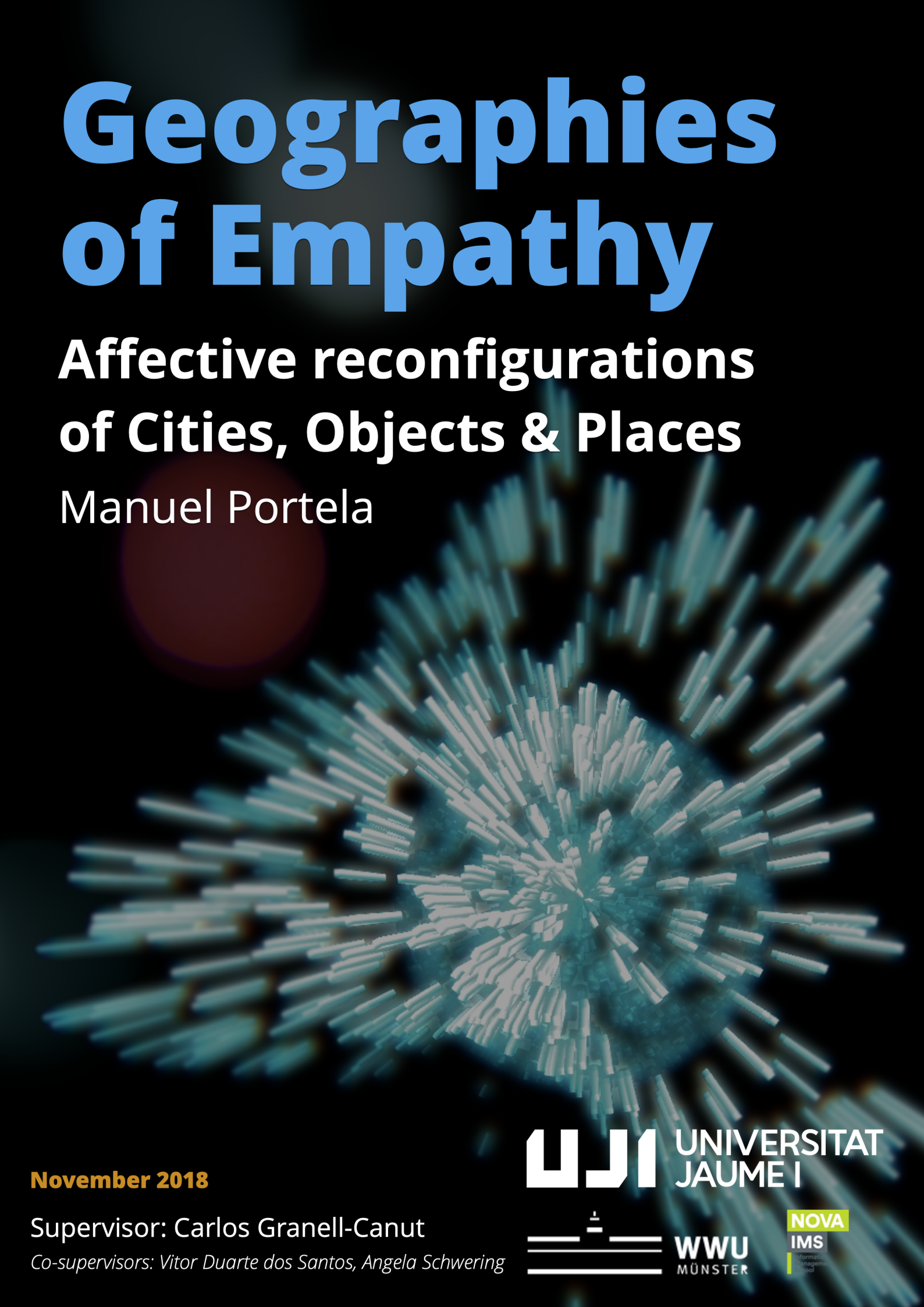
Geographies of Empathy

Affective reconfigurations of Cities, Objects & Places

Manuel Portela



November 2018

Supervisor: Carlos Granell-Canut

Co-supervisors: Vitor Duarte dos Santos, Angela Schwering

UNIVERSITAT JAUME I

WWU MÜNSTER

NOVA IMS

Geographies of Empathy

Affective reconfigurations of Cities, Objects & Places

Dissertation submitted by Manuel Portela to apply for the joint doctoral degree from the Universitat Jaume I, Universidade Nova de Lisboa and the University of Münster.

UNIVERSITAT JAUME·I

Doctoral School of Universitat Jaume I

European Joint Doctorate Marie Sklodowska-Curie in Geoinformatics

Castellón de la Plana, Spain - November 2018

Supervisor:	Co-supervisors:	
Dr. Carlos Granell-Canut (Universitat Jaume I)	Prof. Dr. Vitor Duarte dos Santos (Universidade NOVA de Lisboa)	Dr. Angela Schwering (University of Münster)

Thesis committee:		
	Dr. Carlos Granell-Canut	Universitat Jaume I
	Prof. Dr. Christian Kray	University of Münster
	Prof. Dr. Vitor Duarte dos Santos	Universidade NOVA de Lisboa
	Asst. Prof. Dr. Kristine Samson	Roskilde Universitet
	Dr. Ingi Helgason	Edinburgh Napier University

NOVA IMS Information Management School

Westfälische Wilhelms-Universität Münster

This dissertation is funded by the European Commission within the Marie Skłodowska-Curie Actions (ITN-EJD). Grant Agreement num. 642332 - GEO-C - H2020-MSCA-ITN-2014.

Acknowledgments

I would like to express my gratitude to my supervisor Carlos Granell-Canut for his continuous support, motivation and openness to follow my ideas and guide my work through these years. Besides, I would like to thank my co-supervisors, Vitor Duarte dos Santos and Angela Schwering for their support, encouragement and inspiration during the GEO-C program. My sincere thanks also go to Antonella Radicchi, Eric Laurier, Ingi Helgason, Harvey Molotch, Mara Balestrini, Scott Smith, Marjin de Waal, Marcus Foth, who provided me with the opportunity to visit, gave me advise and collaborate with them in different ways of my academic career. I also thank Boyd Cohen, Diego Cooper, Maria Cristina Cravino, Martín Pablo Villar, Cristian Reynaga and Pilar Conesa who supported me from the first moment of this adventure. Additionally, I thanks Guido Corallo for donating part of his work for the awesome cover image. The special thanks go to Anna-Lisa Müller and Kristine Samson who provided an extensive review and feedback which was critical to wrap up this work.

I take this opportunity to thank the members of GEOTEC, INIT and GEO-C supervisors for their help and encouragement, also for making the program available and giving me the chance to be part of it. Special thanks to all my GEO-C colleagues, in particular to those that we shared extraordinary moments.

Finally, special gratitude to Lucia, who shared all these moments at my side with patience and love. To Negrita, Batman, Newton and Tigor that gave me a lot of purs, paws and warm support before, during and after this period of my life. Last but not least, I would like to give further thanks to my family for their continued support and encouragement throughout my studies and life.

Finally, I want to dedicate this work to my father, who inspires - also in conflictive means - in many ways and would be proud of this achievement in my life.

Preface

This dissertation is the result of the work made under the supervision of Dr Carlos Granell-Canut (Universitat Jaume I), and my co-supervisors Dr Vitor Santos (Universidade NOVA de Lisboa) and Dr Angela Schwering (Münster University), for the Joint Doctorate in GeoInformatics (GEO-C).

My work can be described as a *dérive* (Debord, 1955), an experimentation over the urban territory that included some emotional disorientation and, where some ideas came up in the form of *serendipity*. It wouldn't be possible without understanding my background. My bachelor degree in Graphic Design and my master in Urban Studies. As a practitioner, in my first years of professional career, I've been developing graphic material, websites and interactive installations. Then I've moved to the public sector to work in public policy assessment and advice. In the meanwhile, I've developed different projects for civil society. By experimenting with the three sectors, and facing the difficulties of trying to leverage and generate spaces of communication between them, I have been questioning the differences and similarities of one and another.

Thus, my concern of the otherness became useful as the central idea for this thesis. Empathy, as I understand it, is a curious expression. From the beginning, many had questioned me about the term, and I had no clear answer. Although, I followed my instincts and I could sort the unexpectedness and unknowns. In that sense, the process of my research started in a sort of weaving around rough ideas, taking me to discover an entire world of disciplines and scholars looking forward to answering the same questions by different means. For that reason, I'm glad to present to you this work as a trip with an exploratory soul.

Consequently, the reader will find that along the text, the style of writing is set up in a second person. Not only because I made this work in collaboration with others, but because this work is an effect and a result of interacting with others. At the same time, this text is unfinished until the act of reading it. Hence, you are part of it as well.

On behalf of this dissertation, the text of this thesis is partly based upon the following publications:

- Portela, M. & Granell-Canut, C., 2016. Methods to Observe and Evaluate Interactions with Everyday Context-Aware Objects. In Ubiquitous Computing and Ambient Intelligence. Springer, pp. 385–392. Available at: http://www.springer.com/us/book/9783319487458.

- Portela, M. & Granell-Canut, C., 2017. A call to De-Familiarize with Everyday Objects: Understanding Modes of Ordering and Politics of Interaction. 8th International conference on Communities and Technologies 2017 conference, Doctoral Consortium. Troyes, France, 26 June 2017.

- Portela, M. & Granell-canut, C., 2017. *A new friend in our Smartphone ? Observing Interactions with Chatbots in the search of emotional engagement.* In Proceedings of Interacción '17.

- Portela, M. & Errandonea, L.P., 2017. *The role of Participatory Social Mapping in the struggle of the territory and the right to the city*. In Proceedings of the 8th International Conference on Communities and Technologies - C&T '17. New York, New York, USA: ACM Press, pp. 100–104. Available at: http://dl.acm.org/citation.cfm?doid=3083671.3083676.

- Portela, M., Acedo, A. & Granell-canut, C., 2018. *Looking for " in-between " Places*. Media Theory [S.I.], 2(1), p. 108-133, july 2018. ISSN 2557-826X. Available at: http://journalcontent.mediatheoryjournal.org/index.php/mt/article/view/38.

- Portela, M. & Granell-Canut, C., *forthcoming*. Why do I like a place? Smart enactments of affects, empathy and in-between places Portela. Annals of the American Association of Geographers. 2019.

- Portela, M. & Granell-Canut, C., *forthcoming*. The urban experience as affective mediation: studying the effects of illuminated atmospheres and sensory experiences. Distinktion: Journal of Social Theory.

Manuel Portela
Castellón de la Plana, Spain. November 2018

Abstract

This work addresses the development of digital technologies from the perspective of corporeal and embodied encounters. It offers a critical view of the openness and smartness of cities, at the same time that propose a novel approach to create cities of attentiveness, delight, intensity and meaning. It consists of a study of what becomes called Geographies of Empathy, as means of affective translations (Pedwell, 2014). Empathy is addressed as a conjugation of multiple ontologies that can be defined as a 'becoming together'. Empathy that takes place as forms of aesthetic experiences, collective conditions and structures of feelings (B. Anderson, 2014). By presenting three interactive experiments and three explorations, it addresses the *empathic relations* that reify everyday practices. A focus on how mundane objects and urban places are experienced in encounters, provide an analysis of the mediation of affects, feelings and emotions. The multidisciplinary approach in the process of research is performed by the application of concepts from Science and Technology Studies, Cultural Geography, Media Studies, Urban Studies and Human-Computer Interaction. This work takes the form of a dialectical inquiry between the empirical/propositional and the theoretical/critique. By one side, it discusses the role of interaction design and the ethics and aesthetics of socio-technical assemblages in cities. By the other, it addresses the political effects and consequences of empathic relations in the advent of urban development and the practices of designing urban interactions.

Este trabajo aborda el desarrollo de las tecnologías digitales desde la perspectiva de los encuentros entre cuerpos. Asimismo, ofrece una visión crítica sobre las ciudades abiertas e inteligentes, al mismo tiempo que propone un enfoque novedoso para crear ciudades bajo los principios de atención, intensidad, deleite y sentido. Consiste en un estudio de lo que llamamos Geografías de la Empatía, como forma de versiones afectivas (Pedwell, 2014). La noción de empatía es abordada como una unión de múltiples ontologías que pueden ser definidas como una 'existencia conjunta'. Empatía, tiene lugar en diversas formas formas de experiencia, estéticas, condiciones colectivas y estructuras de sentimientos (B. Anderson, 2014). Con la presentación de tres experimentos interactivos y tres exploraciones, se aborda las relaciones empáticas que reifican las prácticas cotidianas. El foco sobre cómo los objetos mundanos y los lugares urbanos se experimentan en los encuentros, proporciona un análisis sobre la mediación de los affects, los sentimientos y las emociones. El enfoque multidisciplinario en el proceso de investigación se realiza mediante la aplicación de conceptos de los campos como los Estudios de la Ciencia y Tecnología, Geografía Cultural, el Estudios Culturales, Estudios Urbanos e Interacción Humano-Computadora (HCI). Este trabajo toma la forma de una indagación dialéctica entre lo empírico/proposicional y lo teórico/crítico. Por un lado, se analiza el papel del diseño de interacción, junto con la ética y la estética de los ensamblajes socio-técnicos en las ciudades. Por el otro, aborda los efectos y las consecuencias políticas de las relaciones empáticas en el advenimiento del desarrollo urbano y las prácticas de diseño de interacciones urbanas.

Contents

Introduction

Social life is rarely governed by precise rules, and to pretend a real analysis that requires a work of increasingly excellent concept makes its study less suitable for the real and ordinary human experience. This work is focused on the *Geographies of Empathy* by describing relations between humans and non-humans and how these relationships can be traced in many ways.

Representational models, from maps to digital data, to non-representational styles of observing affective life, are used to describe the implications of political assemblages that rule the world. For that reason, the tools presented in the following work should be taken as sensitising tools that can be used to study, engage and act over the complexity of our world. We explore mundane and banal aspects of our habits in the more-than-human life. This thesis is a search for a dialogue between disciplines, embracing complexity as a proof of the conviviality of contemporary sciences.

> **Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody.** (Jacobs, 1961, p. 238)

Exploring alternatives to Smart Cities

The variety of overwhelming developments that are now possible thanks to emerging technologies to create, capture, manage, analyse, visualise and consume data is transforming life in cities. Ever-increasing investments in big data, machine learning and other *smart* technologies are seen as the only way to solve the problems that affect the human beings on the earth (whether we are not sure of other species). Rather, it is usually forgotten that, what brings us together as humanity is not the technology but culture. Looking at one of the fathers of ethnographic research, we take a definition of culture that will help us in this endeavour (Geertz, 1973, p. 14):

> As interworked systems of construable signs (what, ignoring provincial usages, I would call symbols), culture is not a power, something to which social events, behaviours, institutions, or processes can be causally attributed; it is a context, something within which they can be intelligible–that is, thickly–described.

Considering the concept of Smart City (Goodspeed, 2015; Townsend, 2013) as a phenomenon that is generally associated with efficiency, we can admit that it is only a way of making intelligible many social processes that are currently a trend. This cultural form is brought thanks to the possibilities of technology implementation (ICTs). Nevertheless, transformations in these cultural forms have happened during the last decades; e.g., there was recently a call for a city for citizens (Foth, Brynskov, & Ojala, 2015). But, the technological contributions to this call undermined the powers of the affective forces in the spatial realm, which leads to the development of an 'inhabitable map' of a city, where the 'space itself be-

comes a means of conveying information and communication with the goal of approximating the rhythm of thought' (Thrift, 2009, p. 19).

Thrift argues that the cultural means (and objects of consumption) create worlds that constitute spaces 'designed to elicit particular responses, designed to unleash speculation and creativity, designed to amplify what counts as the object' (Thrift, 2009, p. 24).

In that regard, the Smart Cities discourse intends to envision the future of cities. It is mainly orientated towards an efficient and optimal (real-time) management of the city's resources to enhance people's life (Kitchin, 2013). Our relation with the city environment is changing since connected objects are incorporated in the city bridging increasingly the physical with the virtual world.

For that reason, we follow Santos (2016) to think that the improvement of life in cities can be approached from a perspective that considers technology in relation to affective and empathic perspectives. Hence, our contribution recovers the principles of place to guide a technological change towards the re-enchantment of life (Bennett, 2001).

With new opportunities to involve citizens in new relationships within the city, what we present is a multidisciplinary approach to study these interactions. It combines different methods from diverse disciplines (Computer Science, Human Geographies, Social Sciences and Design research, among others) to accost the assemblages in the urban space with the idea to understand the benefits of affective and empathic relations with software-enabled objects. The ultimate goal is to provide knowledge and insightful support for designing future objects for the urban space that improve the experience of people's daily lives.

Still, we need to assume the ethical-political contingencies that condition but also reproduces through the creation of socio-technical assemblages. One of the main critiques of Jane Jacobs that is still valid for urban planning is that she recriminated to practitioners and teachers when they 'ignored the study of success and failure in real life, have been incurious about the reasons for unexpected success, and are guided instead by principles derived from the behaviour and appearance: of towns, suburbs, tuberculosis sanatoria, fairs and imaginary dream cities from anything but cities themselves' (Jacobs, 1961, p. 6)

The concept of smart cities itself is a future desire that fuels the development of new technologies. Leveraged by new data processing capacities (e.g. Machine Learning, Cloud computing, Artificial Intelligence) along with the advent of Ubiquitous Computing and Internet of Things, companies and governments try to take advantage of these technological advances and imaginaries to design, sell and deploy Smart Cities solutions to solve the pressing issues facing cities today (e.i. mobility, transport, environment) (Kinsley, 2012).

The critiques about smart cities also recognise that they bring a crisis to the concept itself and complicate the issues that already existed in the cities. Instead of providing bottom-up opportunities and places for open governance in a wide-world scheme, only a few cities in the world can keep pace with urban needs while social control, poverty, racism and inequality continue to grow.

Many authors have raised critiques of this paradigmatic claim based on the efficiency, sustainability and resilience for the uses of the term 'smart'. Adam Greenfield in 'Against the Smart City' (2013) criticised the level of abstraction, discretionary decisions and manipulation by which large technological companies confuse and sell their services (and imaginary futures) to citizens and city representatives. Meanwhile, Bruce Sterling has been more direct in denouncing the monopolisation of the market in urban technologies (2014). 'To deem

yourself "smart" is to make the *nimbyites* and market-force people look stupid', he said in a recent article in The Atlantic. [1], regarding the non-existence (or the emptiness) of the concept of smart. In a single paragraph, he described:

> However, the cities of the future won't be 'smart', or well-engineered, cleverly designed, just, clean, fair, green, sustainable, safe, healthy, affordable, or resilient. They won't have any particularly higher ethical values of liberty, equality, or fraternity, either. The future smart city will be the internet, the mobile cloud, and a lot of weird paste-on gadgetry, deployed by City Hall, mostly for the sake of making towns more attractive to capital.

Although, not all critiques came from a technological point of view. Urbanist Jan Gehl, who is always looking for a greener and enjoyable life, made a claim against the idea of the smart city and the current trends on self-driving cars [2]. In the same way, the future of justice and equality is compromised due to the automation, which is another item of interest today. Eubanks (2018) argues that the current capacity of processing massive amounts of data affects civil and human rights and economic equity. We may have to rethink what the internet means to our culture to improve our understanding. The ideas of total democratisation or enlightenment came after the massive growth of internet access. Now, we realise that we fall into a state of platform capitalism and fake news, maybe we should seek for an answer, not in an entirely idealistic and rational, mind-driver future. By embodying the effects of what the Internet and us, as a society, create another type of intelligence.

> 'Cities' may indeed pose the general 'question of our living together' in a manner more intense than many other kinds of places. However, the very fact that cities (like all places) are home to the weavings together, mutual indifference and outright antagonisms of such a myriad of trajectories, and that this itself has a spatial form which will further mould those differentiations and relations, means that, within cities, the nature of that question - of our living together - will be very differentially articulated. The challenge of the negotiation of a place is shockingly unequal. Also, the politics, economics and cultures of space - through a white fight, through gated communities, through the class-polarising geographies of market relations - are actively used in the production of that inequality. (Massey, 2005, p. 169)

Beyond the benefits and consequences of novel technologies in cities, the discussion becomes interesting when the possibilities of implementing new relationships between people and urban objects mediated by technology are visualised. From social sciences and design standpoints, the ecosystem of technologies in smart cities initiatives offers unexplored opportunities to evaluate possible constraints in societies and communities, being the latter as novel and important as the technology advancement in itself.

Urban space is seen as an interrelated and dynamic web of infrastructures, territories, and interactions between objects and living creatures. Nevertheless, a high proportion of smart cities projects pay no or little attention to the construction of relations between society

[1] *Stop Saying 'Smart Cities'*, The Atlantic. Available at https://www.theatlantic.com/technology/archive/2018/02/stupid-cities/553052/

[2] *Copenhagen Mastermind Jan Gehl Isn't Sold on 'Smart' Cities* in CityLab. Available at https://www.citylab.com/design/2018/04/beware-smart-cities/559043/ [All online resources cited in this thesis were accessed at the time of publication: November, 2018]

and technology as an assemblage (Venturini & Latour, 2010) leaving the social and cognitive perception as an external effect rather than an integrative part of its development and its relation with space. Our concern in this research is to study how to relate these issues, which are revealed at different scales, to build an exploratory mindset based on different ontologies that permits to observe and evaluate interactions in place and time with the improvements of software and other digital artefacts.

The modern-western society prioritised 'seeing' over 'doing', as Merleau-Ponty (1962) pointed, generating a culture of the other. Another that we can observe without considering part of ourselves. Following Deleuze and Hurley (1988) and Massumi (2015), in this context of technological expansion we should ask 'what can bodies do?', so inquiry about its ethico-political consequences by focusing on 'doing' as a critical part of living together. This stake is what we constitute as initial consideration for taking empathy as a key notion in future societies [3].

Nevertheless, we believe there is room to continue working at other levels. In his doctoral thesis, Fernandez González (2015) carefully analysed the discourses around Smart cities, looking for new perspectives, far from the hegemonic development that other scholars denounced. Roche (2016) defined a Smart city as a place-based city, where 'smart is about the ability to sense and understand the genesis of connected urban places' (Roche, 2016, p. 571). Therefore, the attempts to define the ideal smart city exceed our capacities to accomplish such utopian proposals.

For that reason, our point of view follows Thrift (2016), who argued that we live in an era of emotional politics, or *neuropolitics*. He understood that the media and standards of life are measured by their affective and emotional manipulation instead of the rational (and smart) society that is argued to be. In that sense, living in cities is about living together. This conviviality is a source of power and possibilities that are often left aside in many studies. We agree with Ahmed (2004) that the emotional is not the contrary of the rational, nor is it a 'soft touch'. Through emotions and feelings, we can explore otherness and immediacy with these new technologies that are being embedded in our daily life.

> At particular times and in particular places, there are moments where lives are so explicitly lived through pain, bereavement, elation, anger, love and so on that the power of emotional relations cannot be ignored (and can readily be appreciated) [...] If the logic of efficiency depends on the silencing of the emotions, academics have a role in pointing out that this is an ethically questionable state of affairs. (K. Anderson & Smith, 2001, p. 7-8)

Hence, we propose to navigate new alternatives to the claim of open and smart cities. But, what is a city? From classical geography, spaces, places and distances define the characteristics of a city. Sociologists would argue that social relations, as well as power relations, define what bring people together (Fainstein, 2014). From an economic point of view, cities take forms of 'growth machines' (Logan & Molotch, 1987). More recently, cities have been defined as spaces of high levels of intensities, flows and rhythms (Amin & Thrift, 2002). We can agree with all these visions because more challenging to determine, cities have no clear form

[3] At the time of writing this thesis, interesting outcomes from neurology and other sciences are also pointing towards to the same findings, e.g. Holmes (2018). However, we should be careful about how these findings are articulated with the philosophies presented in this thesis.

and boundaries. Moreover, with the pace that urban spaces are growing it is hard to define what is not a city. We agree with Amin and Thrift who spared that cities can be conceived 'as a set of potentials which contain unpredictable elements as a result of the evolution of problems and solution' (Amin & Thrift, 2002, p. 4). Even when cities contain spaces, people and objects, what occurs in the city turn out to be more critical. In that sense, this work is focused on the former, to learn about the latter. In sum, a city is not something that we can give a definition, but something where everyday practices and ongoings continuously shape and transform.

Fainstein (2014) has argued that, despite the many intentions of creating a critique of inequalities and injustice among urban programs, there is a need to be clear in which are the values of justice that we should follow. Many discussions took place regarding the physical conditions, the dispute for power and democratic representation in cities (Marcuse & Mayer, 2011). Without disagreeing with that stance, we propose a different approach to politicise current trends. With the discussion and debate about the place of citizens in the future of cities, we should turn to a more in-depth analysis of how we relate to the environment in which we live.

After all, life is 'in the intervals between things - in the way that things relate' (Massumi, 2015, p. 183). Therefore, we start from the idea that empathy, as a 'becoming together', can be conceived as one of the many forces on which we can work to achieve a better future. Therefore, to address this new perspective on a Just City we discuss the future of urban life concerning affects, feelings and emotions, which involve our individual and collective experience.

> 'From now on, I'll describe the cities to you,' the Khan had said, 'in your journeys you will see if they exist.'
> But the cities visited by Marco Polo were always different from those thought of by the emperor.
> 'And yet I have constructed in my mind a model city from which all possible cities can be deduced,' Kublai said.
> 'It contains everything corresponding to the norm. Since the cities that exist diverge in varying degree from the norm, I need only foresee the exceptions to the norm and calculate the most probable combinations.'
> 'I have also thought of a model city from which I deduce all the others,' Marco answered.
> 'It is a city made only of exceptions, exclusions, incongruities, contradictions. If such a city is the most improbable, by reducing the number of abnormal elements, we increase the probability that the city really exists.
> So I have only to subtract exceptions from my model, and in whatever direction I proceed, I will arrive at one of the cities which, always as an exception, exist.
> But I cannot force my operation beyond a certain limit: I would achieve cities too probable to be real.'
> (Calvino, 1974, p. 69)

We think that to discuss a future life, when facing socio-technical development alone, it is not enough. Consequently, with our focus outside of rationality, we will follow Italo Calvino and propose alternatives to intelligence in the cities by establishing other realities.

The three objects of Research

Our research is located at the intersection of people, objects and public spaces. In other words, we will look at what happens in the liminal space of their interaction. Consequently, the condition of in-betweenness will be discussed in the course of this work as the main concern.

In this sense, our inquiries are focused on how to understand the qualities of physical and non-physical relationships in different spatial configurations and to grasp the possibilities of making them more enjoyable and valuable for the inhabitants. We want to understand how the quality of life can be enhanced with a novel perspective, focusing on objects as intermediaries and agents present in our daily life (Bennett, 2004).

Ben Anderson described how cultural geographies moved from an analysis of discourses and representations to the analysis of the experience (or lived experience) and, later, to a study of representations-in-relation (where representations also have agency, activity and energy). The focus in this trend is to follow 'what something does – how images transform, how fiction moves, how words hurt, for example – in and through an emergent context formed from other immanent processes, events and things' (B. Anderson, 2018, p. 7). This will be our approach to the three objects of research, but also considering 'the questions of who represents, how and with what consequences' (p. 10). Moreover, we should not take for granted the epistemological and ontological [4] privilege of the research objects (i.e. leaving in away the assumptions of knowing what - and what is not - an object, a place or empathy; and to question how do we know what they are and, what do they do.) , therefore, we consider power as the relational force that '*come to form* as part of the experience' (B. Anderson, 2017, p. 509).

The three objects are presented in each experiment by different means and will be discussed opportunely in each of the subsequent chapters. Taking an ontological differential in each chapter, allows us to take various standpoints and to be sceptic about their causal and relational forces. For a rapid and basic introduction, we provide a brief description of each one.

Place

The idea of space and place have radically changed during the history of Western culture at the pace of philosophical reflections. *Space* was frequently conceived of as empty, open, infinite, and featureless, while *place* was thought as a space filled with meaning, or embedded with cultural values (Tuan, 1977). The idea of spatiality appeared with the critical theories of Lefebvre (1968) and Soja (1985, 1996), understanding the spatiality of places as a social construction. Other authors discussed the emotional connections with places (Shamai, 1991), the lack of identity of place (Auge, 1996), the authenticity of places (Relph, 1976), and also a sense of place aiming to achieve 'an emotional bonding between people and places that are created after cognition' (Najafi, Kamal, & Mohd, 2011, p. 189).

We consider that different social groups or individuals can configure urban spaces according to their lifestyle, common places, intentions and choreographies, leading to a continuous multiplicity of publics [5]. As a first approach, we can define a place as 'a particular space

[4] Jensen and Morita (2015) suggests to take infrastructures as ontological experiments as a mean of acknowledging transformation and reconfigurations.

[5] The notion of public has been discussed broadly, but we can find the roots of such debate in Habermas' notion of 'public sphere'

which is covered with meanings and values by the users' (Najafi et al., 2011, p. 187), which plays a significant role in human behaviour and mental health (McAndrew, 1993).

With the recovery of phenomenology, the idea of a mediated space based on embodied experiences, space and places surged characterised by their sensory and affective intensities (Casey, 1998). The phenomenological approach to space means that 'stressing the sensory dimension of *in situ* experience, the idea of place is forged around a critique of abstract and objective space' (Thibaud, 2015, p. 4). Contemporary ideas of place are built around this mediation as the in-between (Casey, 2001) and the thinness or thickness of its intensity (Duff, 2010). In that sense, scholars from the fields of cultural geography have been studying these intensities of places based on the reification of affects, feelings and emotions, such as boredom (B. Anderson, 2004), faith (Holloway, 2006), hope (Coutard & Guy, 2007), well-being (Andrews, Chen, & Myers, 2014), and many others.

With the relational turn in Human Geography, the concept of space changed from the anthropological emptiness, to 'a spatialized matrix of becoming' (Thrift, 2009, p. 19). From a material consistency to the spatialization of experience, which is in constant mutation, and where the place of objects is vital to understand them.

Places are critical to the imaginaries of the cities. From Walter Benjamin to Italo Calvino, from IBM to transport authorities around the world; academics, writers, technology companies and governments imagine novel forms of technology in public spaces because that is where cities come to life. How to account for, define and work the idea of places is intrinsic to urban life, so it becomes the main scenario of this research.

Objects

The attention to mundane objects acquires relevance for our research since we deal with them in everyday life in the way that 'each object generates a particular choreography of movement and reinforces an ensemble' (H. Molotch, 2011, p. 67). As designers, we deal with affordances (Gibson, 1977) when creating interfaces and objects, and this fact becomes an opportunity to generate the required attention to interact with them. Paying attention to those objects brings a repertoire that implies different levels of understanding of using them and the practices around them (Norman, 2004).

By observing everyday objects, one can discover local interactions with artifacts and urban objects (Giaccardi, Cila, Speed, Caldwell, & Cruz, 2016). For example, the sociologist Harvey Molotch analysed different objects and their dynamics in the city (H. Molotch, 2011), describing a process of social construction where objects become mechanisms to prevent, allow and penalise individuals to do/use things, and transit the city.

In this perspective, objects generate and reproduce power (Bennett, 2004), generate order and create the *publics* (Sheller, 2004b). In other words, objects rule public spaces, reproducing the normative with a direct agency. John Law stated that 'repurposing data or devices designed for "other" purposes (e.g., commercial) is a way to both do social research and to

as a space where privates individuals can participate through discourse interaction and to identify themselves in a group. Such a notion was criticised for being too idealistic and contested by Fraser (1990), who accounted that there are also counter-publics or multiple publics that coexist in a multi-cultural society. In that sense, contemporary approaches to publics can be found in the notion of 'mobile publics' (Sheller, 2004b) and the idea of 'object-oriented publics'(Latour & Weibel, 2005). Therefore, we agree with Jenkins, Dantec, Disalvo, Lodato, and Asad (2016) who, following Latour, argued that *publics* is a way to understand how society deals with controversies and dilemmas, and we must follow those forms of organisation to understand how publics are defined (concerning their limits, causing inclusions and exclusions). In that sense, it pertains to the discussion of place and spaces as politized realms.

critically understand how research is being socially and technically redistributed in more implicit ways by digital technologies.' (Law & Ruppert, 2013, p. 237).

For us, artifacts, objects and bodies of all types, exceed a single definition. In general terms, a technical object is designed to do something and, as Anderson summarises, the work of current geographical trends is to study *what things do* (B. Anderson, 2018). In this sense, anything becomes an object, and it is difficult to differentiate from physical objects and more abstract and representational objects. That is why bodies take a more physical or corporeal understanding of what a technical object unfold in our practices. Because we are working in a cross-disciplinary stance, we will use artifacts, objects and bodies in accordance with their discursive field and its context. In summary, readers should understand that we rest importance of such definitions because what matters most is how these bodies 'become together' in times and spaces and within practices.

Empathy

Empathy is one of the complex concepts that we face in this thesis in a transversal way. Considering the affective life that constitutes our being with others, empathies (note the plural) could also be defined as the disposition to being attuned, coupled or, share capacities with other bodies. For that reason, if treated with care, we believe that empathies can play a role in the process of developing new technologies for cities.

Within the field of cultural geography, empathy can be related to the notion of *affects* (K. Anderson & Smith, 2001; Massumi, 2002). Affects are an expression of the force and capacities of the body. Therefore, empathy becomes a disposition of being (with) the other. We take empathy into account as a state of in-relation, or *becoming*. Other concepts like hope (B. Anderson, 2006), pain (K. Anderson & Smith, 2001) and wellbeing (Andrews et al., 2014) have already been analysed and recognised as dispositional states that organise the space, time and the relations between bodies. Understanding where empathy 'takes place' is our primary concern.

Despite the abandonment of the concept of empathy in the cognitive and neural sciences (and the critics received in the field of psychology Bloom (2017)), recent discoveries brought it back to the forefront, specifically with the findings of mirror neurons, which are responsible for the imitation of physical gestures in our brain. Freedberg and Gallese (2007) stated that 'the observation of static graspable objects activates not only visual areas of the brain but also motor areas that control object-related actions such as grasping' (Freedberg & Gallese, 2007, p. 201). Damasio's findings of somatic markers established correlations between emotional decisions and neural activities (Damasio, 1999). These findings provided new insights into the understanding of embodied interactions in correlation with the aforementioned phenomenological approach, relating affection, empathy and intersubjectivity. Although, critics were also raised on behalf of the perspective taken by fields such as biology, ethology, neuroscience, genetics and evolutionary theories, in what Pedwell (2014) called 'the sciences of empathy', producing a direct translation to a discourse of the existence of a universal empathy, that can bridge social and cultural differences. The consequences of this universalism are the accentuation of post-Darwinist ideas, coupled with racialism and sexism.

Thus, Pedwell based her vision of empathy on a 'social and political relation involving the imbrication of cognitive, perceptual and affective processes' (2014, p. xi), implying that the intentions are part of such relations. As such, she argued that empathy does not emerge

or become intelligible outside the presence of other affects. In other words, empathy is just another affective relation that 'may correspond to a host of feelings, sensations and affective intensities, including a feeling of nothing at all' (2014, p. 20) - feelings and emotions will be discussed below.

Angeles and Pratt (2017) have recovered Pedwell's notion of empathy and argued that empathy 'moves between people and things and places they inhabit. Rather than serving as a resource, tool or asset contained within individuals, it emerges in circulation.' (2017, p. 271). The author considered that these affective relationships could be built through critical-creative research strategies. In this vein, it is unfair to treat empathy as something that is possible to possess (G. R. E. Marshall & Hooker, 2016) but as events that occur in the form of encounters. And these events are precisely the way in which bodies can develop their capacities to affect and being affected and, to *come together*.

Therefore, our inquiry on the Geographies of Empathy is defined as the study of the effects, causes and consequences of empathy as the affective translations that take place in the urban landscape.

We summarise the three objects of research as the following:

- **Place** as a means of individual and collective relationships, linked to emotions and feelings in spatial configurations, where actions and encounters 'take place'.
- **Objects**, artifacts and other bodies that are part of spatial configurations and agents in relation to individual and collective practices.
- **Empathy** as a form of 'becoming together', that connects us corporeally with our environment and other bodies.

Research Questions

The relationships between these three objects define a series of research questions [RQ] that guide and structure our work (as illustrated in Figure 1), namely:

1. **How do artifacts/objects offer new ways of engagement, and what consequences have in our daily life practices?**
   Many scholars from CSCW and HCI have studied engagement with objects, and the degree of engagement at the community level (Balestrini, 2017). Beyond of the cultural and psychological insights, we propose to answer this RQ by examining engagement from a different perspective. We approach engagement by considering an aesthetic, corporeal and embodied interaction that can be expressed as empathic relations. In this thesis, we also explore the possibilities that new technologies offer practitioners to create new spatialities. The primary outcome is a framework to imagine, create and observe empathic relations.
2. **How do atmospheres change our capacities in relation to our place-based practices and habits?**
   This thesis aims to address the effects of technological enhancement in the complexity of daily practices. To achieve it, we consider approaches from environmental psychology

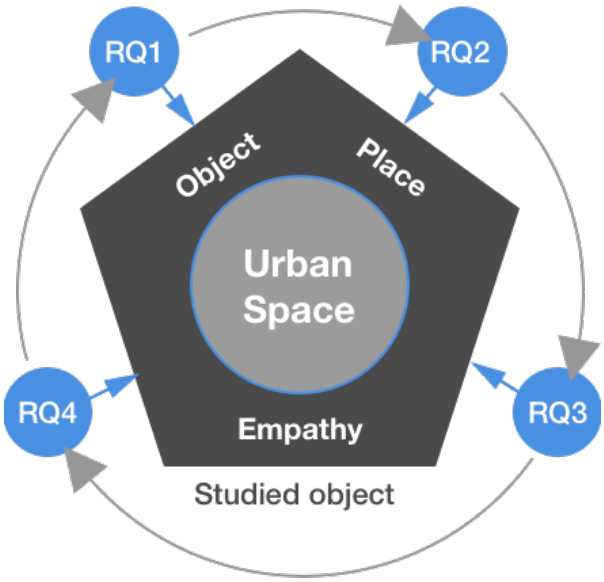


Figure 1: Shows the three objects and research questions interrelated in a triad.

and cultural geography to understand the friction and agency of artifacts, and how habits are affected by them.

3. **How do the affective qualities of places relate to the process of representation?**
   In this work, we understand that the excess of affective life, which takes place in temporal and spatial configurations, is corporeally lived through feelings and emotions. The question is aimed at understanding how technologies for representation work as *capacitors* of these expressions of life.

4. **What are the effects of studying reconfigurations between technologies, bodies and places in the form of empathic relations?**
   This question considers a political approach to the objects of study raised from the geographies of empathy. As scholars, we will explore methodological contributions that are useful for different disciplines that are concerned about the future of cities and society in general.

To answer these research questions, we have set a common background (See next chapter for further details) that served us as a theoretical basis to develop the research activities (e.g. experiments, explorations). These activities are presented as mediations in the context of place-based encounters.

> **Cities exists as means of movement, as means to engineer *encounters* through collection, transport and collation.** (Amin & Thrift, 2002, p. 81)

Encounters and mediations

In this section, we briefly introduce the type of research activities that were carried out during the research period (2015-2018). We divide the description of our work into **experiments** and **explorations** that respond to two different types of encounters with the objects of research.

Encounters have had important implications for the cultural and social geographies and have been firmly rooted in phenomenology. From such a perspective, an encounter with the *place-world*[6] is when a living body goes 'out to meet it' (Casey, 2001, p.688). Thus, 'we live out our bodily habitudes in relation to the changing spatiality of the scenes we successively encounter' (Casey, 2001, p.687).

Sociologist Goffman described encounters as a social arrangement when 'persons are in another's immediate physical presence' (2013, p. 17) and included a single visual and cognitive focus of attention. He also accounted for the processes that rule encounters even when these processes exist as irrelevant, out of frame, or not happening in an encounter. Therefore, an encounter could be defined as a social organisation, a consequence of the 'effective operation of rules of irrelevance'.

Amin and Thrift considered the *orderings*[7] generated in cities, where these orderings are 'often exacted through the design of flow as a set of serial *encounters* which construct particular spaces and times' (2002, p. 83). In other words, urban spaces and times are designed through experience within 'mundane instruments of encounter' (2002, p. 83). That way, cities are conceived as an 'ecology of circumstance, as an ordering of uncertainty' (2002, p. 77). As we will see later, there are many possibilities and types of encounters (and events), which are assembled and translated in many ways (Pedwell, 2014), and provide means of reflexivity (Butcher, 2017), sensory experiences (Middleton, 2010), rhythms (Edensor, 2010), affects (McCormack, 2003), atmospheres (B. Anderson & Ash, 2015), and many others.

Orderings mean that there are not linear or unique orders, but multiple orderings exist at the same time-space. Thus, 'practices are the context for and necessary condition of those orders, each of which must be actively composed or fail' (B. Anderson & Harrison, 2010, p. 17). Consequently, the social is only one way in which orders *become* systematic by the practices that enact them. Therefore, 'the only way to understand the durability of orderings (or collections of orderings) is to trace the relations between the heterogeneous elements that compose them, to follow how the resultant assemblage functions, and to map the encounters through which the elements within assemblages are brought into contact with forces outside of them' (B. Anderson & Harrison, 2010, p. 18) (see more at Chapter 4).

Consequently, if we want to look at the practices of everyday life, we must look beyond the representation of them. Our focus on affects is not intended to avoid modes of representation but, as Ben Anderson described, we should address 'how representations function affectively and how affective life is imbued with representations' (B. Anderson, 2014, p. 14). In doing so, non-representational styles (B. Anderson, 2014, p. 14):

> ...orientates inquiry to the real conditions under which new encounters, relations and events emerge [...] to the aleatory dynamics of an impersonal, unqualifiable, life that exceeds processes of mediation or organisation and is only imperfectly suggested in the names that we habitually give to psychological emotions or bodily feelings (hope, fear, and so on).

As we will see later, 'affect is the outcome of the encounter between entities and how entities are affected by these encounters' (Ash, 2015b, p. 84). By the effects of affective

[6] Similar to Edward Soja's *thirdspace*, Casey defines place-world as 'a world that is not only perceived or conceived but also actively lived and receptively experienced' (Casey, 2001, p. 687)

[7] Orderings became important in Actor-Network Theory as means of processes of organising and ordering the networks that relate the social in precarious and incomplete processes Law (1992). In that sense, orders are not given. We explore more about orderings in chapter 4.

forces, encounters between bodies generate 'a more powerful whole', but sometimes 'one decomposes the other, destroying the cohesion of its parts' (Deleuze & Hurley, 1988, p. 19). Also, because our bodily capacities are unknown to our thinking, we are only capable only of taking *what happens* to our bodies.

> The order of causes is, therefore, an order of composition and decomposition of relations, which infinitely affects all of nature. But as conscious beings, we never apprehend anything but the effects of these compositions and decompositions. (Deleuze & Hurley, 1988, p. 19)

From the perspective of materialism, Dourish and Bell (2007) argued that new digital technologies make people *re*-encounter space. As a cultural practice, the encounters with 'infrastructures (are) normally taken for granted and an unspoken part of the background, must nonetheless be managed, negotiated, navigated, and made to work as part of the environments and practices that they support' (Dourish & Bell, 2007, p. 428). A similar approach was proposed by Kitchin and Dodge (2011) in their definition of code/space, where spatiality is re-enacted by the possibilities of experiencing new assemblages with the transformation that software and hardware bring to reality and go unnoticed. Like with infrastructure, 'people live in a world of objects; the city can be thought of as a forest of artifacts [...], including those which are quite mundane' (H. Molotch, 2011, p. 66). Duff (2010) also related the importance of intimacy with the practices and encounters that occur in a place to determine the construction of meaning and belonging to that specific place, leading to various *affective atmospheres* (Approached in the chapter 2).

Encounters should be considered not only concerning human bodies but also by other more-than-human bodies and entities. In terms of affective encounters, Ash suggested that other bodies can also encounter artifacts as a means of perturbations (Ash, 2015b). Additionally, Gallagher, Kanngieser, and Prior (2016) emphasised in the existence of different types of bodies, such as sound signals or light emissions [8]. 'Cultural meanings are no longer represented by cultural objects, but are produced at multiple sites and interfaces, between hardware, software and humans' (Rose & Hall, 2016, p. 21).

Encounters between humans and non-humans are inseparable in their occurrence. Encounters are the critical event to understand our approach of *empathic relations* and the effects of every day, passionately, with our cities. This thesis is also an encounter between the reader and the materialisation of our work. While the reader is expecting something, depending on whether it is printed on paper (a book) or projected on a screen, the level of many sensations changes performatively. The reader would expect some novelty, a well-written thesis according to a well-established structure and adequately described research methods. Therefore, the chances of disappointment are higher than in other types of texts. The environments where this can be read are diverse and affect the judgement differently. However, since it is a large piece of writing that can to be read in different parts in different contexts, we hope that the action of reading it suits the reader's expectancy and the content of this work. Like any other, this is a 'textual event' or 'text-as-it-happens' where collaboration between the author, the text and the reader is expected to create new time-spaces of

[8] From the beginning, the idea of artificial intelligence and robotics (probably between the 18th and 19th Century), there have been speculations on how machines dotted with semi-conscious capacities can interact between them. We found this interesting essay from Damien Williams that illustrates some imaginaries of robot attentiveness. It is a speculation that opens the door to new forms of imagination. See: *What It's Like to Be a Bot*, Real Life Magazine. Available at: http://reallifemag.com/what-its-like-to-be-a-bot/

knowledge and scientific embodiments (B. Anderson, 2018). In that sense, the encounter with this work will be as intellectual and emotional as many others, occurring with different intensities and involving different modalities of presence and absence. Although, feelings will arise. We encourage the reader to experience this work, not only like an academic work but as an anticipatory work. Trying to re-imagine the experiments in place, the feelings that are described, the emotional links and to think about the condition of being reading this. To the extent that writing a doctoral thesis is an act of becoming a doctor, reading it re-enacts and builds again the experience acquired by different means.

The studies of encounters presented in this work consisted of analysing the mediation of different artifacts, objects or devices. B. Anderson (2014) addresses the conflict that exists between two different notions of mediation. On one side, Anderson refers to the expression of something 'that stands in-between and reconciles two separate things' (2014, p. 13) which is commonly used in cultural and media studies (and other disciplines based on cognitive theories and traditional communication theories). On the other side, far from being a technical analogy, mediation is understood as an 'ongoing process, occurring through multiple channels and forms (including affective conditions), and involving entities affecting one another in and through relations' (B. Anderson, 2014, p. 13). For the last definition, Brian Massumi makes a difference calling it *inmmediation*, a concept that emphasises the 'nonlinearity of the time of the event' (Massumi, 2015, p. 148). Therefore, this notion calls the attention to events (and encounters) in an always-in-relation to its immediate past (in the form of re-enaction, or reactivation), but as a feeling of its potential.

Nevertheless, we do not take any definition for granted, because different chapters (and the encounters described in them) approach mediation from different perspectives and the possibilities of different types of mediations. If affects and, consequently, empathy are an excess, we should account for the conviviality of the term in different relational configurations. In other words, if affective life can be traced through the processes of mediation, empathy becomes one of the many bodily capacities of being together.

Experiments

The experiments we refer are those that were designed, organised and developed by us, but always involving the participation of volunteers (or third parties). We present three different experiments that are distributed throughout the first three chapters:

1. The first experiment, Social Chatbots, was carried out in 2016 in our laboratory. We designed an interaction with chatbots to evaluate empathic traces, along with the development of interviews and psychological surveys to the participants.

2. The second was held in Lisbon during 2017. This experiment was a co-production with another GEO-C researcher. 'In-between' Methods consisted of the study of the mediation of description tools to discuss the attachment to places in the city. We worked with two groups of volunteers whom we conducted the experiment in three stages: An online map-survey, a workshop and, a walk-along exercise.

3. The last experiment was Atmospheric Lights, a lighting installation that was deployed on the UJI campus during December 2017 and January 2018. We gathered data produced during the interaction and conducted *in situ* surveys.

Experiment Name	Chapter	Data Capture	Analysis
Social Chatbots	1	Semi-structured interview	VAS IRI MIM CA TNA Data Analysis
Atmospheric Lights	2	Deep Cover Visual Ethnography Semi-structured surveys	Interaction Analysis Atmospheric methods
'In-between' Methods	3	Map-Survey Focus group Walk-Along	AAM CA Interaction analysis Cartographic comparison
Exploration 1	4	Deep Cover Ethnography	Interaction Analysis Modes of ordering
Exploration 2	4	Walk-Along	Artifact ecologies Modes of ordering
Exploration 3	4	Ethnography	Interaction Analysis Atmospheric methods

Table 1: List of experiments and used methods

List of references: VAS: Visual Analogue Scale, IRI: Interpersonal Reactivity Index, MIM: Multidimensional Integrative Model, TNA: Thematic Network Analysis, CA: Conversation Analysis, AAM: Affective Appraisal Marker.

Explorations

We call explorations to processes of observation, analysis and study of assemblages, encounters and interactions. Such explorations intended to better understand some phenomena by ethnographic methods (accompanied by the use of cameras and research notes) that would allow us to describe them better. However, for carrying out these explorations we didn't delineate any method in advance, but explored a form of 'research in the middle' (Springgay & Truman, 2018a). However, we present each of the three explorations in the fourth and last chapter, contrasting different disciplinary approaches to fulfil our research goals.

1. The first exploration was carried out at the end of 2016 in two Spanish cities (Castellón de la Plana and Barcelona), New York (USA), and Trento (Italy). It resulted in an attentive mode towards the interaction with mundane objects in daily commuting practices.

