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MAPPING THE URBAN EXPERIENCE DIGITALLY

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Introduction

Think of a city you have recently visited or currently live in and what comes to mind? Most likely you think of snapshots of experiences that come and go. For example, a mix of old and young men laughing, joking and slamming domino stones loudly on concrete tables in Berkley Square, New York; a Sunday morning, walking leisurely through the narrow passage ways of the Gothic Quarter in Barcelona and admiring the play of sun and shadows on balconies above you; the views from London's Millennium Bridge towards St Paul's while trying to avoid bumping into the chatting tourists walking to the Tate Modern. Cities are lived places that we experience and make sense of through our sensing bodies. We see the physical shapes and colours of the architecture surrounding us; we can feel the change in temperature as we cross the road from a sunny spot to the shade; we can hear the voices of people and traffic around us as our bodies brush past the crowds; and we can smell and taste a latte on our lips.

The senses situate us geographically and help us to emotionally map our surroundings as they mediate our contact with the world (Rodaway 1994). It is important to highlight here that sensing cannot be reduced to a biological feature alone. As we interpret our sensory

perceptions these interpretations reflect and are shaped by the social values of particular cultures or times. Thus, the moral judgments we link to particular sensory experiences are not subjective but tend to reflect broader social hierarchies and ideologies of the culture we are living in. For example, in the 21st century Western city, characterised by odourless and sanitized public spaces, the smell of manure would be a startling sensation evoking disgust. Yet, most medieval cities would have smelt of manure, reflecting their agricultural industries, modes of transportation and lack of sanitation, but their inhabitants would have been more oblivious to it.

As urban researchers, paying attention to sensory experiences in cities has been important for our work for two reasons. Firstly, it allows us to understand how people relate to places as embodied and emotional subjects and to examine the relationship between material surroundings, feelings and diverse senses of attachment or detachment. Secondly, it permits us to analyse how different urban professions (including urban planners, designers, architects and urban marketers) control, elicit or frame particular urban sensations and thus create particular experiential landscapes in the public spaces of our cities. Consequently, "[a] focus on the senses in the city allows us to analyse the experience of a city as a political domain that links the personal lives of its diverse users with broader structural changes in the city's politics and economy" (Degen 2014: 93). We must also be aware that planned uses, sensations and meanings are not set in stone, but constantly transform and change through the spatial practices of the users in the city, many of which cannot be anticipated beforehand. It is this fleeting character of urban life which, methodologically speaking, is difficult to capture using more traditional methods such as interviews.

Over the years, we have been involved in a range of research projects, studying cities as different as Barcelona or Milton Keynes, London, Cologne or Qatar to mention a few, from a diversity of perspectives. A common thread for Monica, a cultural sociologist, has been to understand what makes the unique feel or atmosphere of each city. And, more importantly, how can we actually capture and represent the rhythms, intensities and the feel of cities? On the other hand, the aim for Manuela as a digital designer collaborating on these projects has been to communicate research processes and results to a diversity of audiences, with the goal of digitally transmitting the reasons why a focus on sensory and temporal experiences matters to urban redevelopment. A range of methods to study cities are discussed in other chapters of this book, such as diaries (Chapter 8, this volume); ethnographies (Chapter 5, this volume); interviews (Chapter 4, this volume) or photography and video (Chapter 10, this volume), yet none explicitly focuses on how to capture and research the fluctuating, lived sensory experiences of place. Indeed, in the social sciences there is much work on developing theoretical insights about how individuals experience urban environments, while less focus has been given to methodological inquiries (but see Pink 2009).

In this chapter, we start by discussing the benefits of digital mapping as opposed to analogue maps. We then set out how we used digital mapping and visualizations as a way to challenge traditional representations of the city. We thereby demonstrate how digital mapping practices can help with an understanding and analysis of urban landscapes as a multiplicity of overlapping experiences and meanings.

