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Maps In/Out Of Place.
Charting alternative ways of looking and experimenting with cartography and GIS

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Abstract

Nowadays, new speculative and experimental ferments on analog and digital mapping are variously infusing both "insiders" (geographers, cartographers, urban planners, GIS scientists) and "outsiders" (Art historians and creative practitioners)' work. To properly evidence and discuss the excitement of mapping that is emerging through a wide range of visual and aesthetical contributions, it is important to contextualize and compare such unconventional practices of map-making in terms of reflexivity and transitivity of geographic knowledge production. This means respectively to distinguish different roles assumed by geographers, cartographers and GIS scientists in the interpretation and application of new theories and practices of mapping, but also to take seriously into consideration the creative mapping culture which is becoming visible outside of their discipline, for example in the artistic domain. In this report, I focus on the "reflexive" stance, by giving a personal, thus not exhaustive, overview of the creative trajectories on mapping currently explored in carto/geography. After emplacing the theory and experimentation on maps and geospatial data within the context of academic geographic production, I discuss three projects where geographers and GIS scientists are at the forefront of the concurrent rethinking of the map as a deforming and multidimensional tool for spatial analysis.

1. (Dis)Placing geography, mapping and creativity

The last decade witnessed the resurge of an intense academic debate on the affirmative rethinking of cartographic thought and practices (see Dodge et al., 2009; Rossetto, 2016). This has reached an astonishingly wide audience, far beyond the disciplinarily boundaries of geography, and besides the critical readings promoted over cartography during the anti-positivist and postmodernist seasons (Dematteis, 1985; Farinelli, 1992; Harley, 2001; Olsson, 2007). Undoubtedly, previous generations of human geographers have molded a peculiar way of looking at maps that implied an obsessive and suspicious attention to the production and the imagery of map-making. Pointedly, they decreed that the discipline of cartography and its governing tools

– maps and surveys – constituted an apparatus at the service of power, where it is possible to diagnose, case by case, the validity of the Foucauldian "power-knowledge" nexus. In the geographical imagery, map-makers have been variously unmasked as powerful authors of territorial claims (Harley, 2001), passive reactors (Harley, 1990), mere technicians, and, above all, liars (Monmonier, 1991; Poncet, 2015). Besides political implications, maps have been often blamed for their representational inadequacy due to the "geometry of silence" (Olsson, 1991a, p. 85) inherently pursued and, consequently, they have been condemned for a clear insensitiveness and indifference to the multifarious nuances, turbulence and turmoil of lived spaces. Rephrasing the caustic words of Dematteis, cartography has been foremost unveiled not as much as "the project toward a perfect world, but [as] the history of its degeneration" (my tr. 1985, p. 44)[1].

Quite recently, the degeneration began to come to terms with a new creative and regenerative stimulus that is informing the world of mapping. Map-making has started to be distanced from its authoritative, political, ideological, technicist and representational attributes, so that nondominant and emergent perspectives have been claimed to have equal dignity of being studied via different approaches, nomenclatures and intersections such as: post-representational (Del Casino and Hanna, 2006; Dodge et al., 2009; Pickles, 2004); aesthetic, artistic and creative (Hawkins, 2014; Hawkins and Straughan, 2015; Lo Presti, 2016; 2018); affective and emotional (Aitken and Craine, 2006; Kwan, 2007; Nash, 1998); literary, fictional and narrative (Caquard and Fiset, 2014; Luchetta, 2016; Papotti, 2000; Peterle, 2018; Rossetto, 2014); tactile (Rossetto, forthcoming), among many others.

The new speculative and practical ferments have been advocated by several geographers to signal divergent uses, experiments and theorizations of cartography that remained unworthy of attention in previous debates. As a result, schol-

ars are, for example, taking more seriously into consideration in their work ordinary and vernacular mapping experiences (Brown and Laurier, 2005; Gerlach, 2014; Rossetto, forthcoming; Wilmott, 2016); additionally, they are observing and participating at various grades to the mapping impulse that is structuring the work of other disciplines, mostly through a visual and aesthetic lens[2].

Opening to the outside has meant to geography the possibility to displace and revise its relationship with maps in less iconophobic and iconoclastic ways. However, if the tendency to study the micro-cartographies of the everyday against greater master narratives of geopolitics and historical cartography is certainly new, the liaisons between cartography and art do not appear to be that emergent. They have been variously underlined by geographers (Cosgrove, 2005; 2006; Jacob, 1992; Wood, 2010), cartographers (Cartwright et al., 2009; Krygier, 1995) and art historians (Alpers, 1983; Bruno, 2002; Buci-Glucksmann, 1996; Watson, 2009).