2. The second exploration was carried out during 2017 at Lisbon, Portugal, in collaboration with some other students. Its outcome was to understand the contribution of non-human agents to the generation of specific actions.

3. The third exploration was carried out in Barcelona in 2018. A public event was used as an excuse to understand how the relations of lighting installations are part of the emergence of atmospheres.

Expected contributions

Our position is to provide a critical theory regarding the affective ways in which technologies are assembled and constitute our reality. We, therefore, offer possible alternative models, look for disjunctions between the discourses and practices, and highlight the unat-

tended (Brenner, 2009). For that reason, we suggest that digital technology can foster different empathic relationships than it does now with the urban environment if we look at the causalities, effects and consequences of the geographies of empathy.

We find ourselves in constant and unavoidable contradictions between the propositional and critical roles, which challenge us in the interdisciplinary approach adopted for this work and that are reflected in the difficulties and disputes within the academia itself.

For that reason, we present this work as a critique of the experience of place and the deployment of smart technologies in cities, to initiate a constructive discussion to revalue the enchantment of spaces as a means of technological improvement to cultivate better places. We argue that all places are constituted by a series of individual, collective and environmental conditions and practices that are blended in metaphors (Bødker & Klokmose, 2015; Bødker, Korsgaard, & Saad-Sulonen, 2016) and affect our feelings and emotions in relation to them.

Coote and Shelton (1992) used the term *enchantment* to refer to art as a technology of enchantment and to state that all kind of technical system (and including art) is immanent enchanted. While Latour (2013) called it a technical folding, entailing implications, complications, and explanations that transform such technicalities into abstractions. Sengers, Boehner, Mateas, and Gay (2008), in an empirical experiment, cited the disenchanting of modern society that Weber proposed as a social need of continuously rationalise our life, and suggested to use technology to re-enchant us with emotions.

In this schema, technology and the so-called smart cities approaches can undoubtedly play a role to accomplish enchanting experiences of daily life practices. For example, Caldwell and Foth (2014) addressed how media architecture can modify and engage citizen's attention within places, while in Foth et al. (2015) a list of urban infrastructures are intervened to alter the 'make-meaning' process of enchanting spaces as a form of activism seen as a *right to the digital city*. This work calls for rethinking the concept of place by reflecting on our own experience of place which lets us introduce and discuss novel perspectives to enrich and shape our line of argumentation for cultivating places.

Rather than focusing only on a critique to existing smart cities approaches and narratives, our argument allows us to understand better how daily life activities are normative and able to reproduce society codes and rules. Besides, we argue that even in the most unexpected spaces, places are in ongoing cultivation through personal and collective interests.

Even more, we should not deny that all the social progress is rooted in socio-technical forms of collaboration [9], which does not mean conceiving a technology and putting citizens afterwards. Whether intentional or not, processes of contest and resistance will occur and technological stabilisation will always be political (Bijker & Law, 1992). As Farías (2011) stated, the study of urban assemblages as a political project 'is connected with a redefinition of democracy towards participatory practices that might eventually recognise and represent humans and non-humans as political actors' (Farías, 2011, p. 371).

In summary, in this thesis, we present and engage with some concepts and ideas, and provide evidence that results from different experiments, to help us to evaluate and plan the strategies in the search to design better places. In that vein, we take a different perspective to argue:

[9] Many studies around STS explain the importance of studying how these assemblages and trajectories of socio-technical solutions took place in our society. Some interesting examples could be found in *Crafting stories of technology and progress: Five considerations*, TECHNOLOGY'S STORIES. Available at: http://www.technologystories.org/crafting-stories/

- Our spatial experience goes well beyond the rational but in relation to our cognition, perception and symbolic understanding of the world.
- Contrary to what models based on rational answers to external stimuli pursue, our senses in relation to our bodies' affective capacities is one of the keys to understand such experiences.
- Because we put the notion of place at the forefront of this research, we propose a set of competencies and enablers of place. These competencies must be taken as being potentially embodied, captured at the moment of interaction by the triad of affect, feeling and emotion, and then perceived as a whole.
- Finally, affects reinforce and re-enact the shared manifold through which 'in-between' spaces are sustained in different levels of intensity. We account for how these intensities, which are translated into forms of power, order our lives. Consequently, we argue that, between different relations of power, bodies get entangled in relations that can be understood as forms of empathy.

However, many questions will remain unanswered: How can technology alter or sustain these relations? What technology's capabilities can provide distinction to a place? How can we ensure access, diversity and equality in urban societies?

We want to emphasise the importance of urbanism oriented to improve life and experiences. While top-down and bottom-up interventions take place in different scales, forms or organisational schemes, the life experience is a continuum in the reproduction of practices unfolded in events. As Balestrini stated, 'framing an issue doesn't necessarily imply a normalisation of the issue at stake, opposite to the creation of attachments but rather a pragmatic approach to foster action' (Balestrini, 2017, p. 249). In this sense, we seek a co-production of space not regarding planning and stakeholders' negotiation, but as a critical approach to encounters as processes of reproduction of norms, rules and codes, shaped by everyday practices, encounters and interactions between human and non-human entities.

As an 'anticipatory knowledge' (Kinsley, 2012), and despite criticisms about continuing to use the term Smart City, we would like to bring new possible futures, or scenarios, to play with the possibilities of a better, but not free of controversy, society.

Limitations in the process of research

We should express our difficulties based on the size of the topics that have been discussed, the time that the experiments were held and the unavoidable progressive construction of the argument. Consequently, many of the topics were touched from many angles during the process of research, where we found contradictions that are difficult to resume in a single work and delineate it kindly without loss any point of view. Although, given the reality of the over-information in the advent of the Internet and ICT's, the effect resulted in believing that everything that was produced during the last centuries in the academia and outside of it. Therefore, the increased workload could be affectively and effectively reduced to a single work in only three years is far from being possible for a young researcher.

In that sense, during the period of research, we submitted many publications from which only a few were published. That exercise helped us to have enough reviews and support from academic fields that we approached, but at the same time, the rejection was painful for

the spirit of the job. It is known that multidisciplinary PhD programmes use to face more difficulties, usually between the limits that represent the confinement to a single discipline and, the obstacles to successfully address the expected outcomes (Lindvig, 2018). We can consider it as the consequence of diving in the fields of other disciplines, and to follow our curiosity of discovering, than to stay in safe waters keeping our scientific process inside the walls of the *known unknowns*. That also took us to transform, re-arrange, modify, our work plan and experiments many times, and is during the writing of this thesis where we can make sense of the totality of our work. For that reason, we encourage the readers of this work to be open and flexible.

Finally, because this project was funded in the context of the 'GEO-C: Joint doctorate in GeoInformatics' program, with a special focus on providing tools for 'enabling open cities', we did not want to propose an alternative to developing tools with a promise to enhance cities concerning efficiency. On the contrary, we intended to provide means for generating a critical assessment and inquiry over which we can build up alternatives employing an ethical consideration, based on the multiples views that we already account.

Thesis structure

Our argument is delineated in three stages. The first is a theoretical, cross-field framework that incorporates Science and Technology Studies, Human-Computer Interaction, Urban Planning, Environmental Psychology, Human Geography, Digital sociology, among others. This study seeks to explore the relations between place, objects and empathy that will lead to a comprehensive knowledge of the possibilities of our primary goal. Questions such as Why do I like a place? How do the feelings within a place can be amplified? What are the roles of objects in our daily life trajectories? How are affective atmospheres assembled in encounters? What can a body do? (refering to Spinoza), or What do encounters look like? (following Latour), will help us to provide a framework and guidelines to develop technologies for raising empathy in urban spaces. Secondly, a set of experiments will be held to collect empirical data to support our framework and address the research questions. Thirdly, we will analyse and propose practices for designing new experiences, their consequences and effects. This set of guidelines will facilitate designers and technologists to think outside the cognitive perspective to understand the possibilities and implications of the process.

This thesis is articulated in four main chapters. Each chapter is aimed to specifically address one of the leading research questions [RQ], although readers will find that experiments also refer to local research questions [Q] other than the primary one, which altogether helped us to frame their design (see Figure 2).

Each chapter has a small abstract to introduce the reader to the topic. Even if each chapter proposes a topic and a discussion around each of the research questions, all of them are interrelated. For clarifying our writing style, quotes are cited with simple comas, while long quotes are indented for a clear reading.

At the same time, the theoretical material is as vital as experiments and explorations. For that reason, at the end of every chapter, we offer a discussion of the results between the local questions [Q] and main research questions [RQ] as a scenario for an alternative Smart City. In other words, the answers can be found as a thoughtful expression that will account for the multiplicity of opportunities given the empirical and theoretical experience presented.

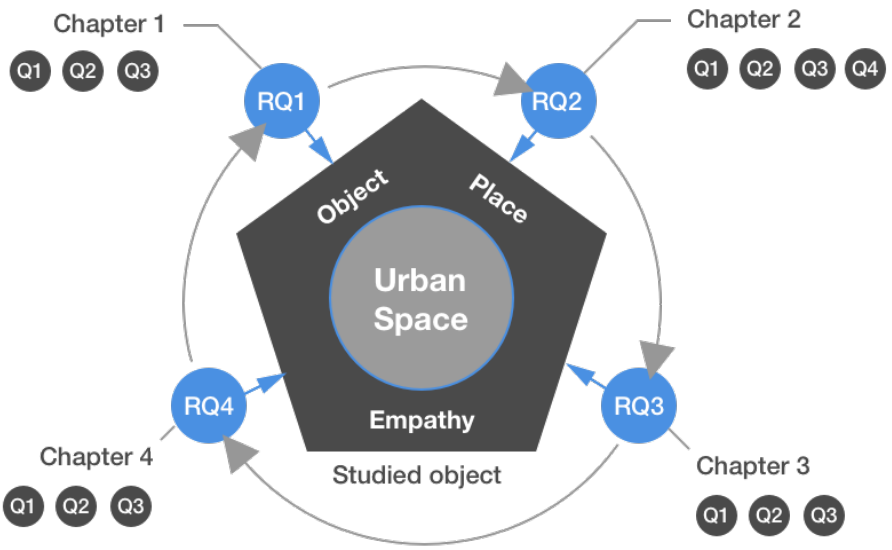


Figure 2: The triad showing how we distributed the research questions in different chapters

Chapters one, two and three address the three experiments that were held during the experimental phase of the research, approaching the three objects of study (place, object and empathy) in a different relation, scale and presence. Chapter four takes the form of a discussion where three explorations help to contextualise the ethical and political implications of the previous three chapters. Consequently, the fourth chapter is highly theoretical rather than empirical but can be considered as the main contribution because it places in perspective the different approaches and disciplines that we put on board for this work.

Finally, in the Conclusions chapter we present the major and minor contributions of the thesis, including a summary of the achieved results addressing the four research questions and how they can project alternatives to smart cities.

Research In the Wild (RITW) model

RITW studies have shown that *in situ* experiments enable researchers to 'explore how a range of factors can influence user behaviors' (Rogers & Marshall, 2017, p. 4), and also provide unexpected findings about 'what humans might or might not do when confronted with a new technology intervention' (Rogers & Marshall, 2017, p. 4).

Following Rogers and Marshall (2017), we decided to use the RITW model to understand what is the contribution of each of the experiments that we held. This framework is briefly presented in this section (see Theoretical approaches) to understand the contribution of RITW experiments, which some-

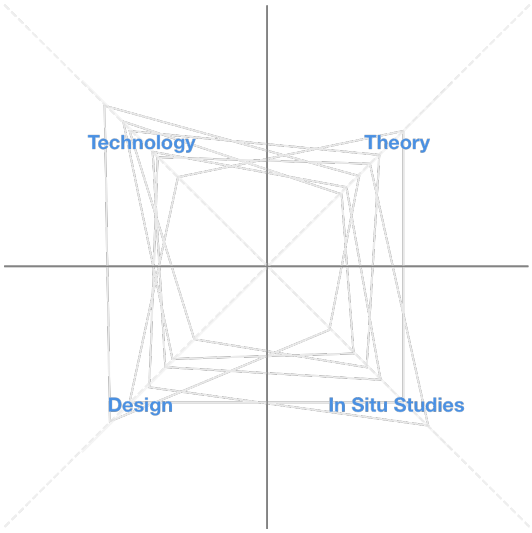


Figure 3: The RITW model

times could lead to uncertain results or discoveries that are hard to interpret, but can be a revelation about what happens in the real world. Therefore, this framework gives certain 'ecological validity' (Rogers & Marshall, 2017) to the results of the experiments.

The framework is divided into four dimensions, that informs and operationalises the freshness of results on each of the experiments. We adapted the description proposed by the authors to our commitment:

- Technology: An experiment could test new technology, or an old technology in new ways;
- Design: Regarding methods to test or create relationships around the use or assemblages of socio-technical experiences;
- *In situ* studies: The influence and the importance of the experiment regarding the locality of its realisation;
- Theory: The contribution of the experiment to a new theoretical approach, concept or phenomenon observation.

At the end of each chapter, we summarised and valued each contribution of the presented experiment. A small remark will provide a graphical and textual description regarding the RITW framework (see Figure 3) to contribute to the general analysis of place, object and empathy.

Theoretical background

Our work addresses the complexity of the urban space from a holistic model that includes a variety of approaches and ontologies, based on different disciplines and fields. Each field has its own goals, methods and theories to approach diverse socio-technical assemblages and phenomena.

The disciplines in Social Sciences and Humanities faced the phenomena of social organisation mainly as observers, focusing on description and explanation. Philosophy, literature and cultural geographies reflect the societal interpretation of them, while social sciences and STS tend to focus on explaining networks and power connections that make these phenomena happen. On the other side, Computer Science and Design Research are disciplines that take more pragmatical proactive perspectives. As noted along the text, we have a personal preference for representational and non-representational perspectives (also called representations-in-relation by B. Anderson (2018)), exploring the conscious and non-conscious reflection of reality through the procedural, performances and events.

Therefore, we summarize our method as a dialogue between theoretical approaches that attends to a 'speculative pragmatism' (Vannini, 2015, p. 62), which consists of following the experience of research around a topic instead of pursuing a common research method or approach. As Vannini stated, a method 'must emerge from within the occasion of experience, and cast out from within its formation the stakes of its coming-to-be.' (2015, p. 36). We work around the emergence through 'research-creation', to which our research becomes an opportunity for 'enacting both social science and participatory art as simultaneous and mutually reinforcing experimental methods for generating provocative awareness' (2015, p. 131).

In this thesis, we organise the works in the form of a relational inquiry, to give meaning to the inputs and outputs of each experiment and to highlight the findings, not only to address the research questions but also to open the doors to new hypotheses. It seemed us fundamental to wonder 'where we stand' with respect to the scientific method, the academia and the existing work looking for novelty in research. By doing so, we are discussing the modes of existence of our fields and the limits of knowledge that surround science, technology and society. In other words, we are challenging them.

Dourish and Button (1998) approached ethnomethodology as a sociological inquiry within HCI and CSCW. They started with the works of L. A. Suchman (2007) (explained later), participatory design and ethnography. In their work, they found two paradoxes of the system design that have been exposed thanks to the ethnomethodological approach. The first one is that the large scale of design systems has an apparent effect on, and is composed by, small-scale actions (ethnomethodology pays particular attention to details of everyday practices). The second one is that by paying attention to detail, it is impossible to being propositive, but descriptive (a topic that we acknowledge along this thesis). Therefore, the authors faced this paradox by including the ethnomethodology approach in order to explain and reinforce the process of system design.

We found ourselves in a similar situation, addressing an extremely theoretical work. For that reason, we forge in this chapter a common ground for all of the main concepts that concern this thesis. Given that we cover different fields, we also consider that the audience of this thesis may not be familiar with all of the theoretical approaches introduced next. To ease the understanding of the collection of theoretical approaches, we classify them into descriptive or propositive, based on their outcomes and contributions to this thesis. However, one of the approaches lies between these two categories. We call it anticipatory studies and design fiction that touches our two intentions and, therefore, defines the spirit of our work.

Descriptive approaches

Theories of social practice

Within social sciences and anthropology, it does exist a distinction between theories of social organisation, from classic structuralism to cultural theories. For this thesis, we take a more contemporary approach as a point of departure that draws upon the concept of practices. This approach is not a closed theory, but a common path between different backgrounds that include the works of Pierre Bourdieu, Anthony Giddens, Michel Foucault, Harold Garfinkel, Judith Butler and Bruno Latour, among others.

Practice is the centre of the social, and is conceptualized as 'a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, "things" and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge' (Reckwitz, 2008, p. 249).

Therefore, authors conceive practices as 'embodied, materially mediated arrays of human activity centrally organised around shared practical understanding' (R.Schatzki, Cetina, & Savigny, 2001, p. 11). That is that practices are social and unveil the orderliness of the world. This approach is a differential from those ideas that place the mind or the semiotics at the centre of the social order. For practice theorists, bodies and activities are co-constituted within practices. In that sense, the condition of human bodies and the character of non-humans are contingent to those practices.

Practices are relevant for our approach to the notion of empathy because it is a way to understand the world, a form of shared knowledge. In that sense, the idea that practices take place in our lives is through patterns and routines. Consequently, analysing the 'breakings' and 'shiftings' of the everyday routines is at the core of the empirical practices of such studies.

In this regard, the distinction between action, habit and practice will appear as contradictory in this thesis. To clarify, *practices* is known as a collective set of practices, while *actions* are embodied movements that can be (or not) part of practices (we will explore this further with affective theory).

Finally, it does not exist an agreement on how to treat *habits*. For Barnes (2001), habits are practices at the individual levels. These habits are not necessarily foundational to practices, mainly because habits do not entail the same shared knowledge between individuals. Also, they change over time in the same practices. However, further, than understand habits as individual competencies, Bissell (2015) highlights the importance of habits for the study of mobilities. He emphasises the role of intensities and the quality of lived experience that the study of habits can bring to the cultural geographies. In a raw definition, habits can be

thought 'as a virtual infrastructure that augments the carrying work that physical infrastructures do', and it allows to understand 'how all movements stretch beyond themselves to condition future movement' (Bissell, 2015, p. 132).

Nevertheless, because we are approaching this work from a trans-disciplinary approach, these terms used in this thesis might sometimes be contingent to their context and the disciplines that we take at that moment.

Actor Network-Theory

From the description of big technological systems (Hughes, 1987) to considering the social construction of technology by Bijker, Hughes, Pinch, and Douglas (2012), the primary goal of Science and Technology Studies (STS) is to explain the relationship between society and technology.

As John Law reflects 'STS has started to explore the ontological, the doing of the real, as well as the epistemological or the representational' (Law, 2008, p .638). For that reason, the importance of doing an in-depth analysis of the creation of meaning in a sociological context, cannot only explain the interaction and its meaning but also conceive the symmetrical relation between society and technology.

Because this thesis is about the role of objects and bodies in society, it is unavoidable to include at the core of this thesis the notion of networks brought in the advent of the Actor-Network Theory (Casper & Latour, 2000; Latour, 1996, 2006, 2011b). The metaphor of a network was used by scholars to draw the role of technology in the development of society (and vice-versa) as socio-technical assemblages. From a constructivist perspective, how networks are initiated and mediated by actants is vital for a better understanding of socio-technical systems. Latour defined actants as 'something that acts or to which activity is granted by others. It implies no special motivation of human individual actors, nor of humans in general' (Latour, 2011a, p. 7). The description of a network is the body of practices and activities that explain the relations and interactions among actants in space and time. This idea is meaningful when we are observing how and under which circumstances technology can motivate, impact, and influence behaviour changes in any context.

To explain it briefly, in Actor-Network Theory (Law, 1994, p. 100) agents may be treated as relational (and not unified) effects. Accordingly, agency is a precarious achievement. So Actor-Network theorists treat the social world as a set of more or less related parts. Another important thing is that for actor-network theorists there is no reason to be a technological determinist. Ergo, assemblages are treated as socio-technical means. At the same time, a technology could be either an artifact, a process or an organization.

This socio-technical approach, which is intended to have a theoretical output, has in mind the translation of technology, learning processes and its political implications. Thomas (2013) developed the concept of socio-technical dynamics that allows to map the interactions between actors and to relate causal explanations.

In this thesis, the goal is not to develop an ANT analysis, but to consider it as a theoretical point of departure. In Chapter 4, we will introduce modes of ordering, an approach that reworked ANT in the form of relational materialism. It will help us to drive the design of experiences and analyse their effects and consequences in order to share them and allow others to adapt our knowledge and development to their purposes.

Non-representational and affective theories

We already presented affects as forces or capacities to affect or being affected between bodies. This relational materialism (also referred to as material poststructuralism (B. Anderson & Harrison, 2010) and vital materialism (Bennett, 2004, 2010)), is one of the main concepts for many scholars and practitioners regarding what is called non-representational theories (NRT). Even though there is not a unified corpus of literature that defines this approach, it is usually rooted by the principles of Actor-Network Theory, along with contributions of phenomenology, and the recently recovered Spinozist and Deleuzian philosophy. The core of NRT is what exceeds our capacities to express, or the non-conscious aspects of life. Moreover, in Cultural Geography some authors developed a set of methods (Vannini, 2015) and common theoretical ground (Dirksmeier & Helbrecht, 2008; Thrift, 2008) for this relational-material account on the 'weaving of material bodies that can never be cleanly or clearly cleaved into a set of named, known and represented identities' (B. Anderson & Harrison, 2010, p. 13), which remains open due to its own nature.

B. Anderson and Harrison described the starting point of the NRT as the following: 'Thought is placed in action and action is placed in the world' (B. Anderson & Harrison, 2010, p. 11). Thus, the utility of non-representational theories is to 'configure geographical thought in the same way that it configures life: as a series of infinite "ands" which add to the world rather than extract stable representations from it' Cadman (2009, p. 1).

Ben Anderson argued that the notion of non-representational 'is used when gathering together a heterogeneous set of mostly, although not exclusively, materialist post-structuralist theories that share some loose starting problems, specifically: how sense and significance emerge from ongoing practical action; how, given the contingency of orders, practical action is organised; and how to attend to events and the chance of something different that they might open up' (B. Anderson, 2014, p. 12-13)

If we question the possibilities of relating place and bodies in terms of empathic relations we must address the understanding of place under NRT. Under this approach, we can find new inscriptions of what empathy could be and how it can be related to the embodiment of a 'particular moment' of place. In words of Casey, the 'enactive vehicle of being-in-place is the body' (Casey, 2001, p. 687).

Nigel Thrift made a huge contribution to NRT in the beginning by following a path of relational materialism to understand place as a 'spectral gathering'. Based on four competencies of places as relational spaces, he stated that 'it is how they matter and why they matter' (Thrift, 1999, p.315):

1. **Things** and the embodiment of the powers of affective capacities;
2. **Emotion** as means of attunement with the others;
3. **Memory** as a register of the experience of such attunements;
4. **Language** as a virtual form of structuring achieved through use.

His proposition was anticipated by Norberg-Schulz' genius loci in which the space we relate with 'is determined by what is visualized, complemented, symbolized or gathered' Norberg-Schulz (1980, p.58). By the combination of such competences, places are always open and incomplete. In other words, 'to experience a place, is to be *affected by place*' (Duff, 2010, p. 881).

The point of NRT is how to analyse representations to understand what cannot be represented and to question the place of representations as a political stance. This is because affects were taken and coined by Massumi (2002) as 'a quality of life that is beyond cognition and always interpersonal, inexpressible. [...] Unable to be brought into representation.' (Pile, 2010, p. 8).

Affects, feelings and emotions are sometimes used as something similar, but the distinction among them raised in importance for non-representational theorists. Affect is considered a double embodiment, i.e., to affect and being affected. It is not possessed by a subject (B. Anderson, 2006), an emergent, a transition that has to be 'taken together'. It is trans-personal. It is an enactment, and can be witnessed as an energetic manifestation, while it is entirely situational in time-space. There is no any before or after, and it is always in movement. For Anderson, there are processes of circulation, flow, transmission or contagion of affects. However, affects are understood as the power of existence, a transition that is felt and carry no specific relation with the notion of scale and cannot be related to a single location, but to an in-betweenness (Massumi, 2015).

'Affects are more than mere feelings or emotions; they also constitute an action-potential, or an individual's dispositional orientation to the world' (Duff, 2010, p. 885). This means, that 'they also frame the array of activities and practices potentially enactable within that place' (Duff, 2010, p. 884). We highlight the correlation between the act of gathering in a particular moment, from the Thrift's definition of place.

While the discussion between scholars depends on the disciplinary approach, we have to take into account the discrepancy between the notion of affects and emotions in many of them. For example, differences reside between ANT and NRT in conceiving feelings and emotions. Even when non-representational theorists are more focused on affects, in ANT, feelings are the same as emotions and are less important in relation to the networks (Rose, Degen, & Basdas, 2010).

We consider that expressions of emotions and embodied affection are both important, but we can only account for the first to represent phenomena. In words of Pile, 'emotions that might appear on the surface cannot, in any way, be traced back to some affectual precondition.' (Pile, 2010, p. 9). On the other side, 'affect takes place before and after the distinctions of subject-world or inside-outside' (B. Anderson, 2006, p. 736).

Although, affects can be registered in the description of situations. Anderson's three-layered mind-body model (B. Anderson, 2006) helped us understand how to be flexible in our observation between layers in this work. However, more importantly, it is to pay attention to feelings and emotions. In his words, affects are non-cognitive, trans-personal states; a between-emotions. Affects move between bodies and spaces. In contrast, a feeling is the pre-cognitive condition of an affected body, but not yet expressed or named. Also, an emotion is a subjective expression of such feelings made conscious (B. Anderson, 2006; Pile, 2010).

What makes affects complex phenomena is that they are non-linear, are relational by nature, and are characterised by their multiplicity. Anderson notice that we should not look for causality or direction between affects, feelings and emotions. Instead, causes or effects of phenomena are orderings that we use for making sense of the multiplicity of our physical reality.

The notion of affects becomes critical because 'emotions and feelings are produced through actualisations and can never coincide with the totality of potential affective expression' (B. An-

derson, 2006, p. 738). The description of daily practices from the perspective of affects is controversial because everyday life is irreducible and always exceeds closure.

Although Pile (2010) concluded, that emotional and affective geographies share the notion of its mobility, both flow between people and other things. Also, both affects and emotions rely on narratives to strengthen their existence. Thus, ethnographical methods become the common approach and the path that we will take to our work.

What is important to us is that non-representational theories take us to a position of observing non-psychological description of everyday events (but not denying the conscious and rational capacities), escaping from the dualities such as the mind/body, human/non-human or subject/object, and committing us to look into the encounters and material reconfigurations. This will allow us is to observe from far of the social engineering of emotions, which are political by nature (Thrift, 2008, 2016) (See chapter 4). Consequently, we will use definitions and methods taken from NRT all along the thesis.

Propositive approaches

Affective computing

Because we are working with empathy and the possibilities of enabling relationships with objects, and other non-human actors, it is necessary to approach the recent discursive constructions within computer science and cognitive sciences. The term affective is problematic because various disciplines use it differently. For this reason, we want to introduce the perspective on affective computing to address possible confusions with affective theories in the NRT.

In the 1990s some advances in neuroscience and cognitive approaches put the emotions again in the centre of the scene after being reduced to an undesirable and irrational judgement (Armony, 1998). The MIT researcher Rosalind Picard developed a conceptual implication of affection in machine development (R. W. Picard, 1997). She based her *affective computing* theory on psychological tests and neural responses, linking decision making to the role of emotions. She argued that machines should recognise these emotions to assist people effectively. As such, Picard offered a set of useful guidelines to design affective systems. Later, Picard and colleagues (R. Picard, Vyzas, & Healey, 2001) argued that machines should provide some affective feedback to the user's emotional state. Specific signals and context would measure this emotional state. However, authors disclaimed of it because even humans have difficulties to determine and categorise correctly others' emotions. The proposed solution was to match gesture patterns to psychological signals, admitting some limitations: first, because emotional response changes from day to day, it is difficult to determine the continuity of measurement; and second, only some specific emotional features can be matched with real emotional states. Other methods presented later by Lottridge, Chignell, and Jovicic (2011) as *affective interaction* also took Damasio's mirror reactions to trace a cognitive model for explaining how affective reactions are translated to emotions and, act in the process of defining the temperament of the person.

Despite the efforts made to progress on this topic, there remain unknown factors to study the implications of computing and machine learning in our feelings and emotions of daily lives practices. For example, Cassell (2000) stated that language ability does not make the agent more social, but the non-verbal actions in cooperation. Beyond of primitive responses

and facial expressions (deeply explored in chapter 1), it remains unclear how conversational situations impact on our emotions.

This lack of correlation means that a critical weakness in artificial intelligence remains unresolved, which raises the problem of how humans treat symbols. Also, concerns to how explicit emotions and feelings are representations of what the body feels. This problem was first described at the beginning of the artificial intelligence program by Husserl (Münch, 1990), and was part of the historical conflict between the phenomenology and cognitive fields.

Moreover, social and cultural effects on algorithmic-powered technologies have recently raised considerable interest in the HCI, Computer Science, and Sociology communities (Blythe & Buie, 2014; Dourish, 2016). Beyond technicalities on affective computing, it is a current concern how this feedback can modify the social condition and personal relations. We will further analyse it in the Embodied interactions section of the second chapter.

As a matter of concern, we argue that affective computing follows the path of what Pedwell (2014) called 'sciences of empathy', rooted in the behavioural sciences. These sciences look at the affective realm as mere information (following the models of cognitive sciences) that can be traced down from inside the bodies, and not as a force that is 'in-between' (we recommend to follow the critiques of such model in Boehner, DePaula, Dourish, and Sengers (2005)).

We found that some scholars focused on empathy from the affective computing approach. They took an approach to empathy from psychology that treats empathy as a human ability to identify oneself with the feelings and ideas of another person. The work of Ekman (2004) was essential for computer scientists in considering (wrongly) face expressions as emotions. Ekman simplified empathy for something that can be programmed on people:

> This feature of our affect programs makes it possible for us to adapt to whatever circumstances within which we live. It is why our emotional responses are linked not just to our evolutionary past, but also to our own personal past and our present. (Ekman, 2004, p. 87)

Nevertheless, he summarised empathy intro three kinds: affective, cognitive and compassionate. The affective style, as he called, was related to feeling what others feel, noting the importance of attentiveness and intensity. These empathic styles were taken by Coulton et al. (2014) to work around empathy between users, but it was always reduced to an exchange of knowledge or, feelings-as-information. The questions that have driven the research were of the kind of 'How do they do? How do they feel? How do they know?'.

In a second example, Wright and McCarthy (2008) considered empathy as a defining characteristic of 'emotional encounters' designer-user relationships. They defined empathy as a tool for 'inspiration achieved from a rich understanding of people's experiences, dreams, expectations, and life contexts and' (Wright & McCarthy, 2008, p. 637).

Because there are confusing trends regarding what empathy is within computer science, there are current calls to go against empathy arguing that they respond to colonial [10], neoliberal (Pedwell, 2012), or racialised/gendered motivations[11].

[10] See the critique to the adoption of empathy in new media by Jade Davids (*Draft of Empathy Manifesto #1: Emerging Technologies (VR) or Technically Feeling*, Jadid.com. Available at: http://jadedid.com/blog/2018/05/21/draft-of-empathy-manifesto-1-emerging-technologies-vr-or-technically-feeling/) and, Virtual Reality by Elvia Wilk (*Trauma Machine: Rewiring empathy with virtual reality*, The Western. Available at: https://popula.com/2018/07/09/virtual-reality-empathy-trauma/).

[11] See how AI recruiting tools are biased by human choises (*Amazon scrapped a secret AI recruitment tool that showed bias*

Approaching affective theories from HCI and Participatory Design

After presenting both approaches to affects, we want to recognise some works in which HCI/CSCW scholars took the affective turn in the same terms that we present in NRT with varying degrees of success.

In Boehner et al. (2005) the notion of affects is 'not a representational state to be transferred from one place to another, but rather is an aspect of collectively enacted social settings' (2005, p. 64), which appear to be closer to the NRT's principle of affective theory but mainly grounded in phenomenology. The authors gave some advice to interaction designers such as 'not making systems more aware of emotions but making people more aware of emotions through system use and design' (2005, p. 66). The main output from their experimentation on affect was that practitioners should provide flexibility to the system in order to promote self-awareness, instead of interpreting people's emotions through logic. Recently, Fritsch and Jacobsen (2017) approached affective theory to work with artifacts that help to solve situations of unexpectedness, precarity and crisis. Their approach was to work with rhythm and senses, to engage different bodies.

In both examples, we saw that scholars approached the affective responses effectively without giving an explanation of what happened, and avoiding any information processing regarding binaries (Fritsch & Jacobsen, 2017). Because affects exceed explanatory capacities, the description rather than the explanation is essential to NRT. Although, it seems still tricky for many to understand the potential and importance of the affective theory in propositive practices.

For example, in a recent paper on participatory design, Frauenberger, Foth, and Fitzpatrick (2018) understood affects as something separated from the conscious and cognition (which is not), and as an explanation of the irrational. In this case, the causes and effects of our explanations to the world should not be understood that way. On the contrary, affective theory escapes from that dichotomy by understanding the multiplicity and the immanence of events. The absence of order doesn't imply irrationality, because affects exceed our body/-minds there isn't any accountable order, but orderlinesses[12].

In summary, we believe there is much to explore to approach HCI/CSCW from an affective theory effectively. Consequently, an outcome of this thesis is to develop a theory of empathic relations from such a perspective that contributes to design practices in positive ways.

Researching In the Wild

In the introduction we briefly presented the Research in The Wild approach as a methodology to understand the contribution of each experiment. In this section, we discuss its origin and foundations.

Urban probes consist of 'a method to instrument urban artefacts to inspire the public to have a discussion about their urban landscapes' (Salim & Haque, 2015, p. 35). The capability

against women, VentureBeat. Available at: https://venturebeat.com/2018/10/10/amazon-scrapped-a-secret-ai-recruitment-tool-that-showed-bias-against-women/).

[12] *Orderliness* is a notion used often in Phenomenology and Ethnomethodology and refers to the apparent stability that emerges under implicit rules in the occurrence of an interaction, however 'orderliness itself has precedence over rules'(Liberman, 2014b, p. 16). Its contingency is usually related to a conversation, talk or human-to-human interaction, although L. A. Suchman (2007) also accounted in human-machine interactions. The notion was treated in extension by Garfinkel (2013) in his inquiry about the social order. For Garfinkel, orderliness is witnessable through the actors that make their actions accountable to the others. 'There are many venues in our everyday lives where objective rules or laws can contribute to the orderliness of the social interaction. In addition to rules, the locally concerted practices of the persons who staff those occasions contribute to the orderliness.'(Liberman, 2014b, p. 12)

of new urban probes is thus defined by enabling the inscriptions of the reality of social life (e.g. digital footprints). These inscriptions can be useful in an analytical approach, in order to define the stability that society reflects on behold of the constant controversies. This approach, held by the anthropologist Latour (2011a), is based on the idea that there aren't static places in the social construction of everyday life, but the existence of phenomena is a continuous negotiation between the actors. Latour put forward that technology and society had also controversies. For that reason, neutrality or stability are not characteristics to describe the technology. To this regard, Venturini and Latour (2010) criticise the assumption of the emergence of the social phenomena (and technological novelty), because it is only the lack of stability which resists to the existence of the social phenomena. Here, it turns evident that social sciences have a central role in the analysis of new technologies.

As it is widely recognised in the literature, traditional quantitative and qualitative methodologies are not enough to deal with the current possibilities of analysis while micro and macro scales are seen indistinctly:

> Still, this disproportion is a problem only as long as we insist on treating digital data as if they were survey data. The advantage of the new methods is that they allow tracing the assemblage of collective phenomena instead of obtaining them through statistical aggregation. The question of representativeness is thus posed in an entirely different way. (Venturini & Latour, 2010, p. 7)

The Human-Computer Interaction (HCI) field, one of the most advanced disciplines that work with technology and society in a practical scope, has traditionally experienced a great variety of research methodologies, combining quantitative and qualitative research methods. Beyond this, it was recently referred 'HCI in the wild' as a set of research methods which avoids lab-centred tests and prioritises to experiment directly in the field, where social interaction occurs:

> Designing in the wild differs from previous ethnographic approaches to interaction design by focusing on creating and evaluating new technologies in situ, rather than observing existing practices and then suggesting general design implications or system requirements. [...] Instead of developing solutions that fit with existing practices, there is a move toward experimenting with new technological possibilities that can change. (Rogers, 2011, p. 58)

For some authors, the strengths in scientific terms of these methodologies that take place 'in the wild' are yet unclear. Höök et al. (2015) showed concerns about the created knowledge, called as an 'intermediate knowledge'. Specifically, the authors recognise the usefulness of the knowledge created, but it does not comply to biggest theories. In the same way, Nova (2015) takes the concept of 'theories of middle range' but he highlights the design as a propositive and speculative discipline.

This type of pragmatic approach that takes place in the field can be also mixed with traditional observational methodologies, like ethnography and ground theory. This combination is what Blandford (2013) defines as Semi-Structured Qualitative Studies (SSQS). Remarkable examples of SQSS are the PhD theses of Girardin (2009) and Balestrini (2017), who used different methodologies and data gathering techniques to analyse the socio-technical possibilities of using design-as-research approaches.

Although, as Rose and Hall (2016) manifested, there is a significant number of technical difficulties, frictions and open questions regarding the use of mixed methods, digital technologies and *in situ* research. Therefore, it is a good reason to follow this path to understand the contemporary cultural and social values that Rose described as mutability, multimediality, and massiveness.

Research in the Wild becomes a useful methodological approach to consider and evaluate our experiments. We take it as a form that falls between the methods used by social sciences and humanities and the traditional computer sciences and informatics forms of research. Research In the wild has been used as a RITW model to visually represent the contribution of each experiment of this thesis.

Anticipatory Design and Design Fiction

Finally, we believe that there is an event in the middle, between descriptions and propositions. Design disciplines have been worked on many occasions and have taken advantage of social sciences and humanities to enrich their own practices. For that reason, we placed this approach outside our twofold distinction.

We already mentioned the use of anticipation as a method in technological developments. Even though, Kientz and Wobbrock (2016) pointed out that contributions in HCI can be quite diverse, ranging from empirical research to artefact design, methodological and theoretical frameworks. The use of mixed methodologies to bring new insights to research is not new. Semi-Structured Qualitative Studies (Blandford, 2013) and design-as-research (Fallman, 2008) have been tested in HCI (a. Crabtree & Chamberlain, 2013; Girardin, 2009) and other fields.

To understand how we can develop these new interactions, we have to look at a discipline that fully embraces these matters. 'Anticipatory ethnography' contributes to building imagined, future experiences and desired relations, even more:

> ...anticipatory ethnography suggests that the properties of the traditional inputs to design ethnography (situated observations) are analogous with the 'value adding' element of design fictions (diegetic prototypes). [...] Assuming that these suppositions are correct, then we can infer that combining the exploratory and temporally independent techniques of design fiction, may allow design ethnography to glimpse the future. Conversely, design ethnography's established tools for sense making and analysis can be applied to explorations in design fiction. (Lindley & Sharma, 2014, p. 4)

In the above definition, the authors also pointed the importance of Design Ethnography as a discipline that 'contributes to a contextual search that will support a design process by producing actionable insights' (Lindley & Sharma, 2014, p. 5). In words of Dourish and Bell (2014), Design has served as a basis for new prescriptive research approaches, and it is established in the Human-Computer Interaction field. Probably Nova (2015) made an accurate description of Design Ethnography as design-as-research, that is:

> ...understood here as 'field research for design' is based on the idea that documenting people's practices and product use in context could be helpful for design. (Nova, 2015, p. 120)

And Smyth and Helgason (2013) reflect that concern saying that:

> The challenge facing design is how to make us more critical of our shared futures and to prompt us to question whose futures these really are and what form they might take; in short, to acknowledge that design can be a political act. Smyth and Helgason (2013, p. 2)

In the light of the above design approaches, design fiction (Bleecker, 2009) or futurecraft (Ratti, Claudel, Wells, & Lang, 2015) can be regarded as anthropological methods to stimulate behavioural change. It is not so much about rationally changing individual patterns of behaviour but instead about providing the conditions to shape the collective meaning by building a possible future and envisioning stories and emotions through technology. We argue that this enhanced experience of the future in cities is transformed, not only by the perception of the reality itself but can be also transformed by the powers and capacities of enabling *empathic relations* [13] in spatial configurations. Both relations, perceptual and empathic, suggest that a city is not a flat field, but multiple spaces that coexist in the same territory, as Bourdieu et al. (1999) once declared.

However, the difficulty in the relation between Design as a research discipline and other sociological disciplines reside in blurred boundaries of their dissimilar goals. 'The corollary "subject" who emerges from user-centered design, however, is not a "humanist" subject; he or she is an "engineered" subject' (Almquist & Lupton, 2010, p. 8). In their essay, Almquist and Lupton (2010) call for embrace a new approach between affordances and meaning, a way to relate both disciplines in more sustainable and socially responsible form of design. It is not casual that in STS, Tutton (2016) draw a relation between materiality and meaning, explaining that our future decisions are *locked-in* by the socio-technical.

Sociology and Humanities in HCI also had a presence during several years, Dourish and Button (1998) introduced phenomenology and ethnomethodology arguing that the relation with design practice is foundational. Scacchi (2004) claimed to include the socio-technical analysis in the field, since 'the traditional attention to system design assumes that system users have clear or well-defined needs that can be addressed through a proper design discipline and participation strategy' (Scacchi, 2004, p. 6) where Science and Technology Studies (STS) can help to 'the continuous evolution of information system requirements'. Later,Dourish and Bell (2011) analysed the conflicts and messiness of Ubiquitous computing in the current state of HCI from a sociological approach.

Many of these approaches helped to incorporate some concepts, although few of them remain in practice. Following our discussion, we remark that Nova (2015) pointed out that Design Research can be different from Geography or Sociology itself where it sees the world as a project. In that sense, speculation is an vital Design method, where imagining rituals as the cultural translation of these choreographies that are entangled in socio-technical relations.

Beyond the critiques that were raised from the geographies regarding the use of such methods as means of visions and stabilisation of unknown futures (Kinsley, 2012), we believe that imagining and enabling futures with a critical perspective could be fruitful as an exploration exercise.

[13] There is an interesting historical reason that we use the word *relations*, that is well explained in *Relation*, Cambridge Encyclopedia of Anthropology. Available at: http://www.anthroencyclopedia.com/entry/relations. We also rely on the trend in human geographies and social sciences of a relational approach, which will be discussed later

By raising the discussion about differences, contradictions and controversies around the utility and possibilities of accomplishing the goals of the practice of design-as-research and design ethnography, we advance the reader the many possibilities that we opened at the beginning of this research. In that sense, our contribution resides partially in to open such a discussion together with our results. However, the practical differences between the utility of pragmatical practices and theoretical critiques are never exhausted in the possibilities of forging relations between sciences.

In the following chapters, we will address all these approaches by playing between the descriptive and the propositive as a form of speculation to satisfy what we defined before as a speculative knowledge.

1

Empathic relations

We explore the notion of ‘empathic relations’ as a form of interaction with the digital. By addressing the notion of empathy, we offered a framework to understand how objects could be thought in terms of empathy. Therefore, we designed an experiment with conversational bots as a first approach to our inquiry.

1.1. Introduction

We have slightly introduced the idea of empathy as a shared manifold, or sense of togetherness. Although, it is not the only definition that we have seen in the history of Western culture. This chapter is focused on the discussion of empathy and the novelty of introducing the *empathic relations* approach.

Afterwards, we will describe our first experiment based on a development of a chatbot platform. This experiment is based on a theoretical framework that we have built upon an analysis of what we called Double-Awareness Devices. As a conclusion, we found many ways in which virtual assistants and other non-human agents can be improved to increase empathy within their communication process. In that regard, the opportunities of affective encounters are enriched by the awareness and the narrative capacities shared between bodies. We close our chapter with a proposition of a city based on aesthetic experiences.

1.2. Background

The conceptual approach to empathy in cognitive sciences and psychology has modified the notion of affection during the 20th Century. Its traditional notion (*Eifühlung*), recovered by Theodore Lipps in 1930, 'into the vocabulary of the psychology of aesthetic experience, to denote the relationship between an artwork and the observer, who imaginatively projected himself/herself into the contemplated object' (Gallese, 2003, p. 175).

But in the psychological and medical fields, empathy is referred to be in the place of the other, and 'structured by the polarized dichotomies between subject and object, knower and known, mind and body, active and passive, science and society, culture and nature' (G. R. E. Marshall & Hooker, 2016, p. 3). The most common definition is derived from Freud's idea in that empathy was essential for establishing the rapport between patient and analyst that makes interpretation possible (Zanocco, De Marchi, & Pozzi, 2006). Accordingly, in social psychology it was interpreted as our feelings reflected from the other (M. H. Davis, 1994). The evolution of the concept of empathy redefined the idea of 'we', since social relations with objects in space are considered as banal, mundane and entirely detached to the possibility to develop an emotional relationship with them (Gallese, 2003).

Aaltola (2018)'s work on the varieties of empathy summarizes the different origins and assumptions around the same notion but from different disciplinary approaches. The discussion is fruitful and addresses different positions (the discussion is rooted in Hume/Kant discussion about morality and its roots on the emotional and rationality approaches). The varieties that she addressed are divided between those that pertain to the 'theory of mind' (the first four) and another that is approached from phenomenological accounts:

1. **Projective empathy:** Rooted in a self-directed inquiry by asking how ourselves would feel in the place of the other.

2. **Simulative empathy:** A form of simulation where it can be imagined how the other would feel.

3. **Cognitive empathy:** An inferential process of perception (rooted in Humean sympathy), an attempt to read the others' emotions.

4. **Affective empathy:** In a form of resonation, in an unconscious process of letting others' impressions to attune ourselves.

5. **Embodied empathy:** Is rooted in embodied interactions as the experiential capacity to align ourselves with others in a continuous process of co-constitution.

According to Aaltola, all these varieties of empathy, present different biases and conflicts that were criticized by different authors. For example, some forms can influence negatively people's social behaviour in terms of manipulation, subjugation or coercion. It is also known that empathy is misunderstood as an all-positive feeling or, as a motivation for individual gratification. On the contrary, empathy is contradictory and doesn't offer always positive feelings[1].

The author also offers an approach to a 'reflective empathy' that is proposed to scape the process of empathizing with the others. Her suggestion includes a first-order level where mental states or feel of the other is identified, and a second-order level where the former is put in relation with other personal experiences. Despite the similitude with the notion of affects, what Aaltola defines as 'affective empathy' it is not approached from the affective theory (or at least present conceptual differences with it), which could offer a more pragmatical variety of empathy[2].

Empathy is a mechanism that can help to address diversity, openness, care and concern. However, it can also carry some biases if it is motivated by egoic attitudes. For example, one can empathize more with people like oneself (rather be open to those that are different), one can empathize with victims of a situation, but not with the cause of which they become victims (this is, attention is often placed in bodies, not actions - for that reason we address the in-between as a form of relational empathy), or, one can empathize less with competitors reducing the awareness to the presence of others. Empathy can be also wrongly understood as something universal. Together with the idea that emotions are universal categories (whereas happiness or sadness are equal to everyone), these ideas can bring not only a lack of concern to others' feelings but also can be used as a form of normative domination. Finally, a feeling of overwhelming empathy can cause naturalization (with a serious detachment to reality) and depoliticization, something that is largely addressed by Pedwell (2014).

It is remarkable that all the biases are rooted in cultural, historical and political reasons, and empathy is not biased *per se*, on the contrary, the author proposes to cultivate attentiveness to reduce the bias on empathy (something that will be addressed later). Moreover, all these varieties of empathy are usually used in combination and the goal is always to motivate a responsible concern on others.

Much of the confusion comes from the idea that empathy is a perceptive capacity where it could provide an impartial vision (over an external body), or to achieve any objectivity (something that is never achievable). G. R. E. Marshall and Hooker (2016) followed this view, by criticising the misunderstanding about empathy in the field of psychology. They said that empathy was imagined as a possession that doctors have or not have. Under this idea, rather than an embodied affection, empathy was understood as a matter of understanding the

[1] As we will not along this thesis, this misunderstanding is similar to what happens with Spinoza's notion of joy, which should not be confused with happiness or other forms of positive emotions.

[2] Aaltola acknowledges that empathy can bring conflicts between emotions because empathy is not very pragmatic. Therefore, reason can help to solve those contradictions. Our proposal to incorporate affective theory into the process of empathy is not to achieve a fully pragmatic approach. On the contrary, the affective theory never looks for escaping contradictions. However, it is rooted in the Spinoza's notion of ethics, which brings a whole new dimension of conceiving the agency of bodies.

other, as a capacity of the practitioner's mind to understand, or sympathize the others. This vision was static instead of a process that happens in-between the therapist and the patient. The authors argue that embracing the affective theory in the correct way, practitioners can understand empathy as an ontological entity.

Nevertheless, the cognitive approach of empathy has been taken in the behavioural sciences, leading to misunderstandings in other sciences (Depew, 2005). For example, in Geography, place was undervalued, leading to concepts such as loss of place (Sui, Elwood, & Goodchild, 2013) or place attachment (Altman, 1992). Empathy was put in relation with an emotional attachment, denying its historical context, losing the narrative, and remembrance of practices that take place in the territory. As it happened with affective computing, empathy and the emotional realm were meant as the contrary to the rational organization of life. Behaviour economics, business schools and design innovators also took it under the so-famous method 'design thinking'[3]. Following this method, *design empathy* is an 'approach that draws on people's real-world experiences to develop a deep emotional understanding of people's needs and to "unlock the creative capacity for innovation"' (Armstrong, 2016, p. 2). This view of empathy as a method for gaining initial insights or needs, under an innovation process, follows the same path described by G. R. E. Marshall and Hooker. It was conceived as an skill that the practitioner has to acquire[4].