Digital mapping

Before we answer the question of how we developed our digital mapping to capture the fluctuating sensescapes of a city or neighbourhood, we need to first clarify the concept of digital mapping. Let's briefly examine what maps are and do. Analogue maps tend to be fixed visualizations, often printed on paper, where the meaning is pre-set and abstract, giving "an aura of seemingly objective and static spatial representation that all too often served particular ideological needs" (Lammes 2017). Early examples of sociological mapping based their outcomes and presentations on statistical data to draw out 'laws of society', as seen in Florence Nightingales polar area diagrams (1858), or to visualise areas of concern such as Charles Booth's (1894-99) poverty maps (https://booth.lse.ac.uk/map/14/-0.1174/51.5064/100/0). Cartography has a long history of mapping physical environments and presenting their specific characteristics to the viewer as facts, rendering maps as "very powerful forms of data visualisation" that allows the viewer to visualise networks and to connect data points to their physical contexts of gestation (Grant 2019:163).

However, since the 1970s, critical human geographers have shown how maps are social constructions and need to be critically examined as practices and relations of power and knowledge (Harley 1988). Hence, as Harley points out "Deconstruction urges us to read between the lines of a map – 'in the margins of the text' – and through its tropes to discover the silences and contradictions that challenge the apparent honesty of the image" (Harley 1989: 3 quoted in Crampton 2001: 241). One of the implications of such a critique of maps is the need to produce maps that allow for multiple perspectives, for example by producing multiple maps and interactivity between user and maps. Furthermore, it is important to be transparent about the process of creation, meaning we need to explicitly acknowledge the tools used to gather data in the research process itself which often tends to recede into the background of visualisations.

While both digital and analogue maps can be understood as cartographical interfaces, or points of contact "which are consulted and through which spatial relations are understood and produced", digital maps no longer entail or promote static representations. Instead they "foreground the multi-dimensional and flexible character of the cartographical interface" (Lammes 2017: 1021) and thus foster new forms of sensory-spatial engagement. Digital mapping refers to a form of data visualisation adopting computational and visualisation tools which use maps, graphics and images to make visible spatial patterns and relationships in the data. Particular to digital maps is that their interfaces "have agency in how meaning is produced…[and] entice us to produce the landscape we engage with in particular ways as they invite us to make specific translations that call both the landscape and the map into being" (Lammes 2017: 1023). As opposed to analogue maps, digital maps invite more diverse, and possibly more engaged, sensory interactions as we can hover over, click and select objects, re-play and stop media objects or add and hide information layers.

The idea of analysing data and its visualisation continues to form an integral part of what is loosely summarised under the term digital humanities and the big data movement of the 21st century (see for instance Berry 2012; Hayles 2012; Chapter 11, this volume). The increased use of computational tools and the development and employment of data-generating applications that dominate every aspect of life within Western societies creates endless streams of user-generated data in the form of texts, images and videos containing strings of additional meta-data (such as time and location) that could be incorporated into digital maps. This incorporation of user-generated data brings into question the cartographer-user dichotomy. The resulting debates about privacy and data ownership as a result of the possibilities of big data creation and subsequent mining for business and/or research are

mentioned here only briefly to remind the reader of their ethical responsibilities as researchers (e.g. Lyon 2003 and Cheney-Lippold 2017). Our concern in the remainder of this chapter is to draw attention to digital visualisations as a research method that lends itself to understanding and evoking the experiential dimensions of urban contexts, and to translating and disseminating research findings.

Mapping the senses digitally

Manuela and Monica first collaborated on a project with Gillian Rose that explored how people experienced designed urban spaces in Bedford and Milton Keynes, funded by the Economic and Social Research Council of the United Kingdom (Rose et al 2010; Degen and Rose 2012). Rose et al reflected on how the website designed by Manuela which drew on our data was aimed at achieving three goals: "to evoke a sense of the complexity of urban spatialities; to invite site visitors to engage actively and performatively with the research materials; and to emphasize the sensory qualities of the environment" (2009: 2099). While the website, containing interactive 2D and 3D maps, served as a container to capture and reflect on our findings about the fleeting sensory experiences in British highstreets and to highlight the complexity of human practices in urban spaces, it was not conceived of as a *tool* to think through sensory methodologies or to *evoke* the multiplicity of urban experiences. Since then, in subsequent collaborations , we have worked towards these additional goals, which we will now discuss (see www.sensorycities.com www.sensorysmithfield.com).