Overall, the aesthetic production of mapping looks to be often discussed differently in cartography and geography. On one hand, Rees argues that: "the first professional cartographers were pictorial artists who had engaged in the work of copying, decorating, and even compiling maps" (1980, p. 63). In this sense, he underlines the practical commitment of cartographers with the artistry of maps. Yet, the history of cartographic design is usually addressed as the transition from art to science, from the pictorial style to the geometrical rendition (Farinelli, 1992). Regarding this, Arthur Robinson considered the artistic experimentation on maps "somewhat disconcerting" (1952, p. 16). In truth, aesthetics – seen as a general theory of perception – proves to have been always an indissoluble component of the cartographic experimentation, by promoting

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[1] The original version refers to geography rather than cartography and reads: "non il progetto di un mondo perfetto, ma la storia della sua degenerazione" (Dematteis, 1985, p. 44).

[2] With the term "visual" I refer to those academic works aimed at exploring the social (and cultural) construction of vision (Jenks, 1995) and the visual construction of society (Mitchell, 1994). For the purpose of this paper, with "aesthetics" I consider a dual nuance of meaning. First, I refer to aesthetics as the art domain; second, I consider aesthetics the ability to feel and perceive, therefore it is the possibility to study both artistic and ordinary images (like maps) through several theories of perception.

cognitive and semiotic studies on mapping and geo-visualization (Montello, 2002; Robinson, 1952). In cartography, anyhow, the art discourse looks often mobilized within technical and applied discussions of map-making. In geography otherwise, art has been an inspirational and stimulating source to reflect, from new angulations, on spatial and territorial issues (see Cosgrove, 2008). Thus, geographical analyses are usually framed by a contemplative glance on the object of art rather than providing a real commitment and contribution to the alternative rendering of mapping practices. Notwithstanding this, the artistic dimension of mapmaking highlighted in earlier contributions is instrumental to the extent that it reminds geography of its historical interest in the imaginative, evocative and iconic dimension of the spatial analysis (see Mangani, 2006; Papotti, 2012). However, the established readings of geographers seem still far from achieving the goal foregrounded by the geographer Olsson, that to conceive not so much "social sciences about art, but art about social sciences" (Interview in Abrahamsson and Gren, 2012, p. 182).

Considering this, new connections between geography, mapping, art and creativity are required to prompt other and hybrid ways of reading and experimenting with maps. Thanks to the teachings coming from the world of art, today, engaging with the ecology of mapping entails a move from a distant, critical, detached and rational "eye" in favor of an immersive, sensuous and synesthetic disposition. Moreover, the deluge of mapping projects in artistic contexts, more often revised through political and programmatic outcomes (see Marston and De Leeuw, 2013), offers a precious source for a visual-oriented and nonetheless critical geographic research.

The resulting theoretical and empirical noise, triggered from the consistent contamination between geography and aesthetics, is today especially felt in the Anglo-American and French domains. It demands a provisional distinction and consequent reflection on the role of different "insiders" – geographers, cartographers and GIS scientists – in the smuggling and application of new transformative theories and practices of mapping. It nonetheless urges an elucidation of the diverse postures that geographers should

take to look at and fairly distinguish the creative mapping culture which is becoming visible outside of their discipline. However, such reflections will be discussed in a further intervention.

Put differently, we could argue that even if other academic and artistic fields are increasingly partaking of the cartographic language, this does not mean that they may also share the same intent of analysis. In fact, if aesthetics is more likely to present itself as a counter-narrative of excessive scientism, and for this reason it may result appealing for some "undisciplined" geographers, however the inner cartographic examples offered in this paper prove that the utility of maps has not to be necessarily dismissed. What is configured is a sort of "functional aesthetics" which complexifies map's ontology through methodological and visual experimentation, without nulling its operativity.

The exploration of the reflexive (geographic) and the autonomous (artistic) experimentation with mapping is thus aimed to strategically distinguish and then re-converge mapping and creativity in relation to the geographical discourse. In this view, geographers should constantly look both in the mirror and at the window, a way to say they need to confront with their own interpretations and productions of experimental cartography, that is reflexivity, as well as with those crafted and experienced by other actors of mapping – that is transitivity – when not co-produced, due to the increasing collaboration with art historians, artists, designers and activists.

Finally, the intervention solicits to open a constructive debate between critical and reflexive analyses of the map and the post-critical idea to address mapping as an open, processual, material, non-textual and creative event. Avoiding accepting the logic of representation as the unique means to analyze mapping performances, there is a crucial need for mixed or "messy" methods that may curve the map towards new horizons of research possibilities.

