol of the exercise was based on the framework of the sensitive map approach. This approach adapts the principles of conventional cartography so that to favour personal information selection and design. Each participant of the seminar had the task to map their space. Displayed information should concern meaningful elements from their spatial environment. Other targeted information was sensitive information including emotions, feelings, and opinions as well as perceived elements from the five senses. The resulted map corpus offers diverse mapping creations. Each map contains several graphic items. Items are mainly cartographical displays enriched with non-cartographical drawings, pictures, photos, records, charts. Techniques were mixed: pen, fabrics, computer-based. The themes of displayed elements are about spatially-stable features like the dwelling, buildings remained open, green spaces, and about ephemeral and sensitive information like social interactions, people, perceived sounds, smells and feelings about the lock-down situation and the pandemic. Some maps have used or were inspired by topographic maps. Though in most maps, distances and topology are subjective. Sensitive mapping appeared as an interesting approach to collect individual testimonies and might be complementary to statistical studies.

Keywords: sensitive map, mapping experiment, lived space, perceived space, lock-down

1. Introduction

The Covid-19 pandemic and the resulted health crisis have led to lock-down measures in France between March 17th and May 11th 2020. The measures aimed at preventing people from physically interacting with each other. For individuals, a time limit of one hour out of the dwelling was set, and during that time length, a spatial limit of one kilometre around the dwelling was added. Public buildings like administrations, shops and restaurants were closed. The restrictions concerned the whole country and all the residents. However, exceptions were applied for people working in the remaining open sectors requiring physical attendance (health care, food supply, specific services), or in a situation of professional or personal responsibilities. Compared to the following measures related to Covid-19 in France at the end of 2020 and in early 2021, measures during this first lock-down, also called containment, were the strictest. The individually accessible space shrunk and as a consequence, the part of space actively travelled was the dwelling and its immediate vicinity.

The training methodological seminar of sensitive mapping *Atelier de cartographie sensible*¹ is held every year since 2016 in *École des hautes études en sciences sociales* (EHESS)² in Paris, France. Audience is mainly students and people working in teaching and research. The courses are about the cartographical display of personal spatial experiences (Brando et al. 2017). The targeted space to display is then the space as lived and perceived by a person or a group of people. Lived space is defined as a travelled space, either occupied for a long period of time or temporarily crossed (Bardon et al, 2013; Mazurek, 2013). Travel can be done *in situ* or possibly at distance using memory and imagination. Perceived space is the space captured by the five senses and through cognitive abilities conditioning our experience of the world (Merleau-Ponty, 1945). Lived and perceived space is unique to each person because it depends on the individual life course including past events. Life course intervenes as a trigger to actions and interactions in an environment (Casati, 2002) and as an observation filter that selects information (Bailly, 1991). Emotions and

¹ Sensitive mapping workshop, <http://psig.huma-num.fr/cartes-sensibles/>

² Graduate school in social sciences, <https://www.ehess.fr/fr>

feelings also occur when experiencing the space and are associated to lived and perceived space.

The first lock-down was an unprecedented context to investigate individual spatial experiences. Limitation of the legally available space was a sudden change in many people's habits. It was a change of living environment for people staying at home and a change of atmosphere (e.g. a less busy public space) for people keeping their professional activities. For all, it meant a change in the diversity of reachable places and in the potential activities. The seminar has initiated at the beginning of the lock-down a practice session for participants to formalize and display their lived and perceived space corresponding the induced changes at that time. A map offers a synthetic overview of a space and so appears as an appropriate display to tackle lock-down as constraints with spatial consequences. The proposed method for producing cartographical displays was sensitive mapping. The expected outcomes of the session were one cartographical production per participant. The practical approach of the exercise had a pedagogical goal. Participants had the opportunity to test the sensitive mapping method within a specific context and by following a defined protocol. Pros and cons of the method could therefore be identified, which helps participants determining whether or not an implementation would be adapted in their further research work. In addition of pedagogy, the exercise contributed in coping with the situation which led to a change not only in private matters but also in an educational matter by stopping in-class courses.