The original meaning of empathy has been recovered in disciplines such as phenomenology (Steinbock, 2004), design (Norman, 2004), and sociology (Latour, 2013; H. Molotch, 2011). In this vein, objects are not considered as an external factor or something that is excluded from our natural embodiment. The importance resides in conceiving the other, and the existence of the objects, in an interwoven relation. From the point of view of the phenomenological interaction, the difference between one body and another is intelligible only in the action of being, there is an aesthetic concern that modifies our perception and cultural prefiguration (Freedberg & Gallese, 2007). We believe that interacting with urban objects recreates these relations with space, constantly modifying our perception of boundaries, paths and points of interest.

1.2.1. Empathy as an aesthetic phenomena

Looking for historical references, the original German word for empathy, *Einfühlung*, was coined back in the XIX century while studying the aesthetic affordance of art pieces. During the process of translation and interpretation it has been replaced by the current psychological orientation, rejecting the empathy from the aesthetic experience (Depew, 2005).

Despite of the abandonment of the concept in the cognitive and neural sciences, recent discoveries brought it again to the field. Specifically, the discovery of mirror neurons that appear to be responsible for the imitation of physical gestures to our brain, was the starting point of new ideas around empathy. The discovery of somatic markers by Damasio (1999) provided to the scientific community the idea that emotional decisions are correlated to neural activities. Specifically, 'the observation of static graspable objects activates not only visual

[3] It was formulated mainly by David Kelley, founder of IDEO. One of the main critiques about it was made by the STS scholar Lee Vinsel. To him, the idea of empathy is 'roughly as ethnographic as a marketing focus group or a crew of consultants trying to suss out their clients' desires', which becomes not to be ethnographic research, neither the idea of empathy that we want to work with. Available at https://www.chronicle.com/article/Design-Thinking-Is-a/

[4] There is also a similar approach from the interaction design that follows a similar path: https://www.interaction-design.org/literature/article/how-to-develop-an-empathic-approach-in-design-thinking

areas of the brain but also motor areas that control object-related actions such as grasping' Freedberg and Gallese (2007, p. 201). These findings offered a novel knowledge that supported the notions of embody interactions, correlating phenomenological approaches with empathy and intersubjectivity.

Conceptually speaking, we acknowledge an interplay between the intersubjectivity and empathy for which Zahavi (2001) argued that 'experiences are not internal, they are not hidden in the head, but rather expressed in bodily gestures and actions'. Additionally, 'bodily behaviour is meaningful, it is intentional, and as such it is neither internal nor external, but rather beyond this artificial distinction.' (Zahavi, 2001, p. 153).

For the phenomenologist Edmund Husserl (Husserl, 2012; Spiegelberg, 1981), things are not accessible to our hand but they are manifested through their *intention*. Thus, an object is inaccessible to us unless we experience it in action. This inaccessibility can be understood also as an artificial distinction. And, in that sense, 'empathy understood as a thematic encounter with a concrete other is either taken to be a derived rather than a fundamental form of intersubjectivity or because there are aspects of the problem of intersubjectivity which simply cannot be addressed as long as one remains narrowly focused on empathy' Zahavi (2001, p. 154). In this regard, perceived objects 'are not exhausted in their appearance for me; rather, each object always possesses a horizon of coexisting profiles, which although being momentarily inaccessible to me' Zahavi (2001, p. 156).

We are also concerned about the process of objectivation in the inter-subjective realm. If our encounter with an object is mediated by its intention, it is not that the object is defined by its characteristic but in the interaction with it. In other words, 'when I discover that the object I am currently experiencing is also perceived by an other, my relationship to the object is changed. Only insofar as I experience that others experience the same objects as myself, do I really experience these objects as objective and real' (2001, p. 159).

Summarizing, the division between body/mind is broken by the understanding of this process of intersubjectivity. Steinbock stated that 'the phenomenon of attention not simply as an initiatory subjective act, but as correlated to the affective force exerted on the part of the matters themselves' (Steinbock, 2004, p. 21). Here, the concept of attention is not related to the concept of awareness, used in computer science and design interaction. On the contrary, attention can be passive, non-egoic, and related to an *affection allure*. In other words, attention emerges, is pre-reflective and pre-linguistic.

This interplay between active and passive attention has been categorized by Steinbock in seven stages ranging from a total passive state to a total conscious objectivation. The first two states (*dispositional orientation* and *passive discernment*) are totally unconscious; the third (*active turning-toward*) is pre-conscious, where there is a formation of sense but not yet an objectivation. Finally, *cognitive interest* and *examination and explication*, are more individual conscious states, leaving *judgement* and *conceptualizing judgment* in a more socio-cultural perspective.

We recovered these conceptualizations to understand better which phenomena are we working with. It is not only important the *egoic*, conscious interaction that it counts for the analysis but how does a different knowledge emerge from observing interactions. And to design proactively for promoting empathic relations, we have to be aware of the unconscious and pre-conscious forms of attentiveness. Table 1.1 shows the correlation between the concepts collected by Steinbock and the three levels of design from Norman. This correlation

	Norman's	Steinbock's	
Consciousness	*Levels of design*	*Modes of attentiveness*	*Levels of affective force*
Unconscious	Visceral	Dispositional orientation	Low Awareness (pasive)
Unconscious	Visceral	Passive discernment	High Awareness (pasive)
Pre-counscious	Behavioral	Active turning-toward	Remembering/Expectation (active)
Pre-counscious	Behavioral	Cognitive interest	Creative Self-giving
Counscious	Reflective	Cognitive interest	Creative Self-giving
Counscious	Reflective	Examination & explication	Active attention
Counscious	Reflective	High Active attention	Proposition (theme relation)
Counscious	Reflective	Conceptualizing judgment	Vertical alteration

Table 1.1: A comparison between Norman Design Levels with Steinbock's modes of attentiveness

provided a staring conceptual base for our research setting on empathic relations.

Ahmed (2004) understood emotions as the feeling of a bodily change. He recovered Descartes' position of aesthetic experience to explain that, 'whether something is beneficial or harmful involves thought and evaluation, at the same time that it is "felt" by the body' (Ahmed, 2004, p. 6). We argue that this process of bodily change is an aesthetic experience, and its result leaves an impression on us. Therefore, empathic relations are intimately related to the aesthetic experience of our body.

Boehner, Sengers, and Warner (2008) argued that the aesthetic experience are indescribable and irreducible aspects of being. They accounted for the many attempts in HCI to provide answers to this aesthetic experience, as well as the dangers carried in codifying and generalizing the qualities of the experience. Consequently, they argued that, instead of being thought as a functional device, a digital system should be designed as a tool of representation and allow users to interpret and experience. Therefore, by recovering the emotional importance given in affective computing (analysed in the previous chapter), they propose a set of strategies to approach 'sympathetic awareness' (something similar will be proposed later in our Framework), rather than proposing formulas to help designers on capturing the ineffable.

In this vein, and recovering the issue of places, we ask ourselves how these knowledges can be taking in account to design technologies for the aesthetic experience of urban spaces (Bull, 2013). Even more, if an aesthetic experience with the other leaves the trace of feelings and emotions, we ask how a sequence of such experience can be conceptualized under the notion of *empathic relations*.

1.2.2. Tragedy and empathy

The question is how do the approach to attentiveness and the aesthetic experience could play between the real-time interactions and the opportunity of creating new possible scenarios. The interplay in this matter can be traced to the ancient times of Aristotle's coercive system of tragedy and the later theatrical approach from Boal (2000), known as the 'Theatre of the Oppressed'.

For what concerns computer science, Brenda Laurel explored the idea of a dramatic theory in the field (Laurel, 1993). She departed by a basic understanding of how computers were conceived in the early 1990s under the distinction of an application (functionality) and its

interface (the form of communication). At that time, ideas such as pleasure and engagement were not commonly addressed in HCI. However, her 'artistic' or 'poetic' adaptation of Aristotle's tragedy was sufficiently experimental for that time. Notwithstanding, critiques followed her work by taking the propositions of Deleuze and Guattari to go beyond the representations. Therefore Murphie (1996) argued that machines are not a theatre, because machines are not representational actions (such as concerts or theatre), but entangle more complex relations that include processes of social construction. Nevertheless, from the perspective that we are taking from representations-in-relation, we think that representations, operations, social constructions and beyond are valid in order to comply to our purposes. That is to say, denying one or another view is to avoid the complexity that we want to achieve.

Despite the critiques, drama (and Boal's approach) was explored in Participatory Design (PD) as a rich driver to enable 'third spaces' or 'in-between' (concept that we will approach in the third chapter). 'Drama brings a strong overlap of the world of end-users and the world of technology developers/researchers, showing concrete projections of ideas from one world into the other world – and, in most uses, allowing modification of those ideas.' (Muller, 2003, p .33)

Plantinga and Smith (1999) analysed the world of films in the search for a pattern to provoke engagement with the public. In their words, 'engagement allows for empathy and antipathy, sympathy and indifference, and certainly implies no melding of minds or identities' (Plantinga & Smith, 1999, p. 244). They understood that empathy is a disposition, or the capacity to engage with the characters; and compassion is what we feel as a consequence of an emotional state. That means that, even in films, emotions take time to catch. The elements that are presented in the films, which are mentioned by the authors as stimulus for empathy, are as follows: Attention, Duration, Allegiance, Context, Congruence.

These stimuli, together with storytelling, appear as important resources in HCI as they provide an environment for imagination, and co-create a different relations between bodies. For that reason, we defined as 'double-awareness devices', to those that provide a fictional scenario by themselves (as a technology implemented in non-expected places) and, on the other side, a generated narrative that invites people to imagine future alternative situations of the human life and technology.

This results in not only delivering a responsive artifact, mixed with real-time interaction and data gathering, but also conceiving it as an agent that offers fictional scenarios that connect us with our capacities of attentiveness. This constitutes our first proposal as an attempt to compassionate with the affective theory from a propositional point of view.

1.2.3. Empathy as affects

Since we have already introduced affects in the previous chapter, in this section we want to clarify its relationship with the notion of empathy, and how we have articulated it in our experiment. Firstly, we adopted the definition introduced by Gallese (2003) as a shared manifold. He proposed that 'sensations and emotions displayed by others can also be "empathised", and therefore implicitly understood, through a mirror matching mechanism' (Gallese, 2003, p. 176). He described a phenomenological level that is responsible for the 'sense of similarity'. In other words, 'actions, emotions and sensations experienced by others become implicitly meaningful to us because we can share them with others' (Gallese, 2003, p. 177). This is what he calls a *shared manifold* of intersubjectivity. Clearly, we have to be cautious to

avoid any misunderstanding in the possibilities of mirror neurons findings. As we explained above, such ideas could imply that empathy is universal and intrinsic to morality (Pedwell, 2014). In Ahmed's words, in which subjects 'feel' something other than what another feels in the very moment of imagining they could feel what another feels (Ahmed, 2004). This is far from the meaning we want to give, rather we understand that there are complex processes that escape our capacities of understanding, where affects, feelings and emotions are just some of those expressions.

Taking the notion of affects as a point of departure, Duff argued that 'affects are more than mere feelings or emotions; they also constitute an action-potential, or an individual's dispositional orientation to the world' (Duff, 2010, p. 885).

What is important to us, by recovering the affective theory, is that 'emotions and feelings are produced through actualizations and can never coincide with the totality of potential affective expression' (B. Anderson, 2006, p. 738). For example, hope B. Anderson (2006) and the lack of it, is based on the uncertainty of future realities, a form of possibility of a 'not-yet'. Wellbeing (Andrews et al., 2014) can be characterized as an affective environment, and can be anchored with a familiar feeling state but hard to define in emotional statements. Our main concern is to understand where empathy 'takes place' as an excess of affects.

Massumi described affects as 'virtual synesthetic perspectives anchored in (functionally limited by) the actually existing, particular things that embody them' (Massumi, 2002, p. 35). In the readings that Deleuze did to Spinoza's writings (Deleuze & Hurley, 1988), he highlighted two type of affections in human beings, the actions (or the capacity to affect as an internal force) and the passions (capacities to being affected, as an external force), both are anchored to how our body unconsciously is attuned with the world. In that sense, attunement, and specifically, the body's sensory capacities are key to understand empathy within the affective theory.

In consequence, we consider that empathy can play a role in cities while we develop new technologies to explore new forms of attunement and embodiment. We take the concept of empathy as an affective force that exceeds our rational and cognitive modalities, an embodied disposition of being (with) others.

1.2.4. Between care and concern

Before moving forward to the next section, we would like to clarify some other distinctions. Empathy has been abandoned in many disciplines for the misreadings and complications that were well identified by Aaltola and Pedwell. However, other notions become widely used, especially in relation to STS practices and feminist readings.

We can't say that concern and care are different, neither similar to what we recognize as empathy in this thesis. Together with empathy, these are relational terms and have a history in technosciences that we can't avoid to mention. Moreover, empathy brings a different form of relational thought to these distinctions. A discussion on differences between terms would take an entire chapter, however, we can make a brief differentiation by citing the work of Puig de la Bellacasa (2017) to point that empathy is not contrary to those, but comes to look at the in-between. Even more, matters of concern and care, appear in the literature as an ethico-political stance that embraces both material assemblages and relational thought.

In the works of Latour (2012), Matter of Concern (MoC) appears as a critique standpoint where 'scientific and technological assemblages are not just objects but knots of social and

political interests and therefore "socially constructed" rather than existing objectively as an expression of the laws of the natural world' (Puig de la Bellacasa, 2017, p. 30). This critique raises the question of how 'things' (or the non-humans in general) create worlds, rather than existing outside human relationship with the world. In that sense things are gatherings (see chapter 2 in relation to place and gatherings). 'In contrast with "interest", concern alters the affective charge of the thinking and presentation of things with connotations of trouble, worry, and care' (Puig de la Bellacasa, 2017, p. 35) (we will talk about interest in the fourth chapter). In sum, MoC is an ontological way of describing things without erasing their complications and controversies, where those things are also lived part of our world, and, without making reductions of power and domination dynamics.

In this scenario, Matter of Care (MoCa) is a re-enactment, prolonging, adding analytical problematics to MoC. Even when both terms have similarities and a common epistemological origin, care carries a sense of attachment and commitment to something that is stronger than concern. 'Care convokes trouble and worry for those who can be harmed by an assemblage but might be unable to voice their concern and need for care' (Puig de la Bellacasa, 2017, p. 42). MoCa is a form of holding together the relations that can be also analyzed in MoC, however, because of its strong roots in feminism, care is tight to those that are not represented. However, MoC is enacted as think-doing, rather than observe the significant "others" from outside. In the words of the author, 'caring here is a speculative affective mode that encourages intervention in what things could be'(Puig de la Bellacasa, 2017, p. 66). In that sense, care has a strong commitment with socio-technical systems, because raise the question of how do the maintenance of socio-technical infrastructure is done, who and in which conditions. Therefore, it has in the root of its spirit, the problem of human (and non-human) labour, and the condition of those who are invisible, or under-represented.

We agree on Pedwell that, 'it does not make sense to see empathy as necessarily linked to "humanising" practices of care because empathy, like other affective relations, is not a property owned by or encapsulated within the boundaries of subjects' (Pedwell, 2014, p. 11). We believe that some confusions can appear between care and empathy. However, the reading that she made of care, is different from which Puig de la Bellacasa. Both authors relate the terms to the more-than-human worlds. And the problem of subjectivity is in the focus of both critiques in a form of radical empiricism.

Therefore, empathy comes to play as an affective translation. Affects, understood as a differential of intensities, creates momentums for caring and concern in events and encounters. Thus, empathy happens in the in-between. It is not something that we should consider from outside. By the other side, Care and concern appear as forms of critiques of technoscience, for re-enabling the knowledge and to place a political stance on technological and scientific practices. Empathy took from the affective theory, comes to provide another layer of complications, to problematize by other means. But the forms of empathy that we will explore also enters into the discussion in a different dimension of care and concern. Even more, both notions place empathy as an affective force in the in-between of every action. All three notions are ambivalent, contingent and exceed our capacities of explanation regarding the immanence of events. We decide, then, to leave the conflict open, acknowledging that empathy is an affective force that we should take into account when we take MoC and MoCa perspectives. In words of Brian Massumi, 'What you're really caring for is not is not your separate self, or other individuals.' Yet, 'thinking affectively means thinking in terms of

ecologies of potential and the events that express and vary them' (Massumi, 2015, p. 202). In other words, to care is to entangle new empathic relations.

1.3. Empathic relations with non-humans

As with human-like attunement with others, we should also consider computers as social actors. That is, to understand the attunement with them not as machines, but as actors that follow and reproduce social rules.

Thinking on Platinga's stimulus for empathic reactions, we can find similarities in Nass, Steuer, and Tauber (1994), where it is presented a method to determine which *social cues* lead to users to act as if they were interacting with social actors and not simple machines. This perspective provided some insights on how users can recognize different type of actors and provide social attributions. It provided a basic understanding to drive our experiment expecting similar results.

Beyond the efforts in HCI for understanding this paradigm, Science and Technology Studies (STS) have a long trajectory considering technological artifact as actants, which include Latour's Actor-Network Theory (ANT) and further discussions (Latour, 1996, 2006, 2011b, 2013).

By mixing embodied interaction with ANT, conversational analysis and ethnographic research, Lucy Suchman proposed a novel perspective on the agency of computers. The question that she addressed is why planned interactions do not happen as the way there were planned. Therefore, she stated that 'the intelligibility of artifacts is not just a matter of the availability to the user of the designer's intentions for the artifact but of the intentions of the artifact itself' (L. A. Suchman, 2007, p. 47). Rather to analyse that phenomenon in a plane of abstraction, she studied situated interactions with technological objects of the moment.

We will recover her studies throughout this thesis, but the propositions of her work leaves us a ground to *plan* (L. A. Suchman, 2007, p. 71) our first experiment:

1. Plans are representations of situated actions;
2. In the course of situated action, representation occurs when otherwise transparent activity becomes in some way problematic;
3. The objectivity of the situations of our action is achieved rather than given;
4. A central resource for achieving the objectivity of situations is language, which stands in a generally indexical relationship to the circumstances that it presupposes, produces, and describes;
5. As a consequence of the indexicality of language, mutual intelligibility is achieved on each occasion of interaction with reference to situation particulars rather than being discharged once and for all by a stable body of shared meanings.

Finally, as Jenkins et al. proposed, we depart from the idea that 'sociality is not *enacted through* computational tools, but is *composed of* computation' (Jenkins et al., 2016, 828), meaning that all computation is intrinsically social computing. Consequently, there is a multiplicity of *publics*, in realities that machines/computers/artifacts coexist and constitute. In the universe of human and non-human agents, that is organized and attend to different

particular conditions, coded-objects co-live with us through their algorithms, their ecologies and, their presence and absences.

These previous works set up a ground to present our theoretical framework from which we developed our first experiments, and constituted the first step in our exploration on Geographies of Empathy.

1.3.1. In-Framing Empathic Relations

The term *engagement* comprises the interactions and understanding that happen between citizens and pervasive socio-technical systems in an specific context. Considering the attentiveness and the intention of coded-objects, at the same time of attunement capacities to affect our bodies, we wanted to observe and understand how such embodiments take place.

To do so, we proposed a Framework to serve us as a conceptual basis to design and develop the research activities and interventions, based on our main RQs but under a speculative purpose. It is speculative to avoid any pretension and to use it for describing enacted realities and, to create scenarios of possible interactive designs. Consequently, we present an open, sketchy and (maybe) incomplete model, that can be used for one of the many possible analysis of empathic relations.

By providing a conceptual Framework, we can visualize the concepts that would help to understand how to design technologies for promoting attentiveness and awareness, and to establish specific interactions, based on the idea of togetherness. We next describe the Framework in two parts, the core and the framework in a temporal scheme. To introduce its novel elements, the framework should be regarded as an interrelated whole.

The Framework's core

By definition, a *device* is a thing designed and adapted for a purpose or function. As proposed in Law and Ruppert (2013), social sciences methods can be also considered devices. In the realm of this research, we understand devices as a method for analyse socio-technical assemblages where chaos and uncertainty are part of the reality that are part of. Much near to the messiness than to structured and organized relations, where side effects are both explicit and implicit. Our intention is to define this type of devices, as we call them Double-Awareness Devices [DAD], as conceptual constructions, that allow us to observe embedded context-aware coded systems as actants (Latour, 1996, 2006).

A tangible entity or artifact can be defined as an object. However, at the same time software enabled objects, or coded-objects Kitchin and Dodge (2011), have the ability to transform physical artifacts into 'living' objects. The concept of *blogject* refers to what constitutes a code/space (Kitchin & Dodge, 2011), by which the traditional notion of static urban infrastructure augmented with code, turns into a platform of infinite opportunities to transform and mold our relations with them. Furthermore, what defines the proposed Double-Awareness Devices [DAD] is not the system itself but the type of agency that coded objects exert over people and the environment: the Situational-Awareness (SA) and the Future-Awareness (FA).

Situational-Awareness (Endsley, Bolté, & Jones, 2004; L. Suchman, 2015), is referred to the traditional concept in informatics as the contextual feedback that is motivated by real-time information and accountability in time and place. In the case of Future-Awareness, we consider the creation of fictional images of possible realities characterised by expectation and uncertainty. Based on the Design Fiction approach postulated by Bleecker (2009), devices

[DAD] motivate the user to imagine and to create new futures, while interacting with coded objects through two main drivers: aesthetics and narrative.

Furthermore, the concept of [DAD] intends to comprise the two agencies even though the new opportunities that these devices [DAD] may bring to our world are yet largely unknown. Massumi (2015) refers to a *blow*, that 'trigger the eventful resolution of a differential of forces at a point of encounter' (2015, p. 92). The tension created between both bodies (in this case with a non-human body) results in changes of the bodily capacities, that one way or another produce an effect of structuring. Moreover, the transition is *felt* (in Spinoza's terms), and moves along the sequence of events, creating structures of power as secondary effects of affective encounters. Both bodies are absorbed by these movements, it is lived by both as asymmetrical but synchronized. The event place bodies in the position of becoming mutually attuned. A 'mutual attunement' is for us a first of many forms of empathy. In this case, we speculate with (radical) technologies that are coming up in the near future (Greenfield, 2017)[5]. Technologies that will be capable to provoke different sensory and cognitive reactions, from AR/VR and Artificial intelligence. One of the many is the possibility to recreate synaesthetic experiences [6] in bodies to offer new fictional narratives. For the matter of our first experiment, we adopted the recent growing trends on developing conversational bots (Goth, 2016; Latour, 2011b) and Internet of Things (Balestrini, Diez, Marshall, Gluhak, & Rogers, 2015; Brambilla, Picone, Cirani, Amoretti, & Zanichelli, 2014) brought to light several coded objects that could be analysed through the lens of [DAD].

The Framework

For the introduction of our framework we present three arguments are vital to motivate the following speculative exercise.

First, Albretch Schmidt introduced the concept of 'implicit HCI' for interactive context-aware systems, as a model for managing interactions with 'invisible' technology that benefits from contextual information and data. This model assumes that there are some implicit assumptions about the expected relation 'with the environment and with artefacts' (Schmidt, 2005) that belongs both to the user and to the designer of the system. Those assumptions are critical to accomplish successfully an interaction, while being aware of possible misunderstandings and communication errors between the user and the system, that otherwise are inevitable. The difference between the expected, the sensed and the desired reaction from a system, exemplified by the Schmidt's implicit assumptions, was also schemed by Benford et al. (2005) in an early stage of the HCI field. But these frictions between the context and the user-interface interaction do not have to be necessarily a negative experience as argued by Cox, Gould, Cecchinato, Iacovides, and Renfree (2016). Conversely, it could unfold and raise awareness between present and future situations.

Second, cultural geographers have speculated and studied the effects of new technologies in different ways. Specially the interface has become a focus of study. Rose, Degen, and Melhuish (2014); Rose and Hall (2016) touched the capabilities of interfaces that are created and circulate in software-supported spaces, but also put on the radar these technologies as

[5] This fantastical piece of technological journalism explains how actual artifacts, designed by corporations like Apple, are preparing the territory for upcoming technologies under discursive formation as 'courage' (*Apple's Airpods Are an Omen*, The Atlantic. Available at: https://www.theatlantic.com/technology/archive/2018/06/apples-airpods-are-an-omen/554537/)

[6] *This AI has synesthesia*, Fast Company. Available at: https://www.fastcodesign.com/90173813/this-ai-has-synesthesia

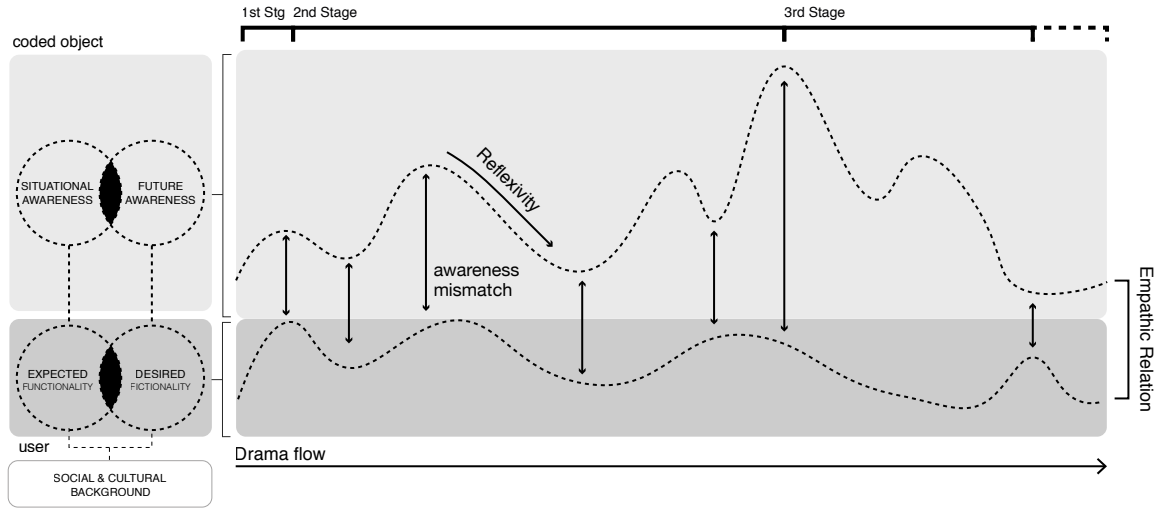


Figure 1.1: The Empathic Relations Framework (A list of projects that we analysed can be seen in Appendix 4.8).

the object of study with particular characteristics that differ from previous objects in cultural studies. In Ash (2015a), the author analysed how video games perform spatial effects, considering interfaces as environments and the manipulation of embodied experiences in forms of *neuropowers*. Moreover, Ash, Kitchin, and Leszczynski (2018) proclaimed the study of 'digital geographies' to extend beyond computational technologies to encompass *ontics*, aesthetics, logics and discourses.

Third, the notion of Aristotle's tragedy as a metaphor (Boal, 2000; Laurel, 1993) helped us to recover some characteristics of drama and storytelling practices. What we remark from those ideas is that there is a close relationship between the artistic expressions and the affective life by producing intensities of feeling (B. Anderson, 2017; Thrift, 2016). Therefore, the principles of drama can help to build the relationship between the character and the public or spectator. This analogy allows us to create a narrative-based object that helps to understand how people get engaged which often provokes the empathic relation with physical, coded objects.

By this model, we understand that all relations are built upon habits and, habits are constituted by practices (for further details, we approach habits in the next chapter). Practices can be observed in particular times and spaces in the form of sequences of actions. Consequently, actions are the smallest event that can be analysed (Atkinson & Heritage, 1984). An inter*action* is never something isolated, and is perceived by the utterances of personal, collective and cultural backgrounds. For that reason, we decided to understand its implications from affective and socio-technical perspectives, as *empathic relations*. Reflecting our previous introduction of this conceptual construction, we remark that any inter*action* takes place *in-relation* with other bodies. That is why direct observtion can bring some insights about 'what happen' during interaction. Nevertheless, we should consider that any encounter and interaction is an open-ended process, and 'any stabilizing structuring is *emergent*, and self-improvised' (Massumi, 2015, p.87)[7].

[7] Massumi conceives relation in contrast to interaction, as the later consist in 'dominant techniques of political expression and negotiation of interest'[p. 202]. We agree on the importance of the relational field as a form to avoid to reproduce structures of power and the implicit separation that interaction that takes form in our society. However, due to the multidisciplinary approach, we are committed to simplifying the use of terms in specific contexts. In this case, the use of interaction is also conceived as

For reading the framework, firstly, we understand empathic relations as flows that increase and decrease in their intensity (B. Anderson, 2017). Secondly, *intensity* can be understood in many forms (affects, attachment, power), which is the object of this thesis. Thirdly, intensity is rooted in a process of (self-)reflexivity, a concept faced by actor-network theorists (Law, 1994) and ethnomethodologists (Liberman, 2012a, 2014b) to explain how things are ordered in an interaction or in a network. Reflexivity sets the context of the interaction, in the sense that 'the structuring of behaviour is done not a priori, but in reflexive relation to circumstances that are themselves in the process of being generated, through the same actions that they in turn work to make comprehensible', consequently 'complexity or simplicity of situations is a distinction that inheres not in situations but in our characterizations of them' (L. A. Suchman, 2007, p. 19).

We are tempted to affirm that there is always something that connects both intensities in multiple ways, and depending on the method of observations we can get different insights. But it is undeniable that there are time-space constrains that limit those possibilities, so we have incorporated the notion of time in the model as a line.

Interactions are not always conceived in positive terms, there also disturbances, frictions and resistances that define those interactions. In a materialist approach, those resistances also bring the object to existence. In other words, 'the difference in the relative resistance of what is bound together' (Latour, 2013, p. 228). We called an *awareness mismatch* when that difference is minimized, as a reaction between the subject and the object, that brings them together.

G. R. E. Marshall and Hooker (2016) analysed the perspective of empathy from the medical therapy from the point of view of Spinoza, arguing that empathies are an excess of affective capacities. The idea of a multiplicity of empathies takes into the account the quality of material entity rather than something that is owned. It is an ontological status of the concept to consider empathies 'all temporary configurations, produced by and productive of forms of difference' (2016, p. 9). Thus, empathies are processes in-between the interaction, where a relation is bounded.

Under this idea of empathy, reflexivity implies that responses to an entanglement of different bodies can include not only the habitual, but also contain the possibility of new practices, new relationships with people and place, new cultural frames of reference generated through deliberation on future actions and, a projection of the self into the future (Butcher, 2017).

Lastly, Boal (2000) analysed the form of tragedy in different stages to explain how the drama generates compassionate effect in the public. Boal's approach can be taken as an inspiration for the *awareness mismatch*'s idea, as it shows a gap between the public/people and the fictional act/computing behaviour. We do not pretend to analyse real-life interactions under the same structure that Boal proposed, but we understand that any interaction is a sequence with positive and negative effects. For that reason, we added three stages that symbolize the infinite of stages that the analyst could consider for analyse the sum of actions in a sequence.

The three stages run under a temporal dimension. That dimension is considered in a time-flow that illustrates the 'performance' of the relation over time during the human-object interaction. Far from being seen under a schema of efficiency, performance is the effect of a sequence of observable and accountable actions in a specific period. What is different

relational, rather than intentional, and it is where the discussion that we propose with the Framework has its root.

from other cognitive models is that our proposal does not correspond with a pattern of regular movements, neither to a set of cultural, social and cognitive understandings. On the contrary, it looks for analysing embodied effects of direct interaction, avoiding any generalization of findings, neither rational explanations of the whole without proposing an analysis-in-relation.

So far, the description of the model helped us to design our first experiment. Because it was our first approach to our theory of *empathic relations*, we will recover this framework at the end of the thesis to evaluate it.

1.4. Experiment 1: Social Chatbots

Based on the framework presented above, the following work was meant to understand the possibilities of engagement and affection in the use of conversational agents (chatbots) as devices [DAD]. Based on an experiment with 13 participants, we tried to understand the correlation between the user expectation, user experience and intended use and, whether users feel keen and engaged in having empathic relations with an intelligent system like chatbots. We used diverse methods for disentangling the meaning of the interaction, taking advantage from psychological questionnaires and semi-structured interviews, to conversation analysis and data analysis. In particular, the personal psychological background of participants was found critical while the experience itself allowed them to imagine new possible relations with chatbots. Our results showed some insights on how people understand and empathize with future interactions with conversational agents and other non-visual interfaces.

For this experiment, our focus was on these questions (Q):

1. What type of engagement can we find between the individual psychological mindset and the reaction with chatbot conversation?
2. Where can we find insights of engagement?
3. How can the user experience with chatbots be measured?

To respond to these questions, we devised an experiment that consisted of testing and evaluating the use of conversational agents and the effect on people. The motivations, design settings, and evaluation methods of the experiment are described as the following.

1.4.1. Motivations

Artificial Intelligence (AI) is a wide topic and involves different algorithmic-driven software for knowledge representation, reasoning, and social intelligence, among others. During the last years, virtual assistants and conversational agents have been exponents of advanced machine learning (ML) processes and new technological capabilities. Nowadays, the use of this type of assistants, based on Natural Language Processing (NLP) and Speech Recognition is becoming more than ever natural since these systems are embedded in almost all smartphones and web interfaces. Moreover, the development of conversational agents, chatbots and virtual assistants are widely spreading thanks to open APIs in messaging platforms (i.e. Telegram, WeChat, Facebook Messenger, etc).

The use of conversational agents for marketing campaigns and costumer care services[8]

[8]The first companies that used bots where airlines (i.e. Avianca Bot, available at: https://www.facebook.com/AviancaOnMessenger/) and News sites (i.e. Wall Street Journal, available at:https://www.messenger.com/t/wsj) , other more integral platforms came later (i.e. Assist, available at: https://www.messenger.com/t/assist or the Russian emotional assistant Alisa, available at:https://boingboing.net/2018/07/28/emotional-socialism.html)

brought a strong excitement in the industry reflected in multiple online publications and news websites. Yet this phenomenon was less studied in the academic field, specially in Human-Computer Interaction. Opportunities and consequences can be found not only in new utilitarian appropriations but also in semiotic and affective relations with those socio-technical assemblages (Latour, 2006). The importance of science fiction in ubiquitous computing (Kaye & Dourish, 2014), and the use of fiction as a research method (Bleecker, 2009), allow technologists to understand the opportunities of algorithmic interfaces (Dourish, 2016; Geller, 2016), while preventing unwanted consequences (B. Anderson, Horvath, & Kaemingk, 2016; Crawford, 2016).

Embodied interactions with technology have been analyzed by a sociological and ethnomethodological point of view by Paul Dourish (Dourish, 2001; Dourish & Button, 1998), understanding that symbolic relations are not only important but also accountable. The use of smartphones and algorithmic applications can also modify our emotions (but also taste and judgement) in automation processes (Barile & Sugiyama, 2015). The importance of the topic is approached by Gajendar who called 'HCI professionals to ensure these advancements are truly improving the human condition, enabling real relationships and supporting our daily activities' (Gajendar, 2016, p. 25).

For that reason, we developed an experiment based on quantitative and qualitative methods to understand the opportunities and effects on human behaviour with this type of interfaces in the real life. We present our first results of a series of interviews with 13 people, who interacted with two self-designed conversational agents, and evaluated their conversational interactions by using strong surveys in psychology and ethnographic methods.

Conversation oriented-objects as DAD

Starting by a raw definition, *bots* can be described as AI systems with automation capabilities for assisting humans in specific tasks. Moreover, conversational agents can be understood as bots systems using text-to-speech and/or chat interfaces (chatbots). In this universe we can find different types of bots based on its architecture (Surmenok, 2016).

Experiments on virtual assistants have been made recurrently in the AI and HCI research fields proving different opportunities to create affection (Partala, Surakka, & Lahti, 2004) and engagement in users (Goebel, 2012); even home-assistant robots can be considered social entities (Hoenen, Lübke, & Pause, 2016). *Generative bots* - conceived as those that are being built to generate new and creative content by the use of NLP algorithms (Owens, 2016; Tintarev, Reiter, Black, Waller, & Reddington, 2016; Wilkie, Michael, & Plummer-Fernandez, 2015)- and *social bots* - those that are created to interact in social networks, even for good (Flores-Saviaga, Savage, & Taraborelli, 2016; Savage, Monroy-hernandez, & Hollerer, 2016; Toxtli et al., 2016) or bad (Ferrara, Varol, Davis, Menczer, & Flammini, 2016; Subrahmanian et al., 2016) intentions) have been studied as well (C. A. Davis, Varol, Ferrara, Flammini, & Menczer, 2016).

Regarding conversational agents, recent publications have shown results on their usability and user apprehension to these new interfaces and technologies (Luger & Sellen, 2016). Along with early findings on computers as social actors (CASA) and the use of social cues (Nass et al., 1994), in Bickmore and Cassell (2005) it is remarked the importance of *small talk* as a way to generate trust on the user, generating a social relation thanks to characteristics such as familiarity, solidarity and affect. But the authors acknowledge that only

on embodied conversations, extrovert people increase trust on social talks, leading an open question on what happens with chat or phone based conversational systems. In Allen, Ferguson, and Stent (2001) it is considered the difficulty that resides in these complex systems to recreate natural turn-taking, change the dialogue domain, recognize intention and follow an incremental generation model of content in contextual conversations mixing dialogue with task management. Even when conversational bots interactions present some communication difficulties, recent developments have been also useful for scientific tasks by providing guidance to certain methods. For example, in citizen science projects, *Ethnobot* has been tested to help volunteers to make sense of their contribution and knowledge improvement (Tallyn, Fried, Gianni, Isard, & Speed, 2018).

As far as we found in literature, there have been several attempts to develop effective conversational agents. In spite of that, consumer oriented products continue being very basic on their dialogue capacity. Since our intention is to analyse the user expectation and experience, we took the opportunity to work with the current state of chatbots rather than looking for more capable systems.

Hedonomics, Anthropomorphism and the Uncanny Valley

Despite that our study does not approach embodied interactions with robotics or physical objects, it is important to remark the place of aesthetic on creating an affective interaction. In Helander and Tham (2003) it is defined *Hedonomics* as a Ergonomics' discipline that intends to evaluate how to measure one's emotions. In the case of anthropomorphism, Lemaignan, Fink, and Dillenbourg (2014) presented a model to evaluate its dynamics. Anthropomorphism is defined as a social phenomenon and includes 'emotional states, motivations, intentions ascribed by the user to the robot' (Lemaignan et al., 2014, p. 226). This topic has been discussed many years ago with several controversies (Don, Brennan, Laurel, & Shneiderman, 1992). However, in the Lemaignan's model, *familiarity* is a key element for engaging the user, but disruption and cognition can modify the long-term perception. These concepts are present in our findings and will be compared later.

The idea behind Anthropomorphism is that human-like robots and embodied systems can rise positive emotions. But it was also stated that excessive similarities can have the opposite effect[9], known in robotics as the *uncanny valley* (Misselhorn, 2009; Mori, MacDorman, & Kageki, 2012). In this regard, it is suggested that leading something to the users' imagination and perception (e.g. unexpected behaviors and random reactions) can help to elude repulsive reactions (Misselhorn, 2009). In words of Brahnam (2009), conversational agent's designers can rely on the *ethos* (the Aristotle's definition of moral character and goodwill) to generate credibility and trust by adapting the agent behaviour to the user.

1.4.2. Deployment

The experiment consisted if creating two conversational agents to test the Framework and the possibilities to evaluate the empathic relations with this technology. For doing so, we designed two chatbot platforms that enabled one-to-one conversations using a mobile phone. For the main interface at the client side (mobile phone), we used the Telegram Bot API[10] for both agents, because it allowed us to have a common interface with a simple implementation.

[9] Similarly, the Honda Research institute considers it as failure of empathizing with a robot, which can be related to the expectations tight to robot behaviour (Gomez, Szapiro, Galindo, & Nakamura, 2018).
[10] *Telegram Bot API*. Available at: https://core.telegram.org/bots/api

As noted in Partala et al. (2004), conversations are preferred in personal proximity level, influencing an affective dominance in participants. We designed the behaviour of agents to reach enough intimacy by using informal language.

For the server side, we found that besides the raising of platforms for creating conversations through Machine Learning algorithms[11], at the time of developing our experiment, few of them supported other languages than English. Since the local spoken language was Spanish, we developed the platform based on what best suited to our needs.

For *Chatbot 1* (CH1), we took the classical AIML processor using the open source software Program-O (PHP). AIML stands for Artificial Intelligence Mark-up Language, an XML-based format for specifying natural language software agents, based on the original ALICE project (Wallace, 2009). It is a widely used system to easily develop and configure conversational agents. Its simplicity though comes at the expense of some limitations for specifying sophisticated conversations to fully exploit the capabilities of natural language processing. Our choice was based on successful early experiments and its multi-lingual support, which fit the needs of the current experiment. We designed the conversations to make them apparently real and interesting by configuring the AIML-based processor with pre-defined conversational itineraries by means of matching short sentences or keywords during the conversation to respond accordingly. We also considered the possibilities of failures and errors, giving the chatbot the opportunity to behave and react accordingly to prevent it from getting stuck. For example, when a participant answered ambiguously, the chatbot either remained in the previous conversation thread or changed the topic. In case of confusion, the chatbot could avoid the answer or related it to a different topic. The lack of context, though, is the major problem of this type of processors, but also one of the main issues in AI in general.

For *Chatbot 2* (CH2), we used a 'Wizard of Oz' method (Okamoto, Yang, & Ishida, 2001), consisting in a person pretending being the bot. In order for a person (operator) to really operate the bot, we designed a web interface in NodeJS to interact with the Telegram Bot API to enabling a chat platform through which an operator could interact with the participants. Obviously, participants were not told about the real implementation behind CH2, and they believed the bot acted autonomous. To reduce bias in answers, the operator received guidance with behavioural rules similar to those followed by CH1. We decided to use this mechanism because only humans can behave freely and we wanted to improve the bot corpus. We expected that by having more contextual answers, participants would get more engaged in the conversation.

The experiment consisted of an individual session where each participant was given a mobile phone with Telegram installed and ready to talk with both chatbots. The expected time to spend for each chatbot was 10 minutes, but some of the conversations ended earlier on the request of participants.

1.4.3. Data collection

Different ways of measuring usability, engagement and affection in interactions with Conversational Agents can be found in literature, like in Hubal et al. (2008); Partala et al. (2004), but only providing partial results. It is clear that there is much to discover yet. Since much

[11] At the moment of the project some platforms were starting, i.e. *PandoraBots* (Available at: http://www.pandorabots.com), *Recast* (Available at: https://recast.ai), *Aiva* (Available at:http://kengz.me/aiva/), *Howdy* (Available at: http://howdy.ai), or *Hubot* (Available at: https://hubot.github.com).

of the communication process occurs in the participant interpretation, our methodology was oriented to consider the previous state of the participant and in order to clarify the affection process through an ethnographic process.

The evaluation occurred at different stages of the experiment:

1. Before the interaction with the bots, we gave to participants a set of surveys. As noted in Bickmore and Cassell (2005), subjects might respond differently based on their predisposition. For measuring its emotional state, we used a Visual Analogue Scale (VAS) with 7 parameters (Happiness, Sadness, Anger, Surprise, Anxiety, Tranquility and Vigor). Followed by the adapted version to Spanish of the Interpersonal Reactivity Index (IRI) (Mestre Escrivá, Navarro Frías, & García Samper, 2004), to understand the disposition to empathy. We also developed a semi-structured interview to learn about their previous knowledge and usage of Conversational Agents and chatbots (including Telegram and Facebook bots), Virtual Assistants (such as Siri, Alexa, and Google Now), and inquired them to their disposition to use those interfaces in the near future.

2. After the interaction with both systems (CH1 and CH2), participants were asked to fill-in a survey based on the Multidimensional Integrative Model (MIM), adapted from the proposed schema by Fernández-pinto, López-pérez, and Márquez (2008). It was aimed to assess each of the interactions within a pro-social behaviour and sense of affiliation based on a cognitive and affective empathy. The MIM survey uses 5 variables (Discomfort, Frustration/anger/impotence, Interest, Satisfaction, Wellness) that correlate with different levels of emotional contagion and affective-cognitive empathy. It was followed by an interview in which users explained their experience and highlighted whether their preconception changed about conversational agents.

3. Based in the logs captured from the conversations with the bots, we used Conversational Analysis (CA), a method approached by Sacks (Sacks, 1992; Sacks, Schegloff, & Jefferson, 1974) and later by Heritage (1991), in order to understand the structure of conversations by systematically analysing each transcription. Our analysis continued with a Thematic Network Analysis (Attridge-Stirling, 2001) of the interviews, established for building conceptual and sensitive insights of the textual data, and also used for similar purposes in Luger and Sellen (2016). Additionally, we used the time-log of conversations to analyse the response time from both sides, giving us some insights and feedback on how the system and participants have behaved.

Participants

We conducted the experiment with 13 participants who can be classified in 3 groups by age: 3 participants in the 18 to 25 years group, 8 in the range 26-36 years, and 2 between 37 and 50. All of them have an undergraduate degree and mostly postgraduate studies (10 of 13, with background in Computer Science, Humanities and Psychology). In terms of gender, 9 of them were women.

The level of digital literacy in the group was high. Seven used computers on a daily basis up to 7 hours, and the remaining six stated that they spent more than 7 hours a day using it. All of them use smartphones on a daily basis, and 12 answered they use them very frequently. Regarding the use of virtual assistants, participants were asked if they knew or have used some of the publicly available platforms. Ten of them have used Siri or Google Now at least

once, but only 3 of them - males, between 30 and 34 with experience in programming and highly educated - have had a conversation with a chatbot using either Facebook or Telegram.

1.4.4. Findings

Evaluating the emotional and psychological state

In a first instance we found that participants already had a prefiguration of a possible relation with virtual and conversational agents. During the interview, they described fears, hope, excitement and curiosity in different emotional insights:

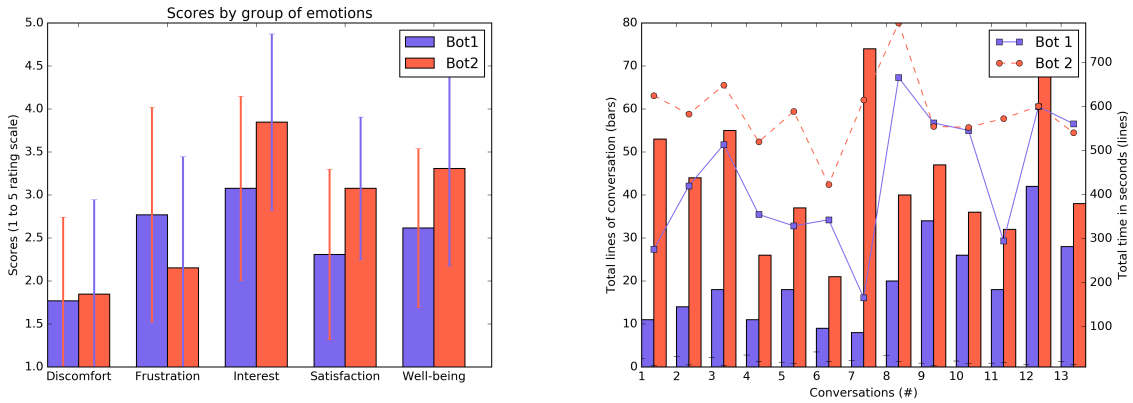
- Some participants were sceptic about the opportunity, and remained so after the experiment, suggesting that the expected functionality was more oriented to a rational aspect of its use. Before and after the experiment, all participants described new functionalities for specific and routine tasks, or new uses of these technologies: 'I think about it for elderly people who have more rejection from technology or displays. By the fact that it is a conversation it can be easy for them.' or 'I think it could be smarter, if people can access to something different, an answer that is not the same for everyone'.
- In a particular case, before the experiment one participant (P04) stated, 'it offers a solution that you already have, it's like I feel more comfortable doing it by myself'. But at the same time he said that he felt old or antique since he is not embracing this new technology and prefers to do it by himself. Looking at the IRI Survey results, P04 scored highly in Empathic Concern (EC) and Personal Discomfort (PD) sub-scales and comparatively low at Fantasy. Nevertheless, after the experiment, the same participant was open to use it for regular tasks and entertainment activities. Other participants, though, were already excited to embrace a relation and felt positive after trying it.
- Other participants reported a change in their emotions after having a good experience, leading to imagination for creating new relations with the system.
- The results of VAS survey indicated that the attitude of each individual was a critical factor both in the development of the experiment and for the possibility of creating more intense conversations: To correlate it with the Framework, *Intensity* can be associated here with longer chatting, more lines of conversation, more user's *domination* over the conversation, and more and varied utterances and *social cues* used during the conversation.

Evaluating the conversation experience

As reflected in the MIM survey, we found that the experience with the second chatbot was better than the first. Participants scored higher for interest (probability of affiliation but with emotional detachment), satisfaction (high probability of affiliation) and well-being (medium/low probability of affiliation) in relation to the second chatbot, while more frustration (low probability of pro-social behaviour) with regards to the first chatbot (see Figure 1.2a).

In terms of the amount of conversation lines and the time of the conversation the difference between both experiences was also maintained equal (see Figure 1.2b).

In spite of the absence of clear insights with the IRI survey, using Pearson's correlation (Pearson, 1896) and Spearman's correlation (Zwillinger, 2002), it showed that the Fantasy (FS) sub-scale is a linear relationship with lower scores of discomfort (Pearson's coeffi-



(a) MIM scoring Mean and Standard Deviation for CH1 and CH2.

(b) Time and Length Conversation Comparison between Bots.