2. Ways of looking/ ways of experimenting

As already mentioned in the introduction, if we want to measure the appeal of experimental mapping practices in the geographic research, the first consideration to do is recognizing that geography does not present itself as a homogeneous body of work. More neatly, the deconstructive analysis of the map affirmed during the postmodern critique was concomitantly followed by massive technological transformations which have changed and accelerated cartographic techniques, by leaving geographers without the necessary expertise to participate in the cartographic production. Those aspects have materially influenced the relationships between geographers and cartographers, often leading to a separation of the two academic careers (see Boria, 2013; Pickles, 1995), and causing the emergence of "cultures of indifference" (Pickles, 1995, p. 51). Beyond real or presumed communicative arrests, we should not be surprised if, even today, geographers are more comfortable with the theorization and anamnesis of maps rather than with the creation of the same, which remains the prerogative of the technician: the cartographer.

Obviously, due to the digitalization of mapping, cartography has been almost entirely poured into the realm of GIS, involving a new category of professionals in the fields of information and communications technology (ICT) and engineering in the practical transformation of the discipline. It is also important not to neglect the fact that mapping has been incorporated into other disciplines such as urban planning, graphical statistics, transport studies, corematic geography, oceanography that offer new advancements, in terms of design capabilities, on geospatial visualizations. Curiously, such sectors often place themselves within the enchanted progressive tale of the history of cartography. Considering what it has been already argued in the introduction, it appears necessary to distinguish a "way of looking" at maps from a "way of experimenting" with maps. In other contexts, those different approaches have been defined respectively as "critical" and "empiricist" (Edney, 2007). In identifying the geographer with the critic, I am stressing the point that geographers are not usually the real designers of the mapping tool, but they take a leading role in

the configuration and interpretation of the cartographic representation. In the literature, critical cartographers are, for instance, human geographers well informed by Marxist and radical analysis. They are also trained in the reading of geographical maps and geospatial data. However, they are not necessarily inclined to use them in their work. In other words, they participate at the theorization of the cartographic knowledge without requiring to be part of the cartography and GIS' industries.

We can then understand the reasons why, very often, geographers' interests may not coincide with the methodological and technical analyses mobilized by map scientists. The same consideration goes for the issue of creativity. According to cultural, social and political geographers, artistic creativity translates more as the discovery of new ways of looking, ostensibly as the frantic search of theories, images and cases where to think through and imagine alternative cartographic stories and representations. This investigation may presume a radical intervention that geographers, but also cartographers, can attempt to reach only by contesting "the trap of socialization" (Olsson, 1991b) in which they feel to be caught in. In this respect, Olsson assumes that: "Whereas research sometimes can be creative, research training is always conservative…There is a contradiction between creativity and socialization. Just as the overriding aim of the former is the creation of the new, so the overriding aim of the latter is the preservation of the old" (1991b, p. 28).

In Olsson's mind, the geographer can become a "loving artist" only once he will break the conservative chains of the discipline, by starting a solipsistic dialogue with art. The postmodern aspiration to the purity of art is deeply understandable within what that the philosopher Rancière (2006, p. 23) defines "the aesthetic regime of the arts" which "strictly identifies art in the singular and frees it from any specific rule". Yet, the renewed encounter with humanities, visual studies, media studies and art history is leading towards a much more contingent and varied consideration of the meaning of both creativity and cartography, which demands further clarifications.

Other ways of looking

By intercepting new murmurs and ferments coming from those disciplines that traditionally study images, several geographers have restored with a different sensitivity their attention to the subject of the map (map-maker and map-user) and to the image of the map. By embracing a much more comprehensive way of looking, they embarked on a further journey of cartosphere's exploration, taking into consideration not only a representational analysis of the map – thus symbolical and discoursive – but also a genuine look at the emotional, perceptible, sensory, material, organizational and processual aspects of any mapping practice.

First, to contrast the withering of mapping interests in geography, there has been a need to rehabilitate the voice of those who were usually considered merely technicians and designers of the cartographic tool, those who would seem to overlook more critical, ethical and emotional issues of their work. This has involved some geographers into an ethnographic rediscovery of cartographers' subjectivity and activity (see Boria and Rossetto, 2017; Lo Presti, 2016). Depending on the context of their work, contemporary map-makers have been reconsidered not merely in the terms of ideology-makers but mostly as "searching souls" (Aitken and Craine, 2006). In this light, the research and design phases of the cartographer can also be interpreted as creative and positive forces (Olmedo, 2011). This alternative reading is closer to what that critical map designers tend to give of themselves. It suggests that cartographers have nowadays the chance to be represented both as aesthetes and scientists who can critically, reflexively and creatively think about their mapping activity. Those approaches also tell us that experimentation, in geography, becomes a way of looking at the practice of map-making, not uniquely at the representation of specific maps. Better, it assumes "a reflective and interpretive style of research focused on the creative processes involved in mapmaking" (Boria and Rossetto, 2017, p. 35), although there is not a peculiar aspiration to create – over than look – differently maps.