Sensitive mapping, which may also be named perceptive and sensitive mapping (Dominguès et al., 2021), is a method focusing on displaying graphically a spatial environment from a subjective point of view. Subjectivity can be the one of the map-maker or the one of an interviewee that a map-maker would draw. It includes information about emotions, feelings, opinions, and information that can be collected by the five senses (globally referred to sensitive information in this article). Subjectivity also concerns the perception of a spatial environment (distances, density of people) during a specific period of time or a personal activity or situation (during night time, at work). Sensitive mapping is included in the various movements of alternative cartography (Rekacewicz, 2020). It is especially related to mental mapping, which theory emerged in the 1960's from urban planning (Lynch, 1960; Gould et al., 1984; Giesecking, 2013) and was later used by geographers since the 1980's (Pichon, 2015). As with mental mapping, it focuses on the display of lived and perceived space by an individual or a population. However, sensitive mapping gives a greater importance to how the displayed information is spatialized, i.e. its location and allocated spatial extent, and to how it is symbolized (Olmedo, 2015; Bardon et al, 2013). Sensitive mapping is often put in contrast with conventional mapping corresponding to Western-style Euclidian cartography based on geodesy and topometry measures (e.g. maps of France by the

Cassinis in the 18th and 19th centuries). Conventional mapping intends to propose an objective display of the world (Brunet et al., 1993) whereas sensitive mapping leaves this intention behind to target a display from a subjective point of view and to favour individual expression and allow creativity. Thus, it can adapt and transcend cartographical rules such as selection of geographical landmark elements shared between the map-maker and the different users of the map, mathematical projections and graphic semiology using visual variables (Bertin, 1973). The sensitive mapping method globally leads to the creation of maps with characteristics about the selection and drawing of information: selection of landmarks meaningful only for a person or a group (Mekdjian et al., 2016; Frémont, 1976); selection of sensitive information like sounds, smells (Grésillon, 2013) and emotions (Poplin, 2017); distance metrics, topology and other units unique to the map (Roqueplo, 2010); figurative symbols and materials (Olmedo, 2015; Griffin et al., 2012). Maps resulting of a sensitive mapping approach can then follow a gradient along the type of selected information, measured topographical elements vs. feelings, permanent vs. temporary, and a gradient along the type of drawing, conventional semiology vs. personal semiology. Along with academic research, sensitive mapping is used in and enriched by several fields: geography, urbanism, sociology, cognition (Heitz et al., 2018; Audas, 2010; Muis, 2016). It is a tool or a topic in multidisciplinary projects (working groups Cartotête (Dernat et al., 2018), and POLAU³; research projects ANR CORES 2919-2022⁴ and ANR MOBILES 2021-2024⁵). The method stands as a cartographical process in favor of communication and interaction between public actors, stakeholders, citizens, thanks to the material creation of a map aiming at taking into account and displaying different thoughts and points of views. It has been deployed to collect people's opinions, in particular about land planning (Ancion, 2018; Rabie, 2017).

The objectives of the article are to present an implemented experiment based on the sensitive mapping method about the display of the spatial environment as lived and perceived during lock-down, and to study how map-makers benefit from, or ignore, the modalities of this method. First, the experiment and the resulted map corpus are described. Second, map contents and graphical displays corresponding to cartographical choices of the map-makers are characterized. Then, a synthesis of lived and perceived environment during lock-down is formulated regarding the characterized map contents and designs, and in complement to existing studies about lock-down.

2. Experiment and map corpus

The experiment about lived and perceived space during lock-down was proposed to the participants of the

³ <http://polau.org/>

⁴ <http://cores.pro/>

⁵ <https://mobiles-projet.huma-num.fr/>

seminar as a practice session. A corresponding theoretical protocol has been initially defined based on the sensitive map approach. Then this protocol was conducted, resulting to a map corpus.

2.1 The defined protocol

The general statement of the experiment was for each participant of the seminar to map their spatial environment as personally lived and perceived, and the changes occurred due to, and evolving during, the lock-down. Before implementation, a protocol has been defined by the seminar organisers in order to provide a framework adapted to sensitive mapping. The parameters of the protocol to be set were as follows: the role and tasks of the participants, the targeted information to map, their map design and the material possibilities. The role of the participants was both surveyee and map-maker. The organisers were the surveyors, framing the experiment and then reading and analysing the created maps. Targeted information concerned individual selection of meaningful elements in the spatial environment of the participants and sensitive information. An instruction was about highlighting changes induced by lock-down so maps were expected to contain diachronic information. The collect of information could be done before mapping *in situ* with a perceptive access to the mapped environment while mapping, or at distance based on external sources like aerial images. It could be done simultaneously to mapping, meaning that the map could be a snapshot of the perceived current environment, a memory from past visits or imaginary elements or possibly thoughts for instance to express ideas associated to parts of space. The map design concerned how to spatialize and symbolize information. Metrics could be normalized, such as in topographic plans, or only relying on individual perception. Symbols could be defined as conventional or original. Concerning material possibilities, it has been decided that all media and formats could be used and that several techniques could be combined. Maps could be hand-sketched, assisted by computer software or a mix of both. In addition to maps, an explanatory text had to be written by each participant in order to explicit their mapping process and choices, and the content of their final map.