Developing a sensory think-kit

In 2015 Monica received funding to create the Sensory Cities Network over two years which allowed her to bring together a range of academics from different disciplinary backgrounds such as geography, history, museum studies and sociology along with urban professionals such as city museum curators, urban planners, urban marketers and community activists from three European cities to explore existing and new methods to represent, curate and research the sensory and emotional realm of the city. Despite the 'sensual revolution' (Howes 2005: 1) in the humanities and social sciences there has been a lack of explicit interdisciplinary and cross-professional exchange on methods to analyse the senses. Over two years, three workshops where held in London, Cologne and Barcelona, hosted by their respective city museums. These workshops involved a more formal day of presentations, then followed by a research day in which participants trialled a range of methodologies that had emerged from these discussions and participants' particular interests, to attempt to grasp the fluctuating sensorial character of a particular street. Our broader aim was to create an experimental space to exchange and develop ideas. Alongside these workshops we developed a digital research tool that we described as a sensory think-kit, which offered methodological approximations, highlighting the explorative and experimental nature of these methods.

During the active research days in the neighbourhoods of Whitechapel in London, Eigelstein in Cologne and el Raval in Barcelona - chosen because of their similar features of being in the historical part of town, being redeveloped and attracting migrants and tourists alike - teams of academics and urban professionals conceived of methodologies to capture the ways in which the senses structure and are structured by the interaction of perceptual bodies and material environments producing particular sensescapes. Each neighbourhood and city produced its own sensory and temporal constellations informed by its history, current urban challenges and key debates that emerged in our discussions. An initial finding we chose to

represent through our digital sensory think-kit was that sensing is not merely a biological process, but that our sensing is mediated through cultural frameworks. Working in cross-professional groups on urban environments quickly revealed that professional training shapes the way questions are posed, results are observed and what type of information is needed to qualify the experiences of the sensory landscape. Hence, on our website we divided our methodological approximations not just into the particular neighbourhoods and cities where they were developed but moreover divided methodologies into the needs of particular professions such as academics, museum curators, sensory educators, urban planners and professionals.

Each city displayed its own sensory emphasis and therefore required differing methodologies, inviting researchers to reflect on the role and range of cultural transferability of sensory theoretical and practical frameworks, and mutual emulations. London started with the theme of urban development and planning, and how the senses can be researched from an interdisciplinary perspective. Four methodologies were developed and digitally mapped by Manuela on the website, creating an interactive visualization of these methodologies:

a) *Social Media and the making of place*: The first methodology examined the ways in which people use Instagram/Twitter to represent themselves in and in front of buildings. The main questions were: How does technology shape sensory expressions, for example through the use of filters? What kind of sensory atmosphere is displayed through social media? How are emotional connections to places and human activities/roles represented through people's photographs? The approach provides a visual-emotional account of a site through social media. As Instagram aims at capturing everyday experiences and emotions, the analysis indicates what senses are

subjectively judged as important in a place and how comfortable people feel in a certain place (Figure 12.1).

Figure 12.1

b) *Standing and sketching*: The second method consisted of standing still for 30 minutes and trying out a range of analogue methods by just using paper and pen. Some sketched what they could see and made movement notations while another person drew a list of her immediate sensory impressions. Questions emerged on how to include movement, temporal relations and the senses in the sketch. So, additionally a list of the senses experienced standing still in one place was produced and a list of the snippets of conversations heard was listed to gather the social meanings of a place. This method tried to get closer to the fluid nature of urban sensing and capture some of the evasive and temporal aspects of urban life.

c) *Mapping the senses:* This relied on observational methods. Three maps of Whitechapel Road were produced. The first one mapped the senses of the observer on the street: What smellscapes can be identified? What can be seen? What do the touchscapes consist of? What can be heard? This was complemented by a map with subjective experiences from people interviewed: What are their feelings about the space? Do they experience a hostile, friendly, or oppressive environment? The third step was to create a 'relationship map' by asking users of spaces: why do you experience this space as hostile, friendly or oppressive? The aim of this method was to create 'places of translation' by bringing together the observational maps of the researcher with the experiences of interviewees using this space.

d) *Observation and evocative interviews*: This method consciously reflected the interdisciplinarity of sensory research by having each researcher observe the same place for 30 minutes by walking around the space. Researchers then met to compare their observations. The disciplinary training informed very different observations of the same place revealing how our disciplinary training shapes how we sense. The researchers' observations then fed into shaping an interview schedule to interview users of the space to evoke the feel of the area (Figure 12.2)..