Geographers have also underlined the importance of the map user in the activation, completion, readjustment, perception of any cartographic process, thus avoiding giving an overestimating attention to the creative power of the mapmaker. As Guarrasi was already assuming in the 80's: "reading completes the map. Without reading, the event of representation cannot happen. Here, the reality is again represented and lived through an unpredictable process" (my tr. 1987, p. 290)[3].

In this perspective, the current geographic research helps also to think of several potentialities activated by the map user, depending on different contexts, affordances, moods, motivation and skills. Put differently, it comes to the fore the idea that the map, "once it has been set up, remains relatively independent from all that preceded it, and goes beyond the uses for which it was initially intended" (Casti, 2015, p. 27).

The flourishing of the geoweb and new spatial media (Crampton, 2009; Elwood and Leszczynski, 2013) has furtherly accelerated the transformation of the map reader into an active co-author of the mapping process. The prospects of completing collectively, no longer individually, the cartographic interface via mashups, volunteered geographic information (VGI) (Goodchild, 2007) and public participation geographic information systems (PPGIS) (Craig et al., 2002), avowedly provides new understandings of mapping, where different actors and objects are constantly working to build or dissolve their mutual links.

Considering this, we can admit that next to geographers' traditional analyses which interrogate maps as stable cultural objects, namely as inscriptions and material representations, emerges the idea of analysing the same maps as actions, much more unstable performances of seeing and doing, ongoing processes and, nowadays, complex networks and assemblages of actors, devices, infrastructures, software, hardware which are not even entirely mappable. Yet, in terms of creativity and artistic practice, the map, even in its current transformations, continues to be investigated as a symbolical artefact, a sign of

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[3] The original version reads: "è la lettura che la completa. Senza la lettura il momento della rappresentazione non ha successo. Qui la realtà viene di nuovo rappresentata e vissuta attraverso un procedimento imprevedibile" (Guarrasi, 1987, p. 45).

the world, and a privileged object of sight. However, if the research training remains "conservative", the risk is to linger in that "preservation of the old" condemned by Olsson (1991b).

Other ways of experimenting

The brief overview provided gives us a picture of that what geographers mean for creativity and alternativeness in map theory. However, how do map-makers approach the cartographic experimentation in which they are on the front line involved?

Usually, the design of any map is seen by the cartographer as a creative act in itself because is active and constructive (DiBiase et al., 1992, p. 213). Additionally, exploratory visualization normally defines an open-ended process where researchers try to experiment new possibilities of representing the data collected without a clear goal and without knowing the final result. This kind of experimentation would be criticized by critical geographers because it is focused on the idea of making maps persuasively work, while ignoring questions of how and why they manage to have a grip on the world. To respond to this alleged frictionless and superficial consideration of the cartographers' activity, the corner of the geospatial research known as qualitative GIS (QGIS) has manifested an interest in bridging the dispute between critical and cultural geographic debates and the science of geographic information. The critical strand of QGIS includes radical, feminist and postcolonial academics who are particularly interested in addressing, through and with maps, issues of social justice, housing, unemployment and the inclusion of unrepresented voices.

Despite the demonization of the automated cartography for its objectivist and neutral claims, QGIS scientists have instead casted as strengths the possibilities to make explicit the partial and situated position of the cartographer in the process of mapping construction, by acknowledging the opaque character of the technology. Conjointly, they restlessly wonder about how to give back the complexity of the object of their visualizations through experimental solutions.

In the realm of feminist GIS, for instance, researchers are reasonably using mapping tools in

their research, thus they are constantly asked to reflect on the limits, pitfalls, and possibilities of articulating feminist epistemologies – including issues of self-reflexivity, emotion, desire and corporeality – with the potentialities enacted by digital technology. An entourage of scholars (Kwan, 2007; Leszczynski and Elwood, 2015) has fervently discussed and experimented new modes of distorting the layered and geometrical space visualized by the GIS to accommodate the complex sensory, embodied and situated point of view demanded by a feminist spatial understanding of the world. In the recent literature, we can find works that exploit georeferenced information to highlight inequalities and differences experienced by women in daily spatial practices (seen in their intersectionality with gender, class and race, sexuality and desire). For example, in 2008, Mei Po Kwan discussed the impact of anti-Muslim rhetoric on the life of American Muslim women in Columbus (Ohio). She collected data from their oral histories, field diaries and in-depth interviews and then she georeferenced them through the GIS, by visualizing the access and use of public spaces and the risky perception of the urban environment (Kwan, 2008). There is a panoply of projects that today concerns closely the politics and ethics of representation with the aim to bring out a new critical and aesthetic vision of the spatial analysis. Indeed, as Hawkins and Straughan claim: "attending to aesthetics is not to ignore issues of politics and ethics, but rather we can recognize aesthetics as a force through which issues of capitalism, neoliberal agendas, inequality, and exclusion have been brought to fore" (2015, p. 25).