2.2 The conducted protocol and the map corpus

The experiment started at the end of March 2020, shortly after the beginning of lock-down in France, and ended in May when lock-down was released. The dedicated practice session was organised during three classes of the seminar, lasting 4 hours each and with 2 or 3 weeks in between. All courses took place on-line for organisers and participants. The protocol was first presented by the organisers-surveyors to the participants-surveyees-map-makers. Then maps were formalized and created. Discussions happened in order to precise explanations about the protocol, to support the participants' ideas and to unlock issues. Bibliographical references about existing sensitive mapping approaches and productions were also given.

Participants were 15, 13 women and 2 men. They were all students in master's or PhD degree in sociology, urbanism and geography. Few of them had attended classes about cartography and had previously used Geographical Information System (GIS) software. During lock-down, participants remained in France. Two-thirds remained in the Paris region, where the seminar was planned to take place. The remaining one-third was mainly in rural environment in France. A quarter of them were foreigners understanding and speaking French.

Each participant has created one map. In this experiment, a map can be made of several graphic items. An item is an already existing or an originally created document corresponding to one material and which content is a consistent whole and can be read individually. Some items are not cartographic though they are associated to the spatial environment and contribute to the display of its experience. The corpus contains thus 15 maps including altogether 97 graphic items. Maps and explanatory texts are published on the Web site of the seminar⁶.

3. Map characterization

The maps of the corpus are personal codified representations of lived and perceived space of the seminar participants. This section is about studying how as map-makers, they have interpreted the exercise instructions and have addressed the sensitive map approach in order to display space during lock-down. The method is to characterize the contents of the maps according to cartographical criteria. These criteria, detailed in each following paragraphs, are the chosen materials for the maps and the types and number of items, the spatial extent and temporality of displayed elements, and then the themes of the elements and their allocated graphic semiology.

3.1 Materials and items

The materials used for mapping are various. It is mostly paper, drawing and fabrics techniques (11 maps), and otherwise numerical media (4). As a map can contain several graphic items, this count concerns the majority of items within the map. There are some mixes of items of different materials. The types of items are partly related to materials. They are: cartographical display (35 items), non-cartographical drawing (9), picture (5), photo (44), video record with sound (2), chart (2). Maps contain between 1 and 14 items. The majority of maps contain several items, corresponding to 1 up to 4 different types. The few maps containing one item are a cartographical display (2) or a drawing (1). 12 maps out of 15 contain at least one cartographical display (Figure 1); 5 maps contain non-cartographical drawings; only one map includes existing pictures; 9 maps shows photos; 2 maps include video records; 2 maps contain charts.

⁶ <http://psig.huma-num.fr/cartes-sensibles/category/confinement/>

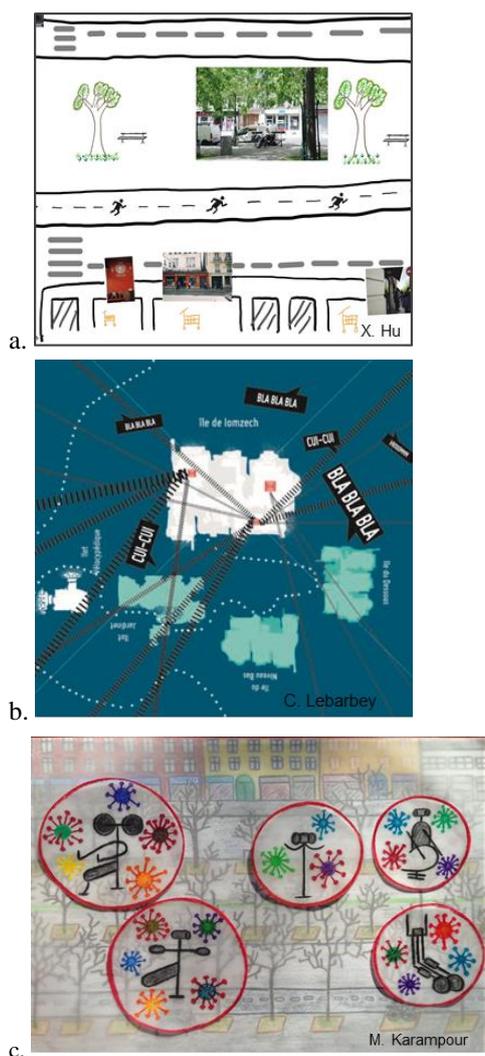


Figure 1. Examples of graphic items from the map corpus corresponding to cartographical displays with different techniques: a. hand-sketched, b. drawn numerically and c. embroidered. Other types of items can be included such as photos (a).