Figure 12. 2

Our London map online represents an overview of the research methods used by the various disciplines. It demonstrates the various viewpoints of researchers and their different sensorial emphasis, distinctly framed through their professional training, when approaching a research project. It provides the viewer with different perspectives, through layered mapping, of how interdisciplinarity offers a multiplicity of approaches to urban experiences.

In Cologne, the themes and discussions from London were developed to understand how particular senses frame the perception of places differently, while simultaneously uniting to form a cohesive identity. Here Manuela developed an interactive map reflecting the city of vision, touch, smell, sound and taste. Each sense was researched through multiple methods which Manuela layered digitally. Images, writing, sounds, arrows and connections allow us to see the multiplicity of sensory perceptions which produce particular experiences and feels of place. For the purpose of this chapter we foreground the digital map exploring sound. The methodological approximations developed for the city of sound are represented digitally to confer the temporal and rhythmical nature of sounds. Cities have rhythms and sounds

change over 24 hours as well as with the seasons. Sound sources mix and create their own symphonies. In winter, inside and outside sounds are separated while in summer open doors and windows encourage blending. Although sound levels can be measured and assessed – sound perception is subjective. The team looked at a particular part of the street first and recorded different sound sources to present a soundtrack of that spot. It became evident that whilst some sources provided more constant streams (such as ventilation, distant traffic, an accordion player), others were fading in and out (such as trains, cars, people passing by), or created sound events (such as a bell on a bicycle, a burst of laughter). The sound recorders picked up everything in range, as opposed to humans who tend to filter out, concentrate on particular sounds, or react to sudden event sounds. Recording provided researchers with references - copies of specific sensory information - yet removed them from their physical context. When sensory information is moved out of space and time vital contextual sensory information is lost which has to be recreated in digital mapping. Therefore, the team took images of sound sources as additional sound references to present later. The digital map offers layers of information that the user can engage with and which highlight the multiple rhythms identified (Figure 12.3).

Figure 12. 3

Lastly, in Barcelona the methodological focus was on how to research, curate and represent the power structures and resistances which are produced through sensory and temporal experiences in urban environments. Again, we divided participants into groups with the task of engaging different audiences in the research process. The guiding question was: How are power relations shaped sensorially on a street? While the London fieldwork focused on multi-modal sensing and the Cologne fieldwork developed attention to the sensory regimes created by each sense, the aim of the Barcelona workshop was to think about how to make

the importance of sensory experiences tangible for diverse audiences and how to represent the findings in a meaningful way.

Five distinct audiences were identified: children, tourists, locals, museum curators and policy makers. Each audience required different types of sensory information and data which framed the data collection methods. For example, in one group we asked 13-16 year old teenagers to map the way in which their sensory experiencing framed their attachments or detachments to place, therefore the research methodology needed to be designed on their terms. The main question was how were the 13-16 year olds to collect the data and how structured should the project's task be. For example:

a) more unstructured / observing task: give them a camera /recorder and ask them to move around capturing whatever interests them personally. The data comes from their current physical use of the space and their movement through it;

b) more structured / game playing task: offer them an imaginary scenario, for example, a global fashion brand wants to create a new perfume based on the 'authentic' smells and feel of el Raval. The task is to analyse the smells and pitch the results to the client. The data comes from their interpretations on what the smells of the space mean to them;

c) more structured / analytical task: asking them to analyse and mark pleasant and unpleasant sensory experiences of spaces using different coloured chalk – for example circling areas of particular smells or identifying obstacles in the designed environment (Figure 12.4).

Figure 12. 4

Manuela was then in charge of translating the methods developed for the different audiences into a digital interactive map. The first task was to localise research results within maps and connect the various drawings, images and sound samples with representations of physical space to allow for better viewer immersion. Secondly, Manuela had to find appropriate ways of layering and juxtaposing information to highlight how different groups experienced power relations, or could learn to understand power relations through the exploration of the map. For instance, the representation for locals included the juxtaposing of the very different experiences of a tourist and a local. The map for policy makers on the other hand highlighted the various spatial features and human activities enabled or prohibited within the space, while also explaining the research method in more detail (Figure 12.5) .