Overall, many expectations have been poured into the GIS by different scientists because the GIS database can include information drawn from many different maps and can also present different representations of the same information (Goodchild, 1995). Moreover, as those same projects show, digital maps can now be integrated by images, photographs, field notes, interviews, narratives, video records and audio, usually linked to georeferenced data. In addition, GIS science is constantly offering new tools to embellish and complexify maps such as new layers, aesthetically pleasant distortions and three-dimensional visualizations.

Methodologically, new data can be collected

using mental and sketch maps, namely cartographic representations of individual or group spatial experiences intended "to capture personal expression of spatial reality" (Boschmann and Cummon, 2014, p. 242). The integration of GIS with methods excerpted from ethnography and psychology has also prompted new discussions on the real possibilities of the system to encode qualitative information such as symbolic and ethnocultural meanings. The problem is that those cultural phenomena are often approached in terms of data exclusion and data scale incompatibility (see Bagheri, 2014). However, the recognition of the peculiar ontology of the GIS (as that of the map) in the terms of a hybrid visualization which merges numbers, images, text and textures, should allow us to realize that even if qualitative GIS attempts "collecting unique spatial data of individual experiences, visualizing sociospatial processes, breaking down particular barriers of positionality in research, and developing new uses of GIS" (Boschmann and Cubbon, 2014, p. 237), the new methods proposed and the resulting outputs cannot be claimed as entirely humanistic, neither totally objectivist. To this end, new concepts and theorizations are needed to overcome this dialectic. A new dialogue between a cultural and qualitative geography and a mathematical-methodological approach has converged for example in the spread of the so-called "digital spatial humanities" (Drucker, 2012), namely traditional humanistic disciplines that seek to re-think and re-read cultural and spatial representations through the support of media computation. One of the first examples can be considered the work of Bodenhamer, *Deep Maps and Spatial Narratives* (2010). The author, aware of the different conception of humanistic space in respect to the Euclidean view incorporated by the GIS, has proposed the notion of deep mapping[4] by changing the terms of the dispute. He refers to a deep map as "a detailed multimedia depiction of a place and all that exists within it. It is not strictly tangible; it also includes emotion and meaning. A deep map is both a process and a product – a creative space that is visual, open, multi-layered, and ever changing. Where traditional maps serve as statements, deep maps serve as conversations" (2010, p. 2).

We can affirm that, even among those who practice and produce geo-visualizations, the idea of thinking and acting alternatively and creatively on the cartographic tools looks strong and alive. However, especially in the field of digital humanities, the ongoing experimentations do not seem still to affect the scepticism of cultural geographers (see Rossetto, 2014). Moreover, map designers cannot certainly avoid issues related to what, why, how to represent in their maps. The range of questions that a geographer should pose to unfold mapping practices as processes, questions and methods aimed expressly to capture the vibrant life and dynamism of such performances rather than revealing the inner meaning of their representations, can differ from those that cartographers need to ask themselves.

The socio-cultural and graphic life of maps can be perhaps more easily connected when the way of looking is overlapped with the way of experimenting with maps. The best contributions to the transformation of mapping may apparently come from those scholars who put in dialogue, both in theory and in practice, the geographical and cartographic dimension of the research, that is qualitative and quantitative, critical and empiricist, imaginative and informational. For this purpose, the following paragraphs illustrate three projects where the fruitful convergence between geographic and cartographic training is practiced through creative experimentations. The synergic work helps to overcome the conservative aspect of the geographical map, whether digital or nondigital, and in the process, further methods of participation, visualization, investigation and creation are exalted. The projects presented in the next sections will demand geographers also to focus on the practical, material, distorting, tactile dimensions of hand-drawn, textile, digital and 3D printed maps. I will present such trajectories by following the movements of warping, sewing and touching rather than holding on fixed points.

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[4] Altough the concept of deep map was first introduced by William Least Heat-Moon in the novel *Prairy Erth (a Deep Map)* in 1991.