Figure 1.2: conversation experience analysis

cient: 0.611, p-value: 0.0264; Spearman's coefficient: 0.412, p-value: 0.1609) and frustration (Pearson's coefficient: 0.615, p-value: 0.0252; Spearman's coefficient: 0.530, p-value: 0.0619). That suggested that fantasy (FS) could be associated to the acceptance of fictional narratives, is important enough in the personality of the participants to alter the levels of engagement within the interaction.

Evaluating the effects of the conversation on engagement

After analysing the conversations through the analysis of their data, we found two signs of engagement in the records of both experiences (see one example in Figure 1.3). First, when the user *dominated* the conversation (understood as who takes control of the conversation in each turn, as stated in the *turn-breaking analysis* (Sacks et al., 1974)); and, second, when the chatbot made explicit use of *social cues* (Bickmore & Cassell, 2005; Ruijten, Midden, & Ham, 2016). That gave us an insight to think about the importance of the agency of such bots, and how NLP development should be improved in that regard. Nevertheless some problems were found when *indexical expressions* (M. Lynch, 1994) appeared during the conversations; for example in the case of *here* or *us*, these terms became confusing for participants since they did not have a point of reference, and because of the invisible nature of the system (Gajendar, 2016). Contextual understanding is important in these details. From the point of view of linguistics, nouns are less important than a well referenced context through the indexical expressions.

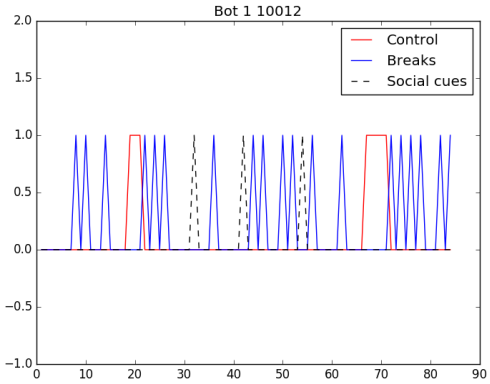


Figure 1.3: Data analysis of social cues, turn-taking and conversation control from one of the conversations.

After analysing and examining the interviews with the Thematic Network Analysis (Attridge-Stirling, 2001; Luger & Sellen, 2016) (see Figure 1.4) method, we highlight here the following findings that will be later on analysed and described in detail in next section:

Figure 1.4: Network of themes touched by participants

- Random, empty or duplicated answers and topic change by the chatbots were perceived as bad behaviour or error in the logic.
- Keeping the context, humour and timing was essential for humanizing the process.
- Positive effects were caused by letting the conversation be open, using *social cues* and empathic signs, and touching personal topics from the bot side.

1.4.5. Discussion

In this section we discuss the findings within the theoretical corpus. The idea is to explore how the experiment contributed to the aim of understanding the nature of emotional engagement between the individual psychological mindset and a chatbot during a conversation.

The preconception in the use of virtual assistants

We found that some participants already knew about AI systems from their personal or professional activities. Another distinctive group showed some reference to commonly used systems like Siri or Alexa. And some even showed an interest or pointed to Science Fiction series or films (e.g. 'After watching HER, the film, I don't think so...'). Those who brought the name of these fictions showed some concerns about privacy and also dystopic future ideas, while at the same time showed more excitement to do the test. Indeed, it is well known that

familiarity with fiction is linked to embodied empathic behaviours (Kidd & Castano, 2013). This suggests the importance of preconception about what these systems are able to do, and correlates with familiarity, as Lemaignan and colleagues aptly mentioned (Lemaignan et al., 2014), when users expect pre-configured types of interactions. Some of these pre-configured behaviours during interviews include: answering while the participant was still writing (leaving the idea that the system can predict what is next), finding relation between topics, having a sense of humour or giving nimbly responses.

The implications on the preconception in the use of chatbots can still be threshed out as follows.

- **The influence of the professional background:** Participants who work in computer science, or have programming skills, showed sceptic expectations about the possibilities of the chatbots. Most of them were open only to perceive the system regarding its functionality, and were less inclined to be open-minded to have a different experience. In the previous section we mentioned a participant with background in Computer Science (P04) who scored high in PD sub-scale. Other two participants, who also were sceptic before starting the experiment, obtained similar results. On the contrary, people akin to humanities or in activities related to cognition abilities got surprised about the possibility of engagement with this sort of systems.

- **The expected learning process:** The assumption that the system 'did' actually learn (expected learning process) was a clear preconception highlighted by some participants. They believed that if they kept talking, the system would get better answers, because 'they will know better'. One of the participants said, 'I supposed that the more it (the chatbot) deal with me, the more it can respond, right? And the more useful it will be, the more agile it will be. I suppose if that would give you more opportunities...'. This belief though was not clearly showed up in the conversation logs, and it can be explained by considering the preconception effect. This shows that the modernist vision on the future of AI systems facilitates the engagement process.

- **The chatbot's context-awareness:** Participants were strongly engaged when the chatbot remembered something that they have said before, even when it was just the participant's name. This effect of contextual answer from the system provoked on them the same empathic feeling. In another example, when the chatbot asked for details about some anecdote expressed by the user earlier, the rise of affection was immediately highlighted by the participant. The participants also mentioned an affection when the chatbot asked something personal. For example, one participant mentioned when the bot 'asked me a special experience for my life. In my childhood, he told me to tell him a little more of that. And I felt it as real.'

- **The timing bias:** In several answers, we found that the response time of the system was critical. But it was unclear the effect of it over the participants' affection. Some of them found that the delay in the response was related to the intelligence of the system (assuming that it takes time to give a smart answer) while others expressed their disappointment in this lag effect. There is no receipt for this matter, since it depends on the situation and the user expectation which can be variable depending on the context and the intention.

In relation with the topic of this thesis, we account that familiarity and preconceptions are well explored as an influence in the impressions caused on our aesthetic experiences (Edensor, 2012) and habits (Bissell, 2015) under the NRT approaches. Thus, the implications of our findings will affect on the following experiments and explorations focused on the place-based and urban experiences.

The effect of unexpected

When the bots reacted with unexpected behaviours, we found some controversial insights. Mainly, people found annoying that the system changed the topic of the conversation. However, some participants understood this behaviour as a way to keep the conversation alive. As noted in Lemaignan et al. (2014), the unexpected, depends on the perceived intention of the agent, and a judgement of it as a failure. This need of a switch in embodied conversational agents was already pointed by Cassell (2000), where non-verbal actions can manage this kind of unexpected situations. But with the unexpected, we also found the presence of some *serendipity connections* (the act of finding new and unexpected situations) that could bring different choreographs on the use of the system, supporting the value of previous findings in Kefalidou and Sharples (2016).

Concluding remarks

This experimental research was aimed to understand the possibilities to embrace some kind of personal relationship with chatbots. In the current stage of artificial intelligence technology, most systems are oriented to specific functions instead of real or contextual intelligence as imagined in fictional scenarios. For that reason, we were aware of the low possibility to fulfil the expected learning preconceptions. However, such preconceptions were found critical for encouraging engagement with the chatbot.

We asked our participants if they would have future relations with these systems, and the common answer was negative. But, some of them talked about their experience with Siri (the Apple's virtual assistant) which was more empathic because it makes jokes and gives funny answers. Also two participants talked about sharing this situation with other friends, as a way of socializing their findings. Socialization is an important advantage because it shows a breaking point of the previous functional idea of systems.

Regarding the CASA and ANT paradigms mentioned above, some participants agreed on being confident with trustworthy systems, even letting them to take decisions in their place, which is undoubtedly a confirmation of both theories. Future designs should consider not only the opportunity to build new agents as a social actors but also consider ethical consequences of it.

We can understand that a critical point for encouraging engagement (Q1) lies in the importance of the preconception mentioned above, but also, the condition of being inserted in cultural practices that relate them to other daily activities (such as commuting, collaborative working, etc).

It is worth exploring the combination of utterances, social cues, discourse postures (Cassell, Nakano, Bickmore, Sidner, & Rich, 2001) and effects of animism (Pasquinelli, 2016) effect of AI, which may contribute to greater levels of engagement (Q2). We agree with Misselhorn who suggested that 'an object which does not display a great number of human-like features, but very typical and salient ones, might do better in terms of perception-based empathy' (Misselhorn, 2009, p. 356).

We conclude that combining different behaviour strategies in the design of the agents would be helpful to engage the user, but the level of human-likeness should be relative to the purpose. In other words, promoting anthropomorphism is helpful, as it also provides a machine-like signals, preventing the user from being confused.

Finally, we presented diverse qualitative and quantitative methods for evaluating these systems. Even when more and deeper proofs of validity are necessary, cross-domain analytical methods for evaluating this kind of interfaces have been proven valuable. While the experience (Q3) is accountable through a qualitative approach, quantitative methods allowed us to have a closer understanding when they are used to systematically capture data.

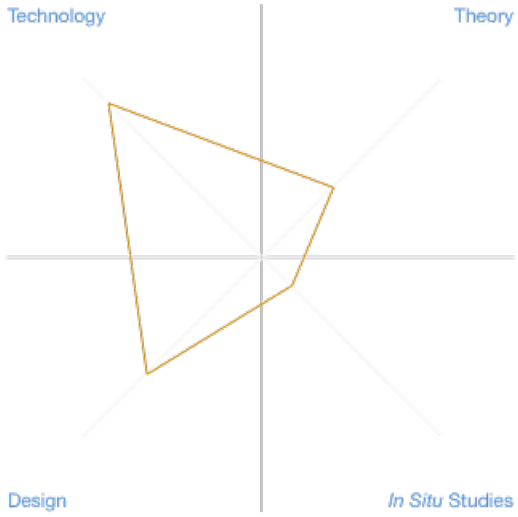
The presented results are partial in the sense that encounters were just part of an experiment, and not part of daily practices, to make a safe statement. More and varied experiments should be made to deeply analyse these phenomena. The experiment was held in an Spanish-centred environment potentially causing social bias, due to language and cultural constraints. Gender specific differentiation might also provide new insights, specifically with methods that presented differences in their results, like the IRI survey. Moreover, the interface used (Telegram) was chosen because it was regularly used by all participants, but cognitive effects could have been different using other types of user interfaces.

While the sample of participants is not enough to having a valid quantitative result, the experiment was focused on how mixed methods can complement each other, focused on the output of subjective appreciations. In this regard, highlighted results should be considered starting points to new future studies.

Although the technology possibilities of creating more sophisticated AI systems that would enhance bots capabilities are dramatically raising, future commercial, connected and location-based products will surely bring new scenarios to create fictional and non-fictional opportunities to study conversational interfaces in many and diverse real-life situations which are ever unimaginable today[12].

[12] Nevertheless, we still see how hard it is to develop such systems and how companies still failing, even when the investors value their business for such failure (*A.I. Is Harder Than You Think*, New York Times. Available at: https://www.nytimes.com/2018/05/18/opinion/artificial-intelligence-challenges.html)

Contribution: Research In the Wild Model



Theory: This project demonstrated that empathy should be understood beyond current emotional imitation and affective computing, rather, we provided a Framework that takes advantages of different disciplines to study the embodied, contextual and complexity of interactions.
Technology: The project showed that simple technologies, along with open source tools, can be easily adapted to work towards empathic relations.
Design: The project demonstrated the importance of designing the experiment and to know the participants background to asses and understand their behaviour. The findings of this experiment contributed with some insights for design new conversations with digital devices.
***In Situ* Study:** This experiment provided little commitment with the *in situ* studies, dimension that will be strengthened in the following experiments. However, it showed that forms of contextual use and sharing could engage participant in different ways.

1.5. Outlook: The city of attentiveness

If we have to characterize the outcome of this chapter, we can envision a city that is based on the attentiveness to lived experiences. Recovering the affective theory, empathic relations with chatbots are shaped by different intensities, from frustration to excitement. These shapes, named feelings or emotions, are what constitute and make sense to the practices of everyday life. A politics of experience is that one where 'the concern is with experience as both the site for the operation of power and as an occasion for the emergence of forms or ways of life that are more than an effect of power' (B. Anderson, 2017, p. 502).

We get back to our approach to objects as political entities that reconfigure the *publics*, to answer our first research question (RQ1): How do artifacts/objects offer new ways of engagement, and what consequences have in our daily life practices?

Conversational bots are just one of the many possibilities that we envisioned with our Framework. At the same time, the Framework helped us to delineate an observational mode

of such intensities in order to measure engagement and empathic relations.

The agency of objects should be thought about how do we use digital and physical devices and for which purpose. Considering that by developing technologies we are always developing a double awareness, we have to consider the situations and the narratives that these objects are part of, and, which networks and assemblages are articulated in their socio-technical relation. Additionally, we have to pay attention to what futures are thrived, and how does are arranged as a force of social togetherness, as a form of analysis.

As an example, the solar-punk movement[13] creates narratives apparently to defy climate change fictions based on delusional and pessimist ideas of futures that are yet to come Wagner and Wieland (2017). The narratives could be embodied by [DAD] in physical objects, and transmit not only aesthetic appreciations (with elements like solar panels and electric cars), but also interacting with other human and non-human bodies in building positive imaginaries and generating certain feelings of togetherness.

If we pay attention to how marketing chatbots and virtual assistants operate in the affective level, brands constantly try to generate new empathic relations with their consumers by providing more human interactions. By using the same resources for different purposes, we envision an entire political involvement, from citizen science projects to citizen activism. In this scenario, new media systems are not only driven in forms of standard messages but with more human-like responses, having an impact on the affective realm and their visceral response. The resulting narratives would brake through on how citizenship experiences the life in cities. Although, this is just one of the many examples that radically disruptive technologies can be thought of in a scheme of empathic relations.

However, we should be concerned about how these technologies affect our liberties and life opportunities. As practitioners, we should always consider that 'we imbue technology with the ideals of the people who have created it, rather than those who use it' [14](Latour, 2008)

We will follow our research with other forms of empathy in next chapters, to explore different relations between bodies and places, and how these ideas could be involved in different spheres of understanding.

[13] There is a bunch of Solar Punk novels that goes against the distopic versions of cyberpunk (*CYBERPUNK VS. SOLARPUNK: BOOKSHELF*, Gray Scott. Available at: https://www.grayscott.com/seriouswonder-//cyberpunk-vs-solarpunk-bookshelf) and a manifesto was released some years ago (*Solarpunk: Notes toward a manifesto*, Hieroglyph. Available at: https://hieroglyph.asu.edu/2014/09/solarpunk-notes-toward-a-manifesto/)

[14] The ethical concerns in current technological trends are extendend to the problem on how technologies represent the groups of interest and which groups are technology made for (see *Tackling the Ethical Challenges of Slippery Technology*, Anab Jain. Available at: https://medium.com/@anabjain/tackling-the-ethical-challenges-of-slippery-technology-94500e723d34) and how individuals can be controlled through these emotional technologies (see *The quantified heart*, Aeon Essays. Available at: https://aeon.co/essays/can-emotion-regulating-tech-translate-across-cultures).

2

A mutual attunement

We discuss the notion of place to address the empathic relations in the realm of daily activities and practices. By working with the notion of affective atmospheres, we developed an experiment to understand how does the senses and the body interact with other bodies.

2.1. Introduction

The overwhelming amount of experiments that are being developed thanks to the capabilities of creating, capturing, managing, analysing, visualizing and consuming data, take us to live within an 'inhabitable map' (Thrift, 2009). Those methods can be useful if, by recovering the principles of place, they could help us to orient such technological development to recover the enchantment of life in cities.

In the previous chapter, we introduced empathy in the form of direct interaction and, defined as an aesthetic experience. In this chapter, empathy is considered a shared state of attentiveness and togetherness (Depew, 2005; Freedberg & Gallese, 2007; Gallese, 2003; Steinbock, 2004; Zahavi, 2001) in spatial relationships, that thrives between states of consciousness and unconsciousness. It serves as a critical concept to better understand how the circulation and contagion of affects between humans and non-humans can change our experience in everyday life activities and relationships. For that reason, we take non-representational theories (B. Anderson & McFarlane, 2011; Cadman, 2009; Murphie, 1996; Thrift, 2009) and other post-cognitivist approaches (A. Crabtree, Nichols, O'Brien, Rouncefield, & Twidale, 2000; Moser, 2005), for what we believe that could be a main turn to deliver more liveable cities by using technology and through empathic relations.

In this chapter we attempt to critically discuss the concepts of place, non-place, placelessness and in-between places in the interplay of digital technology and urban environment. We argue that the distinction between place and non-place is merely contextual and relational. Afterwards, We suggest that digital technology can drive more empathic relationships than it currently does with the urban environment. We put our focus in the mediation of our senses to inquiry the spatial properties of affective atmospheres. Therefore, we propose a set of strategies to enact 'affective atmospheres' (B. Anderson & Ash, 2015) and to cultivate thicker places in the process of empathy enactment within the urban space with new technologies.

The chapter has four parts, where the first discusses places as an introduction for the subsequent description of everyday places, in the second part. This set the scenario for proposing empathy as a mediator, and technological enhancements (as embodied interactions) as transforming forces of such mediations. The third part of this chapter introduces affective atmospheres and affective methods as theoretical framework to analyse the experiment on lighting infrastructure that takes the last part of this chapter.

We conclude this chapter with a remark on how atmospheres change spatialities, providing opportunities to engage with new practices and activities. We suggest that a sensory enactments could provoke diverse feelings and emotions, and, new spatial configurations.

2.2. Background

What are the cities but socially organized spaces? What does it mean to dwell a place? What is the contribution of technology if it is not to create enhanced places for living better?

Wellbeing is one of the driving values that can be usually found in the technological discourse around cities. But it turns out, that the lack of accountability for such concept makes it difficult to understand its real purpose and outcome (Andrews et al., 2014). We believe that recovering the discussion about spaces and places is necessary to look with new eyes at this relation. To understand the importance of places we take the non-representational (NRT) approach, that prioritizes the performative embodiment of the daily life (Duff, 2010; McCor-

mack, 2003; Pile, 2010; Thrift, 1999). Part of the roots of NRT are based on Heidegger's phenomenology, and with it we can find the first thoughts around the theory of place. Along with Norberg-Schulz (1980)' Genius Loci, places can be constituted as spaces to dwell by their effect of gathering.

Our inquiry was oriented to understand how affects take part, and influence, in the process of gathering of urban spaces. Nasar (1994) explained two types of aesthetic experience with architecture, a formal (based on the structure of forms) and the symbolic (related to the content of forms). Alternatively, Rose et al. (2010) described that 'building' is not an object but a process where 'big things' become and remain what they are (thought as a process of infrastructuring in relation with material elements). However, these two visions (from structuralist to relational) require more explorations with other type of elements in urban space is less approached in literature (Clarke, 2010; Misselhorn, 2009).

In Human-Computer Interaction and Urban Informatics fields, there have been intentions to enact emotional relations with space, including different types of interactive artefacts (Krüger & Kuflik, 2012; Quercia, Schifanella, & Aiello, 2014; Salim & Haque, 2015; Wolff et al., 2017) and theories (Foth, 2009; Thrift, 2014). But, the relation of such developments and the effects on the creation of sense of place has not been profoundly explored. On the contrary, abstract and cognitive models and theories have been lead to more structured developments. 'While the social and cultural approaches attempt to deconstruct conventional approaches to cognition (and in particular the underlying cognitive computational claim on mind), the recent exploration of the role of emotions leaves traditional cognitivism intact, and in fact depends on it as the base for adding "emotional" understandings' (Boehner et al., 2005, p. 59).

Therefore, we focused our research on the diversity of feelings and emotions, but also sensory capacities in the human body, that become possible by the use of technological enhancements, the environmental conditions, and other bodies in interaction. Consequently, we used our second experiment to rethink the notion of place from the perspective of affective theory and the atmospheric methods.

> **Are you in public? Public spaces are spaces too, for goodness sake. They are not different in that respect from private spaces. They are simply organised differently, with different architectures, different entry points, different surveillance systems, different soundscapes.** (Latour, 2008, p. 8)

2.2.1. A background on public spaces

The beginnings of the place-making movement dates back to the observations of Jacobs (1961) and other radical urbanists in the 1960's and 1970's. They were the first to understand the importance of details that are required to produce a vibrant city. Jane Jacobs innovated with walking activities. These walks were reproduced all over the world, pushing people to observe cities by embracing their complexity. K. Lynch (1960) worked on the visual aspect, the 'imageability' of the city, while Whyte (1988) focused on the full range of human senses to plan in open spaces. From the perspective of urban planning, this movement was a call to enjoy our cities, to make them slow, and to take advantage of the space. It started with

a movement of constant improvisation and prototyping, bringing people to the streets[1]. An example of such actions is the project on Broadway Avenue (New York City)[2]. The avenue was closed to cars, where tables and chairs (and different types of furniture) were placed on the streets for pedestrians. Unfortunately, the reproduction of this method ended in an over simplification, and it became a commonly copied approach that many city have adopted[3].

Another perspective on the exploration of public spaces, rely on recovering the senses in different ways, which is combined with the idea of avoiding assumed representations of cities to find new relationships and experiences. The Situationist movement coined *psycho-geography* as a method to provoke what they called *serendipity*, that means to getting lost in the city to connect to it (Debord, 1955). This concept is directly tied to uncertainty, and the chance of getting unexpected encounters, which has recently been developed in architecture and urbanism practices and has become a key value in the design of cities (Purnell, 2017).

Nowadays, when someone arrives to a new city as a tourist, he/she uses a map or an application that helps him/her to discover the city's main hotspots. His/her itinerary will be composed of several points that are connected only by sporadic visits to sights that catch his/her attention. However, none of them have any meaning to that person. The idea of gathering, is that places are tied to a story in relation with that space. It could be a recent, embodied history, or an old, legendary one. However, a place must have a deep meaning for a particular person.

De Certeau (1984) highlights the importance of spatial stories in the construction of places, because everyday practices are organised and funded by such stories. When visiting a new city with a tour guide or historian, everything makes more sense, spaces start acquiring new meanings and we feel a connection with some of those spaces. This is because the tour guide or historian has the capacity to bring historical details about the places, to present the specific details of the built environment and buildings to connect their history with the material reality that we perceive. But at the same time, we see the buildings and infrastructure with other eyes. By paying attention, we build our experience and acknowledge the process of meaning creation. That connection is strong, and it will remain there for the future.

History is not only about past stories; it also embraces vivid and embodied stories. 'To travel between places is to move between collections of trajectories and to reinsert yourself in the ones to which you relate' (Massey, 2005, p. 131). Our repetitive, routinised life generates a set of unconscious stories. If we cannot stand in a place to contemplate the details, we can pass through the same place every day without noticing many things. However, on each of these days, there are things that remain there, and others that do not. There may be things that should be there because once were, or there may be things that have never been there. Repetition over repetition not only generates a set of choreographies but also a static image of what that place is. This includes material, immaterial, interactive and emergent aspects, which in the words of Nigel Thrift, can be called *spectral gatherings* (B. Anderson & Harrison,

[1] The most famous organization is Project for Public Spaces (Available at: https://www.pps.org/article/what-is-placemaking), but it does exists many movements, since placemaking is a community-led approach to urban planning.

[2] *BROADWAY BOULEVARD: TRANSFORMING MANHATTAN'S MOST FAMOUS STREET*, Project for Public Spaces. Available at: https://www.pps.org/article/broadway-boulevard-transforming-manhattans-most-famous-street-to-improve-mobility-increase-safety-and-enhance-economic-vitality

[3] Many governmental agencies are taking their principles for design. And, for what remains in bottom-up strategies, some practitioners adopted the term Tactical Urbanism. Nowadays there are many guides that sets the lines for standardization, e.g. *Tactical Urbanism Guide* (Available at: http://tacticalurbanismguide.com)

2010).

However, repetition is neither dull nor exciting by itself. For Nasar (1994), typicality is when the representations in memory of the built environment help to organise the experience in a space. This order and the complexity of space provoke different reactions and discrepancies with the mental models of places.

2.2.2. A debate on Places

Place and space are intrinsic components of any city. An urban space can be configured by different social groups or individuals according to their lifestyle, common places, intentions and choreographies, leading to a continuous multiplicity of *publics* (Jenkins et al., 2016; Law, 2008; Murdoch, 1998; Sheller, 2004b).

The distinction between both ideas has been complicated from decades. Massey (2005) faced the duality by charging the weight of political matter on both sides. For the idea of place, she understood it closed, coherent, integrated, authentic, as 'home' and, a secure retreat; it also has endlessly mobilised in political argument and tends to withdraw from the discourses of invasion/difference, a politically conservative haven. By the other side, space is thought under three main characteristics (Massey, 2005, p. 9):

1. Spaces are the product of interrelations; as constituted through interactions, from the immensity of the global to the intimately tiny.

2. Spaces are the sphere of the possibility of the existence of multiplicity in the sense of contemporaneous plurality; as the sphere in which distinct trajectories coexist; as the sphere therefore of coexisting heterogeneity. Without space, no multiplicity; without multiplicity, no space. They are co-constitutive.

3. Spaces are always under construction. Precisely because space on this reading is a product of relations-between, relations which are necessarily embedded material practices which have to be carried out, it is always in the process of being made. It is never finished; never closed.

Moreover, 'thinking space can shake up the manner in which certain political questions are formulated, can contribute to political arguments already under way, and - most deeply - can be an essential element in the imaginative structure which enables in the first place an opening up to the very sphere of the political' (2005, p. 10).

Even though when the discussion between places and spaces becomes confusing, Massey argue that the distinction between the openness and closure of spaces doesn't reside on its opposition. We should not rely on 'spatial fetishism' (2005, p. 165).

It has been inevitable to address both (place and space) along this thesis. Yet, the presented distinction becomes blurry in many cases. First, because it seems inseparable from the experience itself, and, second, due to our political contest. We should not avoid the discussion at any time, but we will focus more on places, because is where the meaning reside on. Although, we shouldn't scape of the consequences of choosing one or another. Specifically in the post-colonial and neo-liberal aspects.

'If space is rather a simultaneity of stories, so far, then places are collections of those stories, articulations within the wider power-geometries of space' (2005, p. 130). Thus, stories leave impressions in our memories of the places that we visit. The urbanist Kevin

Lynch coined 'imageability' for describing that phenomena. In his word, it is 'that quality in a physical object which gives it a high probability of evoking a strong image in any given observer' (K. Lynch, 1960, p. 9).

But what happen when a place lacks of that characteristic? Placelesness, or the lack of sense of place, is understood as lack of the character of a place (Casey, 2001; Norberg-Schulz, 1980; Relph, 2016). A sense of monotony or unfamiliarity can lead to frustration. The importance of a place is given for what Relph (1976) introduced as the six characteristics to define place:

1. Have a spatial extension and an inside and outside;
2. Integrate elements from nature and culture;
3. Are interconected by a system of spatial interactions and transfers;
4. Are localized;
5. Have an historical components (are emerging);
6. Have meaning.

Following him, the definition of the contrary, or a 'non-place' becomes more specific for explaining which factors are present on how sense of place. A non-place, 'cannot be defined as relational, or historical, or concerned with identity' (Auge, 1996, p. 77), it lacks of any spirit, remain spectral. Although, Augé is clear on the idea of non-place, that isn't a direct opposite of place, it is a provocation that works as analytical tool to observe this lack of character.

In Shamai (1991) we found that sense of place is rooted in the emotional connection with the space, and that is essential for the wellbeing of an individual (see more on Andrews et al. (2014)). The notion and interest of place, is usually confused with our attachment to a place for its emotional connection to it. In terms of Gifford (2014), 'place attachment' has different functions: Sense of security, sense of belongingness, sense of continuity, it foster restoration, and, facilitates the successful pursuit of one's goals. As a consequence, place attachment is one of the most tangible expressions of sense of place (Najafi et al., 2011)

As noted by Najafi et al., the sense of place is psychological but also interactive and physical. Sense of place 'influences attitudes and behaviour beyond itself' (Gifford, 2014). As the authors points, 'sense of place as an emotional bonding between people and places is created after cognition' (Najafi et al., 2011, p. 189), which implies that after our direct affection with it, there are social, cultural and personal motivations and emotions. The experience is the main form of lived places, therefore, what first characterises a place is an embodiment of the spatial interactions, that are rationalized and memorized afterwards.

But, almost four decades ago, Norberg-Schulz (1980) recovered the readings of Heidegger's phenomenological approach with respect to dwelling. He argued that we cannot reduce a place 'to any of its properties, such as spatial relationships, without losing its concrete nature out of sight' (1980, p. 8). In this regard, the sense of place is an entire phenomenon that cannot be explained outside the experience with the place itself. The act of dwelling is, by definition, to be gathered. In other words, dwell means that 'the everyday life-world has become habitual' (1980, p. 23). Thus, place has a spatial dimension (determined by things

and order) and an atmospheric dimension (defined by its character and light). For the author, places are altered by time and viewed as a source of constancy and change.

Thrift (1999) also draws on Heidegger's dwelling to point the relationships between places and practices that are held. However, Thrift correctly noticed that Heidegger latest work presented a romanticism with practices fixity. We noted the same in Norberg-Schulz work that attached specific atmospheres to places. Following the NRT tradition, we have to move forward to question any particular causal relation between practices, places, affects and atmospheres. Therefore, Thrift incorporated Wittgenstein's work and the metaphor of haunting (for which ANT does a great job in representing its power, not without its own flaws (1999, p. 313)). That a place haunts us (and we haunt them) means that practices 'take place *in* a setting' (1999, p. 311), and by that practices open spaces (how do places haunt will be addressed at the end of the chapter).

As a consequence, beyond the idea of a social construction of space (Soja, 1985), there is something else that turns daily-life spaces into places. In spite of the fact that sense of place has been inquired from multiple perspectives, we focused our research on the physical settings and the non-conscious arrangements where actions take place, which have been less explored in the academic literature. Although, we must consider and understand these enactments in terms of creating and remembering meaning and the emotional relationships (Manzo, 2005) that take place in embodied encounters, remaining in a form of *emotional bondings*.

2.2.3. Discussing places as everyday assemblages

Until now, we have introduced different conceptualizations of place. It is undeniable that the importance of place in modern society has become trivial. This may be because of its complexity, but the changes that occurred in recent decades through socio-technical transformations and, the acceleration of the neo-liberalism as a form of governance, tend to reduce the richness of places to simple stereotypes. We can recognize what Auge (1996) took for non-places as regular places for daily life activities. Such activities are full of practices that are assembled in different types of places. In our following argument, we consider how the notions of affects and empathy can be related to everyday practices.

There is no fixed relation between the gathering force of a place and the capacities of embodied empathic relations. And there is no general recipe to cultivate places.

But, we know that a place gathers and we are affected by a place, there is an empathic relation that connects us with it. What we should look for, is how does the affective forces between bodies work in relation with the spaces that those bodies habit. In the previous chapter we presented an experiment based on the notion of empathic relations. Although, the experiment hadn't the spatial dimension into account. For that reason, this chapter looks forwards to understand how technological enhancements can change our relation with spatial configurations. However, technology is neither a static nor a directional thing that is implemented at once. Rather, we should consider technologies as socio-technical assemblages that works differently-in-action.

For that reason, before presenting our experiment, we present the following scenarios that will focus our attention on disentangling, in a theoretical basis, the boundaries between places and non-places to obtain a more comprehensive definition of their characteristics. Thus, what we will try to do here is to provide some examples of how these ideas can provide

a classification for implementing a technology that helps to towards our goal.

Places of transition

In Auge's work, airports are considered to be non-places, because the routine and its standardised processes provides an uniform treatment for each individual, producing a space of detached emotions. These spaces of *supermodernity*, 'have the peculiarity that they are defined partly by the words and texts they offer us: their "instructions for use"' (Auge, 1996, p. 96). There is a social contract that any user agree upon, by transiting those spaces.

However, airports are much more than that. As we mentioned above, affects can be socially engineered and manipulated. The idea that such spaces respond to shared emotions of detachment is feasible because there is a lack of interest, which is ultimately, political.

In fact, individuals experience different realities in the act of travelling, by means that spaces become places of multiple expectations. H. L. Molotch (2012) described many strategies, and put into question what are the apparatuses of security - he described it in a degree of totalness, in the sense that seems perfect - and appropriations - taking to extreme cases, like those homeless that look for shelter inside airports. However, some of the arbitrariness in the procedures, gives the idea of lower degree of totality, that coexist all together. Thus, we can describe airports as transitional spaces. Airports serve to many functions as other public spaces. Those functions are materialized in particular and general cases, for which the later have been used for stereotyping airports as non-places. For example, business travellers take planes so often that they want to save time in such places, and they know exactly how to go through security and border control. They have confidence because they know the procedures and they are able to use the exclusive add-ons that are offered for providing more comfort to such travellers. These habits generate and are affected by different emotional transitions, that define the place's *milieu*. Thus, 'if habits are apprehended as virtual and distributed, rather than internal to individual bodies, habit becomes a key part of this infrastructure' (Bissell, 2015, p. 132).

In the case of families who are on holiday and, may not be sure about how to manage all of the steps that they must follow in the security and border procedures, the emotional excitement of the moment may offset their frustration. Going on vacations or visiting an old friend become valid excuses to suffering all of the violations to privacy that are imposed by airports and border control procedures. The symbolic act of being there and the historical moment for such people, is usually captured by a photo before the security check or at the boarding gate. An airport is a new adventure, an opportunity to extend boundaries of their own experience.

Under the idea of *splinter urbanism*, Graham and Marvin (2001) described on how technologies operate to obscure, or hide, certain systems of control. But at the same time, other kind technological infrastructure is revealed and celebrated to build up iconic spaces (such as radars and traffic control towers). These infrastructures, together with monumental buildings and other iconic constructions, create symbolic connections. Although, as we already mentioned, there is a process of building (Rose et al., 2010) that escapes that logic. Kitchin and Dodge (2011) well exemplified the case of the dependence in the check-in areas, where the system is entangled with the practices, constituting a code/space all together. The sociotechnical systems are part of the practices by co-creating spatialities, and those are cultural embedded as an act of dwelling.

Adey (2009) argues that the scrutinization suffered in airports generates an effect of *data-double* because single parts of bodies are transformed in data (through scanners and other security practices), that consequently helps to the augmentation of the real passengers. These techniques enact a managerial mode, defined (*a la* Foucault) as a practice of *biopolitics*. But that doesn't mean necessarily that airports generates individualities, or exclude factors of sociability. On the contrary, the situation in the airport 'produces and encourages a temporarily atomised subject, whose responsiveness is disabled, who is discouraged from unprompted, spontaneous interaction with the dense mass of humanity with which it is forced to coexist in a constrained manner' Bulley and Johnson (2018, p. 223). The effect of atomization, Bulley and Johnson (2018) argues, also atomizes the act of dwelling, rather it operates in more subtle ways, where technology and material design works to encourage that isolation or separation of dwelling acts (e.g. in zones around seating or information displays).

We cannot describe here the infinite experiences that occur in a complex system such as an airport. If we take the relational, non-representational approach, the idea that there is only one airport, where things are ordered and emotions are impossible in the context of highly normalized procedures, is more of a fictional representation of an airport than what in reality happens there. Even on a symbolic level, airports connect us to the rest of the world, which imbues them with an extreme importance, even in the era of telecommunication technologies. In that sense, airports are part of the assemblage of daily life and of the ideology of globalisation, that can be enacted as places. As said, 'these changing intensities of habit affect the lived experience of place because bodily capacities for moving, sensing, perceiving and attending are transformed' (Bissell, 2015, p. 132).

Any space is paradoxical, and leverages its definition between being a place and a non-place in a process of continuous negotiation. As a consequence, airports as places emerge in a relational way. In a similar sense, Relph (2016) coined the notion of Placelessness, as a 'sameness with', where the intertwine between place and placeness is paradoxical. Duff (2010) proposes the use of Casey's distinction between 'thick' and 'thin' places (Casey, 1998). This conception is tied to the experience between the self and the personal enrichment of a place. While the distinction between 'thin' and 'thick' places appear to be similar to that which exists between places and non-places, it takes the affects as points of departure. This means that the conception of a place does not reside in the place itself but in the affects that are related to it, as an autonomous, relational forces between places and bodies.

According to Duff, 'thick' places can be cultivated by local appropriations. The author relates the importance of intimacy to the practices and encounters that take place to determine the construction of meaning and belonging to a place, which lead to diverse *affective atmospheres* (we discuss this definition later in this chapter). The distinction escapes of the Massey's discussion over space-place dichotomies and the place/placeness/non-place from the other authors, in that sense, the discussion over place is re-engaged in a political manner, but this time from the affective theory.

Places of aesthetic experience

Cultural events in general, and more specifically, technology and the visual/interactive arts, can enable the transformation of spaces. For example, Urban Informatics (Foth, 2009; Thrift, 2014) is a field that seeks for transforming space in new cognitive and symbolic assemblages by using multi-media artefacts such as light, projection and sound.

While these temporal transformations do not produce a different physical space, they produce perceptual differences by enabling new spatialities and evoking sensory transformations. Because places are contextual and become structured by interactions and trajectories, such transformations generate new orders and are implied in new affective relations, assembling new places. However, not every intervention is effective in terms of creating new places. Such performances are often regarded as an entertainment, a break on the routine of a traditional building *façade*, and the potential enactment of empathic relations within a space. However, if there is no dwelling or appropriation, there is no gathering effect. But, as in the case of airports, we should be careful on observing such places, because dwelling can be subtle in unexpected ways.

The ideas of *synesthesia* and *ideasthesia* refer to the effect caused by stimulating two or more senses and, how different sensory organs relate themselves and with our perception, which provokes the stimuli of new experiences, changing the cognitive understanding of the surrounding space. The historian Purnell (2017) revealed that the use of senses in European cities in the 18th century was very different to the actual understanding on sensory experiences. Dark streets and smoky skies led inhabitants to rely on listening, smelling and touching as their primary sensory actions. We are now in an era of visual stimulation, however, playing with more senses could provide more realistic scenarios. Thrift also highlighted that *kinesthesia* supports our understanding of how the body constructs space in its interaction with our senses, as a 'ground to our consciousness' (Thrift, 2008, p. 64), a 'tangled exchange of noisy silences and seething absences' (Thrift, 1999, p. 317).

We will address atmospheres later in this chapter, although it is necessary to understand the aesthetic implications of the sensory capacities. 'Böhme suggests recovering the concept of aesthetics from its Kantian-artistic connotations towards a more ecological and sensory dimension. In Böhme's view one needs to reclaim the original Greek meaning of aesthetics, namely aesthesis which meant "to sense"'(Degen, Melhuish, & Rose, 2017, p. 6). The interaction between senses, are the way that we can attune with our environment, and to set up our capacities to perceive the spaces.

Change and permanence are two main temporal variables that can be manipulated by technology. Duration, for Spinoza, was the main driver of affective capacities, as the 'indefinite continuation of existence' (Deleuze & Hurley, 1988, p. 62). To varying extents, the opportunity to see a place changing in time is remarkable, and it remains in our memory, while the permanence of a change can reinforce that moment. What occurs is because we value the change, and the intelligibility of the process of change is easy to recognise. Thrift asserted on acknowledging that 'like societies, places can be made durable but they cannot last' (Thrift, 1999, p. 317).

Casey (2001) reflected upon places becoming spaces in the post-modern era. He also recovered Heidegger's *disarray of place*, as the effect caused when a place loses its thickness, and is downgraded to a space. Specifically, he mentioned two common consequences. *Glocalization*, in which the 'locale is linked to every other place in global space' (Casey, 2001, p. 684), and the *liability of place*, where its condition of becoming a place is merely hold as an entertainment or distraction with a 'reminiscence of nothing so much as space'. Relph (2016) noted that distinctiveness is what makes a place. As we described before, despite current efforts to provoke distinctiveness in cities, contemporary placemaking practices are just another way to reproduce pattern of urban interventions, which leads to the same glocalization

effect.

However, for Casey, not everything is lost. There is a possibility of observing *in-between places*. For his distinction between the self and the place, the relationship between both is in the body as a way to be in-the-world (recovering Heidegger). For that reason, multiple opportunities are opened, and in place of thinking about losing the self in this relation, it is compensated by the virtue of postmodern nomadism. 'The more places are levelled down, the more—not the less—may selves be led to seek out thick places in which their own personal enrichment can flourish' (Casey, 2001, p. 685). Thinking on Massey's focus on spaces, Casey's proposal is that spaces can be rearranged and reconfigured as new places by processes of appropriation and negotiation.

We argue that the notion of place, as we knew it in the 20th century, have lost its relevance due to the new spatial relationships that are configured in the contemporaneity of trans-humanistic and trans-media existence. However, the category of place should be considered in a less strict sense while our observations are being adapted. In the Thrift's critique 2008 of De Certeau's humanist vision of everyday life and the importance of pedestrian experiences, the author argues that walking practices are also configured by car culture. Along these lines, place as a matter of space, that roots humans and creates and extend our lives, becomes less important in the development of our social life and, more expansively, our place in the world. As a consequence, the quest to explain and describe places, and trying to decode them, becomes less worthwhile than it has in the last decades. Thus, we propose to focus on looking at the *ecologies of place* (Thrift, 1999) by considering the in-between places.

Places of joy

Time is constituent to space. If we are dinning with someone we care about or in a meeting with someone who is important for us, time will move slowly, because we want to remember every detail of the encounter. We can allocate smells, colours, conversations, and gestures. We are nervous, and we want to control the environment and the situation to accommodate the other. If we are having fun with friends or family, time moves faster. It does not matter where we are, the experience change when we are enjoying the time or having fun with others. In such cases, we will remember fewer details. The power of joy, enhance our capacities to act in the world, therefore the duration of such affects transform our perception of time and space. Joy, described by Spinoza, is a passionate power that enhance our capacities for acting, but has its cause in an external power (agreeing in our nature upon other body).

Observing details allows for richer experiences, we enhance our attentiveness and our chances to being affected by other bodies. Norberg-Schulz (1980) stated that there are places that are civic and places that gather because they are natural environments. We must discern the meaning of 'natural' in such natural places. The difference between civic and social places is not about their nature, but rather the level of detail that we are open to interact with. Elements such as trees, sky, mountains or wild animals are associated with cognitive and behavioural complexity. The hypothesis of biophilia explains that environments with such complexity provoke a calm mind (Joye, 2007), which is reflexive on our bodily condition as human beings.

Because details leave different impressions on our experiences, attentive modes are critical; however, not only in the rational conscious mode of awareness. There are different types of attentions, from precognitive to totally conscious attention (Steinbock, 2004); in our case

we refer to a passive mode of discernment.

Places of familiarity and remembrance

A train station is conformed by the sounds of engines and locomotives, the smells of junk food and sweat, brilliantly lit signs and other local elements. Every train station is different, but we expect them to be similar to us. We have the static image of a train station that we know well (references could go from films to the familiar stations that we frequent), and we have a reaction when we visit a new one (especially in a country different than ours). The ticket systems are different, the trains are different with distinct noises, while the food and the smells are different. Even more, a train station also implies a 'mobile collective' in the sense that we are travelling with others, we share our experience with other bodies (Bissell, 2010). As a consequence, the existence of places is always a matter of togetherness. Nevertheless, some transport systems generate different relationships with their cities. The NYC metro system is a constituted part of the city's imaginary. There is no New York City without its metro system, without its grotesque signalling system, the steel infrastructure, the humidity, the rats and the sensation of insecurity. The familiarity of a place is determinant; and it is inherently historical and cultural.

However, the familiarity of a place is part of how remembrance works to make a place familiar to us. In other words, the sensation is that we have lived there, and those memories are vivid for us. This is because we know certain details of such places that tell us stories, and we have stories to tell about it. As Steinbock (2004) noted, 'remembering is a reproductive awakening that turns backwards and reanimates the affective force that now lies sedimented in the retentional past in a kind of dormancy' (2004, p. 32).

According to Duff (2010), the memory of a place is established when affects are rendered, which means that 'thick' places become meaningful and memorable. As the result of technological implementations (such as sensors, internal memory, and software), objects can also record actions (selectively or not) and force us to recollect some memories through an embodiment of practises. As Kitchin and Dodge (2011) described, coded objects can enable specific behaviours that are only performed because of the implementation of software as a socio-technical assemblage. Such objects can serve as important factors that have an impact on humans by constituting code/spaces. Although, an object cannot become aware of the effects and consequences of place.

On the contrary, Ash (2017) argued that the modulation of spatio-temporal intelligibility is partly shaped by the commercial logics of the industries that design and manufacture smart objects, but can also exceed them. This line of though follows the previous work on the agency of objects, that was already described by H. Molotch (2002) on how non-digital devices are also political agents.

In another example, Aibar and Bijker (1997) analysed how a city wall was a determinant for the Catalonian community, to defend its identity and its own city. While communities are a matter of political interest for specific spatial activities, they are not exclusive to humans. Rather, we approach the notion of empathy as a sense of togetherness that exceed the humans as social actors.

Places of altered passions

For our last scenario, we would like to mention a special kind of spatial configuration. Leaving behind the symbolic and consumerist perspectives (that are no less important), the entire

experience of being in amusement parks is confluent between the idea of being with the economic and social event that is accomplished as a societal importance of success and, built up emotions that are enacted in the parks. For example, Disney parks produce shared affections as normalised experiences of excitement. All the attractions are build upon a set of familiar events (such as parades and processions or, the presence famous characters - which is reinforced by films delivered by the same company). This condition is supported by its complex landscape, the colourful enhanced architecture, and the constant musical ambience, that generates emotional (and manipulated) memories. The experiences are characterized by smiling people, excited children and the reproduction of already-known images of the Disney experience. Affects flow and circulate between subjects (Pile, 2010) and other artefacts (Edensor, 2012). This circulation intensifies the bodily capacities along with feelings of joy, where facial expressions are key in communicating the euphoria (Bissell, 2010). This corporeal contagion is not only about feelings, but rather it is based on a process of imitation or mimesis (Thrift, 2008, p. 232). It derives from a condition that is commonly appreciated in crowds, forged in the moment between the space, people and things.

The design of such parks allows the visitor to move from one type of emotional space to another in a short walk. As in the airports, amusement parks have less space for dwelling, event when looks like the contrary. Every space is controlled through different mechanisms. In that sense, the affects that circulate in between are not always linearly related to happiness. Beyond emotions, particular sequences are followed by acts of choreographic enchantment. This flow is more critical than is generally valued. Currently, there is a search for happy cities (Montgomery, 2013) and other positive emotional reactions. As the feminist Segal (2017) explains:

> The problem with happiness, however, is that while we are all for it, in general (or almost all of us), it is not so easy to pin down the nature of the thing itself. It is even harder to be sure of quite how to go about obtaining it. Indeed, it is plausible to suggest that it is the constant search for happiness that itself generates frustration, unease and a sense of failure.

We think that the enchantment of a city shouldn't be compared with this type of flows, as spaces where multiple affects can be manipulated and emotions can be rationalised differently. Our agenda is not one of miser, that 'is concerned above all with softening the costs of ever-rising social wretchedness' (Segal, 2017, p. 30). On the contrary, spaces should be contested, negotiated and dwell, like in any public space (Massey, 2005).

We face an interesting paradox that takes place in an intentional space, where the circulation of affects varies sharply in intensity and generates a heightened production of subtle places. As people usually only visit theme parks once or twice in their lives, such visits constitute temporal experiential actions. The experiences are kept in memories and pictures, but they are not constantly performed as daily routines. For Casey (2001), places are shared in different modalities: through their tenacity,'the presence of a place remains lodged in our body long after we have left it'; by their subjection, because we are an expression of the nature of a place; and by *idiolocality*, because that subject alone can carry the peculiarities of a place in him/her very flesh. This means that what remains in our embodied memory is part of the experience and is reproduced by our idiosyncrasy, disappearing over time. If we argue that time, memory and history are necessary to define a place, the reinforcement of

such embodiment through the reproduction of our *habituale*, as well as our empathy with it, is the only way in which it can be re-enacted. This lived experience leaves an impression in our body, and because of its tenacity, it can be revived at any moment in which we reproduce the same sensation that is associated with such place.

Spaces all over the world, have been built considering local weather and materials as part of its own history, and its consequence effect of globalization. Amsterdam houses are prepared for daily rains, while Mediterranean houses are built to be cold during hot summers. However, Disney park's architecture is atemporal, creating an atmosphere of nostalgic and anthropological showcase (if not reinterpreted by North American cultural values). One can find American 1940's buildings in Disneyland Paris, spaceship simulations in Tokyo, or a jungle in the middle of a swamp in Florida. These scenarios make theme parks especially out-of-the-world situations. However, visitors are not aware of this when they there. Location does not matter if it is not attached to a historical linearity. Thus, the idea of a linear history makes it difficult to detach location from a place. Nevertheless, location and history are not necessarily attached to a place if there is a performance affect that ties our experience within the place.

This is because being in a place is not a directly conscious act (in the sense that Heidegger understood the phenomenological ontology), but something we must discover as corporeal activities that makes sense and actualize our perception of reality. This means that, despite being a human-made place, we do not control and make sense of a place as an artificial one. It is perceived as being as natural as any other place.

Our final observation is that in such theme parks there is no quietness, because they are built for people to consume and move along the park constantly. At the same time, anxiety and excitement are the best driver for such consumption. Intensity is a variable that must be managed. When urban planners talk about mixed-use and mixed-density, the effect of such planning is to enact different intensities of affects. 'Cities can be seen as roiling maelstroms of affect' (Thrift, 2008, p. 171). Any urban planner knows that between buildings and shops, there should be parks and schools. This is something that is well known, and the greater the intensity, the richer the space will be. Further, richness brings the possibility of appropriation, and as a consequence, the cultivation of 'thick' places.