Items corresponding to cartographical display are hand-sketched (27) or computer-assisted (8). Cartographical displays were oriented according to a vertical view angle (26) or within a perspective view (9). Existing background maps have been used in 5 items. The pieces of fabrics are embroidered drawings on thin cloth and tracing paper, overlapping and in transparency with cartographical display items. Non-cartographical drawings were all hand-sketched. Pictures correspond to an extraction from existing publications; in the corpus they are screenshots from a video game. Photos are original productions. They capture the environment of the map-maker. There are also photos of broadcasted photos or videos, e.g. in the corpus a photo of the television news. The two video items concern a call and a record of the sound and visual atmosphere especially targeting the road traffic. One chart is a summary dashboard of perceived sounds depending of the hour of the day. The other chart depicts the evolution over a few days of feelings, either more intensely positive or negative.

A typology of maps can be defined according to a synthetic characterization of their items: a unique cartographical display (2 maps), several cartographical displays related to different dates or themes (5), one or several cartographical displays associated with at least one other type of graphic item (5), photos only (2), a non-cartographical drawing (1).

3.2 Spatial extent and temporality

The different produced items were used to graphically depict either different parts of space (in one third of the maps), either the same spatial extent through different observation filters (in one fifth), or the same spatial extent at different dates (in half of the maps). Those items result in spatial extents and temporalities that give a characterization of the corpus maps.

The spatial extent of displayed elements depends on the map. Extents are ranging from a minimum of the dwelling boundaries to a maximum of the dwelling and outside space around, within or not the one kilometer legal limit (Figure 2).

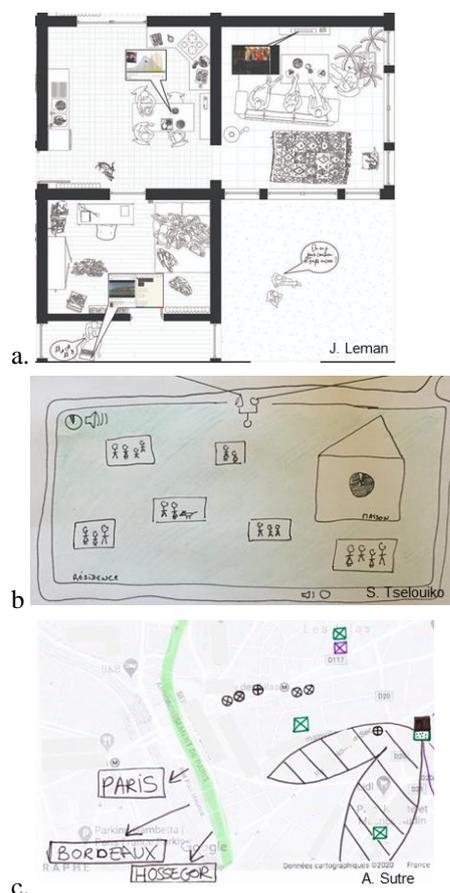


Figure 2. The main three extents displayed in the maps: a. the dwelling, b. the space in the one-kilometer limit around the dwelling and c. parts of space outside the one-kilometer limit, here designated by town names.

In third of the maps covers the only area of the map-maker's dwelling. It includes the built area and potentially an outside private area like a garden, a terrace or a balcony. The remaining two-thirds of the maps

include the space within the one-kilometer limit. The extent is either the exact limit or close to it. This invisible limit in the field is drawn in 5 maps. The extents of the maps matching either the dwelling boundaries or the neighborhood nearby are sometimes enlarged punctually. Some features of the environment were added to the maps because they were perceived from the dwelling. They are located within one kilometer: sounds coming from the neighboring homes, trees in the street, smells perceived from an open window. They are also located beyond one kilometer, for instance captured from a panoramic view. Some features were added even if not perceived *in situ* by the map-maker. They can be meaningful personal elements or public broadcasted elements. Personal elements are drawings and photos of family members and friends, symbols corresponding to towns where people related to the map-makers live, written place names of cities important to the map-maker. Public broadcasted elements are for instance drawings and photos of a television screen during a news program and images from the Internet. The space outside the one-kilometer limit is actually mentioned in 10 maps.

The temporality has been displayed in the map corpus using two main technical processes: production of diachronic items and semiology applied to a same item (distinct colors for different dates). In most maps, dates have been written, corresponding to the calendar date or referring to the beginning of lock-down (e.g. day 1, day 20, etc.; before and during lock-down). When no date has been written, running time has been illustrated with changes in the environment: daylight and nightlight, modifications in the layout of the dwelling, growing vegetation especially discernible during springtime corresponding to the containment period.