3. Warping

Within the new critical experimentation inaugurated under the aegis of qualitative GIS, the use of cartograms has spread. A cartogram is a map produced using a technique where the mapped polygons are stretched or shrunk based on the magnitude of the variable being mapped. The distorted area can make strange and disorienting maps, which can intuitively illustrate the perception of spatial events and phenomena of specific groups and categories. For example, the geographer Picone and the urban planner Lo Piccolo (2014) have recently relied on cartograms to represent the residents' perception of their own neighbourhoods in the city of Palermo. They have collected more than hundred hand-drawn mental maps from students aged between 8 and 16 that they then combined and redrew with the help of graphic designers into collective geo-visualizations of specific urban areas.

In order to "subjectivize" the GIS and to make it intuitively represent the individual spatial perceptions of the users, scholars decided to georeference the point of interest highlighted in the mental maps (Figure 1). After this, they created a spatial distortion by using the "warp" command of ArcGIS (Figure 2). As Picone argues, the aim was not "to insert a qualitative layer in the GIS, but to deform, through a technique called warping process, the traditional GIS representation, that is to show directly on the digital map the perception – deformed, in fact, with respect to the classical spatial logic – that the inhabitants have of their neighbourhood" (my tr. 2017, p. 127).

Beside the critical position taken by the two authors on the most appropriate way of representing, through the cartographic interface, qualitative data on space (Picone and Lo Piccolo, 2014), the project is interesting because it indirectly suggests geographers to recognize the GIS as a process, the product of a spatial practice that, if participatory, necessarily emerges through qualitative and creative methodologies.
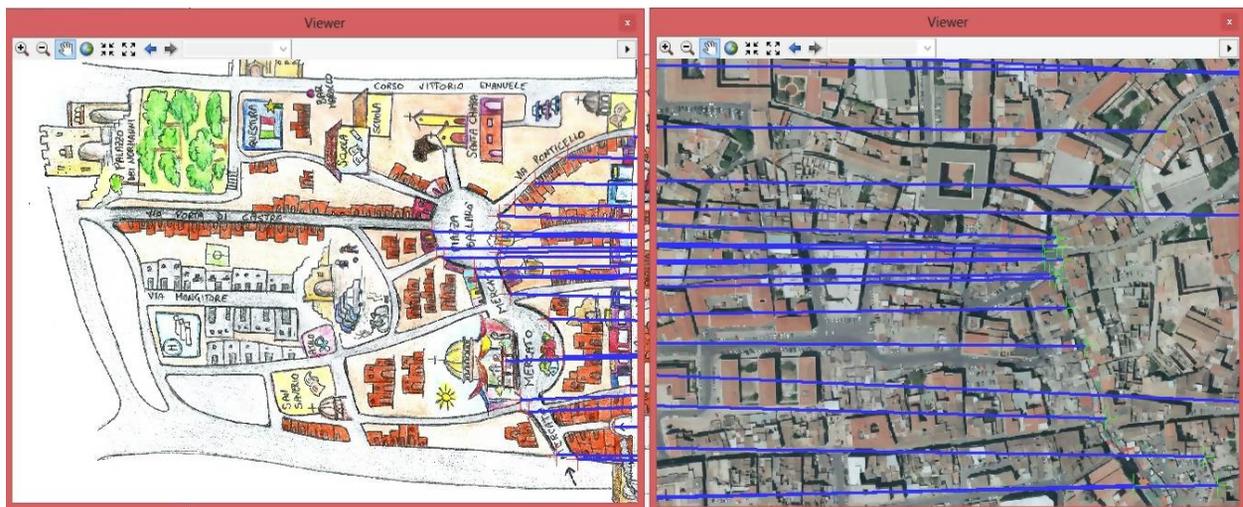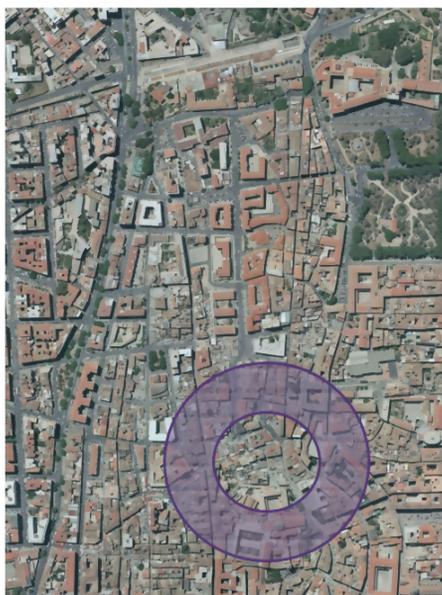

Figure 1. Sketch map georeferenced into the GIS. Source: Slide from the PowerPoint "Mapping Neighbourhoods", presented at the conference "Tracce Urbane", Venice, June 18-20, 2014. Courtesy of Marco Picone.

Aerial Map   Deformed Map

Figure 2. The aerial map deformed by inner perceptions of the inhabitants. Source: Slide from the PowerPoint "Mapping Neighbourhoods" presented at the conference "Tracce Urbane", Venice, June 18-20, 2014. Courtesy of Marco Picone.