We understand that different assemblages of people and objects enhances our experience in the world. In sequence of positive affects, the whole experience becomes in a joyful state that leads to a positive emotion (Andrews et al., 2014). Because affects are always temporary and local, they are never involved in closed or complete relations, and, as such, it does not matter if it is historically related to people's lives. The shared experience with strangers is a constant reinforcement of togetherness, without the necessity of commonly understood and acted identities.

As Andrews et al. (2014) stated, affects exist in any environments and relations by nature; however, they can also be engineered, created, and manipulated to provoke certain feelings and emotions. But, to what extent is this possible? The author argued that affective experiences are unique and unpredictable and are also filtered by previous individual experiences. Even more, places cannot provide any consistent affective relation. However, places reify cultural appreciations, with their reputation and multiple identities, there is an economy of affects that seek to exploit the value that people attach to places. This leads us to consider an amusement park as one of the best, non-ordinary examples of spaces, where

affect and empathy can be enacted. Nevertheless, 'each affective experience is a unique and unpredictable articulation of bodies and objects assembled in certain times and places that are specific and complex beyond any design' (Andrews et al., 2014, p. 218).

2.2.4. Located technologies and place-based interactions

Following our discussion on places and spaces, we want to address also the the notions of environment and context to be explored as spatial concepts. As we argued before, earlier definitions of places conceptualized spaces as empty spaces. Under this perspective, our perception and emotions are purely internal, and our actions and behaviours are understood as rational phenomena. The term 'behaviour' is commonly used in recent theories of design, society and technology (Lockton, 2013), which takes their roots in cognitive, economic and psychology theories to explain people's decision, based on systemic models. Systemic models alone, though, cannot fully account for the complexity of 'behaviour' required to fully explain individual decisions, especially for non-expert people (Rogers, 2011). Among other factors, Yvonne Rogers argued that these behaviour-related theories cannot achieve the expected results in the practical field (Rogers, 2006).

Connected to the Rogers' statement, the situational-awareness (SA) model described by Mica Endsley (Endsley, 1995; Endsley et al., 2004; McKeown, 2013) determined that the context can influence people's actions and decisions. SA is often framed in safety-critical systems where failure may cause loss of life. The concept relies on treating the environmental stimulus as merely data, and it is closely related terms like location-awareness (Nova, 2007) or context-awareness (Bhala & Tayde, 2015), which are about being aware of what is happening around. In that sense, some authors found these models helpful for collaboration processes and interactions at the scale of a city (Nova, Girardin, & Dillenbourg, 2010).

Ambient Accountability

But, from another perspective, Zinnbauer (2012) proposed the notion of 'ambient accountability' as an explicit way to bring context awareness to citizens in the place and time of the interaction to deal with potential situations that could go right or wrong, and helps them to make decisions based on it. Ambient accountability differs from SA because the former accounts for the controversies that exist in the public space and the actors involved in all the socio-technical assemblages.

We acknowledge these approaches because location and situation are important terms for defining places, and it is as important when we work with projects that take place *in situ*. Although, as we explained, the idea of mediation in this work is understood beyond these rational model. Our affective condition is proposed in relational terms, hence, the spaces are not empty. As Griffero (2014) metaphorically explained, atmospheres are much closer to the Japanese concept of *ma*, understood as the 'the necessary symbolic and spiritual interval between things' (Griffero, 2014, p. 122).

Embodied interactions

We mentioned in the beginning of this thesis, that the abstract and cognitive modelling theories that have been lead to more structured developments in computer science.

> While the social and cultural approaches attempt to deconstruct conventional approaches to cognition (and in particular the underlying cognitivist computational

> claim on mind), the recent exploration of the role of emotions leaves traditional cognitivism intact, and in fact depends on it as the base for adding "emotional" understandings. (Boehner et al., 2005, p. 59)

Even though, some recent works (DiSalvo, Jenkins, & Lodato, 2016; Jenkins et al., 2016; Kukka et al., 2014; Rogers, 2011; L. A. Suchman, 2007) have shed light on the interplay between phenomenology, human geographies and Human-Computer Interaction.

The problem that is faced in the field, is that it always exist a process of reductionism and simplification in the design of any system. Although, the recent development of AI systems can modify that condition. For that reason, designers should understand how to deal with that complexity. As roger stated 'when the "second" generation of alternative approaches began to be introduced into the field of HCI there was considerable scepticism as to what they had to offer of practical value that would persuade designers to take them on board' (Rogers, 2004, p. 28). Even when we found that many scholars remain sceptic, a third wave started to explore new paths focusing on the cultural level, the expansion of cognitive to the emotional and the focus of experience (Bødker, 2006).

One of the approaches we have seen is the phenomenological approach in HCI. The embodied interaction approach (Dourish, 2001; P. Marshall, Antle, Hoven, & Rogers, 2013) made the point to go from users in work activities to actors in broad daily life situations. Along with affective computing, Research In the Wild (Rogers, 2011), materialism (Wiberg et al., 2013) and artifact ecologies (Bødker & Christiansen, 2012; Jenkins et al., 2016) are other approaches that contributed to a new paradigm for the field.

The embodied interaction approach to HCI and CSCW is a response to the question on how we interact with the environment, one that acknowledge the embodiment of practices. In 2001 Dourish (2001) published the foundations of embodied interactions. This sub-discipline was focused in the interplay between sociology, phenomenology and computer sciences. His concerns about the embodiment of interaction was drawn upon these three premises:

- First, the designers of interactive systems have increasingly come to understand that interaction is intimately connected with the settings in which it occurs.
- Second, this focus on settings reflects a more general turn to consider work activities and artifacts in concrete terms rather than abstract ones.
- Third, there is a recognition that, through their direct embodiment in the world we occupy, the artifacts of daily interaction can play many different roles.

His ideas weren't new, and are more or less present along our work. But, embodied interaction raised the concern about what is going on in the reality of interaction from another perspective, rather than explain it through the cognitive schema that was commonly taken in computer sciences. Although, few of the ideas were taken seriously in the field, to the extend that, years after, he published an epilogue to clarify the importance (Dourish, 2013).

It does exist a constant difficulty on approaching the dual paradox (Dourish & Button, 1998) between the practitioners and the local/situated actions. 'Ethnomethodology refuses to theorize practice in that, and precisely because, members' real-world practices are only discoverable', although, 'the trustworthiness and generalization of findings relies on their relevance to systems design insofar as findings make observable the work that design must support if effective technology is to be developed.' (A. Crabtree et al., 2000, p. 672)

Later, his inquiry on how to understand the spatial experience from HCI moved to the concern of ubiquitous computing and the effects of technology embedded in our cities (Dourish & Bell, 2007). Many other texts followed, with less practical applications (P. Marshall et al., 2013).

In that sense, another challenge in order to develop systems that respond to emotional affection, resides on how to measure such affection. We have mentioned the efforts made in the field of affective computing (discussed previously), where Boehner, DePaula, Dourish, and Sengers (2007) mentioned that ambiguity, multiplicity, subjectivity and co-interpretation are factors that difficult developing such system outside the common HCI cognitive approach. So far, for evaluation, it seems that there is no clear path to follow but to be open to develop mixed-methods in order to observe widely, and avoiding to treat emotions as mere information.

Boehner et al. (2005) identified certain principles to enact affect in designed systems, critically commenting that an interactive design 'is not making systems more aware of emotions but making people more aware of emotions through system use and design' (Boehner et al., 2005, p. 66). However, for the authors, it is challenging to develop such systems relying not on information, but on flexible interpretation and complex contexts. The interactional and non-representational approach in HCI is paradoxical, because the expression and communication of emotions misleads the situational affection, leaving only the conscious and rational expression of such interaction. The early work of L. A. Suchman (2007) addressed this issue by analysing how interactions with machines are situated and recognising that planning such interactions are more complex than has usually been assumed.

In consequence, the difficulties in the field of HCI took different paths in the way of cognitive sciences and affective computing, rather to explore deeply the world of unconsciousness. The discussion that Boehner et al. (2007) brought to light can be placed as a contribution towards a theory of aesthetics and affects (Boehner et al., 2008) within the third wave in the HCI field (Bødker, 2006; Harrison, Sengers, & Tatar, 2011; Harrison, Tatar, & Sengers, 2007).

Urban informatics

Another issue within the computer sciences and also in HCI, is to treat complex issues as 'wicked problems' (Tutton, 2016), by simplifying the causes and/or consequences, treating the complexity of city as a problem-solution statement. But this difficulty to embrace problems is not exclusive in HCI field (Dourish, 2001; Dourish & Button, 1998), we can account the same for Environmental Psychology (Gifford, 2014), or Social Sciences (Venturini & Latour, 2010) in general.

Urban informatics is a sub-discipline that consist in 'the study, design, and practice of urban experiences across different urban contexts that are created by new opportunities of real-time, ubiquitous technology and the augmentation that mediates the physical and digital layers of people networks and urban infrastructures.'(Foth, Choi, & Satchell, 2011, p. 4)

It differentiates from the field of urban computing by suggesting that the former focusses more on the social and human implications of technology in cities. Therefore it groups all the practices that work on the realm of the urban and public spaces (from façades and public displays, to urban data analysis and visualizations). Urban informatics is an approach that mix architecture, urban planning, media studies, sociology, behavioural psychology,

cognitive science and human factors engineering, among others (Foth, 2009, 2017).

Even if the relationship between embodied interaction and urban informatics approaches aren't explicit in theoretical constructs, they share some basic principles. From location-based experimentation, to the interplay of senses, and the questioning of their effects within the spatial knowledge.

As we will see at Chapter 4, we must consider Thrift's position (Thrift, 2016) about the politics of affects and the 'regimes of feeling' that he alerts regarding technological enhancement of livid experiences. Undoubtedly, technologies are enabling a new kind of opportunities to create and transform spaces, and it comes with the transformation the struggle of power. Though, his concern of non-conscious condition of affections are yet to be discovered. Here, what we purpose, is always look for open systems that help to envision ethical and human liberty, in place of authoritarian manageability of feelings.

2.2.5. Affective Atmospheres

After reviewing place's literature and comprehend the background around affects and embodiment approaches on HCI, it is now our intention to look at the differences and changes in the appreciations that naturally emerge from environmental alterations and discuss the potentials of atmospheres as a means to enabling the existence of new spatial assemblages.

In this section, we take as starting point the notion of *affective atmospheres*, because they 'capture the emotional feel of place, as well as the store of action-potential, the dispositions and agencies, potentially enactable in that place' (Duff, 2010, p. 881). In other words, affective atmospheres are the path to enact the cultivation of 'thick' places.

Affective atmospheres are 'coproduced by conventions of social practice' (Edensor, 2012, p. 1103). But also, it is important to acknowledge that affective atmospheres 'facilitate and restrict particular practices and, in doing so, precipitate particular structures of feeling' (Bissell, 2010, p. 272).

Böhme coined the term atmosphere as a phenomenological analysis of the aesthetic experience. He described atmospheres as 'affective powers of feeling, spatial bearers of moods' (Böhme, 1993, p. 119) that attune our bodies to the aesthetic intensities. Therefore, 'affective atmospheres emerge both from anticipative aesthetic work and spatial formation and from the engagement with accidental encounters' (Michels & Steyaert, 2017, p. 97). Böhme and many authors coincided on that atmospheres are not a property of bodies (human or non-human), neither something subjective but vague by nature Bille, Bjerregaard, and Sørensen (2015). The existence of atmospheres is something in-between that is continuously emergent. Atmospheres have aesthetic qualities, for do so, work 'as both a way of representing and perceiving the world' (Sumartojo & Pink, 2018, p. 16).

One of the issues that brought light over the process of emergence of atmospheres is the need to understand the always-changing environmental qualities of everyday situations. For Griffero (2014), there are atmospheric memories of our lived experience, that are registered ontologically in ordinary and intuitive ways. Although, atmospheres escape and are not always constant. Instead, 'are susceptible to how the material environment changes, to changing human values and cultural premises' (Bille et al., 2015, p. 34). The author acknowledged that atmospheres determine the effects of a first impression, which is transformed in subsequent encounters.

Affective atmospheres and collective affects

Ben Anderson took encounters as a point of departure to analyse atmospheres by means of collective affects. The affect can take the form of a collective condition that mediates how life is lived and thought of.

As it is commonly understood in human geography, and is worth to remember, we refer to affects as 'a body's "capacity to affect and be affected", where a body can in principle be anything' (B. Anderson, 2014, p. 9). Even when he addressed affects in many forms, we are interested in the questions that Anderson raised regarding the possibilities of locating affects in time, space and place. He declared that affective life is organised and mediated, while affect is not a special property of one domain of life neatly separated from the others. On the contrary, 'life is saturated with attempts to intervene in what bodies can do' (B. Anderson, 2014, p. 52). Our interest is to explore the contradictions that such interventions bring to our existence, in particular spatial and temporal settings.

Thus, affective atmospheres are just one of the many forms that affects can be accounted for the collective affective life. Through the analysis of the work of Böhme and Duffrene on atmospheres, Anderson sets out a variety of indeterminate characteristics of affective atmospheres. Atmospheres surround, fill and wrap bodies and spatialities are organised through atmospheres, while atmospheres lack explicit boundaries. He calls to study atmospheres as an *emergent causality* because 'we cannot be sure of the character of the atmosphere before registering its effects in what bodies do – an atmosphere is revealed precisely as it is expressed in bodily feelings, and qualified in emotions and other actions' (B. Anderson, 2014, p. 156).

Beyond the discussion regarding how atmospheres, objects and other bodies are part of affective atmospheres, the issue of how objects emanate affects and are affected by them remains open. James Ash took two different perspectives to explain it. First, he developed the concept of *perturbations* to explain that there are relationships between objects that cannot be accessed by humans. In this sense, these perturbations generate multiple space-time relationships and atmospheres that cannot be explained by the notion of affect. However, atmospheres generated by perturbations 'create feedback loops between the human and the non-human, which in turn reinforce the durability of these atmospheres' (Ash, 2013, p. 26). He concluded that technology produces times and spaces that are local to atmospheres because the qualities expressed by objects emerge from specific encounters.

In his second exploration, Ash returns to the notion of affect to explain that 'material relations between components that make up an object and the absolute material thresholds that define an object by what it can do' (Ash, Kitchin, & Leszczynski, 2015, p. 84) allow technology to potentially emanate what he calls *inorganically organised affects*. His focus on the organization reminds us to Anderson's approach for collective affects. As affects are not attached to specific objects, *structures of feelings* can be defined as the 'conditions how something appears by organising the way in which it comes to be felt as part of the dynamics of everyday life. It is a collective dispositional relation to the world' (B. Anderson, 2014, p. 121).

Returning to Ash, the author considers that technical objects can adapt to certain thresholds of homeostasis. In short, affects are related to the purpose of a technical object (or the broken relationship of its purpose). He accounts for the way technology is involved in the generation of affects, where the different experienced situations could have different effects

on different human beings.

In this regard, his understanding of affects comes into conflict with the affective notion twice, in the relational approach and their multiplicity. If affects can emerge from objects, then it is not entirely relational but a materialist perspective. In subsequent sections, we put this discussion of where these affects can be traced and what is the nature of the affective life in different encounters. If affects and emotions are always-already entangled with one another in encounters which are mediated by forces that exceed their spatio-temporal location as it was proposed by Anderson, then it escapes the logic of the materialist orientation that Ash put forward.

Affective atmospheres in public life

Before moving forward, it is worth to explore other authors' approaches regarding space, technology and affective atmospheres. For example, David Bissell considered affects in mobilities and defines affective atmospheres as 'the relational potential for things to act or change in a particular space' (Bissell, 2010, p. 280), relating spaces to specific atmospheres but clarifying the affective capacity of transform and to be transformed.

He also took into consideration the affective arrangement of material objects involved in the assemblage or milieus of such spaces, which also 'have the capacity to reconfigure the affective relations between passengers' (Bissell, 2010, p. 280). In this way, traffic signs and similar objects in public transport infrastructures and systems influence the affective atmosphere in which they relate to. Although the emanation of affect from objects was not considered, the author argued that those objects are part of the discursive constitution of such spaces.

Also, for Bissell, affects have the capacity to align bodies and to be perceived as part of different collectives. The emergence of these coherent alignments in different bodies could be also considered as the way affective atmosphere are co-produced (Edensor, 2012) and as methods for studying the phenomenon.

In a later study, Bissell (2015) highlighted how habits are involved in the capacities of bodies of being affected. In terms of affective atmospheres and individual experiences, the repetition of such habits emerges in relation to the spaces that we navigate, suggesting that 'habit is not coincident with individual bodies, but part of the movement of life that brings living beings into existence in formative relation to their milieu' (2015, p. 131). Our attunement to atmospheres is therefore conditioned by our previous experiences in a sort of anticipation or dispositional orientation (Edensor, 2012) that is built upon our history.

Though, by affecting body's environmental attunement, practices and habits, artefacts and objects can induce people to specific *involuntary vulnerabilities* (Healy, 2014), in forms of *biopolitics* (Thrift, 2004). From the car industry (Sheller, 2004a) to shopping centres (Healy, 2014), it has been acknowledge the powers of emotional vulnerabilities and exploits to drive the subjectivities and foment consumption behaviour.

Thus, subjective appreciations are intrinsically related to our chances of being affected and generating affects. This notion is quite important for our work, as the affective capacities of the spaces and objects that we analyse are tied to habits, and the possibilities of changing the constitution of physical infrastructure could impact on the emergence of new affects in many ways.

Lupton (2017)'s work ,which took a perspective on how digital devices co-exist with the

ambivalences and ambiguities of feelings and emotions in health-related places, is another way of understanding the relationship between spaces, devices and social aspects of affective life. While digital devices become part of people's lives and are inside health clinics, the aesthetic apprehension of such spaces and atmospheres is clearly attached to that kind of places. Thus, if habits and repetitions of movements in mobility generate *some kind of* expected atmosphere, places of highly social demand and repetitive routines provide opportunities for affective transformation.

Affective atmospheres have been accounted in public transport (Bissell, 2010) and public places (Duff, 2010; Edensor, 2012; Merriman, 2016) by methods that include participative observation, go-along walks and interviews. In those studies, artifacts such as signs, posters, lights, speakers, parking lots, doors and turnstiles are specially noted as shapers of dispositional behaviour. Although 'the precise shape of affective emergence and modulation is unpredictable' (Bissell, 2010, p. 283), and concurs with the difficulty of facing everyday life practices and the unexpectedness of appropriation practices of digital technologies. In sum, atmospheres 'as the ongoing sensory and affective engagement with our lives that takes in many impressions, sensations and feelings' (Sumartojo & Pink, 2018, p. 30).

2.3. Experiment 2: Atmospheric Lights

After a long introduction for this chapter, we have learnt that urban planners, technologists, and architects shape the urban environment in modern cities. Spaces are designed by manipulating feelings and emotions, creating opportunities for affect circulation (Thrift, 2016) and atmospheres (Böhme, 1993). We pay the attention to the reality of changing spaces and places by the practice of designing urban atmospheres.

By recovering the 'atmospheric methods' (B. Anderson & Ash, 2015), together with the earlier works on lights (Edensor, 2012) and sounds (Gallagher et al., 2016), within other sensory experiences (Middleton, 2010), our inquiry was focused on the emotional traces of affective encounters and transitions. Because 'light can also be deployed to delineate the contours of collective memory' (Gandy, 2017, p. 366), we studied an empirical case, based on a in-house project of lighting intervention that was aimed to provoke a sound-reacting and illuminated atmosphere. It worked as an excuse to discover, discuss, and raise conflicts regarding the actualization (Deleuze & Guattari, 1991) of affects in creative ways, and puts in perspective the transcendence of such atmospheres.

But, what are the possibilities of technology to alter or sustain these relations? Or, in words of Relph (1976), what are the possibilities of technologies to give distinctiveness to a place? Recovering the four competencies of place (or spectral gatherings) proposed by Thrift (1999) helped to can define four questions at the time of design new embodied interactions:

1. How do the interactive lights generate different reconfigurations of the space differently?
2. Are the interactive lights part of the affective atmospheres?
3. Which feelings and emotions are expressed through the presence and absence of lights?
4. How do the spatial configurations alter the activities and practices that take place in the station?

In the way that Thrift describes it, recovering Deleuzian-Spinozism, there is an 'affective relationship', where affect 'structures encounters as a series of modifications arising from the

relations between ideas which may be more or less adequate and more or less empowering' (Thrift, 2016, p. 62).

2.3.1. Motivations

We started from the idea that the perception of a place is not related directly to the objects that place contains, but to its atmospheres (B. Anderson, 2014; Böhme, 1993; Griffero, 2014) and rythms (Edensor, 2010). In other words, atmospheres are merely (but not only) 'a qualitative-sentimental prius, spatially poured out, of our sensible encounter with the world' (Griffero, 2014, p. 5), also conceived as 'the specific emotional quality of a given "lived space"' (2014, p. 36). Thus, our argument starts from questioning how is the effect of the changing environment and the affective forces of the atmospheres over our habits and the everyday perception of certain places. To clarify, the perception of place here is meant to be understood affectively and corporeally, rather than rationally and symbolically. Place is where we perform our habits perceived atmospherically as an extension of our *sensorium*, an intersubjective constitution of the spatial side of our habits.

For this experiment, we chose to work with illuminated atmospheres, directing our inquiry towards the affective forces that circulate in scenes in which the presence of artificial light is massively present, altering the way our senses are attuned to physical spaces.

Light has called the attention to several scholars. From a phenomenological point of view, specially, because light is valued for its effect, illumination. Böhme (2014) studied the phenomena of light, as it provides different encounters with it, that involves the effect of bright, radiance, fibrillation, mattness, glow, fluorescence, and many, many more. In that sense, light (and specially bright) changes our relations with things and spaces, because it brings the possibility of seeing. Bille recovered the concept of *ecstasy* to describe the phenomenology of light-things, which means that 'at certain times things transcend their own tangible borders to alter the presence of other people, places, and things' (Bille, 2017, p. 26), also ecstastic things 'may step out from itself and impose itself on other things' (Bille, 2015a, p. 260). Even more, light 'as atmosphere lends an emotive character to things, locations and environments which appear in a certain kind of illumination' (Böhme, 2014, p. 16).

For Bille and Sørensen (2007), people have related with light in three different ways: lumen, lux and their social orchestration. For the latter, they remarked the creation of *lightscapes* by playing with the material relations between light and darkness that led to cultural meanings (e.g. creating *hygge* in Denmark (Bille, 2015b), or *hurma* at Jordan (Bille, 2017)). Designed spaces and atmospheres were studied when it comes to specific settings that transform places for specific purposes. Thus, light 'in public and private places becomes luminous regimes that reveal power relations, ethics, and morals, while facilitating social life' (Bille & Sørensen, 2007, p. 274) .

Regarding public spaces, light and darkness modify the character of urban atmospheres Edensor (2015). Urban lights are aesthetic qualities that can give rise to a form of enchantment shaping movement and mobility. Specifically, automatic lights can be felt as 'certain passing way of feeling in the city, at moments when the material and affective worlds met' (Sumartojo & Pink, 2017, p. 7).

In that sense, we incorporate the factors of time and space and how affects change and alter spatialities. As light projections, lights can be a way to defamiliarise with habitual

Figure 2.1: The station and its surroundings.

spaces Edensor and Sumartojo (2018). What Edensor asserted that 'anticipation engenders the coproduction of an atmosphere by preparing visitors for an emotional and affective encounter with the resort in noncognitive and cognitive ways' (Edensor, 2012, p. 1115). As atmospheres change and are embodied differently between individuals and collectives, we explored the opportunities to intervene a space and grasp the existence and changes of affective atmospheres, recognise subjectivities and follow the reactions in spatial movements of those that passed-by. In sum, we propose to explore in which conditions anticipation feed the mutual attunement and co-production of atmospheres, drawing from an empirical experiment and observation.

2.3.2. Deployment

The University of Jaume I is relatively new. It was founded in the 1990s and its campus is in a small to medium-sized city (around 200,000 inhabitants), Castellón de la Plana, Spain. Students, staff and visitors arrive there by bike, car or bus. As there are many towns around Castellón, many people use either private cars or public buses. The campus has only one bus stop, which is a hub for five bus lines. The bus station is therefore also used as a node where some of the lines finish their service.

The bus station stands in front of the Ágora, a circular esplanade that operates as the centre of the campus with the most important buildings surrounding it. Architecturally

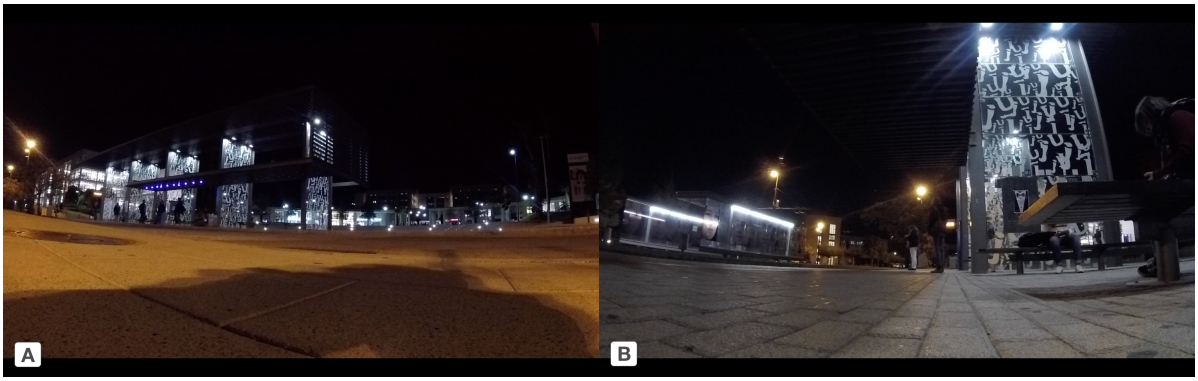


Figure 2.2: Accounts on how people distribute their bodies in the station.

speaking, the campus faces the bus station is a steel, glass and wood structure. The station is in an open space, and is partially covered by glass and a wooden roof (See Figure 2.1). Weather in Castellón is warm (reaching as high as 40°C in summer) and it does not rain very often.

By observing the behaviour of people, we arrived at the conclusion that the bus station was a good place for our experiment. It is common to find people who are waiting alone or in groups of two or three. While their purpose is waiting for the bus, they usually talk or use smartphones. Other types of activities were noted, such as reading books, walking, eating, making phone calls, playing video games and waiting without doing anything specific. Benches at the bus station are widely separated and when people are approaching the station, they distribute uniformly over them, avoiding being too close to each other (See Figure 2.2). When all four benches are occupied (even by only one person), newcomers stay stand. This behaviour is not new: on the contrary, it is common in Western/European societies.

However, the entire spatial perception changes when the sun sets and the darkness fills the spaces in between. Darkness is not problematic at all (Edensor, 2015), on the contrary, it changes the entire place, bringing it new potential. The station has light reflectors placed in the ceiling projecting only half of the surface, leaving some spaces in shadow. Therefore, the effect of the buses entering the station generates not only a soundscape (Radicchi, 2017) of engine and beeping sounds, but also a projection of moving lights. This means the hostility generated by the lack of soft lighting is aggravated by the fury of noise and loneliness of people feeling the urge to get to their homes. This situation presents itself as an interesting playground, where the senses are delighted with the many stimuli. Between the internal anxieties and the external signals, different affects can be accounted.

Around this scenario, we imagined an intervention that would allow people waiting for the bus (and other passers-by) to change the lighting environment at will by digitally interacting with the soundscape.

As we explained before, we based our design in the analyzed Thrift's competences (Thrift, 1999) and adapted the given definitions to help us to define an effect through atmospheric relations in the following table (Table 2.1). We have defined each of them in terms of how technology can modify places, and the effects that are possible through this.

To exemplify and understand better how these constructs works, we selected a set of experiments held by third parties to analyse under the competences and the proposed effects

Figure 2.3: The glowing effect of the lights in the station. Video available at https://vimeo.com/250609443

Competences	Definition	Effects
Thing	Give different feedback and alter materiality	Inclusion, exclusion and openness
Time	Modify the perception of time and duration of events	Change, transformation and permanence
Memory	Use of empowerment and imaginaries to generate remembrance and allegiance	Familiarity, typicality and disctintiveness
Emotions	Modify the sensory context creating enactments	From single (e.g. touch: haptic and taptic) to complex, as synesthesia, ideasthesia, kinesthesia and others (see Geurts (2003))
Language	Use of language (visual, spoken, sound), metaphors and ideas to modify and organize new narratives	Complexity/simplicity, connected/disconnected, certainty/uncertainty

Table 2.1: Definition of 'affective atmosphere' technological enablers.

(See Annex II). Unfortunately, most of these experiments are not permanent, therefore, the effect caused will eventually disappear with time, rather because they become familiar or the by the effect of other contingencies. Thrift itself call to understand NRT as an experimentation, and highlights that the kinaesthetic knowledge 'is projected through objects which are based on maximizing movement experiences through the application of particular sequences of movement which engage the visceral sense as well as the proprioceptive and fine touch, rather like hieroglyphs of the kind found in dance and other performing arts' (Thrift, 2008, p. 73).

We designed our experiment following the constructs mentioned above:

- Thing: the installation consist on a light sequence made of bulbs and wireless signal. Materiality is given by the interaction and light response.
- Time: The reaction of the system change the perception of noise and light, as a visualization of it. Through the user intervention, the feedback of the system provides different time reactions.
- Memory: The system provides a different reaction through the interaction that alter the practices and memories of the place.
- Emotions: By the reaction, and the interaction with users, people react emotionally to the installation.
- Language: A language of colourful lights is used to enact new interpretations.

We designed and developed a lighting system based on a set of RGB festoon style light bulbs that were divided in two rows along the stations and controlled by a computer (See Figure 2.3). The light bulbs were programmed to change according to the ambient sound collected through two microphones. One microphone pointed specifically to the place where the buses arrive, and the other one at the place where people usually sit. As the system took both inputs (see above), the feedback (to users) in form of variations of lights responded differently to each stimulus. Those perturbations (Ash, 2013) were meant to bring the potential of new atmospheres.

We complemented the lighting system with a control/interactive system. We designed a system to let people connect to the lighting system via wi-fi connectivity and change the visual rhythm of lights. They could choose between four different rhythms controlling the reaction of lights differently. This capability was announced in the same station with some posters placed around and in the same infrastructure. It should be said that those were not the only posters placed on the glass walls of the station. As it is a strategic and popular meeting point, other adverts such as music bands, casting announcements and the detailed of each bus route competed for people's attention.

2.3.3. Data collection

After the introduction of affective atmospheres, along with the description of the experiment, we come back to Anderson and Ash to highlight what makes our work distinct. In their analysis, the authors questioned the existence and identification of atmospheres in the affective turn and the non-representational perspectives. Therefore, the questions are: How can we understand the causalities in the emergence of atmospheres? How can we enrich the

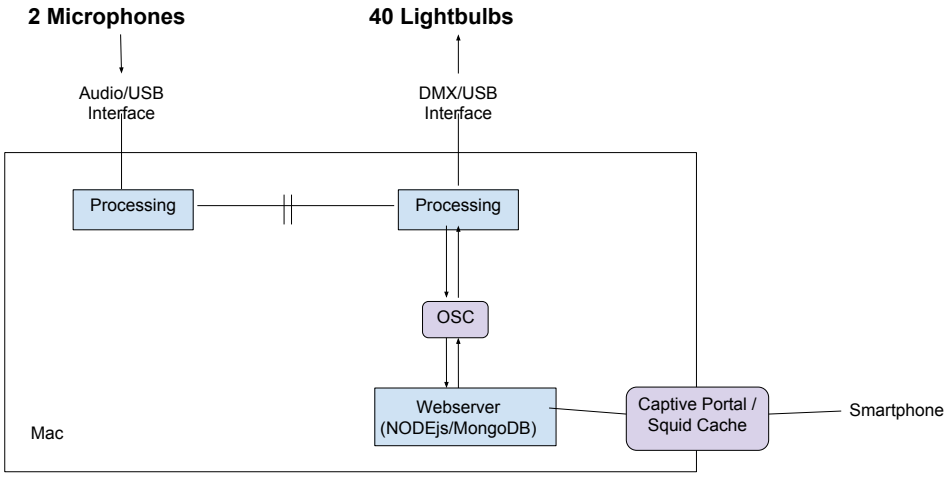


Figure 2.4: A description of the system

analysis of such atmospheres to address multiplicity within the design practice? This put us in an ambiguous position whereas we should define insights for designing specific material settings, but conceiving the openness and unexpectedness of affects and atmospheres.

Considering that atmospheres have effects on and emanate from multiple objects which they relate with, the approach to atmospheric methods is focused on the organisation of physical encounters, 'where affects emerge when two beings or entities contact one another in some way' (B. Anderson & Ash, 2015, p. 35) by following these steps:

1. **Identification:** Naming atmospheres will 'render them subject to intervention' (2015, p. 36), beyond the complications raised around the act of generalising and simplifying an atmosphere with denomination.

2. **Coexistence:** Determining the limits, boundaries and connections between atmospheres. A place can be 'constituted by multiple atmospheres that touch, contact, and rub up against one another, rather than a single, overarching, or dominant one' (2015, p. 39). Thus, some affects can be part of atmospheres or constitute more than one, and they can change or transform them. Yet, bodies and objects can be touched while they are out of the atmospheres.

3. **Causal powers:** Studying the causes and effects of atmospheres is to be submerged in their ambiguity. So, the authors suggest treating them as affective propositions. Even when atmospheres are *irreducible phenomena*, they are also an *emergent cause* since 'we cannot be sure of the character of the atmosphere before registering its effects in what bodies do' (2015, p. 44).

4. **Transformation:** Considering how affects generate changes between bodies and objects, atmospheres have, on one hand, a threshold of internal change that is a consequence of the mass and the configuration of those bodies and objects, and on the other, a tipping point where atmospheres stop emanating and are *overridden* or *subsumed* by another atmosphere.

We built upon this method to study and approach the effects of atmospheres in illuminated spaces. Tim Edensor pioneered the study of light festivals in cities, the Blackpool Illuminations (Edensor, 2012). His approach to affective atmospheres established the importance of understanding how affects circulate and considering them as part of specific routines, cultural ambience and previous attunement. We take Edensor's work as a point of departure for our experiment.

The experiment was running from the second half of December 2017 to the end of January 2018. We made observations and took notes, pictures and video recordings before, during and after the intervention. We followed Sumartojo and Pink (2018), who asserted that by using diverse forms of observation (especially video) before and during the installation, allows us to study *about*, *in* and *through* atmospheres. We also interviewed 40 people who were around the station, including students, professors, administrative staff, cleaning and security staff and bus drivers. These interviews were held in a first period during December and in the second period during the second week of January.

2.3.4. Findings

We present the following findings, that we accounted during the period during which the installation was working. Later, we will discuss these findings to answer the research questions regarding the place of affects and atmospheres.

Anticipation, interest and practices of infrastructure

As our installation was deployed without prior warning, people were initially surprised. While we were assembling the lights and the control system, bus drivers and security staff watched us intrigued, wondering about the purpose of it. Drivers were afraid of being monitored in some way; one of them even asked if the microphones were intended to capture and record people's conversations.

Because of Christmas, almost everyone who asked about the installation thought it was a Christmas decoration. One of the drivers interviewed was happy because the university has never put up seasonal decorations. We had not expected Christmas to be the first obstacle to our experiment, but we decided to leave the intervention until the end of January, well beyond the Christmas season. However, many people who were interviewed in the second period, after Christmas, also got confused, and almost angry because 'it was only for Christmas'. That reaction gave us a starting point to question the opportunities for someone to accept such a change. Why didn't they like it? What was wrong with it?

Edensor (2012) argued that people are influenced by previous encounters, so atmospheres and the willingness to being affected are mediated through memory and dispositions to affects. We agree on his terms, because disposition to be affected exists even when the reaction is not what was expected. This can generate a shock in the person, and feelings can become apathetic. As affects arise differently on each occasion, habits of regular encounters can easily disrupted. On their way back home, a bleak and unenthusiastic mood was normal for some (Bissell, 2010). Long faces, embedded in their phones, tired and bored with their daily activities, were common pictures we found in our field observations.

Firstly, as Merriman (2016) pointed out, 'habits and environments are, in effect, shaped through multiple "infrastructuring"' (2016, p. 93), so we could not expect more from these encounters where the vital qualities of infrastructure are none other than desolation and boredom, as in many habits associated with mobility.

Secondly, boredom could presented itself as a state of stillness or static sensation, but that does not mean that it is passively disposed (B. Anderson, 2004). Rather, this habit of extending time is just a moment to disconnect from the stress and pressure of daily activities. It is presented as a form of practice, to relax and prepare for the return to and disconnection from social life. Our lights therefore interfered with this disconnection exercise, demanding attention and a reactivation of the senses, leading to more animated moods than might have been expected. While some of the people interviewed stated that they 'don't feel alone' during the period of waiting, others claimed the lights were an uncomfortable disruption. Those for whom the lights altered their habits, rejected the possibility of enjoying the light installation.

Mediated atmospheres

Effects amid encounters with infrastructures and the contagion of affects were also addressed by Bissell (2010; 2015).

His notes on people's attitude towards certain habits allowed us to inhabit places in a different way, and the habits also helped us to orientate our view of the way we organised

the space itself and the relationship with other objects and subjects. Here, both effects generated and completed what we can qualify as an atmosphere. The organisation of space is characterised by the distance between passengers; each passenger or small group waiting the bus keeps a distance from others. As such, passengers occupy the station space in the following way: first-comers occupy the unoccupied benches; then, people remain standing in between the benches but facing the street. When there is no more room, people decide to walk or wait outside the station (See Figure 2.2 for reference).

The spatial attitude is accompanied by the physical attitude described above, which means any newcomer is atmospherically invited to adopt the same attitude to attune to the rest unless a bus arrives. Only then does the situation of stillness break and people move to form a queue, while those who remain waiting maintain the atmospheric effects until the bus leaves.

We cannot avoid mentioning the agency of the bus in breaking and generating this new atmosphere, where the senses are greatly excited due to the movement generated and the noise around.

From the perspective of other passengers and personnel, practices are quite different, and the affects that involve them differ between passengers and other passers-by. For example, some atmospheres remained and others arose; some seemed to have no effect on people, while others collapsed.

There were passengers who also came in large and small groups, altering the atmospheres in many ways. From talking loud to breaking the spatial arrangement, they disrupted the spatiality of atmosphere of those who were close. For those in the group, time goes by faster, as their attunement is not to the mood of boredom but in a more diverse disposition. As affects are always mediated (B. Anderson, 2014), their encounter with the atmospheres of others generates many effects that are difficult for us to recognise.

Sensations of unconformity, cheerfulness and attractiveness arise, affecting everyone in different ways. That means changes produce a lack of homogeneity in movements and the organisation of objects, senses and the environment, generating a process of rearrangement until other atmospheres clearly recognisable emerge. Thus, the updating of the virtual is clearly a subjective phenomenon in which we can perceive the fuzzy boundaries of atmospheres.

Something similar happens with the coloured lights. The first encounter provoked enthusiasm from everyone, but the lights quickly became part of the infrastructure without altering habits. Because the lights were interactive, when someone eventually changed the behaviour of the lights, this meant 'the apprehension of illuminated space often confounds this distinction, shifting perceptions about what appears solid' (Edensor, 2012, p. 1107). Some adjectives used by interviewees, such as 'dynamic' or 'entertaining', show the effects in time perception that the light created.

But this change was perceived less than an encounter with a group of people arriving, interrupting the space with their bodies, with voices louder than the rest and movements creating visual distractions. In the presence of this change, the senses of hearing and sight constitute space and time differently. New atmospheres can be distinguished when the forces of these changes affect others.

Our senses are crucial to relating with the environment. As Erwine (2016) remarked, sight is a highly aesthetic and complex sense where perception is less defined, and light can

provide spaces with personalities (sombre, cheerful, erratic, ethereal, fierce, mysterious). Colour, temperature and rhythm can be combined with the qualities of light, but also the reflection of light from different materials and the shadow generated by them, producing new spatial perceptions.

Although the sense of hearing is simpler and spatially accessible, sounds animate our world. We can clearly differentiate pleasurable sounds from uncomfortable or noisy sounds. Rather than something that can be generalised, levels of noise are very personal, often mediated by other sounds which may even be inaudible to humans (Gallagher et al., 2016). Thus, for Erwine the acoustic space shares some characteristics with atmospheres, as acoustic spaces re constituted as *bubbles*, similarly to the term *spheres* used by Anderson to describe atmospheres. Erwine also accounts for the difficulty in naming the experience of sound and the lack of vocabulary to describe what we feel as bodily symptoms or moods.

Sight and hearing are distance senses, because we do not have to be close to their origin to interact directly with them. For the historian Purnell (2017), sight and hearing were considered objective and rational senses, located outside of our bodies. Scientists experimented with blind people in the 18th-century to understand how to develop the other senses that were considered closer to an emotional trail. Light and sound dramatically changed the landscape of the 20th-century cities thanks to technological improvements. Some critical analysts related the advent of light to the development of capitalism and the consumer society. In the 1960s, Guy Debord (in Purnell (2017)) talked about the 'accumulation of spectacles' and the importance of appearances. Purnell argued that we have a unified perception of the experience, but there is a hierarchy of the senses that rely on the cultural and discursive conditions of the modernity. Moreover, almost all experiences with our environment are mediated by various senses that cooperate between them. Consequently, a change in the hierarchy of senses can result in a radical change in our experience.

Besides, Anderson and Thrift argued that new technologies are being developed to influence our behaviour in the affective level [4] by exciting and changing the relations between the sensory structures. As Thibaud (2015) pointed out, the notion of sensory mediation and the importance of intensity open a door to looking at the urban disciplines through the prism of the in-between.

Following the Thidbaud's proposal to use sensory mediation, part of our exercise intended to restructure the experience of the space by translating the ambient acoustic reactions into light expressions. We obtained few successful results in this direction, rather than those expressing feelings of unconformity or happiness. Some of the interviewed told us that they don't travel by bus, and they only came to the station because they saw the lights from far away (as the *Ágora* is a wide, open space, lights were visible from many points). They were attracted by the lights and colours, but specially, by the incipient change in the appearance of the station. Our question remains concerned with the effects of our installation, and contributed to changing, exaggerating or appeasing the effects of rhythms, affects and atmospheres.

In this vein, we would ask how this installation is part of the station and what to *be part of it* means. If affects emerge through the new relationships with the incorporation of lights,

[4] Authors recover one famous company *Airscent* (Available at: https://www.airscent.com) that works with scents to modify the smells of some places. Although, from the point of view of scientific reserach there are many projects around that idea (*How do you feel?*, Science Squared. Available at: https://www.sciencesquared.eu/how-do-you-feel)

therefore constituting its spatiality, the continuity of the atmospheres that are constituted should be regular for the given space. Moreover, the presence of lights as if they were part of the routinised infrastructure and the background of our habits, took us back to boredom and similar atmospheres. We asked people if they wanted to leave the lights throughout the year. The opinion was divided. Those who felt uncomfortable wanted to get the installation out because they did not see why it was still there. Those who felt a happier atmosphere wanted to keep it all the year because it was considered as an improvement. This simple distinction showed us that considerations concerning whether something is part of the infrastructure become reality when affects are manifested and reflected in feelings and emotions. Thus, a temporary condition could turn into two different spaces.

Some answered the question in rational terms. Two people were concerned about energy consumption and the cost of such installation to the university budget. Their points of view went well beyond of the expected response regarding their emotional state and took what might be considered a political stance. In other words, their notion of space was not felt in terms of personal attunement, but they questioned the governance of a public resource and allowed themselves to make a statement on what would or would not constitute that space. In this case, the atmosphere is expressed by means of feelings of discomfort. This suggests to us how personal and cultural background influence the emergence of atmospheres and certain affects, which we will explore in third exploration of chapter 4.

2.3.5. Discussion

Working with an interactive installation is to blend the worlds between perceptions and own imaginaries. It was an opportunity to understand how senses are involved in the affective life, and how affects are hooked in and shape places. As an exercise, we deployed a lighting intervention with the promise to see how do the senses and atmospheres play a role in the development of everyday activities. With this installation, we invited the passers-by to interact with it and, discover the feelings and emotions that the changes in lighting reactions and interactions with the sounds of the ambient that provoke on them.

This work was an attempt to analyse how affects are part of mundane spatial relationships and how they constitute places in corporeal ways. We used the atmospheric methods (B. Anderson & Ash, 2015) as a starting point for our analysis on affects, while sharing insights and comparisons with the data collected from the interactions.

Our research pointed towards to observe critically and develop a framework to create interactive applications and interfaces having in account the materialities, affects and, other relations more-than-human bodies, that take place in the urban realm. It was an exploration of transdisciplinary account on how a place can be perceived atmospherically as an extension of our sensorium, an intersubjective constitution of the spatial side of our habits (Bissell, 2015).

We found that change and transformation are key characteristics on the identification of atmospheres, it boundaries and effects (Q2). Even when atmospheres are perceived as singular, there are common aspects that are repeated 'with variations across sites, networks, or events' (B. Anderson & Ash, 2015, p. 49). In the case of the bus station we focused on how habits and attunement towards certain practices entered in conflict with the light intervention, creating other spaces of negotiation (Q1).

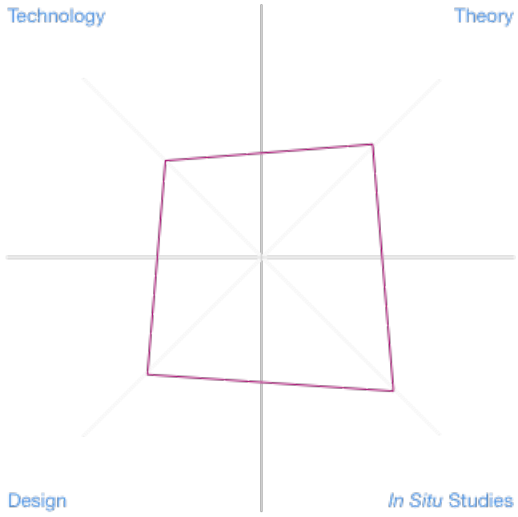
In our experiment, some of the feelings and emotions expressed by the interviewees while

the installation was functioning were similar to those expressed before the installation. Indeed, changes in the infrastructure acted more as a disturbance or perturbation (Ash, 2013) towards other systems rather than affecting people's capacities. Thus, the created atmospheres coexisted with others. For example, in the case that people came to see the lights from far, generating excitement and curiousness (Q2). Thibaud (2015) stressed the current trends on urban design that play with senses in a dual concern. He thinks that contemporary urban policies are 'creating a festive spirit while integrating law and order' (2015, p. 4). He sets these two concerns and two different movements, *to drum up* (by creating exceptional events) and *set up* an ambience (by taking care of the relevant spaces on an everyday basis). In a way, we critically review both movements by observing and intervening in both case studies, trying to break down this distinction. We found out that both scenarios can bring affects of anxiety or boredom by generating suspension or acceleration of the rhythms that mediate our experience (Q3) (Edensor, 2010). Consequently, many versions of the same affects could radically change the experience of atmospheric qualities of a same physical space (Q4).

We question atmospheric manipulation for specific needs. In the form of (infra)structuring atmospheres, we purpose a more dynamic and heuristic vision on how we can observe spatial relationships regarding affects, feelings and emotions. Our contribution to HCI thus is a method that could be used to explore how objects and artifacts fit some practices, and disturb others, by *becoming* part of atmospheres. It is important to highlight the ontological difference between affordances, affects and atmospheres, as they are different phenomena and are addressed differently by diverse disciplines. In this case, we acknowledge that materialist manipulation doesn't ensure any correlation or effectual cause to atmospheres or affects. On the contrary, we propose to 'play' with the possibilities of transformation by addressing material changes only as one of many methods available.

For the understanding of place, we highlight the importance looking at the atmospheric qualities of certain spaces that are tight to habits. But at the same time we accounted for many of the effects and materialities that generate certain orders that drive our experience. Political purposes can take advantage of this by discouraging or influencing certain practices and feelings and altering the memories of affects, thereby promoting new habits and cultural assumptions. We will explore more of these methods in the Chapter 4 of this thesis.

Contribution: Research In the Wild Model



Theory: This project showed the capacities of affective atmospheres to changing habits and practices in specific spaces. Thus, it also demonstrated how technological enhancements can influence the transformation of atmospheres.
Technology: The experiment showed how the interconnectedness of several devices can play with the environmental conditions, the perception of spaces and trigger sensory reactions. In this case, we developed a simple platform that can be adapted to incorporate more devices and create games and other interactions with it.
Design: The project demonstrated that public installations should be designed integrally; i.e. the platform itself, the reactions of the system, the communication of the installation, and the methods to capture and analyse the data. Additionally, it showed that changing in the aesthetic experience provokes different perceptions of the daily infrastructure affecting people at many levels.
***In Situ* Study:** This experiment demonstrated how *in situ* studies can contribute to geographical research. For the project there were collected qualitative and quantitative data that was useful to evaluate how people behave, use the space and how the transformations created, change their perception and intention in the use of space.

2.4. Outlook: The city of delight

The discourse about Smart Cities have been turned into an orientation to citizens. In general terms, from a pure technological discourse, it moved to a governance issue (Wiig & Wyly, 2016), followed by a citizen-centric approach. In other words, the general concept of Smart Cities is based in a ICT implementation towards to make liveable cities for citizens. But this liveability is understood only in terms of efficiency and speeding-up for daily activities, and/or forms of reducing the climate change.

Those improvements, specially resilience, are not bad at all. However, modern urban interfaces not necessarily generates any sense of place, but to produce harness (McCullough, 2013; H. Molotch, 2011), exclusion (Duneier & Molotch, 1999; H. Molotch, 2011) or dis-

abilities (Moser, 2005, 2006) in specific settings. Even more, we should consider that place attachment is not always considered to be positive, as it may lead to conflicts in the urban sphere (Gifford, 2014) and, thereby raise negative emotions (Manzo, 2005). Because of the multiplicity of places and object relationships, it is not possible to build a fit-for-all place.