Figure 12. 5

Mapping the Feel of Place

For this research, we produced a series of evocative maps which placed a great emphasis on the lived experiences of respondents within a specific urban environment to map the feel of place (www.sensorysmithfield.com). In contrast to the projects mentioned above, we did not represent our methodology or the direct physical space but aimed to evoke and translate contextual qualitative data in the form of sensory spatial experiences of specific social groups, including their individual and shared memories. The maps were also conceived of as visual aids that highlight the importance of sensory and temporal experiences in framing the identity of places to render it more accessible and comprehensible to a wider audience. The maps were disseminated as webpages (written in html) for greater audience reach and

contained interactive and animated graphical elements (using JavaScript) to superimpose data layers (toggle on/off) and thereby highlight distinct characteristics of the research data.

There are specific challenges in visualising sensory data. First of all, capturing the fleeting nature of senses and their occurrence in specific moments in time, such as seasonally or at different times of day. Furthermore, the subjective, interconnected and holistic nature of sensing itself, including cultural and social dimensions, or multiple senses working together, needs to be taken into consideration. A second challenge lies in translating specific sensory data from a physical to a digital space as "the interface changes what and how we see, how we experience and interact with reality and how this reality is reconfigured through the computer" (Pold 2005: np in Lammes 2017:1022). Whilst auditory and visual data can be easily captured and played back in their "original" form (ignoring the specific settings and characteristics of recording tools here), smells require translation into a textual or visual form to be able to be represented and explored in the digital realm. Thirdly, sensory data is removed from its context through the recording process and a simple playback does not offer a holistic re-experience. The fourth challenge consists of the researcher and visualiser often not being the same person, meaning that the visualiser is not necessarily embedded in the research process and data creation. Therefore, a further translation process happens between the research team and the visualiser. The research team needs to communicate clearly what it aims to represent through the digital mapping while the visualiser tries to recreate complex experiential and temporal patterns. The fifth challenge is anticipating the needs of the users or viewers of a visualisation, including their cultural and social backgrounds, but also their ability to use interactive devices and media. To respond to the various challenges, we decided to use a cartographic approach linked to a series of interactive digital maps to provide contextual awareness.

The first map (Figure 12.6) concentrated on visualising the historical development of the urban form. This was done by superimposing various historical maps which blend from one to the other as the map is played in a linear fashion. It highlights a constantly evolving network of infrastructures, such as streets and other means of transportation, and marks the emergence of relevant historical landmarks while simultaneously displaying the disappearances of other features such as the river Fleet or a nearby prison, at very specific moments in time. All of these form part of a collective spatial memory that has left traces in the urban landscape. The map also highlights retained experiential constellations which therefore remain visible in successive maps, such as the consistent street patterns. In addition, the map can be explored in more detail by selecting a specific time period. The viewer can then read more about significant historical developments responsible for changes to the urban fabric as well as listen to some embedded sound samples to enhance her awareness of sensory transformations in the area, such as the sound of cattle being replaced by the sound of traffic. Figure 12.6

Details about the various structural landmarks that highlight a particular spatial memory in this area can be explored in the second map through simple selection processes. We decided to use two maps for historical references as information became too dense and obscured the message we were trying to convey.

The third map (Figure 12.7) contains significant sensory information such as smells, sounds, and textures and allows the viewer to decide which information to superimpose over a contemporary spatial map. The viewer can overlay sources to achieve a more holistic sensory re-experience or view a single sensory source at a time. Visual objects such as graphics,

images and text were used as stand-ins for the sensory data obtained from research observations to remind the viewer that this is a summary – a coding and grouping - of individual's sensory experiences over longer time periods. These visual objects highlight inherent sensory characteristics through two devices. Firstly, objects were grouped by source of origin of the sensory experience, in other words were the experiences produced by humans, material structures and technology, or nature. These three groupings were colour coded. Colours to classify the sources of experiences were obtained from the colours of the market. The fleeting nature of some sensory experiences is conveyed by using blurred circles to show smells and animations to highlight the movement of specific sound sources through space. Textures are displayed when the cursor hovers over specific areas of the map to remind the user of how such data is experienced through predominately (though not exclusively) touch and vision in real life.