4.   Sewing

The rethinking of cartographic practices passes also through "experimental geographies" (Last, 2012) which engage directly geographers in the guise of artists. Those scholars manifest a multisensorial disposition in the dialogue with the cartographic matter, by re-processing and adapting the suggestions arising from artistic methodologies for the purposes of their research.

In 2010, Élise Olmedo, at the time Ph.D. student at the Université Paris-1 Panthéon Sorbonne, conducted a "geo-cartographic" study in Marrakesh, in the district of Sidi Youssef Ben Ali, to make visible the female perception of both intimate and public spaces.

Considering the traditional cognitive cartography too reductive for her research purpose, perhaps understandable if we acknowledge the "mechanistic, reductionistic and uncritical characteristics of cognitive cartographic approaches" (Rossetto, 2014, p. 521), Olmedo theoretically and visually elaborated a sensitive map that allowed, through artistic experimentation and the use of mixed methods, an anchorage to the lived space (Olmedo, 2011, online). To elaborate this

map, she first proceeded with a geographical survey of the area, consisting of distant observation. Then she conducted an ethnographic fieldwork with a group of female dwellers.

The collected data were transferred and consequently transformed into a textile artefact. The combination of the textile adjective with the map object may seem tautological given that the term "map" comes from the Latin "mappa" to properly indicate a piece of cloth. In her invention, the geographer simply rediscovers an original quality of the cartographic means. The map created may be perceived as a beautiful gadget, but it requires specific accuracy and skills as that claimed by professional cartographers and GISers. Through an online video (Figure 3), Olmedo creatively illustrates the distinct phases and expertise that led to this production. In the case of Naima, one of the interviewees, the resulting map consists of two poles, one representing the workplace, the other figuring the domestic space.

Locations and their sizes are distributed in relation to the degree of importance and affection felt by the woman. This is, again, a mental map

but, this time, tangible and thick, on which the author tries to assign and attach feelings into places through a negotiated and participated symbology elaborated with the interviewee. In this nuance, the tactile map does not only serve to transmit information, but is evocative and emotional, it can arouse sensations and discussions on the part of those who have crafted and consumed its texture with several senses. Additionally, "la carte sensible" (Olmedo, 2011, online) is perceived by the author as an alternative mode of mapping, opposed to the authoritative mapping, that is the standard and controlled data-gathering for decision-making.

This project also tells us that cultural geographers are reviving the "use" of maps if maps are rethought and integrated by other tools: photographs, textiles, texts, materials and audio-video recordings that try to compensate for the narrative limitations of the conventional geographical map. Importantly, her work highlights the idea to factually and sensory engage with the map, by avoiding treating it as a dematerialized image. In doing so, geographers may also begin to see both map-makers and map-users not only as "visual" readers but also as touchers of immersive surfaces (see Rossetto, forthcoming).

Figure 3. Naima's map (Olmedo, 2011), still from video. Source: https://vimeo.com/28730700.

5. Touching

The non-verbal and tactile communication of maps has been recently discussed and experimented even at the interface of digital and analog mapping. In the first project discussed (Picone and Lo Piccolo, 2014), we have seen how spatial data can be digitally warped to re-

store the analogic experience of the "sense" of place. However, the capabilities offered by the use of 3D printing technology, when combined to artistic and critical thinking, can also make the virtual spatial analysis highly material, thus not merely simulated through a screen. This is evident in a series of installations designed by the geographer Heidkamp and the Art Historian Slomba from the Southern Connecticut State University. Here, the convergence between geography and art has brought to fore a project called "GeoSpatial Sculpure" (Heidkamp and Slomba, 2017), where sculptural artworks convey accurate geospatial data.

Concretely, the two researchers have explored uneven economic development in Connecticut by considering several indicators and the different ways they might be visualized three-dimensionally. This led, for instance, to create an installation in which to represent the rate of unemployment in rural and urban areas (Figure 4). The modelled figures innovatively illustrate the actual number of unemployed respectively in Hartford, the capital city (on the left) and in the rural town of Scotland (on the right). The map of the two cities is engraved on plywood and shows two areas of almost identical size but with an extremely different unemployment rate, 15.8 (7,961 individuals) against 4.3 (42 ordered, thus manageable, individuals). The dots that we usually see represented in maps become now human figures that intuitively reveal the thematic content of the installation. The goal of the two authors is to expressly involve a wider audience in the analysis and discussion of spatial data. The search for a public engagement needs a place where to exhibit such works and a clear invitation to touch and sensory explore such data. In this respect, participation is an integral part of their second project. The spectator can engage with red monoliths (Figure 5), which represent the employment rate of all Connecticut. Where the unemployment rate is higher, towns are sinking.