3.3 Displayed themes and semiology

The content in a map spatial extent is displayed based on pieces of information selected by the surveyee-map-maker according to its own specifications. Collection of information has been carried out in the field: observation *in situ* using the five perception senses, creation of a herbarium. It has also been based on external sources: aerial images, edited background maps. In accordance with the given protocol, map contents correspond to several themes shared between maps. They are related to places where map-makers lived during lock-down and to the pandemic context. Themes have been organized into the two following sub-sections with respect to the stability of their spatial location: spatially-stable features and spatially-ephemeral features including sensitive information. Semiology of displayed elements is described thanks to systematic map reading and characterization as well as to map keys provided in one third of the maps, explanatory texts and oral comments by the participants.

3.3.1 Spatially-stable features

In the corpus, a shared spatially-stable feature is the map-maker's dwelling. It can be considered as the central spatial landmark among the maps. It has been displayed

at different levels of detail depending on the allocated extent compared to the entire map extent. High level of detail corresponds to the display of the configuration of the dwelling and to features included inside the dwelling. Low level of detail corresponds to a punctual symbol of the dwelling, located relatively to the outside environment of the dwelling (Figure 3). Two maps do not directly display the dwelling but only refer to it indirectly through the display of its close environment. Within a same map, dwelling can be displayed at successive dates. Even if its location and configuration remained unchanged, features such as pieces of furniture and objects such as books may have been relocated in order to adapt one's private space to uses appeared or modified by the public restrictions.

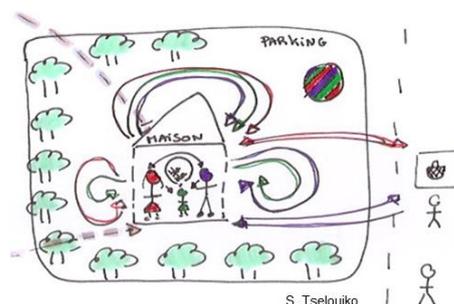


Figure 3. Extract from a map, which illustrates spatially-stable landmarks: housing displayed with a figurative symbol containing family members, surrounding vegetation, public buildings and shops.

Besides the dwelling building, the spatial environment is displayed based on common cartographic themes like other buildings and roads, and on themes which have arisen with lock-down like shops and hospitals. Added characterization was attributed related to the restrictions and the pandemic context. Shops are qualified as opened or closed. Places with a high density of people are mentioned as contagious.

Another spatially-stable thematic feature displayed among the maps is the vegetation. It concerns vegetation inside the dwelling or outside in the public space. It refers to individual plants and trees, up to large green spaces. Cartographical highlights are about the spring growth of the vegetation, reflecting the attention paid to the flow of time during the lock-down period. Highlights also concern the use of green spaces during the permitted excursions outside the dwelling: for staying outside, walking, and sport activities.

In most maps, salient features have been outlined using bright colors compared to colors allocated to secondary features. They come out upon a grey mapping background or a transparent overlay. To display land cover types, solid colors were applied in one map (brown color for built area, green for vegetation), and otherwise figurative symbols were favored (drawing of houses, of trees, of pieces of furniture).

3.3.2 Ephemeral features including sensitive information

Along with relatively spatially-stable landmarks, other mapped features can be qualified as spatially-ephemeral or shifting markers. Sensitive information (emotions, feelings, opinions, perceived by senses) is included in ephemeral information. Ephemeral information displayed in the corpus concerns face-to-face or digital social interactions, smells and sounds, for instance bird songs (Figure 4). Sounds are specific or amplified by the lock-down: applause for healthcare workers at 8 p.m. every evening, ambulance sirens. These markers are salient in the maps and can be assumed as recurrent over time, thus they are relevant for several map-makers.

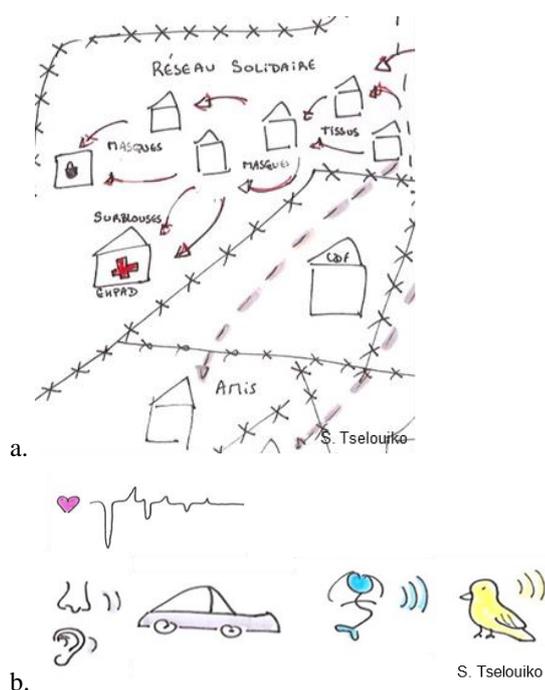


Figure 4. Two extracts from a same map, which illustrate ephemeral or shifting markers about a. social interactions (support network, friends) and b. chart of feelings during a day and information captured by the senses (smell and hearing) and their sources (cars, ambulance sirens, birds).