Environmental psychologists argue that designing places is to provide 'symbolic and affective qualities (that) are very important to attract more people to places' (Najafi et al., 2011, p. 188). But, facilitating these everyday activities more efficiently, doesn't strength emotional bonding and well-being. Social 'activities connect human to places but may or may not influence people's attachment' (2011, p. 189).

Modern urban planning and architecture has mainly oriented to large, tangible infrastructure and buildings, and creating aesthetic arrangements in natural and human-made landscapes (Norberg-Schulz, 1980). But, the current *smart* paradigm is focused on developing technological infrastructure. In that vein, 'the most effective technology is what becomes adopted as infrastructure [...] all the stuff you notice only when it goes wrong' (Thrift, 2014, p. 1264). Beyond this consideration, history has shown us that people have always paid attention to the arrangement of objects and networks. What is different now is the possibility of that which is enabled by new data (Thrift, 2014).

We are committed to demonstrate that technology can be understood and used to bring new, even temporal, *genius loci* to cities. As we mentioned above, a lack of character means a lack of *stimuli*. This monotony cannot be materially unmade because it means that it would be built up throughout cities repeatedly. Thus, it is the task of urban planners and architects to find new ways to provide essential changes to urban environments. However, what is required is a better understanding of how technology provides a unique opportunity to change the material conditions and intensities through different operations in time and space. As Boehner noted, 'instead of sensing and transmitting emotion, systems should support human users in understanding, interpreting, and experiencing emotion in its full complexity and ambiguity' (Boehner et al., 2005, p. 59).

We formulated our second question as (RQ2): How do atmospheres change our capacities in relation to our place-based practices and habits?As an answer, we promote a city of *delight*. 'The job of the designer is to orchestrate the sequence of sensory experiences to increase the probability of delight' (Erwine, 2012, p. 245). Erwine took the example of thermal senses, where a constant temperature condition is not desirable because it loses the potential of affecting bodies.

The variation and transformation of sensory responses become important variables on the design of spaces to augment the possibilities of delight local customs or preferences[5]. But not all senses respond equal to the same pattern of variation. Either way, we argue that stimulating the sensory realm of places, enhancing the affective capacities of bodies and, the ability to transform, reshape, mesh, destroy and dislocate atmospheres, we can look forward the creation of new spatialities. A city of delight is a city with diversity, that changes, provide stimulus and open possibilities. Even though, a city of delight is not free of negotiation, contest, and struggle. A space in transformation is, nevertheless, an space for collective and individual change (for good or for bad). A constant transformation that changes how things are organized, while body capacities are altered.

[5]Currently, MIT Media Lab is experimenting with the alteration of senses in a project called Masque. However findings are not yet conclusive (*Masque*, MIT Media Lab. Available at: https://www.media.mit.edu/projects/masque/overview/)

In this chapter, we analysed the affective atmospheres, together with embodied interactions, and how these interactions are part (or not) of our daily activities and habits. Consequently, in the following chapter we explore the relation between habits, place-meaning and diverse forms of representation.

3

A place like home

Maps helped to carry and share human experiences and stories along human history. Between the codes of creation, read and use of maps, thousands of practices produce unexpected coincidences and missed messages. In this chapter, we analyse the use of geographical representations to put under a critical perspective the notion of place, and to share different perceptions, emotions and memories of lived experiences.

3.1. Introduction

This chapter is oriented to analyse the use of representational tools under non-representational theories. We will focus our analysis on what was lost between representational platforms and lived experiences. We agree on Massey (2005) when she questioned maps as a discourse of heterogeneity, that never follow the stories that are part of the temporal dimension of space. 'If you really were to take a slice through time it would be full of holes, of disconnections, of tentative half-formed first encounters' (2005, p. 107).

From another point of view, places are too often represented by cartographic technologies with excessive attention put on the Person-Place relation. We have therefore focused our work on studying how maps can further benefit from inquiry into the process of place attachment. Though process has been scarcely studied (Lewicka, 2011), it has been taken up by Scannell and Gifford (2010), who proposed a model in which place attachment is organized in a Person–Process–Place (PPP) framework. Process refers to three main aspects of experience: Affect, Cognition and Behaviour. In the experiment that we hold for this chapter, we used this framework to study daily life activities, noting that such activities unveil much of the meaning of places. Granted, it is known that daily activities are resistant to being represented by rational models, and indeed that 95% of our daily life behaviour is not allocated in our consciousness (Thrift, 2008). In this vein, we take a non-representational approach because it focuses on the procedural and performative aspects of life, with the potential to develop a speculative topography from embodied emergent experiences (McCormack, 2003).

In sum, we inquiry on the meaning of personal places, comparing stories and aligning thoughts and emotions. We think that cartographic platforms provide richness in the disencounters that they generate, in which knowledge is built up over the discussion and the identity of the self is contested against the social and the established knowledge. Therefore, we tested different methods to study the spatial experience by a representational mechanism. We argue that maps become useful tools to analyse the mediation of affects, feelings and emotions of places, as well as the symbolical and political construction of spatial arrangements.

3.2. Background

In this section, we will approach the role of cartographic tools as mediations of our own realities. Later we will re-discuss the notion of place, to incorporate the notion of in-between as an extension of thick and thin places introduced in the previous chapter. Both discussions will be the starting point for explore a previous work, and make place for the experiment that stars this chapter.

3.2.1. Cartographic mediations of places

Maps are tools for navigation, discourse construction, and considered prosthetics of our own body (McLuhan, 1994). When are deployed on handset devices, they are extended as representational and navigational devices (Dodge, Kitchin, Perkins, Dodge, & Perkins, 2011). From historical to semiotic analysis, studies on maps have a long background in the history of western culture (Cosgrove, 2008; Wood, 2010).

In their nature, maps are not only static, objective or utilitarian. They dictate how we see the world, are epistemological and ontological devices (Dodge, Kitchin, & Perkins, 2009). A performative perspective on representations of the world would suggest that both, the episte-

mological and ontological, are enacted simultaneously (Law, 2008, p. 13). Thus, Leszczynski (2015) suggests that space 'is instead ontogenetic –- a material and social reality that is constantly brought into being through embodied socio-technical practices, such as enrolments and deployments of spatial media in the practices and spaces of the every-day' (2015, p. 6).

We should mention the importance of cartographies in relation with the territory and the concept of space. Agnew (1993) critiqued how geography and social sciences entered in a confusion two decades ago, regarding the representational tools to represent spaces. He staked that a *locale* is a space where things happen (following Giddens) and, that differs from the structuralist vision of the reproduction and transformation for the social relations; even more, that and the symbolic belonging and attachment to a place, or *sense of place*, is not always related with the points and lines that we can draw over a map. We already discussed the notion of place and space and, it is not intention to come over it, but it is important to acknowledge that these three forms of understanding are directly interwoven together when we consider analysing a map or any spatial representation.

Latour (2011a) pointed that maps are *immutable mobiles*. The inscriptions and descriptions that the maps are meant to represent become mobile but also immutable, presentable, readable and combinable with one another. Rather, the practice of 'mapping are rarely unfolded in isolation, but are embedded within wider discursive fields and forms of praxis' (Kitchin, Gleeson, & Dodge, 2013, p. 15). Consequently, Gerlach (2014) pointed that the distinction between ontology and epistemology disappear in the performances of maps. Far from consider the correlative alignment of the map to represent the territory, we should account that it is the territory that fits on the map as an active practice (Paraskevopoulou, Charitos, & Rizopoulos, 2008).

However, maps are also spatial stories (De Certeau, 1984) and the very process of generating, translating and distributing these stories, destroys the past context, including its relation to other parts of the story, in which the foundation was made and only the narrative remains. Stories thus 'carry out a labour that constantly transforms places into spaces, or spaces into places' (De Certeau, 2002, p.75). The act in which the narrative is taking part transforms the map in a tool for legitimated coercion and coercive actions.

The meanings of inscriptions are also created during the action of using them. Liberman (2014a) argues that the interpretation of maps does not reside in the act of reading them but in the organization of knowledge and senses, making thus the maps evident to who is reading them. Recent works show similar results in the interaction mediated by digital and mobile maps (Bouvin, Brodersen, Bødker, Hansen, & Klokmose, 2006; Laurier, Brown, & McGregor, 2016), understanding that walking is never 'merely walking'. Rather, we are walking together with technologies (even those mundane) that mediate, 'interfere, intervene and influence through pain, style, standardisation and erosion' (Laurier et al., 2016, p. 15) with our body within the environment, as if it were walking boots (Michael, 2000). But, at the same time, the features of mobile maps are sold as an idea of *continuous connectivity* that conditions how the knowledge is geographically sorted (Wilson, 2014). Consequently, for our research, we will consider walking 'as a set of translations and a process in, or of, itself' (Middleton, 2010, p. 590). In other words, it will be a way to understand the process of representation in action.

Leszczynski considers spatial media 'as a basis from which to grapple with the socio-spatial effects and significance of these technological phenomena through opening up the

possibilities for engaging them in terms of ontological conditions of mediation' (2015, p. 3). Therefore, she brought to the discussion the always-mediated reality and the necessity to discuss the articulation between the virtual and the physical in relative terms and avoiding treating them as divergent spaces. But in terms of emotions, feelings and affects, working on the liminality is also working with that emergence, while meaning is not immediately available (McCormack, 2003). Thus, the virtual is in the realm of potential, where the body is not yet ready to account on it consciously.

Therefore, cultural geographers were concerned about the dislocation between representation and the reality. For Galloway (2006) there is an incompatibility between the truth of social life and its own expression. Thus, any interface, as a cultural object, is the essence of this incompatibility. Moreover, Rose and Hall (2016) highlights the obsolescence of cultural studies of original objects, arguing that the question should be moved from representation to productivity. In other words, 'Cultural meanings are no longer represented by cultural objects, but are produced at multiple sites and interfaces, between hardware, software and humans' (Rose & Hall, 2016, p. 21).

In this aspect, Gerlach (2014) introduced the idea of vernacular maps, in which the practice of *legending* (refered to the process in which cartographic legends are writen, but focusing on the situated action under a NRT approach) is to consider the introduction of 'reimaginations, affect, events and becomings' (2014, p. 33) into the process. Related to our third object of research, we can account on Pedwell consideration of empathy as a space of mediation, since understanding it 'is not just about attempting to "know" or "feel" how another feels, but about seeking to understand the structures of feeling and feelings of structure (Ahmed, 2010) that produce and mediate us differentially as subjects and communities who feel.' (Pedwell, 2014, p. 69). Accordingly, mediation as an 'ongoing process' as we defined at the beginning of this thesis, is the core of our exercise between a definition of place and the use of maps to understand the structures of feeling and feelings of structure that organize subjects and communities.

3.2.2. In-between places and liminal places

We previously sketched a discussion of place, we took Duff's inquiry on thick and thin places, and we barely accounted on the idea of in-between spaces. In this section we recover the discussion starting from the definition of place as 'a particular space which is covered with meanings and values by the users' (Najafi et al., 2011, p. 187). Norberg-Schulz coined the notion of *genius loci* of places as 'the concrete reality man has to face and come to terms with in his daily life' (Norberg-Schulz, 1980, p. 5).

If we consider that 'affects also frame the array of activities and practices potentially enactable within that place' (Duff, 2010, p. 884). As such, we can assume that the act of gathering, in a particular moment, could be related to the affective qualities of places.

Additionally, Relph referred to a paradoxical relation between place and placelesness, by which places are not permanently a place or non-place, but they are enacted and relational to its own terms (Relph, 2016). Affective theories are relational by definition, though, a place definition is also relational. So far, we discovered the relation with practices and habits, but also an emotional relation.

If non-place is defined as a space that 'cannot be defined as relational, or historical, or concerned with identity' (Auge, 1996, p. 77). Place attachment is considered as an emotional

connection to a place, and one of the most tangible expressions of sense of place (Najafi et al., 2011).

Lewicka (2011) found that there are only a few studies that correlate place attachment to the scale of a place, where neighbourhood scale is not very related to place attachment. Even more, the lack of understanding on how place attachment is bounded to personal space and practices, opens a rift between the representational and where the action takes place.

A second rift on approaching maps from the process, can be identified between the spatial and the temporal. Much attention was placed under the spatio-temporal approach to representations, but less on the effects of time over the notion of places. 'It is not the spatial which is fixing the temporal but the map (the representation) which is stabilising time-space' (Massey, 2005, p. 108)

As Lammes et al. (2018) argued, there has been a recent turn in temporal though (known as tempo-spatialities), considering the multiple effects of time and the experience of spatial practices. These novel forms of relation are combined with the issue of representational tools as well. Moreover, the advent of new digital practices complemented these new inquiries with more capacities of representing the dynamics of such processes.

Then, how do we co-produce these representations? How do we account the the temporal *and* the spatial dimensions? But importantly, how do we work with the notions of places and spaces from relational perspective with cartographic tools?

As a conceptual departure for identifying spaces that emerge in embodied experience, we supplement our analysis with recent work from Downey, Kinane, and Parker (2016), who emphasised the liminality of spaces, identified also as an 'in-between'. Borrowing from Eric Prieto's version of the concept, they wrote that in-between spaces tend to run the risk of falling between categories, of being misunderstood, and of having their importance ignored. This is because (Downey et al., 2016, p. 3):

> (Their) spatial (physical and/or conceptual) position implies both integration of and resistance to whatever is either side of or outside of the in-between. [...] One cannot occupy an in-between space or exist (in-)between two binary states without a resultant tension and/or mobility between both elements of the binary, which resist but also merge with the middle in-between.

Consequently, in-between spaces are at times difficult to define and describe, because the procedural attributes that those spaces present were key to our analysis. But more important, liminal doesn't mean a limit neither an space where someone can be or exist in the middle. There is a resistance that force to pass through.

Tied to the experience between the self and the place, and as the personal enrichment of a place, Duff (2010)'s distinction between thick and thin places enriches our argument. While these concepts look like the distinction between places and non-places, the former pair takes affects as a point of departure. This means that the construction of place does not reside on the place itself but in the relational force between places and bodies.

For Duff, thick places can be cultivated by local appropriations, relating the importance of intimacy to practices and encounters that occur in a place to determine the construction of meaning and belonging to that place, leading to diverse affective atmospheres. Affective atmospheres capture the 'emotional feel of place, as well as the store of action-potential, the dispositions and agencies, potentially enactable in that place' (Duff, 2010, p. 881). In other

words, the concept of affective atmospheres is in the path to enact the cultivation of thick places and inducing sensations in our body. Taking into consideration the Norberg-Schulz's approach, affects are what gathers people, and emerges in the act of dwelling a place.

We discussed Massey's importance of spaces, but its distinction with place got stuck in its political use. Rather, (Downey et al., 2016, p. 2) offered clearer definitions:

> Within the conceptual framework of human geography, place embodies a sense of human familiarity and is seen, broadly, as either comforting or restrictive — or both. Space, on the other hand, is representative of geographical uncertainty and those areas which are unknown; it may be "read" in similarly internally contradictory terms — that is, as either liberating and/or threatening.

The liminal space (Downey et al., 2016), or the in-betweeness, escapes from any structure, definition or category system, resulting in a world of diluted places. We explore the in-between as a mode of navigating the ambiguity between thin and thick places, finding the way to cultivate temporary enactments of social-symbolic spaces. We propose a notion of place attachment by relating people, places and processes by different means.

3.3. Previous Work: Participatory social mapping

Before presenting our experiment, we decided to introduce a previous work for this doctoral research. We believe that the concepts and findings are valuable as introduction for the experiment that will be exposed afterwards.

This is a case study of Social Mapping and Participatory Cartography over a *shaded* territory in Buenos Aires City, Argentina. The project 'Caminos de la Villa' was possible thanks to the collaboration of multiple NGOs that worked together to provide visibility on urban development issues in poor neighborhoods, commonly called 'Villas' or 'asentamientos'. We took a critical perspective on how the process of developing mapping tools are embedded of expectation, negotiations and interactions between actors. Doing ethnographic research and documentation analysis, we found that the creation of value for residents was not in the tool itself but in the appropriation process and the feelings of empowering, led by acquiring new knowledge at working collectively.

The city of Buenos Aires has neighbourhoods, or slums, which population is more than 200.000 inhabitants that are living in poor conditions. The complexity of the topic around poor and social housing in Buenos Aires is sometimes oversimplified on how it is represented in the news and political discourses. This situation is usually a cause of discriminatory stereotypes regarding how these people live, and escapes the detail on how relations are built (Catenazzi, Quintar, Cravino, De Representaçao, & Novick, 2009). As Pierre Bourdieu described it, 'referring to a -problem suburb- or -ghetto- almost automatically brings to mind, not -realities- [...] but phantasms' (Bourdieu et al., 1999, p. 123).

This situation gets worse when the territory becomes invisible, by hiding the unpleasant from the rest of society. This situation is reflected in the lack of public policies oriented to enhance the quality of life and the living conditions of people. The *site effect* (Bourdieu et al., 1999) caused by displacement is not just a consequence of location, but a matter of inhabitants' identity and empowerment.

Cartography in general has the power to act as a transmitter and as concealer of the message. At the same time, it naturalizes the reality in which is embedded (Escolar, 2003). In

fact, 'the importance of space itself in having an impact on people's lives is rarely highlighted in such studies as a fundamental aspect of life in poverty' (Vaughan, Clark, Sahbaz, & Haklay, 2005, p. 410).

In this opportunity, we reviewed 'Caminos de la Villa', a case study that address the problem of representing these territories. We used the concepts of Social Mapping and Participative Cartography as an example of the exercise of community building. The studied case shows how Participatory Social Mapping can help to tackle the lack of publicly available territorial representations. At the same time that bring the opportunity to build a network of collaborations and negotiations that results in different benefits, with impact that covers the identification and empowerment from the locals to a defence of the civil rights in the territory. We took the *right to the city* approach, which has to be understood not as an individual liberty, but the exercise of a collective power that reshape the processes of urbanization (Harvey, 2014; Lefebvre, 1968). In that sense, it was our first step in working towards the understanding how representational tools work as relational forces.

For the case analysis, we collected documentation from the project (news articles, the project's website and official data released by the government), visited the field to observe the local conditions and problematic, interviewed the team of the involved NGOs and held informal talks with local government representatives. This research was held during 2015 and 2016. We believe that it is an important case for the field, where social mapping becomes not only a tool to tackle specific problems but generates a big impact on how social actors become aware of their own capacities to organize themselves.

3.3.1. Digital maps as tools for empowering communities

Collaborative mapping practices in the digital era are not new. The use of Geographic Information Systems (GIS) for participation in communities is a practice that has been discussed in the academia for decades (Ash et al., 2015; Dodge et al., 2009). The main concern is usually focused on the veracity of information, but keeping a community engaged within participatory mapping projects is also a burden issue.

In the Volunteered Geographic Information (VGI) approach, the qualitative data provided by non-expert volunteers is critical (Goodchild & Michael F. Goodchild, 2007) because it brings the capacity to consider citizens as sensors of their own city (Roche, 2014). By the other side, a more bottom-up approach was suggested by Turner (2006), where *neo-cartography* could be truly appropriated as it is created by the community itself, with their own resources and skills. The author argues that the difference resides in the decentralization that helps to scape to the scientific scrutiny.

Although, Sieber and Haklay (2015) criticized the importance given to the qualitative data obtained by volunteers, since it is usually submitted without any scientific methods, and the trustworthy of the data becomes obscured when the origin of it is unknown. Methods evolved around Citizen Science approaches, providing new tools and methodologies to overcome these weakness (Ballard et al., 2017; Cunha et al., 2017; Kullenberg & Kasperowski, 2016; Qaurooni, Ghazinejad, Kouper, & Ekbia, 2016).

Participatory limits within technological skills

Technological advancements, including mobile connectivity and digital mapping, provided new opportunities for creating decentralized information. Although, digital divide could be a

barrier for the creation and manipulation of digital cartography. Haklay (2013) categorized different types of participation regarding the knowledge of actors, or *hacking skills*. He defined 4 levels of appropriation of digital cartographies: *meaning*, *use*, *shall technical*, and *deep technical*. When more skills are needed, the appropriation of the platform rises, but the number of participants diminishes. We will see in the further case study that technical skills are necessary, but alternative solutions arise thanks to collaboration between actors.

In the universe of digital tools, there are many groups and organizations like *MissingMaps*[1], *Ushahidi*[2], *OpenReblock*[3] or *FieldPapers* [4] that work together in the development of absent cartographies with *OpenStreetMap*[5], supporting and providing know-how to oppressed or excluded groups. Two closer projects are *MapKibera*[6], that mapped the slums of Nairobi in 2009, and *Know your City*[7], a global network of community-based maps of slums and settlements.

Social Mapping and Participatory GIS

Mapping practices in communities are not new, and we can find such activities in territory disputes back in the 1960's (Bryan, 2011; Caquard, 2013). Community mapping is related with the concept of critical cartography, as it provides not only a tool for representing the territory but as a form of agency and empowerment within the local actors (Crampton & Krygier, 2005).

From another point of view, Jaramillo and Mora-Páez (2004) defined *social mapping* as a set of methods to assists and facilitate participatory planning processes. In social mapping, the social production is recognized as a vital component of the mapping practice. Is the creation of subjective appropriation that makes sense of the community working (Barrera Lobatón, 2009). By mapping intangible relations in space creates a connection between actors. In this regard, Dotson (2013) defined *community ergonomics* as an understanding where the community phenomena is, at the same time, a communitarian experience, a social structure and a communitarian practice.

By the contrary, Kim (2015) argued that *critical cartography* is not necessarily a participative practice, because 'the engagements with the subjects usually involved individuals rather than groups of vendors' (2015, p. 223). Differently is the concept of participatory mapping, by which not always represents the community and/or it is not owned by it. For presenting this case, we consider both, social and participatory mapping, as it became a social construction among the participatory practice.

3.3.2. The Case Study: Caminos de la Villa

In 2014, two organizations, Asociación Civil por la Igualdad y la Justicia (ACIJ) and Wingu, launched a collaborative project called 'Caminos de la Villa' (in English, *Slum's paths*). This project was funded by a third actor, AVINA, an international foundation, with the aim of mapping the *villas* and *asentamientos* in the City of Buenos Aires. In a first instance, the efforts were put on five of them: Villa 21-24, Villa 20, Los Piletones, Fátima (ex Villa 3)

[1] *MissingMaps*. Available at: http://www.missingmaps.org
[2] *Ushahidi*. Available at: https://www.ushahidi.com
[3] *OpenReblock*. Available at: http://openreblock.org
[4] *FieldPapers*. Available at: http://fieldpapers.org
[5] *OpenStreetMap*. Available at: http://openstreetmap.org
[6] *MapKibera*. Available at: http://www.mapkibera.org
[7] *Know your City*. Available at: https://www.knowyourcity.org

y Zavaleta. The mapping process was made with local political organizations in which the inhabitants were represented, called *Juntas Vecinales*, and other institutions such as schools and other external actors. After the pilot, during the year 2015, the project was extended to the seventeen slums of the city.

The project tried to give an answer to the lack of presence of the communities, territories and institutions in the official maps that were offered by the City of Buenos Aires' Government (GCBA). Because the cartography was not sufficiently detailed (lacking of street names and internal divisions), the citizens weren't able to make claims or report problems with public services to governmental offices through the official platform (BA147). This situation increased the territory dispute that affected citizens and organizations who had the mission to protect the rights of those inhabitants.

The process of building this collaborative mapping had different stages and the goals were three (Wingu, 2015):

1. **Collaborative supervision of the public workings in neighbourhoods:** To provide citizens, NGOs and relevant local institutions a way to be informed about the ongoing public works, its plan and the information access to monitor it, at local and national level.

2. **Report problems on public services:** The limited access to basic services on slums such as potable water, electricity, waste collection, etc. is a real problem. Nevertheless, there isn't a system that could generate information about the critical aspects of each service. The purpose was to generate that missing information and articulating with the government was central in the project.

3. **Demand for public information:** The city has a law that allows to anyone to ask for public information to the government. Despite this, for the slum's inhabitants this mechanism is not easy to access. In this matter, the project gave the possibility for demanding public information with the intermediation and assistance of ACIJ.

Regarding these goals, the platform allows citizens, through a simple application, to check the state of current development of public workings and also, to create an arcade of information about the deficiencies on the public services and then articulate it with the corresponding governmental offices to be fixed. Finally, helps indirectly to require public information.

Figure 3.1: Participative mapping sessions.
Image source: https://www.caminosdelavilla.org/

In a first stage, after the refusal received by the government for providing the official maps, Wingu decided to make new cartographies with the community. They started a process of participatory workshops with local students and neighbours to create the basic cartography of each territory. This experience was useful to generate local knowledge and value inside the community. After this, they identified different local places and institutions recognized as points of interest by the community. Finally, those points were listed and integrated to the platform's database.

The whole design process of the platform -names and designed elements- was defined by the participation and collaboration with the citizens (see Figure 3.1). According to one of the ACIJ's members, 'the cartography had to be made in a participatory way with the community. As well as how it would be visualized (on the platform). We didn't want to impose even the visualization'. The symbolic appropriation that was given to the platform through the creation process resulted in an affirmation of the communitarian identity.

Of course, having your home in a detailed map related with a street instead of a *grey zone* inside of a big block, was very valuable for locals. By the simple process of making it visible, the place attachment increased as a symbolic link with the territory. Therefore, the aesthetics of the platform was important, but also the stories and the narrative were vital to citizen's empowerment. They used the maps as a way of self-representation of their identity and territory.

After making public and open source the cartographies made with the support of the community in 2015, the City of Buenos Aires' Government decided to publish publicly the slum's blocks and streets developed by ACIJ and Wingu on the official maps.

The relation between the local government and the NGO during this period had different stages but definitely changed after the publication of the maps. Some governmental institutions like the agency for environmental protection (Agencia de Protección Ambiental - APRA) or the secretariat for housing and social inclusion (Secretaría de Hábitat e Inclusión - SECHI) called ACIJ to develop projects together based on the platform. Moreover, the office that have as a mission to guarantee the rights of the people in the city (Defensoría General de la Ciudad - DGC), started to use the platform as a hub of different issues and needs related with slums.

Difficulties in the process of appropriation

In order to promote the use of the platform, ACIJ run workshops to train the citizens on technical skills and to create new strategies for their claiming. Despite an occasional increase of the citizen's interest about this matter, the enthusiasm dropped after each meeting.

In the interviews with the members of ACIJ and Wingu raised the fact that the inquiry to the government about public workings through the platform had not guarantee of transparency. The reason was that the reports were always supported by more traditional mechanisms of direct action. These complementary elements that compromised the transparency of the process and the long time that bureaucratic responses usually take, had a negative impact in the interests of the neighbours on continuing using the platform.

Although, different and unexpected appropriations with the cartography showed that the utility of maps can be found on how the socio-technical helped to build the meaning for the community. Some neighbours took the maps printed in paper and used it to place the claims and spotted problems to take it directly to the government office. This low-tech appropriation is just one of the examples that showed how participants themselves came with creative propositions to skip technological barriers.

3.3.3. Findings

If we consider the main goal of the platform (to provide a place to centralize the claims in neighbourhoods and use it as a replacement of legal or traditional reclaim process, in Figure 3.2), this wasn't accomplished as expected. The platform itself wasn't a replacement for other negotiation methods. Rather than consider it a as failure, it provided very pragmatic outputs.

Firstly, it raised the need of creating the absent cartography. Secondly, it helped to compile, systematize and provide visibility to information useful for different actors. And thirdly, brought new tools to the community.

Figure 3.2: Resulting map of participative data collection.
Image source: https://www.caminosdelavilla.org/

We take this case as novel, not because the use of digital tools, but because the agency among actors was vital to make it happen. In this case, the relational powers were remarkably visible, more than the representational. We detected two important findings in the observation of this case, that we describe as follows.

Active maps, or the double role of mapping practice

The process of mapping is the reproduction of a discursive practice itself, where 'its relational power to make a difference was negotiated and debated – evoked, challenged, denied, reasserted – pushed and pulled through a series of media lens and public debates, bound within a contingent set of emergent social, political and economic relations, embedded in specific sites' (Kitchin et al., 2013, p. 15). Kitchin et al. argued that maps are spatial practices enacted to solve relational problems, thus, cognitive codes are as much important as the factual data.

At the same time, Bryan (2011) stated that communitarian cartography is a constant negotiation of the territory where it doesn't exist an 'after the map'. In other words, 'maps are active; they actively construct knowledge, they exercise power and they can be a powerful means of promoting social change' (Crampton & Krygier, 2005, p. 15).

In the studied case, we observed clearly this duality of maps. By one side, the tool provided a complementary help to face the reclaims to the local government, as it provided a local cartography, mapping the points of interest and a database to follow case by case. In other words, it becomes a tool for managing information and local knowledge. But on the other side, the process of mapping helped to enhance new relations between actors, from inside and outside the communities. The connection between organizations, local institutions, government agencies and other relations, consequence of the mapping process, can be seen as a process of empowering and an exercise of power.

The main factor of empowerment can be accounted by the publication of the official cartography by GCBA, and the collaboration with Google in providing images for the Street View service afterwards. Although, regarding the process of empowerment, this has been evidenced inside the community by the constant use of the cartography to generate new points of interest, and holding new meetings between different local organizations for organize themselves by present specific cases and claims to the local government and the judicial instances.

Outside the community, we highlight that the collaborations that raised between ACIJ and the ombudsman of the city (DGC), or the local environmental protection agency (APRA). The maps also offered the opportunity for the neighbours to access to some municipal services. Before the process, municipal workers or medical assistants and ambulances didn't enter to slums since they were afraid of entering to an unknown territory. After the release of the

cartography, this situation changed and neighbours receive the assistance as it is their own right as citizens.

Building a network, gather communities

In the introduction of this article, we mentioned the technological/hacker skills that are critical for managing the digital platforms. We accounted, in the interviews, that the solution resides in the collaboration. This is why, network building is a main concern in the practice of *Participative Social Maps*.

Although, applying the appropriation levels proposed by Haklay, we understand that reaching a high level of decentralization, collaboration and external organization is necessary. Most of the participants were involved just in a *use appropriation level*. Although a big proportion of neighbours have been involved in the *meaning level*, which helped to follow the goal of community building. The *shall technical level* was only appropriated by the NGOs that took part in the organization team. This simple analysis bring us the required roles that are related in the development of the case, where one group depends on the other to reach the goal.

In a non-technical aspect of the network, we evidence the critical role that the three NGOs played on the project, providing different resources, knowledge and community building. The funding from AVINA was necessary as well as the technological support from Wingu, but ACIJ's experience, working on a decade in and with the communities, reveals the needed strength in gather the community to participate on such kind of projects.

Lastly, we accounted that the processes of negotiation changed the relation between ACIJ with the local government, which started as a struggle, and became an opportunity to build new bridges for future collaborations.

3.3.4. Concluding remarks

The project had a meaningful impact on tackling inequality problems. Because it provided the visibility, and the tools for organize the neighbours themselves.

Weak points were also found in the analysis of the case. In first place, the technical assistance had to be continuously provided (from training, to infrastructure). This problem was present in zones where were a lack of infrastructure (such as internet connection), or where were an absence of technological skills in the communities, and, also on maintaining and providing constant technological support for keeping the platform working. In this case, as the project covered the entire territory of the city, we were in the presence of a big project that called the attention of funding institutions to support it.

The second weak point is the motivation's decay in using the platform. It was mentioned in the interviews that workshops and other meetings helped to spread the interest on the platform. But engagement is not easy to retain when it is hard to measure the direct impact on real, complex problems. In other words, people have their own priorities in their daily life and intangible values are difficult to be prioritized when are just accounted on virtual spaces. For that reason, keeping a high interest on the platform required the constant assistance and a face-to-face presence, from ACIJ and Wingu.

We can conclude that, local and very personal experiences made the project rich for the community members. Undoubtedly, the practice of building the cartography was the most valuable process in the project, where the neighbours were involved actively.

Lastly, we consider this case, an example for the exercise of power among the struggle of territorial issues and identity affirmation, highlighting the importance of the *right to the city* as a collective exercise. As we pointed in the introduction, invisible and stigmatized communities suffer by the reproduction of discriminatory discourses broadcast by mass media, as they lack of voice. Once they are involved in this kind of projects, the media coverage and the interaction with other institutions provide them a tool for speaking on their own. Despite we can't declare that this project was a process of emancipation, it was one step closer.

Regarding the capacities of social maps, we can understand that the exercise of mapping brings a new opportunity to enunciate and systematize local knowledge in the inhabited territory, and for the denunciation of perceived conflicts and injustices (Torres, Gaona, & Corredor, 2012). In sum, this case is another example on how maps can be a tool for supporting legal reclaims and accounting against the inequality treatment from the local government offices.

In conclusion, in this case, we approached the representational powers of maps, and the co-production of the territorial abstraction. In this relationship between the objects and the space, place is less questioned but agreed upon. Empathy is approached corporeally as a common notion, but abstracted in a representational tool for specific purposes. As Elwood and Mitchell (2015) highlighted (by recovering the works of Wilson and Kinsley) 'that connect our knowledge and action in the present moment to knowledge and possible action in a future moment, and open the possibility of collective uptake of individual memory' (2015, p. 150), where these practices 'in the present moment render particular kinds of politics visible or invisible, possible or impossible' (Elwood & Mitchell, 2015, p. 149). This affirmation will follow us to the experiment, where we will explore other effects of maps in the definition of places. We abandon the map as a tool, but an excuse. As we defined above the mediation express its power not as symbolic but as process.

3.4. Experiment 3: 'In-between' methods

By paying attention to the mapping practices and how the process itself orders the actors that are involved in the process in different ways, we wanted to go further in the understanding on how representational artefacts, tools and methods can help us to unveil realities from the non-representational. B. Anderson (2018) called representations-in-relation, to exploring the possibilities of describing the lived experience. For that reason, we framed our next experiment with the following questions:

1. How does lived experiences and enacted memories act in the process to understand the multiple and overlapping definition of places?
2. How we can acknowledge the sense of place as a simultaneously enacted, performed and re-imagined?
3. How we can approach the process of signification and sense of place with an in-relation approach?

From the starting point of the studied case detailed above, we designed the following experiment. This project, started as a collaboration with Albert Acedo, another early stage researcher and PhD candidate at the GEO-C project who was also working on sense of place and place attachment (Acedo, Painho, & Casteleyn, 2017).

We carried out an experiment based on three different methods oriented to capture in-between spaces with a special focus on the PPP triad. The diversity of methods allowed us to link lived experiences and enacted memories in order to understand multiple and overlapping experiences of places. Furthermore, collaborative discussions and walking activities helped to redefine both individual and shared experiences of place. By doing so, the notion of the 'in-between' helped us to understand the complexity of place as constituted, shared and represented, resulting in the acknowledgement of a sense of place as simultaneously enacted, performed and re-imagined. With this experiment we continue working around memories as a collective practice, thus, processes of signification and representation are meant as an approach rooted in the performance as the main movement to work over the concept of place.

3.4.1. Motivations

The capital of Portugal, Lisbon, is currently a swarm of tourists, students and inhabitants that draw a fascinating place to conduct our experiment. In 2012, Lisbon suffered a critical administrative structuration going from 53 to 24 administrative parishes. This adjustment supposed a considerable transformation in Lisbon's autonomous governments (*freguesias*) changing their names, boundaries and political administration. Since the last three years, the city is also living a process of gentrification that is having a significant impact on its culture, economy and landscape. This conversion was also the starting point for thinking about the sense of place of Lisbon' inhabitants.

We took a critical perspective on the notion of place, to better understand how the study of mediation of cartographies, in combination with language, perceptions and memories offers the opportunity to unveil the concept of in-between places. We held an empirical qualitative analysis, in the city of Lisbon, where a group of participants (1) performed a web map-survey to understand the spatial dimensions of their sense of place, (2) followed by a joint discussion about their places' representations and memories and, finally, (3) took a walk-along to obtain a deeper definition and characterization of their meaningful places. Results suggest that analog and digital maps generate different virtual images of space, while the navigational use of maps generates multiple representations of the territory. Besides, the mediation of different narrations and the description of encounters within the Person-Place-Process triad helped us to establish the importance of in-between places for a complete conceptualization of place and its perception. Therefore, we achieved a multi-layered approach to understand the emergency of in-between places, and argue that this relation between ontological, utilitarian and navigational definitions of place are mutually tied together in the use of maps.

3.4.2. Deployment

We carried out an experiment to grasp the emergence of the in-between by using different methods. We recruited 10 students from Universidade NOVA de Lisboa and divided them into two groups regarding their availability for the meetings. The first group was composed by three females and one male, while the second group was composed by three females and three males. All of them had between 20 and 33 years old. The experiment was designed in three stages (Figure 3.3), each one being conducted with different settings, as described next. Both groups accomplished the entire experiment successfully.

Figure 3.3: The three stages of the experiment.

3.4.3. Data collection

Online map-survey (stage 1)

Participants were asked to fill in an online map-survey (Acedo, Mendoza Silva, Painho, & Casteleyn, 2017)[8], meant to understand and spatialize participants' sense of place and social capital in the geographical region of Lisbon. Participants were asked to draw areas of interest regarding: (A) the places they belong (places where one fits in), and the relations that they have towards a certain geographical area; (B) the groups that they belong to, and the place where those relations between human collectives and interactions arise as fruits of trust, reciprocity and cooperation; and (C) the places where they are willing to participate in civic activities.

Everyday mapping activities of citizens through platforms such as *Google Maps*[9] and *OpenStretMap*[10] answer a need to define a route or mark a location that is related with a geometrical perception of space rather than an individual perception of a singular place (Roche, 2016). Sui and Goodchild (2011) already noted that Geographic Information Systems (GIS) can be considered media, since they allow to interact between virtual and physical territories. Nevertheless, it should be noted that 'spatial media intrinsically do not conform to systems metaphors that underwrote myriad definitions of GIS' (Leszczynski, 2015, p. 3). Elwood and Mitchell (2015) also warned about the dangers of GIS as digital media because exist a lack of control on the speed and how histories are built collectively. At the same time, the proliferation of spatial media 'also mean that our digital histories are also more open for modification and reworking than ever' (Elwood & Mitchell, 2015, p. 152). Therefore, the goal of this web map-based survey was to situate citizens' significant places and where their meaningful relationships take place. By drawing these areas of interest and giving them a name, the participants valued those places independently and, simultaneously, they were reaching a better understanding of urban spaces.

Workshop (stage 2)

After completing the map-survey, we invited both groups to join and work with their feelings and emotions as triggers. The activity was set in a room with a shared map on top of a table, and a camera hanging from the ceiling to record the interactions and the use of the provided tools. Two of the authors took the role of facilitating the process in Stages 2 and 3, taking

[8] *Place and City*. Available at: http://www.placeandcity.com
[9] *Google Maps*. Available at: https://maps.google.com
[10] *OpenStretMap*. Available at https://www.openstreetmap.org

notes, providing guidance and taking part of the discussion. The duration was one hour, structured in five parts or phases:

(a) We gave participants a sheet where they could list important, meaningful or significant places (Duff, 2010) along with their feelings and emotions regarding each place. The proposed questions were: Which places do you recognize that are yours in the daily life? Which activities do you carry and take place there? What are the feelings that you have got when you think of such places? What is the intensity of those feelings?

(b) After completing the list, they were asked to value them in the Affective Appraisal of Environment marker (Russell & Lanius, 1984). The affective appraisal theory assumes that people can judge the ability of a place to alter feelings, in that sense, the marker is a two-dimensional graph (the dimensions are 'pleasant' and 'arousal') that allows to categorize places. In our case, we wanted to use it, not to effectively judge the places, but as an exercise to promote deeper thinking about individual feelings related to a place, before explaining it to the group.

(c) Next, each participant was asked, to mention (one at a time) the places that he/she had in the list, locate it on the map, and explain to other participants why he/she selected that place, what intensities and emotions brought to him/her, and how these distinguished from other emotions. After doing so, participants were required to rank the place before continuing with the next on the list. This constituted the main part of the workshop activity since meaningful discussions appeared on it.

(d) After the main part, participants were required to think whether they wanted to share another place that was not on their list, and might be related to familial relations, social relations, or would even represent to some extent the city.

(e) Finally, we asked participants if: they wanted to change the ranking they have chosen for the places, if they wanted to change the appraisal of the place; and, if they felt that they would change the geographical areas that they have marked in the Map-Survey (stage 1).

Go-along walk (stage 3)

Walking is a frequently used activity in cultural geography, atmospheric studies (Sumartojo & Pink, 2018) and more-than-representational approaches (Springgay & Truman, 2018b), because 'how people use "sensual" talk in their accounts of their pedestrian experiences yet exploring these accounts has done more than reveal how people discursively attend to their actions' (Middleton, 2010, p. 585). The 'go-along' method can be performed by different modes of mobility, in this case we focused our experiment only in walks. Consequently, a walk-along is an in-depth qualitative interview method that is useful 'for exploring — and subsequently improving understanding of — people's experiences of their local residential context' (Carpiano, 2009, p. 3). It facilitates the analysis of everyday practices in place, the relations with other agents, and to keep sensitive to the affective dimension of place-making activities (Duff, 2010).

After selecting an arbitrary point of departure, some participants of each group performed the walking exercise. From each group, we selected 3 participants to be part of the activity, while two of them guided the walking tour and the other one was who held an action camera

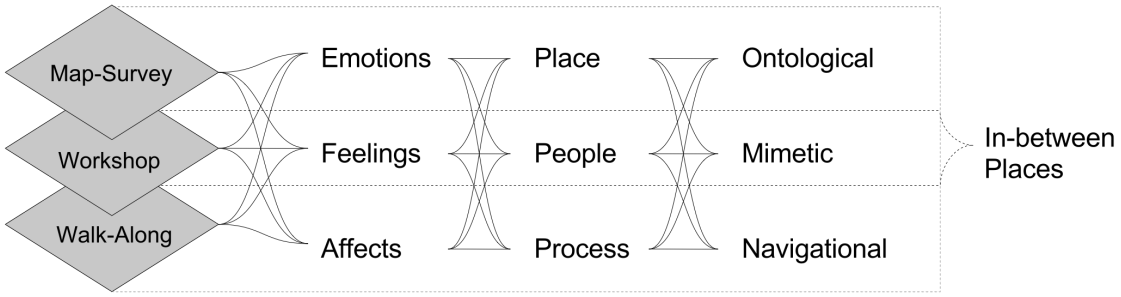


Figure 3.4: Layers to relate the three triads and methods helped to work around in-between places.

with a head-mount. We asked participants to meet in a metro station as a point of departure, and the guides took the group to the places mentioned in the previous workshop session (stage 2). The main intention was to differentiate the places that they have pointed in the map and how they relate them to vivid spaces, what comes up and how others relate their own experiences. Because we did not want to evaluate their map-reading skills, we did avoid the use of maps during the walking and let the guides choose the path to follow.

The walking activity was oriented to understand the affective dimension, but also to understand how places pointed out in the previous stages are enacted, omitted, mentioned and re-created in practice. For that reason, our guidance and interventions were focused on remarking and inquiring the group about such places. As outputs, we got GPS tracking points and paths, field notes and video recordings, which were analysed after, in comparison with the other materials.

A multi-layer approach

The experiment, which was made up of three different stages, led to a complex map of how places are built, and the virtualities and imaginaries that work between the qualitative, quantitative and performative methods.

The Figure 3.4 shows three scopes (columns) of analysis for each of the stages; layers of analysis are seen per each row. For example, the first scope contains the emotions, feelings and affects layers. The combination of layers within scopes allowed us to observe the phenomenon differently. For the clarity in the explanation, the division between scopes and layers is not so rigid as it may appear, because in practice, we might have used all layers for any of the stages, and, because boundaries in reality have not explicit form at all. Nevertheless, we found that specific combinations of scopes-layers eased the development of certain stages and clarified the search for in-between places. In that sense, we used a holistic approach to detect the best combination given the following empirical analysis. Working as filters, each combination of scope-layer led us to reconstruct our findings to identify and determine in-between places. It was a relational exercise of using different means and strategies to develop our experimental activities, involving different layers of knowledge, states and skills. We suggest that in-between places can be unveiled working in the interweaving of what is represented and what is not.

For the analysis, we transcribed the conversations from Stages 2 and 3 by using Jef-

ferson's transcription system (Jefferson, 2004). As Gene Lerner explained, 'understanding turn-taking for conversation and other forms of talk-in-interaction is key to understanding human conduct, because most actions carried out through talking are shaped by the organization of that talk into speaking turns: it shapes how speakers compose their contributions, it shapes where they position those contribution in the ongoing interaction, and it shapes when they get to participate' (Lerner, 2004, p. 4). Then, we analysed the video recordings by means of noticing (Laurier, 2014). This allowed us to pay attention to gestures and negotiation of meaning, by repeating the recordings many times.

We used cartography as a complementary tool and as an excuse to participants to talk about their places. To analyse them, we overlapped the data resulted from the Stages on an ArcGIS map to explore them together to find correlations between what was said in the meetings with what was effectively marked. Besides, to make sense of the entire process, we reviewed the resulting material several times, reading it through different scopes and layers, searching for clues of in-between places.

3.4.4. Findings

As Goffman (2013) stated, small group encounters have implicit rules and roles, that we should account in a face-to-face encounter to fully understand the dynamic of an interaction. For example, in the experienced encounters, it is obvious that we were talking about the same city, but not everyone was born there, or had relatives living in the city. Despite similarities across participants (i.e. young students), it is remarkable that they had different personal interests and motivations. While that is expected in a face-to-face encounter, other rules are made-up during interactions. For example, the leadership in one of the groups during the second stage was not clear, and sometimes facilitators interrupted participants' descriptions of places to rearrange the discussion altering the established dynamic of the conversation.

These observations are key to understand how places are defined in the group. It is not the same when someone tries to narrate an experience, or when there is a consensus about a place, or when its meaning is imposed by one of the participants. The roles that are taken in the interaction defines the importance and relevance of the mentioned places.

During the experiment, we noticed that the knowledge of the territory and its relation to the cartography was disparate among participants. One of them was very keen on finding places and helped others on this activity. He expressed his interest in walking and travelling in the city more than others, which seems to enhance its capacity to relate the territory to the map. But the activity of strolling around the city alone does not suffice to develop such spatial skills fully. Other participants who stated they use to like walking around had more difficulties to determine where the places were. As such, we argue that there are different types of spatial memories, which are also enacted by different types of mediations, interests and motivations.

Ontological, mimetic and navigational

The mimetic interpretation of a map is a resemblance between two objects. While the territory is directly mapped to it, it loses the correlation and continuity between what we experience and what we can say about places (November, Camacho-Hübner, & Latour, 2010). This was obvious in the experiment, when people tried to mark, describe and orient others in the workshop. Moreover, more than once in the exercise, the provided maps generated confusion

regarding the place they wanted to show. This situation forced participants to abandon the map as a representation and describe the place by its physical characteristics, activities and personal feelings.

Places are personal appropriations of spaces, and by sharing them with others, participants had to try to imagine what were the perceived characteristics of the place being shared. Although, when a participant shared a place, the first point of reference was always one that, in appearance, could be easy to recognise by others, such a metro station, a shopping centre or a stadium. While the other participants recovered the virtual image of the place, the participant who was describing the place changed the narrative to focus on the site that he/she wants to share. This strategy is manifested in the following description where a participant mentions a station (Santa Apolonia) trying to orient others, but without success:

> Ohh! Actually, I don't know much about this place but I've been visited through outside the station. There is some traditional market as well the street market. And I found it very interesting. I used to do photography over there. And Santa Apolonia is also one of my favourite places to visit, because there is differentiation. I'm the kind of person that I always love to travel, so I can be anywhere.

The group, then, tried to recalibrate their thoughts to understand what the participant said, but not without producing moments of confusion during which some participants got lost:

> That market was a kind of street market in the traditional way. I mean street harbour like this, they have the cars and there are in the gardens on the road side. They are having new products, second hand, maybe, or some traditional. And then sometimes you find some very good articles over there.

This demonstrated that any attempt to transfer an spatial knowledge and to define any kind of experience within a place can be missed outside the discussion. And there is something more, if she would have pointed it in a map without describing it, the essence and quality of that place would be simply lost.

In sum, even when participants shared physical connected places, we can consider that the imaginaries between them are unconnected and dislocated in the beginning. Thus, spatial memories are enacted and shared differently on the arrangement of each encounter and help to entangle spatialities into places as means of navigational interpretation (November et al., 2010).

If those stories lost the continuity, it could lead to more ambiguity. In the same example, the participant could not accomplish her goal of sharing her favourite place and the other participants became confused. She alternatively shifted to describe what activities she likes to do there, justifying her preference for that place:

> I used to do photography over there, and Santa Apolonia [metro station] is also one of my favourite places to visit, because there is a different situation... I'm the kind of person that always loves to travel, so I can be anywhere. I mean, I'm planning to go to Faro. I'm planning to Porto as well, and I'm also traveling... and photography is my passion. So, I always love to go to the place where I can find the way to go ahead.

She was struggling with the activity on trying to transmit her excitement. While the emotional traces of the place are those of joy, the affects in the room were those of tension and

fraught. She started to talk loudly and changed her strategy many times until one of the facilitators ('A') took the leadership by clearing the doubts of the place by naming it. Even when some of the participants were not totally convinced about the response, but, his confidence and authority role as a facilitator of the meeting gave him the enough power to stabilize the knowledge.