This difference can be touched by hand rather than be merely observed. As the authors furtherly explain: "Because the smaller sculptures are portable, and easily hand held, there is a participatory and interactive nature to engaging with the data. As the objects are passed from one participant to another, each locating his or her indi-

vidual town or data interest, discussion of the form and meaning of the objects becomes a natural extension of the work" (Heidkamp and Slomba, 2017, p. 11).

Holding in hand means to recognize the haptic dimension of such maps. The haptic is a term coined by Alois Reigl and it is often used in the visual scholarship (Bruno, 2002) to theoretically appreciate not only the optical but even the tactile affordances of images. Hapticity also implies a sense of reciprocity because it allows people "to get in touch" one to another through the surface of things, as the authors here promote with their cubic maps.

Figure 4. Rural vs Urban Unemployment Rate in CT (2013). Plywood, Printed PLA Filament & Architectural Figures & 2013 CT Department of Labor Data. Courtesy of Patrick Heidkamp and Jeffrey Slomba.
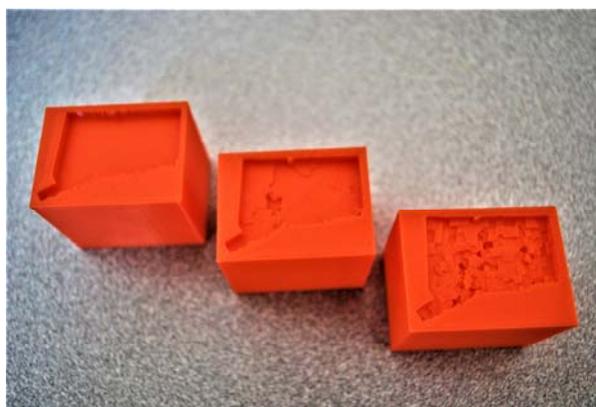

Figure 5. Unemployment in CT-Spatial Data Aggregation: State, Labor Market Area, Town (2013); Printed PLA Filament and 2013 CT Department of Labor Data. Courtesy of Patrick Heidkamp and Jeffrey Slomba.

6. Conclusions

In 1991, the geographer Gunnar Olsson introduced his famous essay on "Invisible Maps" with the following statement: "In this paper I report on a visit to the Land of Thought-and-Action. The journey begins at the Gate of Geometry and ends at the Gate of Geography. In between, we pass through unknown territory, guided by maps of the invisible and a compass of the taken-for-granted" (1991a, p. 85).

In this brief report, inspired in several passages by the words of the famous Swedish geographer, I tried to explore the reversed path. The journey began at the Gate of Geography, as a way of looking, and then ended at the Gate of Geometry (alias Cartography and GIS), as a way of experimenting. In between, we passed through unknown territory, that of aesthetics and creativity, where dialectics and boundaries across disciplines thin, and geographers accept to be guided by tangible, distorted, coloured, drawn, sewn and sculptured maps.

Despite cartography, mapping and GIS tend to be often demonized and delegitimized by radical and critical geographers as "the evil side" of geography, especially in the wake of anti-positivist and deconstructionist gestures; or they are uniquely approached in the terms of an historically constructed disciplinary and scientific field with its own methodological apparatus and legacy, I tried to argue that a renewed and divergent interest in mapping can bring new conceptions and attitudes besides the understanding of the map as a technological means of power.

Maps can be also addressed as human (even academic) performances of seeing, sensing, touching and acting in/through/with space. In this perspective, we may argue that the mentioned projects place themselves in the direction aspired by Cartwright, who invoked geovisualization to absorb "new forms of multisensory and multimedia communication" (2004, p. 32). In doing so, they also reveal how much maps have still to murmur and affirm, when massively appear in their comings and goings through countless spaces of displays and through different materials and skins.

The interwoven of alternative ways of looking and potentially transformative ways of doing

maps could suggest reliving the interest in mapping by elaborating, rather than an un-affected, tedious and technical cartographic epistemology and methodology, a fresh twisted and chaotic strategy to explore the universe of contemporary mapping practices. To this end, the reflexive heuristic approach proposed by Casti, "capable of holding together the outcomes of cartographer and geographic theories, the artistic hybridizations envisaged by historical cartography and the possibilities offered by digital technologies" (2015, p. XIV), looks important and compelling. However, it still lacks a considerable effort to deeply understand and seriously engage with the inventive propulsion envisaged by "contemporary" art theories and methodologies, in addition to modern and historical work. Only at that point, geographers and cartographers could avowedly affirm to have achieved a new disruptive sense of art "about" social sciences.

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