Conventional symbols of arrows or of dotted lines have been used for social interactions, affective relations and thoughts toward a person or a place, as well as for movements. Information about emotions, sentiments and opinions are mostly written in the maps or in the side texts. It was associated with smileys in only one map. Information collected from the five senses were mostly symbolized with evocative drawings which are punctual (the source of a sound like a bird) or linear (smell flows).

4. Sensitive mapping for lock-down

Characterizing created maps by the seminar participants led to the identification of specificities about the sensitive map approach. Designs and contents meet aspects and benefits belonging to conventional mapping: synthetic overview of a space and graphic display based on visual variables. Adaptations and distinctions from conventional

mapping were necessary to spatialize elements without normalized distance metrics and to integrate sensitive information. This section considers sensitive mapping as a method that may provide insight into the containment and possibly in similar situations of sudden changes. A summary is formulated about how the surveyees and map-makers of the experiment have taken advantage of or have set aside the opportunities of the method. Then lived and perceived space during lock-down conveyed by the maps are put into perspective with existing published studies.

4.1 Specificities of maps created from a sensitive map approach

Concerning the overall shapes of the maps, materials and component items, it appears that map-makers have taken into account the release of constraints inherent to conventional cartography proposed by the protocol. Most maps of the corpus are combinations of items, which are included into, adjacent to, overlapping or associated to each other thanks to lines and arrows. Cartographical displays are central. However they are completed with a great number of other mutually enriching items, especially photos. The diversity of materials and items gives original displays. They may correspond to personal skills, for instance sewing when providing embroidered symbols on overlays. The numerous items target several parts and aspects of the environment of the map-makers. They offer a selected though meaningful contributions to individual lived and perceived spaces.

Concerning the displayed parts of space and extents, the corpus maps are outlying the new divisions of space due to lock-down. There is the dwelling, displayed in all maps, and corresponding to the spatial extent reachable physically at any time. There is then the space reachable under conditions of distance from the dwelling and of time length. The layout of the one-kilometer limit indicates its importance for the space to be possibly travelled. Then the space which is not reachable physically is included in the map extents by punctual elements. Those elements are located related to the dwelling and to the space reachable under conditions, though with little metric and directional correspondence with their actual location in the field. Beyond one kilometer, space had become uniformly out of reach. Subjective distances were displayed. In parallel to spatial extent, time comes out as important information in the maps. Dates are mentioned and explicit changes of the map-maker's environment are illustrated. Lock-down meant a slow-down or a stop in life rhythms. Maps stand as time snapshots raising awareness of time flow.

The displayed themes are testaments to the careful observation by the map-makers of their environment, and to a new way induced by the lock-down of exploring and using space. The sensitive map approach allowed producing contents with limited pre-defined specifications. In the reachable parts of space, important features visited (public green spaces), used (furniture, objects) or perceived (sounds) by the map-makers were

selected and outlined with noticeable and evocative figurative symbols. The non-reachable space has little allocated extent in the maps but still it is put in evidence. Private and public connections remain thanks to personal emotional ties, to numerical communications and to media. Explicit information about emotions, feelings, opinions are quite scarce. Corresponded mentions are symbols with an entry in the map key and written texts within the map or in the explanatory texts aside maps. Sensitive information appears as not obvious to display cartographically since its location in the environment and so in a map may not be precise, and since expressive semiology may be easy to find.

4.2 Testimonies of lock-downs for lock-down studies

The corpus resulted from the sensitive map experiment contains a variety of displays. This variety is due to the variability in individual knowledge, capacities and sensitivity concerning the cartographical field. This variety is also the consequence and the illustration of the various individual lock-down situations, here the map-makers' situations. The number of maps in the corpus is low. However, these maps report personal experiences and they generate and enrich a general knowledge which fully integrates them. A complex situation such as the Covid-19 outbreak and resulted measures benefits from individual testimonies. This type of approach is reflected by the collections of lock-down memories set up by French public authorities⁷ and in research projects focusing on forms of individual expression like logbooks (Didier, 2021). The sensitive map approach might be a complement to statistical studies about containment that target representativeness (Gaille et al., 2020; Lambert et al., 2020; Montagni et al., 2020).