Figure 12. 7

The fourth map tried to capture the main findings of our research, namely the intense juxtaposition of histories, times, social groups, sensescapes and individual and group experiences that define this area of London (Degen & Lewis 2019). To evoke this, we constructed six fictional personas to summarise our data on key sensory experiences and engagements of distinct social groups with different areas at different times of the day or week in and around Smithfield Market. The aim was not to create an encompassing map but to evoke the many different ways in which this vibrant area shapes strong feelings of attachment in different user groups from office workers, to residents, market workers, visitors or transient users such as cab drivers or couriers.

Figure 12.8 provides a choice of spatial itineraries that the viewer can follow. It highlights not only social practices and spatial engagements of particular social groups but also reflects in more detail subjective spatial experiences within the area. Important here was the ability of the viewer to superimpose significant routes, indicated by differently sized dots, for the selected groups in order to demonstrate the importance of specific urban structures and allow for comparisons between users. The map allows the viewer to explore significant locations mentioned by respondents, and links with the second map. It further reflects on and visualises the contextual interviews as a distinct qualitative research method by adding relevant images and quotes along the route of a specific respondents group and thereby displays how Smithfield's sensescapes distinctly shape individual and group experiences.

Figure 12.8

The fifth map – Figure 12.9 - evokes the soundscape as an example of the sensory changes within a 24 hour time window. We employed a sound designer to record sounds over a 24-hour period at key points around Smithfield Market which then were edited into a loop. The sound was recorded using a binaural recorder, which records in a 360 degree spectrum, which produces a more engaging listening experience. It allows the user to immerse into a distinct spatial context through the exploration of auditory memory. The user can select a specific time to experience how the rhythms of the sound evolve and view a montage of images which together evoke the distinct atmospheres of place. The sound is enhanced and the context of creation is rendered more comprehensible through the addition of textual and visual information to allow for a more holistic experience. Notes made by the recording artist were also added to reflect on the process of data creation and also to account for the individuality and subjectivity of the researcher as a distinct layer in the research process.

Figure 12.9

Conclusions

One of the biggest challenges for researchers of urban sensory and temporal experiences has been to find ways to represent these more visceral, corporeal and emotional qualities that compromise urban life: "The difficulty lies not so much in how to communicate sensory, visceral experiences verbally but, more importantly how to 'translate' these non-linear and non-narrative moments of experiencing and being in the world" (Degen 2014: 98). We suggest in this chapter that digital mapping and visualisations might offer one way to capture and render the fleeting nature of urban experiencing tangible to a variety of audiences. Digital mapping invites "users to perform certain bodily actions that are then inscribed in it and become mediated through it" (Lammes 2017:1024).

The interactivity of digital mapping allows for more elasticity between sensory research and its representation as it not only allows users to explore and retrace the steps of urban explorations – but to create her own. It allows us to communicate complexity through techniques of information layering which creates different viewpoints on research data through the inclusion of various subjective experiences and sensescapes, including those of the researcher, and thus fosters multiple interpretations. As Lammes (2017: 1021) highlights digital mapping interfaces do not just represent spatial relations "[r]ather, they co-produce 'spatial formations' (Thrift,1996) and are mediators via which changing images are produced, combined and merged in ever shifting spatial associations". This chapter discussed and reflected upon what it is possible to achieve through digital mapping, highlighting some of

the challenges of conducting this sort of research. Ultimately mapping urban experiences digitally has the potential to offer a new way of thinking about the felt politics of everyday urban living.

Frequently Asked Questions

1. Why is it important to research urban experiences?

The senses reveal urban life as an embodied, active and constantly transforming process. The sensory entanglements or our bodies and urban materialities produce our sense of place and our sense of self. While cities are of course material, political and economic environments a focus on sensory experiences reveals how broader structural changes affect social life and are experienced in daily life. A key difficulty identified by urban professionals, from architects to policy makers, has been how to adequately find a language to map, reflect and, to an extent, quantify sensory experiences. Partly because of their ephemeral nature but also because evaluations of sensory perception are linked to questions of aesthetics and taste. Urban

practitioners and policy makers suggested the need for more robust feedback mechanisms pre- and post- planning changes. The senses are crucial in mapping the socio-economic stratification of areas both in terms of promising what is to come and in attracting or detracting certain social groups and uses of the public space. Practitioners and policy makers agreed that knowledge and awareness of the sensory is not adequately embedded in urban policy and is hampered by a lack of understanding of how people perceive and understand the city. Digital sensory visualizations might be a first step towards this.