In the following, 'A' tried to share with the group that he realized which place the participant was talking about. However, the others took some time to catch it. We can notice that on the following transcription made in Jefferson's system:

```
A:   [So did nobody knows other name
3:            [I- i- think::
         (0.1)
2:   No, that is
3:      [I don't know the name
A:             [Feria de ladra
3:   Sorry?
A:   Feria da ladra
3:   yes, that is
2:     [Ah is that
1:       [heh
4:        [heh
A:    I knowand you don't know (    )
2:   Yes, feria de ladra
3:   You know eh- >what is the problem with< this eh: I have seen so many
     places here in Lisbon but I- I (    ) pronunciated the name and I never do
     to call them=
A:            [yeah]
3:   =memorize em, but I just know brought ( ) the area: this is=
4:                                                    [(h)m]
3:   =why I just interpretated:
A:                            [Ok
```

Additionally, we observed in the transcriptions that not only the perception and qualities of place were expressed, but also the participants' personalities. Therefore, the ontological feature of maps is taken by each participant as he/she uses it to express his/her identity and vision, while others can access to that vision to understand the participant's vision.

Assistive and complement lectures

This kind of recalibrations and stabilizations are common in group discussions. However, maps mediate in the process in different ways. In one of the groups, after looking for specific places in the analog map, participants were lost. One of the reasons was that the map didn't have street labels and other common references in contemporary maps. We decided to use a complementary digital map based on the OpenStreetMap (OSM) service, which was projected on the wall of the room. Then, participants tried to match the digital reference to the analog one. It took time to find the right places and it was necessary an intermediary reference to localize the area in which the place was related to, and then, look for the specific place.

Digital artifacts, media and information devices surrounding in our daily life activities, are interconnected both in terms of their functions and meanings, creating physical and digital ecologies (Fuller, 2005; Jung, Stolterman, Ryan, Thompson, & Siegel, 2008). Our daily activities, platforms like Google Maps and OSM, allow to re-imagine our location in a relational perspective. They are publicly accessible mapping platforms that open new ways to locate information and way-finding practices. For that reason, we forced participants to think outside their own practices of interpretation, making them to amplify the scope and influence o digital maps to solve their situation and to learn from it.

On the other side, we accounted that this is like how people use the digital platforms in navigational settings. For historical or touristic purposes, only relevant places are marked to quickly find them, but usually these maps lack other common references or places, like fast food chains, banks, or buildings that foreigners can easily recognize. Once a tourist gets lost, he/she then tries to match the references on the map with the place where she is, and the absence of common references may make the navigational task difficult (Ishikawa & Takahashi, 2013). In our case, the multiple references to metro stations, fast food chains and other commonly known places, helped to mediate the locations. By doing so, participants unveiled also activities that they used to practice in these places but were not included in the list of places of preference.

The mediation of such places unveils in-between places, revealing a set of practices that are not conscious and, possibly hidden from the rationale of the group. This is where the intersection between the representational and non-representational is found useful, because the experience lead to reveal the realities of their places.

People and places in process

During the walking activity of the first group, one of the participants led the group to her special place. We found that she had difficulty to put a name and to give a concrete description of the place. For that reason, the participant complemented the narration with gestures and specific descriptions, references and negotiations until the group realized what she was trying to communicate.

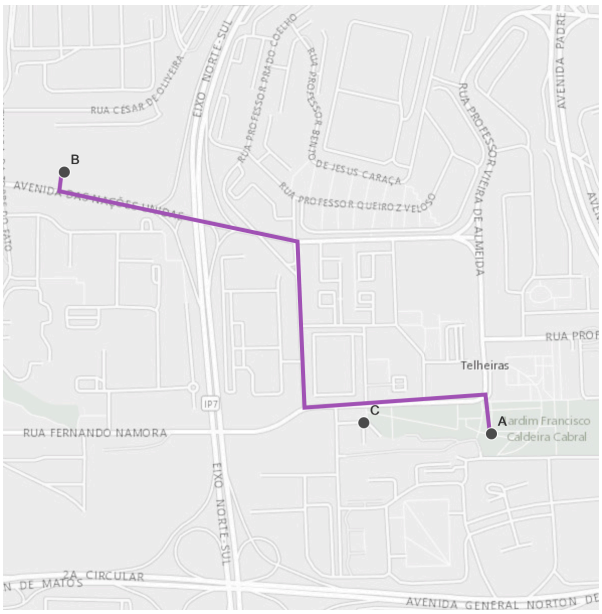


Figure 3.5: Path followed in the walking activity with the first group.

Because it was a common space for two of the participants, we decided to do the walking activity around Telherias station, the starting point located in the middle of two of the mentioned places. When the participant started to guide us to the place, she explained that she found the place (Point C, in Figure 3.5) by chance, while she was heading to a meeting with her supervisor in the supermarket 'Continente' (Point B). We reproduced that path to understand where and under which circumstances affects, feelings and emotions raised on that activity. The place that she found so special appeared in con-

trast between two crowded places, as an oasis, with the characteristics that she preferred (peaceful, relaxing)[11].

We found that during the workshop, she only could mention the metro station (Telherias) near the place, but because she could not describe it in more detail, she gave up on explaining more about that place. She neither could point it on the map, she only realized where the place was when other participants named the station. She explained:

> And going out of metro, it was a new place for me [..] During my whole walk, I found it very pleasant. Very peaceful. Something positive. I mean, you are walking towards the Continent from your metro station that there is a long walk. And I found it very peaceful and I was doing, I have a brainstorming during there so I have very positive thoughts. I found that. I mean, I've been going there after that two or three times, just for. Because of my thesis.

Edensor (2012) argued that affects are always anticipated, having a social, cultural and personal background. In this case, the intention of the participant was focused on finding that place that she felt important, to transmit their feelings and emotions to us. She prefers pleasant, quiet places, with natural elements and where one can develop certain activities such as reading or studying. But the fact of sharing it with others turned to be a difficult task to accomplish. In the walking, she resorted some words such as 'magical' or by referring to fictional scenarios. The group accommodated their understanding of the meaning of what she was saying:

> I know that the place is very common, but the ambience, the entrance is... and, I sit on that desk and... that entrance, that entrance. The green one. The entrance of... Like a fairy tale, Alice in the wonderland, or Scotland.

She also repeated her expressions as an act of affirmation of her feelings. 'It really makes me happy. I have been there. Eh, I've been coming here for more than three times. So, whenever I came here I use to sit here. At least for thirty or forty minutes.' And then, reaffirmed the feeling while she explains how it works, and in which situation she found it. 'But it appears that, if I would sit here, the magic will remain there.'

Regarding this quote, we understand that the activity of mapping is not just a construction of symbolic reference, and it is performed in time and space. As Liberman (2014b) put in words, 'a map does not provide for those practices prior to an occasion — instead, it is the occasion that affords the map its coherency, a coherency not of ideas but of a collection of practices' (2014b, p. 47). But at the same time, the different activities allowed us to complete the virtual aspect of the place, only by the mediation of several cartographies, verbal descriptions, physical gestures, negotiation between participants and our own ideas, feelings and emotions. What grouped all those mediations together was the contagion of affects (Thrift, 2008) and emotional references, which made us react in such a way that we felt the importance of such place. It was that specific moment of being in the place, after a sequence of synchronous and asynchronous activities and choreographies that permitted us to arrive a moment of reflexivity and understanding. We can argue that in-between places

[11] The Project for Public Spaces made a reference to understand how places can be 'for lovers' that offers a similar description of the place that the participant referenced (*Public Space is for Lovers*, Project for Public Spaces. Available at: https://www.pps.org/article/public-space-is-for-lovers)

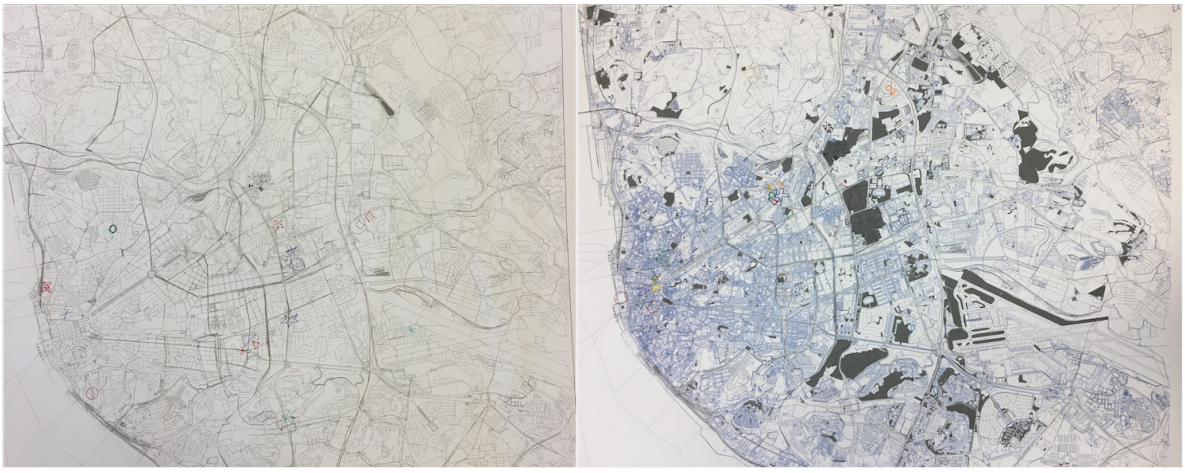


Figure 3.6: Comparison of the two maps, where the left one (second group) has more distributed references and the right one is more clustered (first group).

are special, hard to communicate and represent, but often necessitating and/or leading to unique moments of common understanding within a group.

Reconfiguring spatial memories

Activity groups are embedded in a constant negotiation of meanings and personal exposure. Given the lack of necessary landmarks and contextual clues in conversations, Liberman affirmed, in a Wittgensteinian view, that ‘the meaning of a word is naturally unstable over the course of a conversation’ (Liberman, 2012b, p. 263), and for that reason ‘meanings do not reside in people’s heads but in the world’ (2012b, p. 266). Participants in both groups re-arranged their places to follow the conversation and the general meaning of the experiment. The importance of places, then, is entangled to the utterances of other participants.

During the workshop, the first group offered a resistance to communicate personal or intimate places in a first instance. Rather, they spotted publicly known places that were of touristic interest, natural or cultural heritage. Because of that, organizers had to force the conversation to move towards personal places. However, in the second group, because most of them knew themselves before, mentioned common places for most of them (See Figure 3.6). In both cases, personal places came in the second or third attempt of describing places. Lewicka (2011), by comparing other studies, found that participants tend to prefer places by environmental features and characteristics of place than by social ones (family/friends). In the list of personal places that we asked to complete before placing their places in the map, we corroborated Lewicka’s findings, given that at least half of the participants put their university and Arco do Cego (the main square where they use to meet) in the top of their lists. Nevertheless, comparing to the maps from the stage 1, with the exception of one participant, none of those places where marked as important regarding social capital or place attachment. Here, places like Belem (the most touristic place of the city) just came up in the group activity. Consequently, in-between places are also mediated by popular images, common assumptions and knowledge.

Placing affects, feelings and emotions

Looking at the words used by participants to describe their emotions in relation to places, we found that many of them did not describe emotions but activities or relationships with these places. For example, in the second group, one participant pointed a square where he socializes with his friends and university colleagues; when we asked him for emotions, he only answered that he use to hangout there. He didn't expressed any feelings, as it is normal for him. We understood that multiple emotions came up at the same time, making the explanation confusing. Therefore, there isn't a rational aspect, emotions or feelings pertinent to a place, but multiple and mixed as participants remember. Considering that emotions are 'constituted categories in relation to which the felt intensity of experience is articulated' (McCormack, 2003, p.495), we realized that some are not yet established, but are becoming in the course of the discussion.

In some cases, for representing what they feel about, participants decided to describe the place in physical terms first. Then, what they used to do there, and why they liked it. Because of the difficulty to assign a word to emotions and feelings, a place is represented as a set of descriptions and gestures that altogether try to transmit the felt attunement (Edensor, 2012). Besides, we perceived the unsuitability of some tools, such as digital and analog maps to describe emotions. In the analysis of what they have drawn, we observed that, in a first instance, participants avoided these places in favour of more common places, and only after a prudent time, they were able to communicate more personal places that were not on the list.

On the other hand, the places that were top-ranked sometimes fit with specific feelings or emotions. For example, one participant mentioned reiteratively pleasant and quiet places, as something that she was expected for her selected places, and in fact she thought it was a common expectation.

When using the appraisal marker most participants chose merely pleasant places, and very few thought on unpleasant places. More interestingly, we asked later if they wanted to move any marker to another position. Despite few participants made changes, one case was paradigmatic. The chosen place was the house of childhood of one of the participants. Since the neighbourhood (Chelas) has a bad reputation, the discussion shifted from his description of individual concern to a more public debate regarding insecurity and other social consequences. Although, was the participant who mentioned the bad reputation of the neighbourhood, probably with the intention to differentiate its public reputation from his own experience and appreciation. 'The area where my grandparents live was not problematic. It's a fine place', he confessed. Then, other participant (who already knew him) commented on her concern about safety. 'Sometimes it can be a scary place but nothing bad happened to me there', she said. As a second witness, she helped to build a stronger argument, saving his negotiation between a personal and a public definition of the place. Consequently, the first participant decided to move the marker to a more pleasant position (Figure 3.7), most probably because of the negotiation that took part.

On the scale of places

Participants of both groups recognized Parque das Nações as a public space, but it was referenced to different activities. The place is a neighbour that was firstly built for the World Fair in 1998 with a series of venues, such as a shopping mall, a riverside, restaurants and a

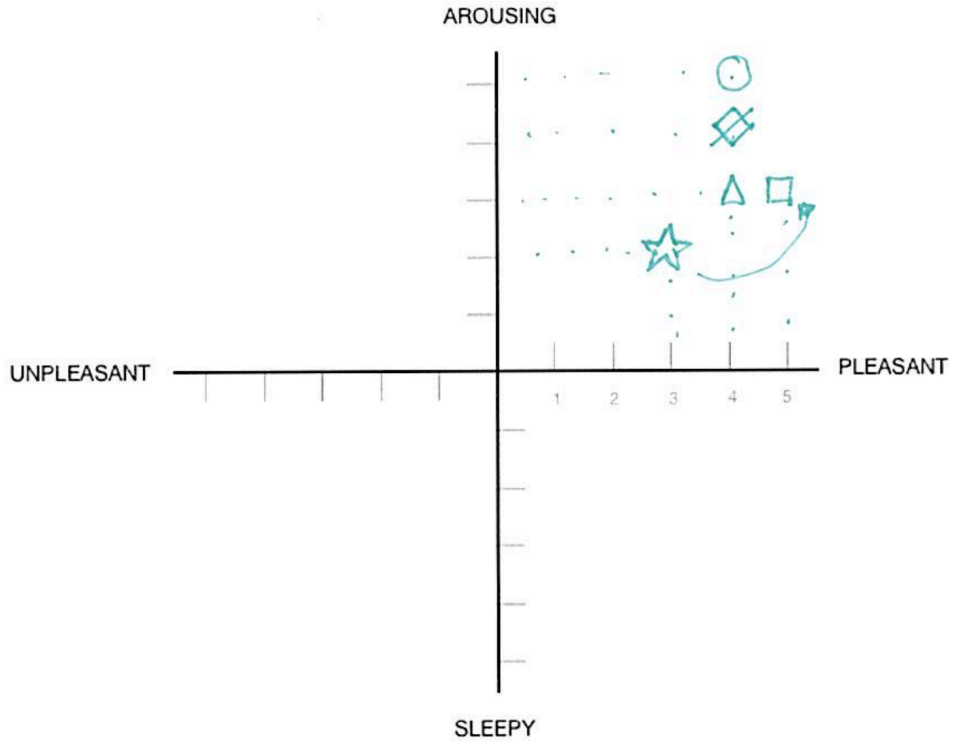


Figure 3.7: Appraisal Marker where the place in Chelas was changed by the participant.

concert hall. It is well-known for leisure activities, tourism and shopping. There is also a set of residential buildings that were built after the fair, and one of the participants lived there since her childhood.

For her, the place has a different value, compared to the rest of participants. Although the descriptions made during the walking were levelled down to a more historical narration. When we analysed the data we found that she had selected all the areas of the parish, while others only selected a specific sector of it. We assumed that she has more attachment to the entire parish area and knows many places that she can be related to, while others only referenced few places and, consequently, felt less attached to that place.

Exercises through distinct means and tools required participants to pointing places differently. In the first stage, we asked them to define areas of influence, regarding sense of place or attachment, while the tool also forced them to do so in a specific manner. In the second stage, we gave them symbols to represent places, which allowed participants to point a specific place, and not an entire area. For example, inside Parque das Nações, people placed marks at different venues, while they have selected the entire area when using the digital tool. In some cases, participants, by freehand drawing, also used the symbols to fit an entire area. Therefore, they adapted the given tools to fit their intentions, and defined the scale to which they wanted to show their space appropriation. Without the practical opportunity to work remotely, the appropriateness of analog tools fits much better into the level and scale of representation of places.

Figure 3.8: Atmosphere and objects around the bench.

Representations of what is missing

We must consider the agency of external actors in the link between places and their recognition. Various places mentioned during the exercise were discovered or considered thanks to a mutual constitution between objects, affects, and spatial arrangements. For example, one of the participants was requested to meet in a particular place with her supervisor, and in the way to that place she discovered another place that became long discussed in the group activity. Yet, some of them realized the importance of a place because others mentioned and it was discussed together. To convey its importance, she appealed to descriptive adjectives like happy place or magic. Even when she admitted, 'I know that is very common', followed by a mention to the ambience of the place.

That place had a specific setting; as it can be seen in Figure 3.8, a bench placed in a path, and in the back, a wall covered by leafs with an entrance where the protagonists of the scene were. This place was no sufficiently important until she mentioned the kind of activities that she usually does there, to realise why the place and the objects enable the possibilities of being considered special to her.

As Duff (2010) pointed, the characteristic of a place is not given as a matter of discover it, but made it. In this regard, the networks built between social, affective and material resources enact places. But Duff itself noticed the difficulty on identifying and understanding how these places are composed, and consequently, how these places can be studied.

Figure 3.9: A group comparing what they have done in the analog map and the areas defined in the online map-survey.

Disencounters in mapping

In our exercise, we used different types of mapping platforms, from analog to digital cartographies, to conceptual maps and narrated stories (Figure 3.9). All each presents a diversity on how places can be approached and understood. Over the abstract forms of representation, stories that were narrated, generated a sensation of togetherness (as empathy) on participants, but mixed with the symbolic relationship between the map and the territory. For us, this correlation makes no sense if the awareness rises and, a consensus between participants is made afterwards. On the contrary, when participants tried to start their stories by pointing a place in a map, they immediately created a sequence of memory enactments on the others. These enactments generated more spaces of debate, which derived on a longer discussion to align the narrative of the speaker with the others.

Each place is a hub of relationships between activities, emotions and feelings, that anyone relates to. That is also transmitted in the course of the discussion through gestures, voice attunement, rules and other elements that appeared in the face-to-face interactions, generating a circulation of affects between participants. This circulation disappears when we use maps as tools of representation, detaching the memories, creating an isolation of codes and rules for reading them. Therefore, places are defined as a higher level of abstraction, missing those that are not clearly defined because are impossible to represent.

We call these places ‘diluted’ because are not static in our virtual image of the world, neither have a physical representation. These places of becoming, are not strictly tight to a physical space, they can be translated, transposed, and reimagined.

3.4.5. Discussion

In this chapter, we put in perspective the development of representational systems to contribute to our inquiry of what people consider a place. With the adoption of digital platforms,

what a private or public space is, individual and group relationships with space have changed (de Waal, 2014). Our relationship with the urban space is also changing due to the use of software-enabled devices (Kitchin & Dodge, 2011). Therefore, contemporary maps can also be analysed under our [DAD] framework.

However, none of these cartographic tools was thought to raise, share and contribute any personal value of space. As we saw in our exercises, in-between places are commonly unmarked spaces, which are only shared between participants when enough confidence exist among them. Beyond all the places that have been pointed during the activity, it remains to be understood why some places that participants have put on the list, were not mentioned during the group discussion. Omitted and absent places are also significant. As Gerlach (2014) recovers Deleuze's manifold cartographies, is in the multiple 'and, and, and…' of descriptions, embodiments and processes that we can find these in-between and diluted places. Downey et al. (2016) defined in-between spaces as 'familiar, yet unknown; they are secure, and yet intimidating.' (Downey, Kinane, & Parker, 2016, p. 3).

Much more understanding is needed on how in-between and diluted places can be used to describe and study everyday life, and to what extent the difficulties of discussing its meaning implies for future technological developments. In this experiment, we have examined spatial mediation and spatial memories as part of the constitution of places, as a collective knowledge, and that this may help to delineate new methods to create, share and capture them with or without digital artifacts (Q1).

Given the proposed framework in Figure 3.4, we accounted that some methods were more suitable regarding specific layers (Q2). However, all methods are valid as they are means to problematise and becoming entangled with the relations that come to be. Instead of capturing data, methods are useful to research 'in the speculative middle' as Springgay and Truman (2018a) suggested. For example, walking along provoked circulation of affects and, at the same time, to focus our inquiry on the process of constituting meaning. The workshop helped us to discuss emotions, while the circulation of affects was also spotted in the discussion. However, the use of the map as navigational device offered a focus on Places and Process, an excuse to put under inquiry the representations. However, situated reflexivity of the discussions and mediations are hard to reproduce. And, we expect that more studies focus on the Process of creating places and the mediation of cartography.

The notion of place has been discussed for decades, and it is in constant transformation. As Duff (2010) pointed, we should not try to force it and understand that levelled down places are also opportunities to generate new personal, appropriated spaces. He also describes what is called enabling places as those that create wellbeing, therapeutic, restorative functions, or promote health relief (Duff, 2011). Although these places are not static, they respond to specific enabling resources (social, affective and material) that define a place as much as they are the product of it. Duff proposed a perspective to study places as a relational matter, where a place is not something static as we accounted in our empirical work (see the example of encountering a place in the trajectory taken in Figure 3.10). Thus, he noticed that 'enabling places cannot always be identified in advance, and that a place that is enabling for one individual may not be enabling for another' (Duff, 2012, p. 1394).

For that reason, we consider that we can look at new ways of narrating and communicating those places by using newly available technologies. Nonetheless, as Thrift (2008) said, new possibilities of visualising maps by interactive means are also an opportunity to capture

Figure 3.10: The trajectory to reach the described place. Noticing the change of atmospheres in the way.

changes on affects. Consequently, our call here is to critically face the use of media as representational tools, instead of continuously reproducing the same ambiguity between common spaces and places. Rather than discussing the differences and similarities of the concepts of place in the more-than-representational and performative scheme, our analysis of place moves from the study of places to the discussion and exchange of knowledge and the opportunities and difficulties fuelled by the current technologies. A diluted place escapes from static definitions, but it can be found in descriptions, memory enactments and other performative kinds of expression. Diluted places are, beyond anything, affective. And because it lacks formal boundaries, scales and topographies, the cities that are enacted are fluid, flexible and multiple. In this vein, we offered a different approach to understand the sense of place, not as a particular definition of clear emotional triggers, but a relational understanding how these places can be appreciated in the process (Q3)

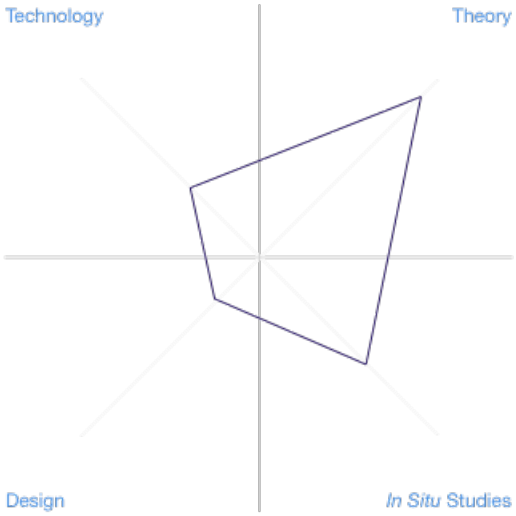
We approached this chapter to work with two tendencies that enter in apparent conflict. The activity of mapping and abstract representations, and the procedural, constant process of creation and identification of places. Our investigation was based on the interactions of the encounters and the order of the activity from a relational perspective. We conclude by considering the concept of dilution and turning the notion of places into an exercise of observing practices and exchanges as a means of affective propositions.

Nobody lives according to facts. Instead, everybody lives according to narratives. We are a species that tells stories. The confusion is not because the existence of too much data, but that the stories are mostly incoherent and incomplete. This, in turn, is due to the loss of ability to pay attention.

There have been many attempts in social and cultural geography to understand the process of defining places from the drawings of interaction and descriptions. Most of the works were focused on understanding how places are enacted, mentioned, defined. By the contrary,

we are attracted by the complications and disencounters in the definition. Thus, the idea of diluted places contributes to geography in the understanding of what is missed or skipped in the process of sharing spatial knowledge.

Contribution: Research In the Wild Model



Theory: This experiment posed a very high stance on the theoretical approach. The concept of diluted places, together with in-between spaces, provides a workaround with the problem of representing places that are hard to define.
Technology: The experiment showed how different technologies, from analog to digital, can serve to the purpose of analyse the stories and look forward to describe diluted places.
Design: In terms of design, the experiment contributed towards an interdisciplinary approach, and, focused on a process of co-creation and sense making with the participants.
***In Situ* Study:** This project demonstrated how does *in situ* studies can unveil more details to place descriptions. With the walk-along process, we could understand better the relations between daily practices, participants' meaning of the places, and the environmental conditions in that those practices take place.

3.5. Outlook: The city of meanings

The Latin word *investire* means 'to clothe, to cover or to surround'. Meaning is not something that exist but something that we have to *investire* to notice its existence. But that effect goes in both directions. A meaningful city that one that allow us to embrace and to clothe its spaces to found its meaning, but at the same time it cover us with meaningful experiences.

In this world of constant adequacy to technological innovations that moves towards a more connected and socially exposed life, individual and collective stories are reshaped by social network platforms, standardized forms of data visualizations and common codes of design and representations.

Nowadays, the necessity of making common characteristics and coincidences between people visible, opens the door to exploit individualities and personal differences, producing societal values based on the abuse of those in weaker positions. In this vein, Pedwell (2014)

reported the use of neo-liberal affective technologies and psychologies that are designed to produce 'accurate knowledge of "cultural others"', and called to use such emotional and affective translations 'as a fluid assemblage of translational processes involving difference, conflict, negotiation and, potentially, the creation of newness' (2014, p. 37). Following her directions, we report on the abounding in these differences of narrations and stories as rich resources to study, where the value of life in cities can be located in-between representations.

Therefore, our research question (RQ3) was: How do the affective qualities of places relate to the process of representation?

To answer that, we shall be open to formulate new questions that illuminate the relational path to answer it. How are novel platforms for mapping and representing the territory losing the situatedness of place? How they miss these diluted places? Who is benefiting from these reproductions? Alternatively, how do these assemblages work for the development of urban infrastructures and real state value in cities like Lisbon?

In a world of diluted places, we should explore the in-between spaces as a mode of experience such affective atmospheres and, to cultivate temporary thick places. Contrary to foment the creation of permanent meaningful places (that structure the relations of powers), we encourage practitioners to play with the capacity of socio-technologies to potentially create a multiplicity of virtual enactments.

We argue that meaning is not only build up from symbolic relations, but it is also a process of always-becoming that bound us together. Consequently, representations are always in-relation to our experiences and practices.

In our next chapter, we will introduce three explorations to wrap-up some of the concepts and knowledge approached in this and the previous chapters. Additional, we will explore other forms of researching reconfigurations between objects and places.

4

Addressing orderings and publics

Based on the concepts and experiments presented in the previous chapters and the three explorations of this chapter, we propose a debate on a process of politicisation and discursive construction on what we called *geographies of empathy*. We conclude our argument politicising the interactions with objects and the possibilities of empathic relations.

4.1. Introduction

In this chapter, we turn our focus again on objects, letting other ontologies (atmospheres, in-between places and diluted) on hold. We think it as a necessary step to address once again the three objects of research as a form of insights for design practices, to put them in conflict all together at the conclusions. We do it because, firstly, we account on the capacities of each discipline to provide different bits of knowledge; secondly, that differential knowledge may enter conflict but can be addressed together; thirdly, on the contrary, these differences constitute a form of speculative practice; fourthly, it agrees with the nature of this thesis a sort of a dialogue between ontologies.

Following the multi-disciplinary approach that characterises our work, in this chapter, we analyse the opportunities and consequences offered by the methods and the empirical basis that we have been working. This chapter presents three explorations that put several ANT and HCI concepts in dialogue, that will result in a discussion on how an object-oriented ontology can also be thought with the previously presented ontologies (affective, atmospheric, in-between). In each exploration, we offer three different perspectives and conceptual constructions that let us develop different ways to study the embodiment of spatial activities. These concepts and models are not conclusive, but provocations to extend the possibilities beyond the boundaries of disciplines. In that sense, these provocations exemplify the conflicts that exist between fields and disciplines in building frameworks to understand and operate in the world.

The chapter is structured in three different parts to discuss each research question:

1. **How can we unveil assumptions behind their design and usage by understanding the effects of interactions with mundane objects order our lives?**
   In the first place, we approach the interaction with objects and machines to inquiry their impact or consequences. We introduce 'modes of orderings', as a set of strategies to address the complexity of the *publics* in urban spaces.

2. **How can we reconfigure the use of artifacts to understand the modes of orderings for designing better urban systems?**
   The second approach is focused on the street scale. Specifically, we explore how our interaction with mundane objects can drive the order of our daily life activities. We introduce the concept of 'artifact ecologies' in contrast with modes of ordering, to analyse some examples of interaction with urban infrastructure and to re-frame the analysis made in Chapter 3.

3. **How can we understand the transformation of atmospheres and our habits as a matter of political importance?**
   The last part is about the urban (illuminated) atmospheres introduced in Chapter 2 but addressing a massive event. Our inquiry is on how can these affective relations generate apparatuses of discourse in a political manner by articulating different orderings.

4.2. Background

Design is about questioning the facts and proposing new answers. A good design process has to enable the right questions for the problems that designers face. For that reason, we encourage to question the orders, the territory, the assembled objects, the strategies, and the

assumed affordances in the public realm. *Publics* are, in fact, organizations of humans and non-humans (Jenkins et al., 2016). Therefore, with the background of the previous chapters, we will move forward to theorise *public objects*, considering encounters as the main context of analysis.

Sociologists and urban planners (Jacobs, Mosser, Gehl, etc.) have promoted empathy and diversity by letting people use objects freely, making everyone comfortable and more social. At the scale of cities, an open system could be designed to provide the best scenario for sustainable technologies. The openness is an aesthetic quality, not because it is just a matter of good looking to be open, but it is deeply linked to social order, a way to sort the multiplicity and to assemble realities.

The attentiveness over spatial arrangements helps us to make sense of our reality and empathise with other bodies. Therefore, methods that study the attentive capacities can provide insights on how it is ruled and governed by objects and their interactions with people. We based our thesis on encounters and mediations. Thus, affordances are also important not only regarding the usability of objects but also because they enable agency (Withagen, de Poel, Araújo, & Pepping, 2012) and shape our relationship with space (Kitchin & Dodge, 2011).

Approaches like *in the wild* or *deep cover* have recently acquired more relevance in the HCI field due to their importance as observational practices that require to be tested *outside the lab*. These perspectives intended to eliminate some biases related to the absence of a natural environment in which sociotechnologies are designed. Uncertainties and unexpected events are intrinsic features of urban space. For that reason, we propose to take an ontological approach (Coole & Frost, 2010) to question the design of new interactions based on attentiveness and avoiding individual epistemological assumptions. Therefore, we present different explorations to recover the attention and re-familiarising to what is happening on the streets. We explore an opportunity to guide interactions based on ethic and aesthetic principles. As affects are forces of orderings, urban spaces present their ambiguities that become rendered as a gathering in the emergence of affective atmospheres. If artistic, interactive and playful expressions can help to enact empathic relations with the spatial practices, 'affective atmospheres emerge both from anticipative aesthetic work and spatial formation and from the engagement with accidental encounters' (Michels & Steyaert, 2017).

Moreover, in the third exploration, we look for cultural and societal consequences of place-related affects and its location in the in-between of attention and interaction. Our ethnographic observations point towards certain affects which can mediate specific spatial arrangements, between sensory embodiments, individual activities and social practices. In such context, cultural dynamics are also part of places and influence the circulation of affects.

4.2.1. Observing the city

Thinking on the street level of modern cities, citizens perceive a chaotic and messy web of overlapping objects and networked relations. Designing for public spaces is usually harder than designing for closed environments because there are more opportunities to engage with large amounts of potential users with radically different preferences and characteristics. Besides, the high presence of objects in urban spaces creates a grey zone for visibility and shortens people's attention. Even more, the use of mobile devices generates new mediations

(Laurier et al., 2016) that not always augment people's perceptions, but built up different spatialities and publics.

Some urban interventions such as interactive displays and projections deployed in famous streets and traffic lights with interrupted light emission are aimed at catching pedestrians' attention. Even though the introduction of interactive objects is usually novel in the environment where they are deployed, its novelty tends to quickly decrease over time, taking them to the mundane world of urban objects. In consequence, new layers of complexity are added into the urban fabric every time, generating residual effects in terms of noise and visual pollution. The addition of new objects implies the old ones become part of the environment making everything more complicated in our ordinary life.

Even though in HCI/CSCW fields it is common to find projects that place new technologies in the context of public spaces (Memarovic et al., 2012), we assume that design processes rarely start from the observation and analysis of interactions in connection with what is already there. Even more, such interventions tend to be opportunistic, with multiple goals to achieve in original experiments (Alt, Schneegass, Schmidt, Müller, & Memarovic, 2012). The proposed approach is focused on a sociological analysis, using methods to drive the design process with more holistic and post-humanist views, and it is an opportunity to lead the process in a straight way path to create new interactions in the urban sphere. We contribute with our work to the strong consensus that design anthropology and ethnographic methods can help to tackle down the weaknesses on identifying and determining social and urban complexities (Nova, 2014).

On one side, beyond the novelty of interactive and pervasive technologies, we argue that ordinary, *old* objects, besides being familiar to us, generate different choreographies that can be traced and reshaped if we observe and understand them better. Paying attention to these movements creates a significant opportunity to engage people, but also to harm others. We propose a reformulation of the process of designing interactions and putting them in conflict with their politics (Smyth & Helgason, 2013). In that sense, anthropological insights offer a critical perspective that nurtures the design practice with the analysis of new future objects, cost distribution and understanding of how those objects assemble the social (Clarke, 2010).

The concept of wicked problems emerges when social system problems are ill-formulated, where the information is confusing (Tutton, 2016). In other words, this apparent chaos is reflected by a lack of more in-depth analysis and observation on how public places are organised. In previous chapters, we have worked with the concept of place, as a notion that refers to an individual o collective emotional and symbolic relation with particular spaces. In this chapter, we will focus on spaces, and the practices take place. In that sense, we argue that the apparently chaotic and messy nature of the public space in the field (Preece, Rogers, & Sharp, 2002; Rogers, 2004; Sheller, 2004b) should be understood by other means to be acknowledged in its nature.

Farías (2011) acknowledged that 'assemblages are self-contained processes of heterogeneous associations calling for a positive description of their becoming, not external explanations' (2011, p. 369). Rather, urban assemblages are ontological constructions that 'involves accounting for all actual entities involved in such processes of construction, whether human or non-human, their interactions and transformations'. Therefore, citing Latour, the author noticed the richness of assemblages as a method, because it replaces the structuralist view and puts the focus on how these humans and non-humans are connected and generate

networks of power.

For that reason, we address this issue by providing tools for observing the mundane and, dynamic methods to designers who want to engage in the urban space. We aim to focus and enrich our theoretical approach following the five roles suggested by Rogers (2004) to drive a successful design process in HCI: descriptive, explanatory, predictive, prescriptive and generative.

4.2.2. Methods for urban attentiveness

Jane Jacobs made a call to put the eyes on the streets (the vital organ of cities) as a critical point of view. Streets are full of the vitality of their neighbours, but also provides a scenario for encountering strangers. Those encounters keep streets safe because of 'an intrincate, almost unconscious network of voluntary controls and standards among the people themselves, and enforced by the people themselves' (Jacobs, 1961, p.32). Hence, there is no need for technological development for count and control, but to observe how those networks work. She started *The Death and Life of Great American Cities* (Jacobs, 1961) in the following way:

> The scenes that illustrate this book are all about us. For illustrations, please look closely at real cities. While you are looking, you might as well also listen, linger and think about what you see.

Ethnography and active observation are not new in urban disciplines. William Whyte (1980; 1988) used to record and observe interactions in public places. He was worried about empty spaces in New York City since the 1960s due to the massive construction levels in the city, leaving many empty spaces (Whyte, 1980).

> We mounted time-lapse cameras overlooking the plazas and recorded daily patterns. We talked to people to find where they came from, where they worked, how frequently they used the place and what they thought of it. But, mostly, we watched people see what they did. (1980, p. 16)

As a departing point for our explorations, we noticed that the Whyte's practices of observation were not organised by a specific scale. Instead, Whyte and his colleagues analysed entire public squares but also situated activities (i.e. where do people seat, and which activities do they perform there). As we have seen in Whyte (1988), the activities in the streets have changed, as well as the behaviour of people. Reasons are infinite and are not our work to determine them, but the methods used by Whyte are still valid. Moreover, he acknowledged that there is not a limited number of activities developed, but they increase and change as time progresses.

Sennett (1992) also wrote about the negotiations with others in the space and the unpredictability of the public. Earlier, Benjamin and Tiedemann (1999) conceptualised the flâneur in the XVIII Century to describe the observing activity in the city; a concept has taken afterwards by the Situationists to make it a practice of methodological observation. More recently, Jan Gehl (2010) and its studio used a similar methodology to design *Cities for People*, a human scale perspective on urban planning.

> Perspective vision and prospective vision constitute the twofold projection of an opaque past and an uncertain future onto a surface that can be dealt with. They

> inaugurate (in the sixteenth century?) the transformation of the urban *fact* into the *concept* of a city. (De Certeau, 1984, p. 94)

De Certeau thought that the 'concept-city' was in the process of disappearance since the *spatial practices* would be more critical. Even if that became true or not, we recover the importance of walking as the primary practice. The pedestrian activity is an *act of speech* that has a triple enunciative function: is a process of appropriation of the space, is a spatial acting-out of the place, and implies relations among differentiated positions. These enunciations can instantiate different orderings as we will see in Exploration 1).

Walking activities were also used to analyse the spatial environment and context, in the same way, that Walkthrough experiences in HCI provide more understanding on the use of interfaces. In anthropology and human geography, walking also offered new understandings on 'the intensification of certain senses at certain times that makes us aware of corporeal planes of experience' (Middleton, 2010, p. 577), allowing us to understand walking as a socio-technical assemblage as it is mediated by 'mundane technologies' (Michael, 2000). These interactions with mundane objects were mentioned in the embodied interaction approach (Dourish, 2001; P. Marshall et al., 2013). Thus, the starting point of our research has to do with the observation of how objects 'direct our attention to doing mobility together' (Laurier et al., 2016, p. 15) to shared action.

4.2.3. Urban interactions

Designing interactions and interfaces for the urban space is not new in HCI. We have read about encounters in urban spaces (Balestrini et al., 2016; Foth, 2008), Urban Informatics (Foth, 2008, 2009), Urban Interaction Design principles and taxonomies (Salim & Haque, 2015), and Ubiquitous Computing and Public Displays (Alt, Schneegass, Girgis, & Schmidt, 2013; Alt et al., 2012) in several publications. In Alt et al. (2013), public displays are analysed as they influence cognition and measure different interactions for that purpose. Balestrini et al. (2016) found that encounters in the public space can enhance interactions with objects and generate new social dynamics, *affordances* (Gibson, 1977) and coordination between individuals.

We noticed that ethnography, prototyping, designing and testing methodologies are well covered in the field. But, what comes before the objectivation process, for which the designers make sense of the problem to be solved, is addressed less because it is more abstract and is assumed to be less critical. Especially, contemporary trends on innovation tend to simplify the problems to be addressed. Dotson (2015) argues that some rhetorical narratives regarding the democratisation of technologies and disruption lead to a process of *permissionless innovation* that carry a detachment of political responsibilities. Moreover, the ill-formulation of real problems diminishes the opportunities and expectations of solving actual problems (Tutton, 2016). Preferably, a movement of *technological solutionism* (Morozov, 2014) create a path dependence for solving problems by creating expectations based on fictional apparatuses that don't necessarily correspond with the reality. We found that few researchers have noticed the social and political consequences of interactions.

Smyth and Helgason stated that the 'challenge facing design is how to make us more critical of our shared futures and to prompt us to question whose futures these really are and what form they might take; in short, to acknowledge that design can be a political act' (Smyth

& Helgason, 2013, p. 76). For example, Hinrichs and Carpendale (2011) unveiled that, usually users that interact with public displays do not plan and even notice the consequences of their decisions made during the interactions. Social exclusion attitudes such as fighting for their physical or territorial position was observed in common collaborative interactions. A. Crabtree, Rodden, Tolmie, and Button (2009) proposed to recover the idea of *defamiliarization*, treating the familiar as an anthropologically strange 'that help designers rethink the assumptions built into domestic technologies' (2009, p. 882). Latour (2014) pointed out that also many technologists confuse the technical (meaning efficiency) and materiality (as modes of existence), mixing the understanding of networks (and making sense of them) with how the world is articulated. Therefore, a process of *defamiliarization* would help to resonate again with those infrastructures.

For our purpose, it is worth to recover the principles of Phenomenology that explores the ontology of objects to understand how to approach this research, in conscious and subconscious ways. Differently, from the traditional HCI perspective which used to be related to a cognitive and perceptual understanding, phenomenology understands more deeply the aesthetic and visceral essence of interactions with the world.

In Robertson (2002) we found some intents to relate phenomenology with Computer Supported Cooperative Work (CSCW), recovering the Merleau-Ponty's reversibility by understanding how awareness and perception can be considered in designing interactions. Robertson pointed out that 'perception is always self-perception' (2002, p. 312). But, the analysis did not take phenomenology in depth, only noting that public availability is not passive. Like Suchman, he claimed (phenomenology is widely introduced in embodied interaction approach mentioned in Chapter 2) that cognition is 'publicly available', organised, and it is collective, but without more detail.

Activity Theory (AT) (Nardi & Kaptelinin, 2006) also offered similar concepts for the Interaction Design field. Specifically, the approach is based on Russian psychology, and cultural mediation research where confronts the basic 'user-system' abstraction in HCI, considering the multiple activities in which people could interact with technological artifacts. In spite of its similarity to STS and some phenomenological approaches (as the author accounted), we found many controversies rooted in the conceptual assumptions of this approach. For example, AT seeks to understand the unity of consciousness and activity as a whole and as an accountable phenomenon. Even more, AT takes advantage of a static framework for structuring the multiple activities that people perform and are behind the possibilities of recognition. It is not our intention to go deeper into the discussion between different disciplines, but we recover some differences and expose some concepts that can help us to address the following explorations.

4.3. Exploration 1: Objects' materiality and human-machines reconfigurations

We depart from the idea that places are a matter of material design, their material and spatial design must always be acknowledged as a question of political importance Latour (2004). The territorial relations in public spaces are 'always material and can be described as a kind of fluid topologies' (Karrholm, 2007, p. 445). For our purpose, we acknowledged the contributions of Actor-Network Theory (Latour, 2006, 2011b) as well as the works of Bissell (2010)

and H. Molotch (2011) of the orders generated by public objects, and the materialities of affects (Rose et al., 2010). The importance of materiality in the public space is built around the theory of socio-technical networks which stabilisation permits to describe specific territorial arrangements.

4.3.1. Motivations

Public spaces are grounds of many activities and exchanges or territorial practices, as well as the different modes of ordering, practices in *territorial sorts*[1] are overlapped, diverse and multiple. Although, public spaces do not work similarly to everyone in every moment, neither they are available for everyone. Multiple virtualities of spaces coincide in temporal frames, and designers don't account for those different modes very often. Hence, it is important to acknowledge different uses of the space, embracing the territorial complexity. In words of Sheller (2004b), 'social actors are never simply one thing, but always carry with them multiple identifications and capacities to "play" different parts at once' (2004b, p. 48). Because it is not our intention to go more in-depth on this discussion, we refer to Karrholm (2007) where this problem is well described.

Our interest is focused on 'spatial formations as products that must be constantly defended, held together, maintained and repaired. Rather than an underlying structure or a structural context, space thus appears as a relational effect' (Farías, 2011, p. 370). In that sense, when we mean that objects are a matter of political importance, we are not proposing a traditional overlook about the cities' conflicts of interest between classes or social structure, but an understanding of how these modes arrange the space, creating complexity, multiplicity and mutual connections. This means, the mediation of the digital that constitutes the lived space through practices and *technics* (Rose, 2017).

4.3.2. Deployment

We take *modes of ordering* as a method to orientate the observation process. The logic behind this form of observation is rooted in ANT (even when Law criticises ANT for telling stories and order the orderings, by the use of symbolic interactionism) and in Foucault's discursive reading. For Law (1994), the problem of how the world is organised is that the social life is not in a single order but is materialised in multiple orderings. Therefore, orderings escape from the social order as a linear formation; however, the social 'is materially heterogeneous' (1994, p. 2). He also relied on ethnographic observations of many kinds, to observe the orderings, accounting that the observer should be considered part of the structuring process as well.

Orderings are essential understanding for designers because 'certain heterogeneous sociotechnologies (which are themselves ordering effects) open up the *possibility* of ordering distant events from a centre' (Law, 1994, p. 104), which is the same to say that orderings are manifested as forces that can change the relations of power in society (and therefore their use and practices by people). As an example, Knox, O'Doherty, Vurdubakis, and Westrup (2008) analysed how the orderings of objects, subjects and artefacts in airports are 'charged' with volatility and uncertainty, to the extent that the same objects could pass from one order to another (i.e. a passenger could be a customer or a terrorist, or a bag could be a lost luggage or

[1] Territorial sorts are described as a kind of fluid topologies. It is a materialist perspective on the production of territory that is always object of territorial strategies and network organisation (Karrholm, 2007).

a bomb). 'Order(ings) and stabilities, we have argued, are (inevitably) temporary, incomplete and prone to noise, interference and overflow' (Knox et al., 2008, p. 885).

Modes of ordering are presented as a non-reductionist method and a set of 'specific strategies of reflexivity and self-reflexivity' (Law, 1994, p. 107). Modes of Ordering looks for patterns that 'embody, generate, or perform agent-relevant economies of scale. Thus agents do not have to deal with all the intricacies of the networks that they confront and seek to translate.' (Law, 1994, p. 108). Since there are multiple and indefinite numbers of self-reflexivity, their scale and character are both contingent, but they are only instantiated in time and place. In conclusion, this relational materialism method is defined as 'a way of imputing coherences or self-reflexive "logics" that are not simply told, performed and embodied in agents, but rather speak through, act and recursively organize the full range of social materials' (Law, 1994, p. 109).

One example of studying modes of orderings is the work of Moser (2005) to analyse disability in public places. On Moser's own words, 'disability is not something a person is, but something a person becomes. The question is how people become and are made, disabled and what the possibilities for articulating alternatives are' (2005, p. 668). Following Moser's definition, disability is socially shaped, but this condition does not depend only on the ability to move around, also depends on how apparatuses of discourse create, materialise and normalise this condition. People do not live in just one coherently arranged mode of ordering, but multiple and varied. The process of ordering is emergent, precarious and recursive. What can be useful is to understand how the *publics* emerge in different material relations, and what orders are enacted on them.

These modes of ordering can be found in interaction with objects, digital artifacts and other bodies (Moser, 2006). The ability to understand and manage our action is not only cognitive and logical, but also social. Bruno Latour argued that 'technology always entails folds upon folds, implications, complications, explanations' (Latour, 2013, p. 228). In his words, technology is not about materials, but 'the difference in the relative resistance of what is bound together' (p. 228). For that reason, we take advantage of this perspective to analyse public interaction due to disentangle the coherent discourse, and to unveil assumptions behind their design and usage.

4.3.3. Data collection

Video recording is a widely established and adopted practice by the HCI community and interaction analysts for testing experiments and doing ethnography observations. We take advantage of video cameras to provide different points of view for further analysis footage.

On one side, Deep Cover and participant observation approaches provide us with a 'completing covert research into users' naturalistic responses to interactive technologies' (Williamson & Sundén, 2015, p. 544). For this type of settings, it is useful to stead the camera in a (1) fixed place, taking a third-person perspective on the observed object and interaction.

On the other side, the first-person point of view is also helpful to observe in a more embodied and personal perspective. For this purpose, small-sized action cameras (i.e. GoPro cameras) can be attached to one's body avoiding annoyances in wearing them (Borgmann & Sneep, 2016), giving the opportunity to record not only the space where a person moves, but also the actions he or she enacts such as touching, walking, and moving the head to look at something in particular. In these settings, two points of view are manifested to our

analysis. Firstly, the embodied interaction is presented as a (2) first-person experience and directly recorded from the parts of the body where the camera is attached. Secondly, the (3) contextual point of view is provided by recording what is around a person and placing the participant as an observer, especially when a camera is mounted in a person's head recording her head movements and what calls her attention. These two set-ups are essential since both relate to the main characteristics in the affordance theory, namely, the meaningfulness of the environment (3) and the opportunities that are created by it (2) (Withagen et al., 2012).

Even though we considered the fourth point of view, that would be a camera placed in an object as if it could view the world. We choose to not use it for the simplicity of the process of analysis. However, we understand this kind of experiments that take objects' observation view may undoubtedly bring interesting insights to the study of the social life of objects (Giaccardi et al., 2016).