National lock-down measures were the same for everyone, but their implementation and perception at a personal geographical location and situation were different: dwelling in rural or urban environment, shared or not with other people, continuity in working or not. In rural environment, displays have corresponded to the dwelling extent and focused on its detailed description. Outdoor was accessible under conditions, though changes between pre- and post-lock-down (family reunifications, occupants spending more time together) may have resulted in fewer consequences. In urban environment, the dwelling is a central landmark in the lived and perceived space, though outdoor is also highly displayed in the maps. This may be related to an unusual behavior of careful and regular observation of the outside world by the map-makers (pedestrians, vegetation, fauna, scents). Personal implementation and perception of lock-down are also different regarding the emotions (coexistence in the maps of positive and negative emotions) and decisions (whether going out or not of the house despite the virus).

During the experiments, mapping corresponded to time breaks for observation and cartographical creation, even reinforced by the containment situation (Gangloff et al.,

2020). It allowed personal investigation and expression, in contrast with broadcasted news focused on the single thematic of Covid-19 and illustrated by quantitative maps and charts (Didier, 2021). Appropriation of space, i.e. the way to adapt a space in order to fit one's own uses (Fischer, 1978), has emerged from the maps. Maps depict changes in spatial configuration (moving pieces of furniture) and in uses (relocating a sport activity from outside to the inside dwelling) initiated by map-makers. In reverse, mapping implies formalizing, simplifying, categorizing and naming (for instance by using possessive articles to design public places, e.g. *our forest*). The action of mapping might favor an appropriation process.

5. Conclusion

The described experiment highlights the possibilities of the sensitive mapping approach. Mapping a spatial environment often means identifying spatially-stable and lasting landmarks. In conventional mapping, these landmarks aim at being shared between map-makers and map users and their display tends to be objective. In sensitive mapping, landmarks can be meaningful only for one person or a group, and their display may not be easily understandable by map-readers. Shared or personal, landmarks stand as milestones in a map, from which non-obviously located emotional, perceptive or ephemeral information can be displayed. When changes occurred, imposed by legal measures like during the first containment in France in 2020, everyone had to adapt. Adaptation could have concerned behavior, especially spatial behavior, perception or features. Mapping one's living space supports this adaptation within a globally and newly-defined spatial environment, and contributes to an appropriation process of this living space. Sensitive mapping happens to be an interesting approach to bring a more individual, subjective though more detailed point of view to statistical and large-scale studies about the Covid-19 pandemic.

6. References

- Ancion, H. (2018). Cartes sensibles et promenades exploratoires : Parcourir et cartographier pour rendre compte d'une réalité. *La Lettre des CCATM*, n° 69.
- Audas, N. (2010). Dossier Approches urbaines insolites. La dimension affective du rapport au lieu des individus : techniques d'enquêtes comparées. *Natures Sciences Sociétés*, Volume 18 (2), p. 195-201.
- Bailly, A. (1991). *Les concepts de la géographie humaine*. 1ère édition en 1984, Paris, Masson.
- Bardon, A., Guéry P., Legenne, C. and Tricaud P.-M. (2013). La carte sensible, un ancrage dans l'espace vécu. *Les Cahiers de l'IAU Île-de-France*, n° 166, p. 69-73.
- Bertin, J. (1973). *Sémiologie graphique. Les diagrammes, les réseaux, les cartes*. 1st edition in 1967, La Haye, Mouton & Gauthier-Villars.