2. Why can it be important to digitally map and visualise sensory urban experiences?

As described in the last question, problems and difficulties in shaping urban spaces are often rooted in communication between the stakeholders (including inhabitants, policy-makers, etc.). The creation of the right feedback loops before and after changes to the urban fabric could improve this. Digital maps, as both projects discussed here highlight, are a visual aid that render the actual research process and its results more accessible and comprehensible to wide, but also specific, audiences. It is also important for digital maps to be conceived with specific audiences in mind such as academics, urban professionals, museum curators.

3. What are the differences between (dynamic) quantitative data visualisations and more qualitative data visualisations as the maps discussed here?

Computational power allows the analysis and transformation of large quantitative data sets (big data) into visualisations (Manovich 2010). Some are being analysed and transformed in real-time, to create dynamic data visualisations that update according to the data streams they receive. Examples for such mapping projects entail the use of traffic data, hotel or taxi

bookings, house prices or Instagram images such as "On Broadway" (http://on-broadway.nyc/) or "London – the information capital" (Cheshire and Uberti 2014). The projects discussed in this chapter highlight an important alternative potential for data visualisation. They provide a way to link in depth academic research with new techniques and practices of visualisation that are emerging such as data journalism and artistic project to tell alternative stories and approaches to urban life.

4. What should one keep in mind when trying to create interactive digital maps to visualise urban experiences?

From a visualising artist point of view it is important to understand the software you are working with, what can it do and what are its limitations. Manuela has been working for years with Adobe programs but there are a variety of other free programs/apps available that allow you to achieve similar results. Additionally, there are apps that allow for things like the integration of sound samples and textual descriptions such as freesound (https://freesound.org/) or Mapit GS. So you don't necessarily need to have programming or graphic skills, but it helps having a basic understanding of both. Whilst apps can add data for you, they might not provide the visual feel you are after, being too restrictive and reductive. When creating your own graphics, texts and images think very carefully about the message you are trying to convey. Colours, for instance, can reinforce power relations or have undesired cultural associations. Also important is the right ordering of information on specific maps and layers. Each visualisation is already an extreme reduction of reality and the context of research. Therefore, check if information is grouped correctly? Do maps contain too little or too much information? And lastly, think about your interactions. Can they help to

convey a certain feeling or sense? Is every click necessary or does the user get lost in my

maps? Be patient, observe and try not to lead your user!

5. What are the virtues and limits of using digital visualisations to map urban

experiences?

The ability to use digital visualisations as a communication tool is a great advantage. Maps

enable the exploration of different points of view, spatial memories and urban experiences

whilst also enabling us to appreciate the origins of data and research methods. Limitations are

of course set by technology, and the translation processes required to render certain senses

legible in the digital realm but also to close the gaps between actual context and digital

representation.

6. How should academics best work with a digital designer and vice versa?

As an academic you are the research expert and know best why you have used distinct

research methods and which data samples illustrate your findings and results best. Listen to

your designer about the possibilities of how data can be visualised, combined and made

legible for others. Develop mapping ideas together and let the designer experience the space

herself. Discuss how you feel maps could look or find sensory examples to communicate

your feelings to her. Be aware that the first mapping idea might not be the best. Be open to

experiment!

As a digital designer be aware of the unique skill set you are offering but keep in mind that the content expert is the academic. Therefore, immerse yourself into the urban environment as a designer. Having an understanding of the research methods and aims of a specific project is very important. Offer different solutions and do not be discouraged when the first ideas end up in the bin. Be patient and keep in mind that the researcher might not know what they want exactly, advise what is digitally possible and be aware of user experiences. Try being as open as possible, providing sketches rather than finished maps to communicate solutions. You are more likely to change ideas when working with prototypes. Lastly, test your maps on your anticipated audience to understand if you have met their intellectual and interactive needs.

Follow Up References

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