⁷ <https://francearchives.fr/fr/actualite/224765841>

- Brando, C., Dominguès, C., Jolivet, L., Mermet, É. and Seten S. et al. (2017). Mapping experiences of personal appropriation of a new place from a diachronic perspective. Workshop Maps & emotions in ICC 2017, July 1st, 2017, Washington, USA.
- Brunet, R., Ferras, F., and Thery, H. (1992). *Les Mots de la géographie, dictionnaire critique*. Collection Dynamiques du territoire, p. 148-154.
- Casati, R. (2002). *Topology and Cognition*. McMillan Encyclopedia of Cognitive Science, McMillan.
- Dernat, S., Bronner, A.-C., Depeau, S., Dias, P., Lardon, S., et al. (2018). Représentations sociocognitives de l'espace géographique. *Cartotête, 2^{ème} Journée d'études Représentations sociocognitives de l'espace géographique*, Avril 10-11, 2017, Strasbourg, France.
- Didier, P. (2021). Les temps du confinement, de l'ordinaire et du domestique : une recherche participative sur le vif par le recueil de témoignages écrits (Récits Confinés). Journée d'étude *Les vécus du confinement, un an après*, June 25th, 2021, online.
- Dominguès, C., Jolivet, L., Mermet, É and Seten, S. (2021). An attempt to define perceptive and sensitive mapping through lived space experiments. 30th International Cartographic Conference, December 14-18, 2021, Florence, Italy (accepted).
- Fischer, G.-N. (1978). L'espace comme nouvelle lecture du travail. *Sociologie du travail*, 20^e année, n° 4, p. 397-422.
- Frémont, A. (1976). *La Région, espace vécu, Analyse régionale*. Paris, PUF.
- Gaille, M., Terral P. (scientific coord.), et al. (2020). Les sciences humaines et sociales face à la première vague de la pandémie de Covid-19 - Enjeux et formes de la recherche. CNRS, Université Toulouse III - Paul Sabatier, France.
- Gangloff, E. and Morteau, H. (2020). Le logement face à la crise sanitaire. Note d'analyse n° 3, PUCA (Plan Urbanisme Construction Architecture).
- Gieseking, J. J. (2013). Where We Go from Here: the Spatial Mental Mapping Method and Its Analytic Components for Social Science Data Gathering. *Qualitative Inquiry*, Volume 19 (9).
- Gould, P. and White R. (1984). *Cartes Mentales*, traduit de l'anglais par A. Perroud et M. Roten. Fribourg, Suisse, Éditions Universitaires de Fribourg.
- Grésillon, L. (2013). Sentir et ressentir Paris. L'exemple du quai du RER B à Châtelet-les Halles. *Noroi, Environnement, aménagement, société*, n° 227, p. 11-24.
- Griffin, A. L. and McQuoid, J. (2012). At the Intersection of Maps and Emotion: The Challenge of Spatially Representing Experience. *Thematische Kartographie*, Volume 62 (6), p. 291-299.
- Heitz, C., Marc-Zwecker, S., Mathis, R. and Le Ber, F. (2018). Étude exploratoire des représentations de coulées d'eau boueuse en Alsace : Analyse d'enquêtes psychosociales et de dessins à main levée via un logiciel dédié. *Actes du colloque SAGEO*, 14th Spatial Analysis and Geomatics conference, November 6-9, 2018, Montpellier, France.
- Lambert, A., Cayouette-Remblière, J., Guéraud, E., Bonvalet, C., Girard, V., Le Roux, G. and Langlois, L. (2020). COCONEL COronavirus et CONfinement : Enquête Longitudinale, Logement, travail, voisinage et conditions de vie : ce que le confinement a changé pour les Français. Note de synthèse n°9, vague 11, INED.
- Lynch, K. (1969). *L'image de la cité*, Paris, Dunod.
- Mazurek, H. (2013). Cartographie : vision ou reflet ? Une réflexion autour des « références indigènes ». *L'Information Géographique*, Volume 77, p. 109-148.
- Mekdjian, S. and Olmedo E. (2016). Médier les récits de vie. Expérimentations de cartographies narratives et sensibles. *Mappemonde*, n° 118.
- Merleau-Ponty, M. (1945). *Phénoménologie de la Perception*, Paris, Gallimard.
- Montagni, I., Arsandaux, J., Macalli, M., Schück, S. and Tzourio, C. (2020). Étude Confins sur la santé mentale des étudiants français lors du confinement en lien avec la COVID-19. Colloque *La santé mentale sur les campus universitaires face aux défis contemporains : de la discrimination à la COVID-19*, October 26-27, 2020, online.
- Muis, A.-S. (2016). Psychogéographie et carte des émotions, un apport à l'analyse du territoire ? *Carnets de géographes*, n° 9.
- Olmedo, E. (2015). *Cartographie sensible : tracer une géographie du vécu par la recherche-création*. PhD in Geography, dir. Jean-Marc Besse, Université Paris 1, France.
- Pichon, M. (2015). Espace vécu, perceptions, cartes mentales : l'émergence d'un intérêt pour les représentations symboliques dans la géographie française (1966-1985). *Bulletin de l'association de géographes français*, Volume 92, n° 1, p. 95-110.
- Poplin, A. (2017). Cartographies of Fuzziness: Mapping Places and Emotions. *The Cartographic Journal*, Volume 54 (4), p. 291-300.
- Rabie, J. (2017). *Ce qui fait lieu. Vers une éthique chorographique*. PhD in Land and urban planning, dir. Thierry Paquot, Université Paris-Est Marne-La-Vallée, France.
- Rekacewicz, P. (2020). Pour une cartographie critique (ou radicale) : Tentative de définition et d'approche. *Atelier Présences Cartographiques*, February 1-2, 2020.
- Roqueplo, A. (2010). La cartographie chez les artistes contemporains. *Revue du Comité Français de Cartographie*, n° 205, p. 107-118.