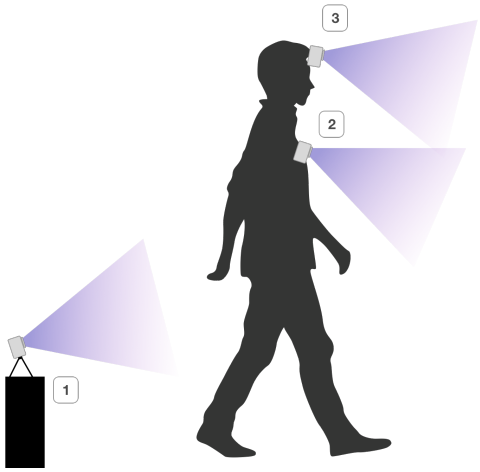


Figure 4.1: Different possible positions of cameras placed to record body movements

Beyond the point of views from the user perspective (2 and 3), cameras can be attached to different parts of the human body, providing different outputs. Placed in the head, for example, the head movement following the sight and hands movement can be recorded. Using a self-pointing head mount, it can record the movements of the eyes and facial expressions. In the chest, we can get a closer hand movement at the same time that we got a fixed camera pointing to the front. This can be useful to complement with the head position. Using a hand mounting can give a closer look to what the user is pointing at, and the interaction with specific interfaces and objects.

Another useful resource can be found in the process of playing the footage. Laurier (2014) recommended repeating the same sequence multiple times to unveil gestures and defamiliarise the actions. We also modified the speed of reproduction to test other perceptual points of view. That way, we observed patterns which otherwise are not captured by the human eye at the usual pace. For example, animals movements, effects of weather conditions, or repetition of moves.

Laurier highlighted the process of familiarisation and re-familiarisation with the ethnographic process (Laurier, 2014). He stated that 'we fail to notice how those things look and quite how they happen because familiarity, they are no longer noticeable' (2014, p. 254). To help in the process of re-familiarising with the subject, video helps to reconnect the observer with it. He differentiated *notice* from *seen*, where the first follows an observer's active role. Therefore, noticing is oriented to take into account 'those very practices that produce the unexceptional looks of things' (2014, p. 256).

To take advantage of noticing in video analysis, it is necessary to define a categorisation process. This process observes the *adjacency pairs* (actions produced by different actors that are ordered and can be categorised) and, *spatial adjacency* (actions that are also ordered but in spatial terms) in the identification of orderings. With the definition of those pairs, we can

categorise *membership* (where members are those who use the categories and are part of the actions).

In this exploration, we took the recordings from the public space and used these two main 'sense-making devices' (Laurier, 2014, p. 262), pairing participants and categorising members, 'as they are relevant to and transformed by their courses of action' (2014, p. 262).

A third element to consider is gestures. We did not take the Laurier's approach for recording facial gestures, by pointing to faces and analysing physical hand gestures, because our technical capabilities do not allow us. We instead considered gestures within the objects; touching, looking at, follow others, and follow signs. As we commented in Chapter 2, our senses provide different kind of attunement with other bodies and the environment that are expressed with bodily gestures and actions.

What defines the importance of those gestures is the consideration of *counterfactuals*. For example, if a person changes the walking path or points with the head to a specific situation, it changes the order of actions that the events are made up. This analysis is interlaced with noticing physical and spatial movements. As noticing objects is our main subject here, we assume that not only physical touching is an interaction, but lighter gestures and moves can provide us insights of attention to a specific object. This is critical, for example for analysing context-based interactions.

Sequences of actions or movements are unveiled in everyday interactions with Public Displays (Hinrichs & Carpendale, 2011), where users do not plan and even notice about decisions, and much less expected the consequences of those interactions. Sequencing is an act of bringing coherence (Moser, 2005) to the action, noticing how these low-level actions (Hinrichs & Carpendale, 2011) are concatenated means to disentangle that ordering. Defamiliarizing by analysing each sequence is to acknowledge the actions that build order as a consequence.

In summary, the element of knowledge becomes accountable and can be used for creating scenarios in future designs. A difference in the *intention* has to be noticed, where we build these observations to specify problems and situations that can be useful in the design process. Finding meaningful solutions to social issues is not the primary goal for interaction analysis practice since these methods acknowledge situated actions instead of their causes or effects. But we believe that *noticing* can be a contribution since 'we can notice things in video recordings of collective practices that ask us to change our minds about what things mean and how they mean to the groups that we study' (Laurier, 2014, p. 272), which is highly valuable for a designer.

Details

We asked diverse participants to record a travelling path with two action cameras within a city. As mobility can be understood as differently embodied practice (Middleton, 2010), the main goal was to have a better idea on how they interact in those movements with different objects. As we did not define a type of transport *a priori*, participants chose the best for them depending on the route of their preference. We have analysed recordings where people developed diverse travelling activities (walking, biking, taking a bus or a subway, and in running activities).

The experiment was conducted in four different cities, Castellón de la Plana and Barcelona (both in Spain), New York (USA) and Trento (Italy). The focus was not on the path taken or

the cognitive aspect of spatiality, but the interaction with the objects while people moved.

We have recorded around 5 hours with different settings and cut in fragments to analyse them after. The full analytical process was as follows:

1. We started with an ethnographic study of the situation. We asked volunteers to record their commuting. We also recorded other interactions in deep cover mode and took notes of specific situations that called our attention.

2. We then proceeded with a Two-pass video analysis (Hinrichs & Carpendale, 2011) (fast-forwarding the videos in search of things that called our attention, and then specific observation)

3. We cut videos in selected fragments, doing annotations (we got 54 fragments from different recordings) (Laurier, 2014)

4. We went through the re-watching process, looking for *adjacency pairs*

5. We did a Member analysis

6. We looked for body movements, attention and gesture analysis

7. We categorised movements in the different type of movements and interactions

8. We created *Features* (see below)

9. We analysed *Modes*

10. We re-created *Features* through design level analysis

11. We added Features and Modes to the model

12. As the last step, we re-analysed the obtained model comparing the result with each of the three levels of design (Norman, 2004).

We define *Features* as publicly available characteristics of each *Mode*. As John Law explained, modes have no character or scale. Therefore, these features can be analysed and defined to provide insights into the design process. Although, they should not be taken as a simplification of the ubiquity of the problem. Rather, features are just connectors of the networks. In that sense, this is one remark of our practice of ordering. The variation in the elements of a designed object can be perceived as a differential to address such features.

Designers should not confuse features with the characteristics of the objects, neither in direct relation with both. A feature is not a need since there is no order. Instead, features are effectual in an observation.

As an example, in a mode of mobility, navigation and orientation are features that can orient the attention of a particular person or many people. In a biking activity as a mode of transport, street signs are relevant as normative traffic rules our habits. Whether or not signs call our attention will depend on, i.e., our speed, the closer or how distant these signs will be. These features were noticed in the analysis when we analyse *adjacency pairs* (step 4). But other features were also visible in the *gesture analysis* (step 6).

4.3.4. Findings

Generating categories regarding the use of urban space can be simple but require a profound observation to look at particular actions. For example, pedestrian crossings are used by different group members that can be ordered by speed (elderly walkthrough, sightseeing activities and dog walkers are different than runners and bikers), or active attention (those that wait standing for the street light, others wait until the street is clear, but there is always that jump to the road no matter what - See Exploration 3). Social and cultural practices are also compromised. In crowded streets, for example, it is common to see that critical mass empowers people to cross even with the red light, others stay until they got the signal or in some cases, it is culturally acceptable to pass when no car is coming.

Enabling modes

Policies and norms usually mediate orderings, but other implicit rules (Goffman, 2013) are just engaged in a series of gestures, where pedestrians, bikers, drivers and even animals generate a choreography to move from different points to others, negotiating the space. Aaltola (2018) argues that many of the implicit norms that concern individuals can be traced back to her notion of affective empathy (see Chapter 1), where the cultural tendency is conceived and justify it as a 'natural order' of things. As we know, the form that we set the orderings is just one form of many, based on our resources. Therefore, they may generate and embody a characteristic set of problems, whereas the problems are ubiquitous and 'modes of ordering only ever achieve partial success' (Law, 1994, p. 111).

From our experiment, we found that recording the same places where different modes of mobility coexist bring different opportunities to enable new interactions. In that sense, in different situations, some objects can be ignored, considered disturbing or, searched by the participant to develop specific actions. For that reason, it does not depend on the type of user, but on a combination of situations that changes continuously. As we stated, modes are not manifested once at a time, even if these socio-technical assemblages unfold in our reality sequentially.

Here is where *multiplicity* matters. The latent multiple modes conflict with the typical design approach. The user-system perspective is not enough to explain the existing complexity. The reader will find that the model that we purpose can provide a connection between the features and the potential users in a design process.

For example, we observed (in Figure 4.3) that an activity like running is mediated in a navigational mode, but also by actual circumstances (music stops suddenly) and technology, modifying the participant attention. In the other example (Figure 4.2), the observer is aware of other activities, where the attention is oriented to the *intention* (crossing the street to take money from the ATM or avoiding motorbikes to get the parking ticket at the machine). By recovering the notion of atmospheres (Chapter 2), observed people were in relation with many atmospheres that could have affected them. However, particular atmospheres determined by factors, i.e., their mood, their decisions, or their attention to specific objects could be affected in the process of walking or running and as an effect of paying attention to others' movements.

Affordances of objects

Objects carry intentions that make their agency visible. A bench in the street is not just a place to sit, it depends on the mode of use (see next exploration to further analysis on

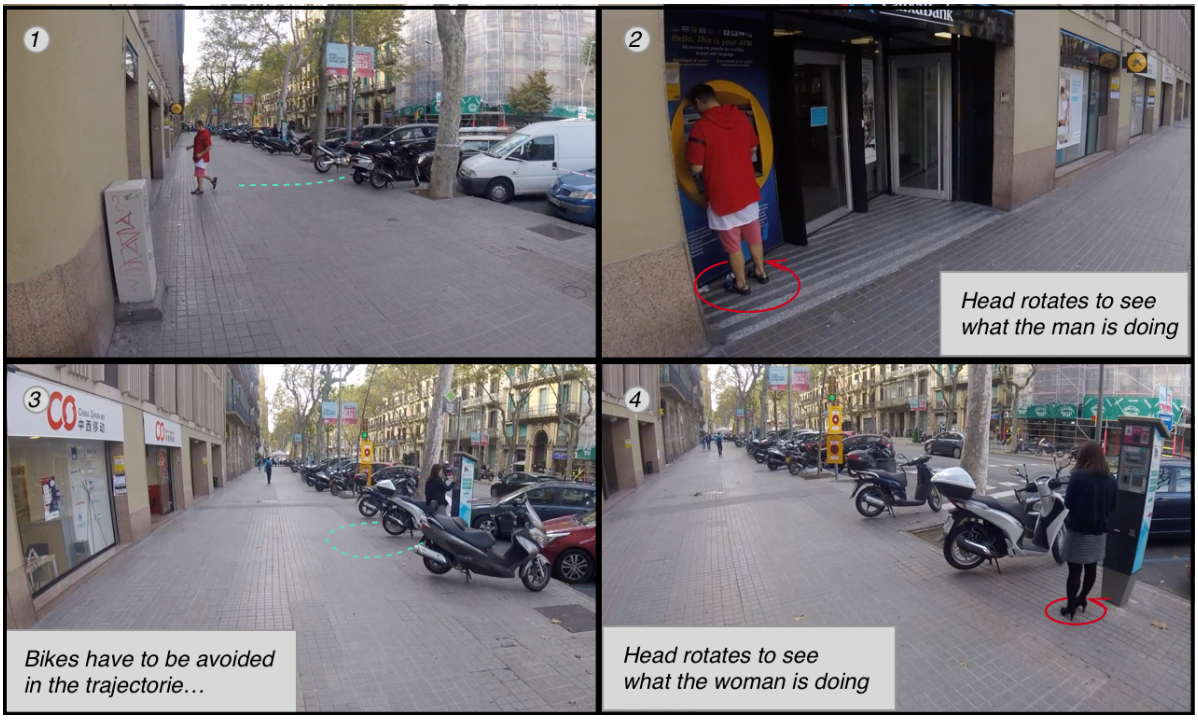


Figure 4.2: Looking at others interactions

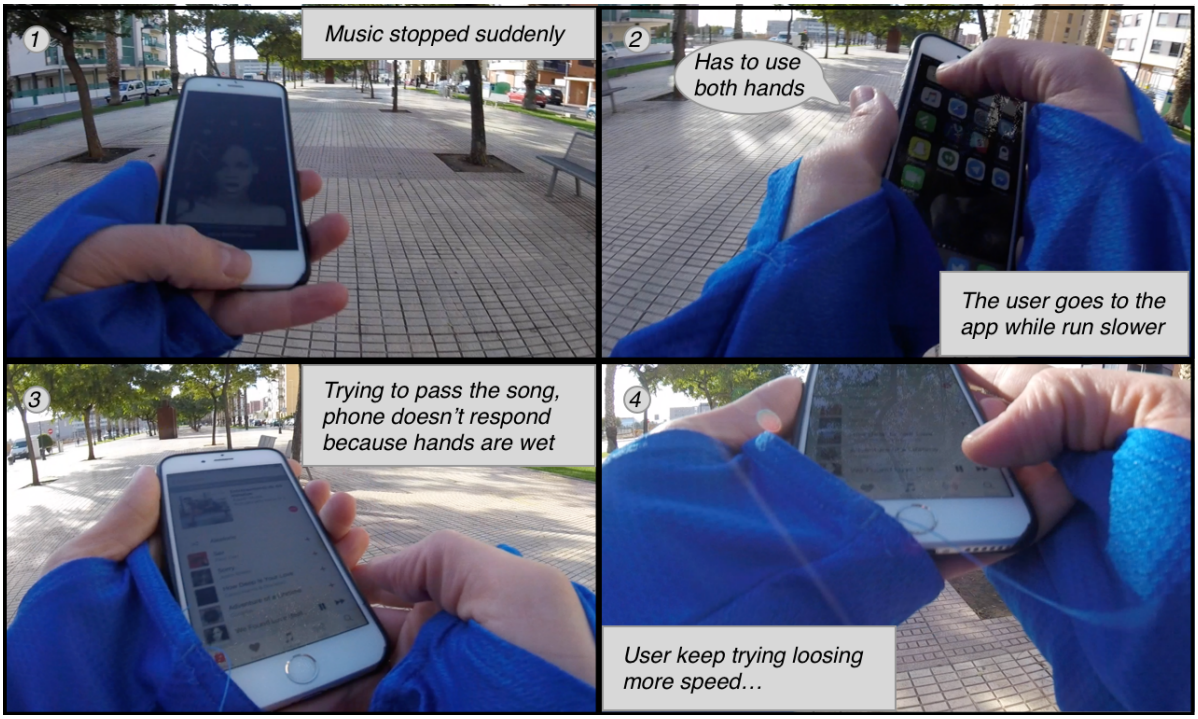


Figure 4.3: Music mediated running

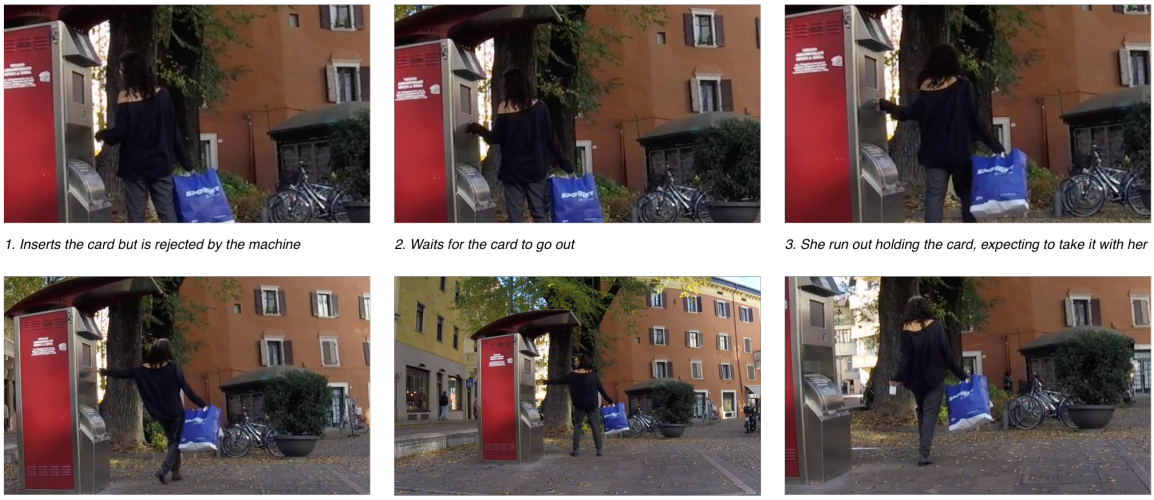


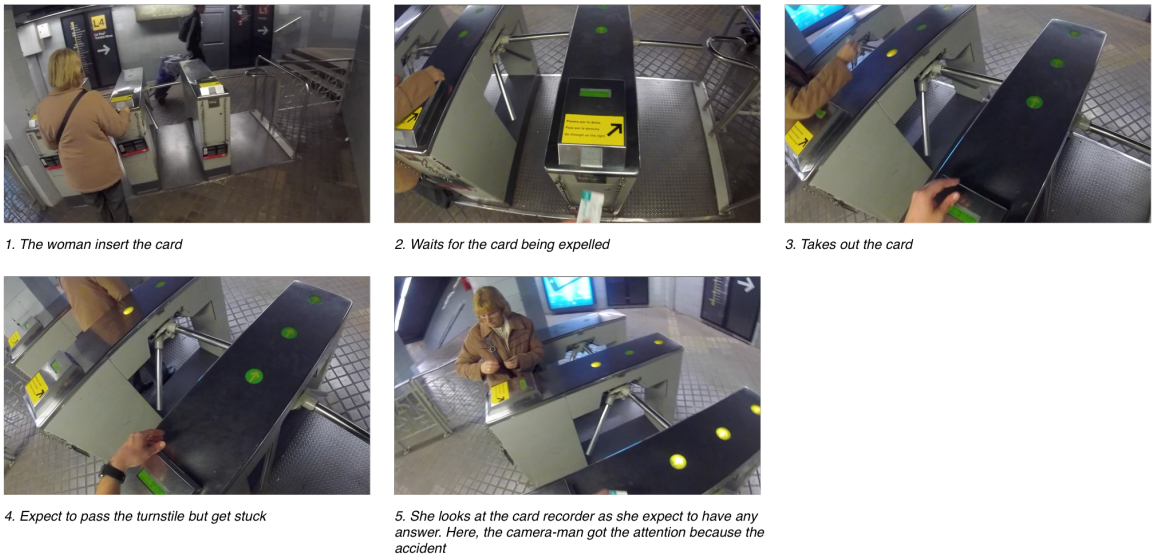
Figure 4.4: Trash Machine

use). It is a continuous calling to gather people, to change our attitude, to calm down, to contemplation, to talk to others, etc. Along the same lines is an ATM or a parking ticket machine. These objects go unnoticed in most of our urban experience unless we need them or we enter into conflict with their affordances. When someone interacts with them, it calls our attention not only because of some aesthetic fascination or because we like them in some way. It does raise our curiosity and attention because that transaction is valuable for our cultural mindset.

So far, the intention of the user and the intention of the designer was defined in many approaches. For example, in AT humans are differentiated from artifacts for being intentional beings. In the affordance theory, objects can provoke specific uses, but under the decision of the designer. The carried intention is shaped as a voluntary force that does not respond to a rational and cognitive response, but to the affective capacities that is embodied dynamically and relational by the bodies.

By understanding this kind of intentions, we can re-define some assumptions in the design process. For example, public displays are commonly thought as solutions for displaying information in a novel and interactive way. Nevertheless, it is also known that people do not always require complex details, and despite the curiosity that interacting with a touch device could raise, unveiling multiple modes of intention could provide more interesting situations to inform or provide contextual reactions, feelings or emotions to users (see the effects of such capacities in the third exploration).

Talking about intentions, we cannot avoid to recover our first experiment and the empathic relations Framework, for interlace it with the concepts introduced in this thesis. Figures 4.4 and 4.5 illustrate two situations where the interaction became interrupted, causing rejection and annoyance. Our corporeal relationships with objects are mediated and can be observed by the modes of orderings. Smooth interactions can be observed as networks that entangle affordances but also positive affective capacities that take part from the relationship between the bodies and their environment. Therefore, an empathic relation taking the form of be-



1. The woman insert the card

2. Waits for the card being expelled

3. Takes out the card

4. Expect to pass the turnstile but get stuck

5. She looks at the card recorder as she expect to have any answer. Here, the camera-man got the attention because the accident

Figure 4.5: Metro System

coming together in mundane or more fictional ways, altering the intensities of affects that are in relation. But, if the affective relation interlaces the bodies negatively (causing affects of sadness, in terms of Spinoza), the capacities of bodies would be diminished, letting us evaluate interactions as a matter of rejection or accessibility.

Accessibility

Action cameras let record what is accessible from different parts of the body and different mechanisms of sense. Analysed together with other modes, we determined what is accessible in different settings. For example, what is accessible to the sight depend on not only the speed or the activity that the user is doing, but also the height of the object and where the attention is driven. The combination of senses (such a sudden noise or a bright light) can modify our attention. Similarly, a mode of accessibility can also be affected by the personal-object space[2], a distance between an object and a user to touch it or to make gestures. Sound can also be recorded to understand how likely it is to trigger action with voice commands.

Conducting experiments with a diverse group of users can bring different combinations: age, physical conditions and disabilities, interests, activities, modes of mobility, speed, etc. A broader spectrum of resulting combinations can give an interaction designer more possibilities to design a system in an urban context.

The researcher can increase the number of studied *modes* and *features* based on empirical observations, creating new combinations to specify different possible users. This flexibility on how to use new strategies of self-reflexivity is critical to address the *multiplicity* of modes. Equally important is that social diversity should be considered to avoid biases in the process of defining the modes.

Despite the unlimited possibilities that this kind of observation methods may provide, it is up to the researcher to determine how to expand the modes based on the specific goals of the design process and available time. But at the same time, we encourage to be cautious

[2] Hall (1988) introduced the study of proxemics and the effect of interpersonal communications as a matter of social ordering and ruling

about the possible research bias and individual assumptions that can intercede in the process. Modes of orderings are never exhaustive, where reality always exceed our capacities to observe it.

The use of the ethnography is always a useful approach to develop more complex projects and to imagine new possible scenarios. Next steps for the process of design could, and we suggest, integrate design fiction (Dourish & Bell, 2014) and participatory design (Qaurooni et al., 2016), Circulation (Zimmermann & Nova, 2015), Critical Design (Dunne, 2005), and others. There are never final solutions for wicked problems, Tutton pointed out, but re-creation and judgement of these resolutions by different social actors.

4.4. Exploration 2: Artifact ecologies of public objects

In a first stance, we explored methodological observations can help to account the multiplicity of interactions, starting by multiplicity as an always exceeding force of our lived experiences. Assuming that, to design interactions, arbitrary and subjective decisions should be made. To address the decision-making processes we analysed the use of *artifact ecologies,* approach from the HCI community and, studied two specific cases to apply our attentive methods in public spaces, which we call an *ecology of public artifacts*.

The notion of artifact ecologies considers that artifacts and objects are not independent but are in connection with people, activities, the built environment and their social, cultural and historical context (Jung et al., 2008). Since this notion was presented under the HCI field, scholars have acknowledged different disciplines to consider and account for the subjective, cultural and social perspectives of such ecologies.

4.4.1. Motivations

Theories regarding designing devices evolved from a workstation perspective (at the beginning of CSCW) to a more contextual analysis (including RITW approach). As we mentioned, Activity Theory can be found in a 'second wave' of a field that started from the working desk and slowly detached from cognitive approaches. The 'third wave' of HCI departs from a post-cognitivism and phenomenologically oriented approach, where the research is positioned in social contexts. This new perspective takes into account the emotions implicated in the process of meaning creation, which are no longer considered static (Harrison et al., 2007). Affective computing, Research in the Wild, Embodied or Situated interactions, and Artifact Ecologies perspective are all part of the 'third wave' of HCI (Bødker, 2006). One of the main issues that these approaches drag from previous waves is the archaic notion of use.

The concept of *ecology* (in HCI) refers to the constellation of artifacts that we access and use in our daily activities (Bødker, Lyle, & Saad-Sulonen, 2017). Since Jung and colleagues (Jung et al., 2008) coined the term Artifact Ecologies a decade ago, many scholars have used it, for example, to consider an ecology of personal artifacts and community artifacts (Bødker et al., 2017).

Thanks to more vibrant and mobile lifestyles and available digital systems, Sheller (2004b) noticed that the boundaries between private and public interactions are more temporal, flexible and dynamic, opening the opportunity to develop more interactions, and leading to a multiplicity of *publics* (special moments or spaces that allow actors to switch from one setting to another). For that reason, we argue that publicly available objects should also be

considered part of our central practices because our daily life is largely performed in public urban spaces.

The use of mental maps helped to organise the multiple layers of connections that participants recognised in the use of different artifacts (Bødker et al., 2017; Jung et al., 2008). The Human-Artifact Model based on Activity Theory models helped to understand the dynamics of interactions, underlying that our relation with artifacts is not static but related to our practices (Bødker & Christiansen, 2012; Bødker & Klokmose, 2011). This perspective gave the opportunity to consider the user expectation over the use of the artifact with specific motivations. H. Sørensen and Kjeldskov (2014) acknowledged that interactions transcend the artifacts themselves when they are in communication; considering multi-artifact systems as means of plasticity, migration, complementary or multi-user settings.

In this regard, Bødker and colleagues (Bødker & Klokmose, 2015; Bødker et al., 2016) understood how users rely on metaphors and familiar knowledge to use digital technologies. Consequently, the authors argued that the distinction between physical and digital is not useful for understanding the experience of interaction. Moreover, appropriation and learning to use new technology is to share a practice, 'a process of concept formation and stabilisation of language' (Bødker, 2017, p. 15). In this sense, Bødker accounts for the *multiplicity* in meaning creation, where users mix and borrow concepts, analogies, and metaphors, as noted with the notion of *conceptual blends*.

Definition of use and non-use

In activity theoretical HCI, the user is the basic unit to define the role of technological artifacts. However, Satchell and Dourish (2009) criticised the *user* as a discursive formation, arguing that there are different types of interactions beyond of *use* and *non-use*. They proposed six different forms of non-use that fit individual (but socially embedded) artifacts. The dilemma is extended by Bødker who consider artifact ecologies 'beyond the individual user and conventional use' (Bødker et al., 2017, p. 7), based on sharing use and community artifacts. Thus, the focus is on ownership, mediation and displacement, suggesting that opening to such complexity 'requires new methodologies that allow a more holistic understanding of people's relationship to digital artifacts across spheres of everyday life' (2017, p. 8).

Designers deal with affordances when creating interfaces and objects, create opportunities to call the attention to interact with them. Attention is built as a repertoire that implies different levels of understanding (Norman, 2004). However, 'each object generates a particular choreography of movement and reinforces an ensemble' (H. Molotch, 2011, p. 67), where digital and non-digital artifacts mediate and interface our reality by different means (Galloway, 2006), creating different geographies[3].

One of the incompatibilities presented between Modes of Ordering (coming from Actor-Network Theory) and Artifact Ecologies is that the latter does not assume symmetry between human agents and non-human agents. Differently, taking AT as a point of departure, for Artifact Ecologies theorists, it is always the human that has an intention and, therefore structure the network. From the perspective of Modes of Ordering, analysing the use of an artifact would be technological deterministic, rather than considering a socio-technical

[3] One clear example is the current trend on publicly available bikes and scooters, that are not only abusing of public space but generating different mechanisms of behaviour due to their ubiquity and connectivity (*Scooters littering US city streets shout at people: 'Unlock me or I'll call the police'*, The Guardian. Available at: https://www.theguardian.com/technology/2018/jun/07/scooters-littering-city-streets-shout-at-people-unlock-me-or-ill-call-the-police).

heterogeneity. But, following the model presented by Jung et al. (2008), the person (or the community) is always in the centre of the network, leading to specific boundaries, and limited possibilities of translation. Usability is, in any case, just one of the modes of being analysed in a complete materialist relational approach.

From machines as texts and scripts, L. A. Suchman (2007) addressed the problem of the social construction of 'the user'. However, she concluded that 'there is no stable designer/user "point of view" nor are imaginaries of the user or settings of use inscribed in' (2007, p. 192). She suggested to follow ethnomethodology procedures in which 'the question shifts from when do actors deviate from standardised procedures, to when, where and how does some course of activity comes to be enacted as action consistent with a rule' (2007, p. 194).

Almquist and Lupton (2010) took the affordances theory principles to compare user-centred and human-centred approach in design practices. The main problem, they pointed, is the difference between the function and the meaning of an object. The focus, in their opinion, should be in the multiple meanings, latent functions and affordance of designed objects. Therefore, their vision reinforces our argument (Almquist & Lupton, 2010, p. 14), because of this:

> ...dynamic and fluid region includes the latent functions and meanings of designed objects and environments that are brought out by acts of use, repurposing, and interaction, and thus constitutes the space in which 'users', construed and constrained narrowly by instrumentalizing design thinking, become genuine human subjects, bearing memories, desires, and creative capacities that cannot be fully predicted by research conceived on determinist or behavioralist grounds.

For that reason, like in previous exploration and experiments, we directed our attention to mundane objects, remaining open regarding the centre of the network. In this case, we adopted the artifact ecological perspective to understand how the approach can be enhanced with some of the principles of modes of ordering. And, because we interact with them in everyday life without owning or using them in the conventional understanding, we believe this exploration could give a contribution to HCI and CSCW practitioners.

Interaction designers put a lot of attention in the design and appropriation of new artifacts and the interaction between them. Processes of constant innovation, which include the development of new network and communication technologies, produce a few frictional relations. However, cities and urban public spaces are constituted by century-old technologies recently with new Ubicomp and interactive deployments and installations (O'Hara, Harper, Mentis, Sellen, & Taylor, 2013; Satchell & Dourish, 2009).

Given the short but concise review of state of the art, we challenge the relation with urban objects concerning activities and practices. In Bødker and Christiansen (2012) authors acknowledge that practices are not stable but constitute a web-of-practices, leading to consider a model of dynamics inside artifact ecologies theory. Later, Bødker et al. (2016) noticed that users change their minds (and metaphors) along with the changes that occur in the use of artifact for different purposes.

Our analysis takes the core idea that 'the blends intended by the designers are different from those developed by users, sometimes in rather unexpected ways' (Bødker, 2017, p. 19). Given the study of orderings in the previous exploration, we put into perspective the appropriation of those objects that were not designed having actual technologies in mind, but we

still interact with them every day. Although, we observed that if community artifact ecologies are enough messy and relational (Bødker et al., 2017), public artifact ecologies require more attention to be analysed. We argue that, even with the attempts to incorporate a relational, always-in-transformation, account of activities, the artifact ecologies lacks of resources to acknowledge the affective dimension of such processes that constitute the potential forces [4]. Consequently, we propose practitioners to pay attention to the ecologies of practices, rather focus only on artifacts. In that sense, the notion of empathy brings the necessity to veer to more distinct qualities of empathies that cultivate attentiveness, care and concern rather focus only on some of the varieties proposed by Aaltola. As a consequence, a better understanding of interactions with objects from this perspective might eventually lead to a bigger contribution in designing better systems in urban contexts under ethical concerns.

4.4.2. Deployment

This exploration recovers part of the materials of the third stage from the experiment in chapter 3. We performed different walking activities with two groups of two to three students from our university between 20 and 30 years old. We asked participants to reproduce frequent paths, commuting or places that they like. They guided the other participants and us while we inquired them on how they found those places, what activities they performed there and with whom.

We developed a walk-along activity because is an in-depth qualitative interview method that is useful 'for exploring — and subsequently improving understanding of — people's experiences of their local residential context' (Carpiano, 2009, p. 3). This method was deeply explained in Chapter 3, but we remark that it facilitates the analysis of everyday practices in place, the relations with other agents, and remains sensitive to the affective dimension of place-making activities (Duff, 2010).

4.4.3. Data collection

Walking activities were recorded with audio and video (by using action cameras). Afterwards, we selected specific video sequences, where participants interacted with objects and analysed them by using conversational and video analysis (Laurier, 2014) (see Exploration 1). When it was required to expand the corpus of recordings, we conducted additional stand-alone observations in public places to increase our data, ending with more than 20 hours of video footage. Finally, we used the taxonomic layers provided by Jung et al. (2008) and Bødker et al. (2017) to map the use and non-use of the artifacts.

Because of the type of place-based artifacts that we analysed, the surroundings were more relevant for our cases. Our focus was in the attentiveness of personal or community artifact ecologies rather than in activities and, in consequence, the dimensions used in artifact ecologies as *purpose of use* and *context of use* became relatively less important. Even though, the encounters and the sequences of actions defined the orderings after all.

Out of the multiple artifacts we observed during the walking exercises, we selected two different examples to show how modes of ordering and affective atmospheres contributed to engaging critically with daily activities in the street.

[4] However, since affective forces are a non-conscious phenomena we can never fully access, which puts ourselves in a position where we should explicitly acknowledge the arbitrary decisions that are made as practitioners. This is something unusual in design practices and constitutes an ethical practice.

Figure 4.6: Pressing the button of a traffic light in the example.

4.4.4. Findings

The findings are divided into two cases that came up during the experiences and the analysis of the footage. Both cases helped us to exemplify the contribution of this exploration to the analysis of publicly available artifacts.

Case 1: Modes of Ordering in traffic lights

Traffic lights are one of the more normative objects in streets and evolved upon the car appearance during the last century, displacing pedestrians to sidewalks (Mcshane, 1999). At the beginning of the 20th century, traffic lights were hand-manipulated. Nowadays, complex central systems synchronise traffic lights in entire cities to improve traffic flows by programmable settings and sensed spaces. However, unexpected human habits always create new types of interactions, so that cities through trial and error processes are continually adapting their systems to the cultural, historical and physical conditions to make cities safer.

Remarkable improvements are traffic lights for bike lanes, down counters in pedestrian lights, and more recently, lights built into the pavement for raising the awareness of pedestrians using smartphones. In that sense, these artifacts have been adapted to the change and use of other technologies and practices. *A priori*, it is undeniable that our relationship with those objects has to be contextualised and related to many others (Sumartojo & Pink, 2017). A second observation concerns with what we know regarding the main functionality of traffic lights, i.e. their visual signal that assembles the normative effects. That is, we are allowed or prevented to cross the street. Amid the two ends, there exist many operations and practices that make those rules less clear (see Exploration 1). Consequently, one of the adaptations was to place a button to alter the attention of the traffic lights, to reduce the waiting time for pedestrians to cross.

Our first experiment was conducted to analyse the button of a traffic light. One of the

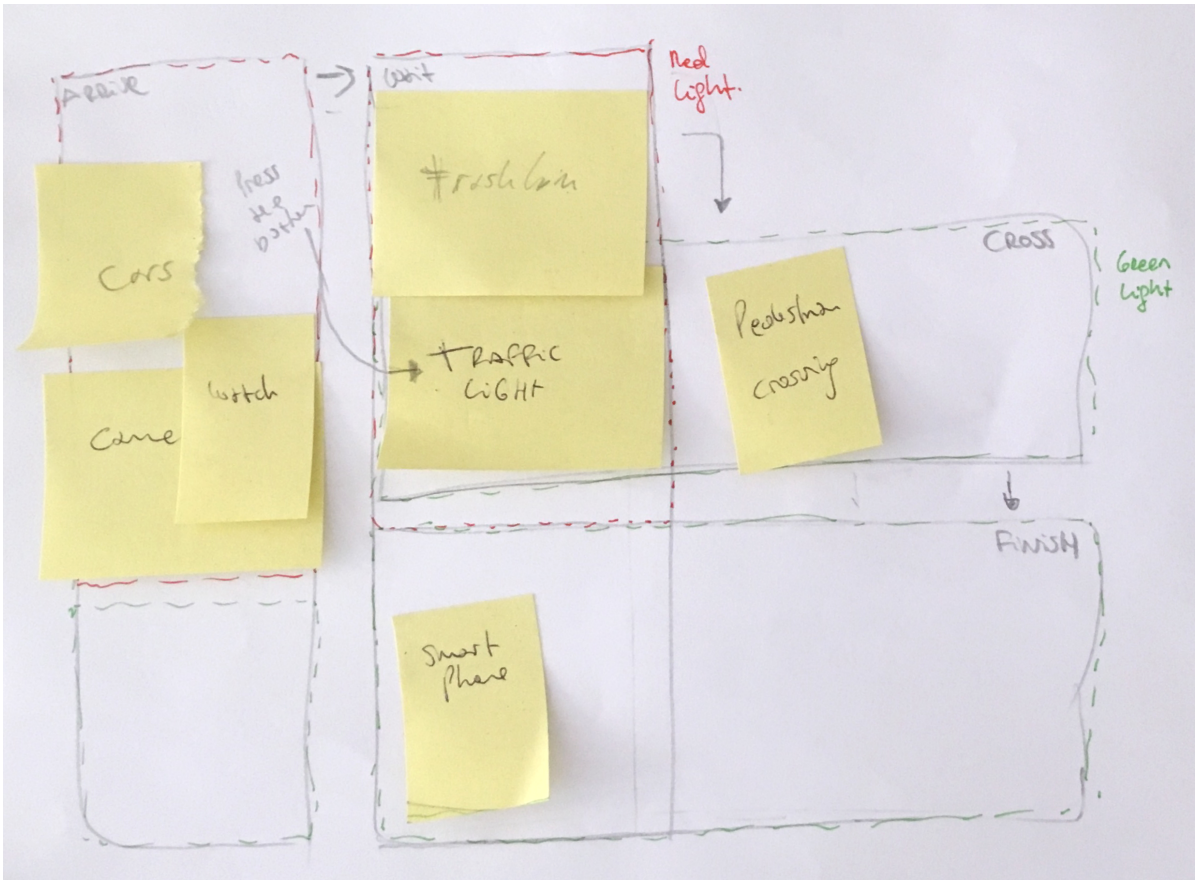


Figure 4.7: Mapping the instances of crossing and artifact use.

groups raised the discussion regarding their use and understanding of that artifact when they approached an avenue (Figure 4.6).

'You know, I think it takes a bit to change' admitted one of the participants. 'I have a strong feeling that it doesn't work', said another. During the conversation, both exposed their beliefs regarding the use of the button. As it did not give any feedback when it was pressed, nobody knew how and when the reaction should be, if any.

'You have to give some time for the cars to pass. Then, it turns green. If you press the button, it can make it faster, but not that much', explained the first participant. Since there is no feedback, the time needed to change can only be estimated by pedestrians, which makes the button's usefulness ambiguous. The second participant admitted that it only helps to turn this act of press-and-wait into a habit, working in a cognitive level to force pedestrians to wait until crossing.

After the analysis of this discussion, we conducted different recordings to observe people's actions in other crossings. One of our main guesses was to find out what happened during the (waiting) time, i.e. what they were doing while awaiting and under which circumstances and cases they did not wait for any more.

We mentioned that the taxonomic layers are reduced in our research. The main activity, in this case, is mobility (going from a place to another). Although, we noticed the action of crossing there are four different *instances*: *arrive* to the corner, *wait*, *cross*, *finish* the crossing (Figure 4.7). These *instances* match differently with the use of one or many artifacts

and constitute different overlapping activities. For example, personal artifacts, like watches and phones provide the opportunity to listen to music, check social networks or send emails while the person develops activities in the street and interact with public objects. As we could see, each activity is performed in the interaction with other bodies. Sometimes, entering in conflict with the expected behaviour. Whereas the *instances* of the observed activities could open multiple possibilities and instantiate new *modes*. The attentiveness put over different artifacts and situations, and could be indicators or gestures pointing towards new *features* to have into account.

In some sense, the signal should allow or prevent someone from crossing. To accomplish this action, we understand that red and green lights with the human figures have specific meaning for pedestrians. This is a shared social code, that commonly works along with crossing or zebra lines, indicating the exact path to cross. This *subjective meaning* is usually shared by everyone in a same cultural context that does not correspond with all societies and urban norms. For example, 'jaywalking' (or crossing the street at any point) was prohibited in Amsterdam until 1995 where the Dutch eliminated that prohibition allowing pedestrians to take the shortest path on their convenience, making the streets of the Netherlands as famous as they are now for their conviviality between different modes of transport [5]. However, there are always slight differences that may influence its meaning (for example, for some countries the yellow light for transit is meant to be allowed, where in others the yellow light is a prohibition to cross).

A *site (of use)*, as location, a layer was added to the analysis as we consider the public space as the general context. This layer offers an understanding of the type of artifacts that are placed and activities that can be taken. It should not be confused with the notion of places discussed in this thesis. Talking about traffic, we can spot railway crossings, school crossings, and so on. For these different typologies, behaviour changes in every *instance*, time is experienced differently and attention changes depending on what people expect from the interaction with the objects and people around interacting with different atmospheres, that constitute regular rituals, practices and habits (see Chapter 2). Even though the combination of objects and places are infinite in public spaces but, for this exploration, we only analysed two place-based artifacts.

Case 2: The atmosphere around the bench

The second example occurred in a different setting. This time, one of the participants showed others a place that was meaningful for her. It was a green square, with a bench and trees in the surroundings (See Figure 4.8). She was particularly affected by that place, meaning that, for her it was special. We already analysed this scenario in Experiment 3, however in this exploration we will mention other objects from the point of view of artifact ecologies.

This particular bench has a special relationship with its environment, it belongs to this place, and invited her to develop the activities that she likes to do there. Photography, reading, studying, or just contemplate in calm, are some of them. Here is where the affective atmospheres approach plays an exciting role in providing a context to develop new activities. In other words, the place and its atmospheres generate specific possibilities of practices, leading to performing concrete activities. Under a regular affordance's perspective (Gibson, 1977; Norman, 2004), the materials and the form of the bench also contribute to assigning

[5] *When there is no such concept as 'jaywalking'*, Bicycle Dutch. Available at: https://bicycledutch.wordpress.com/2017/09/05/when-there-is-no-such-concept-as-jaywalking/

Figure 4.8: The atmosphere around the bench in Case 2.

some possible uses of the object. But we argue that thanks to corporeal relations and feelings, specific activities take place there and give proper context to connect different artifacts in new and engaging ways that were not previously considered.

In this case, we can understand how the orderings play a role in helping us to understand the existence of the bench on the ecologies of use, that otherwise would not be observed. The environmental causes were only explained by the empirical analysis and the narrative performed by the participants. If the context would have been different, from the personal interests of the participants to the natural ambience, such possibilities of ordering (and use) would not be possible. Therefore, we expose the role of the analyst as a significant figure in the ethnographic work.

4.4.5. Ecologies in perspective

We are tempted to ask ourselves why these artifacts should be part of an ecology and to discuss what *use* is, and why *non-use* matters for design. It is evident that people *use* traffic lights to cross the street safely, but do not interact directly with them except for the button. However, the attention is directed to the lights when we reach the corner of the sidewalk. There is an intuitive manner to interact with public objects while, at the same time, others raise individual assumptions (like the button discussion in the traffic lights case).

The examples that we gave in this exploration limit or extend the use of space to certain affordances. But as we examined, people adopt new practices and offer their meaning to them. Attention becomes the primary form of interaction in public space; it is not casual that advertising and public displays compete strongly to catch the attention of passers-by. Modes of Ordering are defined by specific practices of use that constructs order and normalisation. An ordering is transported and circulates widely, to many different locations, following but also extending the extensive networks of public services, and working to standardise many

different practices' (Moser, 2005, p. 675). Orderings also work in active association with other kinds of social rules, such as law enforcement, financial resources and institutional organisations. In this sense, artifacts at individual level extend and reproduce such orders by means of cultural appropriation and practices. Consequently, the role and the position of each individual in society and space defines how do *publics* emerge.

For those who did not follow the traffic light (as a normative artifact), could be included in the group of non-users (Bødker et al., 2017; Satchell & Dourish, 2009). However, such an affirmation is not accurate, since breaking the rules is as well a political instance given the *status quo* that the normative provides. As we discussed earlier, the term *use* is less accurate for this kind of analysis in traditional usage. People use their phone or a bench, but they are influenced, or other types of artifacts call their attention. Individuals are not permanent users, but their condition of users is also becoming, slipping and moving between multiple modes (Moser, 2005). All of them are part of complex and superposed activities and practices, even if these are perceived coherently. Even more, we should put under question if, as publics, there are *counterusers*. If use is meant to incorporate an artifact for a purpose or intention, a *counter*use would be those users that are not perceived or accounted or uses made for displaced and invisible groups.

Additionally, the notion of *use* should be understood in connection with our senses Lupton (2017), and not only related to conscious perceptions. Thus, affective atmospheres provide a background for the study of affects and non-conscious dispositions. Since affect drives our feeling states realisable within a particular place, it also provides the principal means by which abstract spaces are turned into vibrant, valuable places. As we observed in the bench example, the relationship with the environment and its atmospheres led to developing new practices within the objects that constituted that place. Yet, we do not have to forget that atmospheres can be anticipated and, in consequence, reproduced conditioned by previous experiences, habits, familiar emotions and sensations that produced feelings of belongingness (Edensor, 2012; Edensor & Sumartojo, 2018). Hence, generating a sense of place among people.

Another aspect relies on the matter of ownership. Because these artifacts are publicly owned, there is no private use, neither shared in the sense of communitarian goods. Their use is ephemeral but, at the same time, is part of a collective responsibility that must be accounted. Travel experiences are affected by individual dispositions and the affects that are in circulation (Bissell, 2010). Even if personal interpretations are unique, all affective atmospheres are collectively experienced. In that sense, belongingness is also a mobile where the public is a matter of collective interest.

Space is ordered by the artifacts' affordances creating atmospheres, structuring our process of meaning creation and our practices, leading to a circulation of affects and a propensity to cultivate thick places. In the second example, we observed that the use of simple furniture in a specific environment provoked new practices, increasing the opportunity to connect digital artifacts with new and different *contexts of use*. For example, thanks to a particular atmosphere, studying is not only possible in the house, office or the library, but in public spaces.

Developing exploratory studies 'can reveal how people use artifacts and how they have developed their ecologies to some extents' (Jung et al., 2008, p. 209). In this exploration, we presented an approach that could complement other studies in understanding how place-

based objects may work as hubs (Jung et al., 2008) for different activities. It can be argued that such activities are temporal and not well defined in comparison to more specific daily life routines. However, with the mobility offered by wireless connections and mobile devices, boundaries are more flexible than ever. For that reason, people tend to do micro-activities in different places and moments (e.g. answering emails or calls during commuting times). This is why we believe that *site*, as a layer of analysis, provides a context to evaluate the use of digital devices in relation to other devices.

Spaces are entitled by many affective qualities that can be only conceived as places in the reality of the virtual (cutting down the potentials to a single, linear form). This makes us think that rather than ecologies of artifacts (and practices), and placing the human in the centre of the activities, we should embrace what Erin Manning (in Massumi (2015)) called 'ecology of events'. This ecology of *emergent* events by avoiding to take the human as a given and asking what the human does, but to centre in the immanence of the event. In other words, this approach is what is conceived as the more-than-human, where humans are only a part of the environmental ecology. In the following exploration, we will address this issue through the analysis of affective atmospheres.

4.5. Exploration 3: Atmospheric transformations

So far, we have explored the effects of direct interactions in limited contextual spaces. In contrast, for this exploration, we carried out a more discursive analysis of illuminated atmospheres on a larger scale.

To understand the origins of the struggle between the modernist vision and the social concerns in the urban field is worth to begin from what was called the revolution of everyday cities. Jacobs (1961) pioneered at criticising the changes that were coming to urban development and taking a stance in urban critical thinking. By carefully observing and analysing the everyday life of Greenwich Village, Jacobs' central insight was that the vibrancy of cities is the product of spontaneous interactions and activities that occur not only in known areas but elsewhere in a city. These unexpected encounters are the product of random historical development which cannot be replicated by ordered design. Jacobs' critical point is still valid nowadays, and it can help us to think about engagement and participation, not as embodied actions held by people, but as interactions in everyday life which define the neighbourhood identity.

From another point of view, Bourdieu (1989) stressed the power struggle that takes place in urban agglomerations as an extension of the fight between social classes. This effect is reflected in some concepts that he developed to understand how society is structured. The *habitus* (Bourdieu et al., 1999) is the physical embodiment of cultural capital that constitutes the deeply ingrained habits, skills, and dispositions that we accumulate over our life experiences. For the author our *habitus* allows us to successfully navigate social environments and also to relate human activities with another critical concept for the sociology, field, or arenas. Each field has its own set of positions and practices, as well as its struggles for a position as people mobilise their capital to stake claims within a particular social domain. In terms of Bourdieu, the city is a field, where power is settled, and part of the people's acts are based on the intention to get favoured places in such field.

This exploration is approached from the position of radical thinking. The critical urban

theory is the form that scholars refer to a rejection of technocratic and neo-liberal forms that urban development took (Brenner, 2009). At the same time, these postures are ways of contest politically and ideologically to the forces that generate inequality and abuse of power. Storper and Scott (2016) criticised the paths taken in urban theory in the post-structuralists approaches, arguing that by putting everything at the same ontological level gives a flatness in the matter of which critical theory was stronger.

Despite that our thesis is not focused on this discussion, we acknowledge the different ways that non-representationalists, post-colonialists and feminists scholars approach the urban contradictions. Brenner (2009) postulated that critical theory 'have mediations to the realm of practice, and it is explicitly intended to inform the strategic perspective of progressive, radical or revolutionary social and political actors' (2009, p. 201). To his perspective, critical theory is based on four propositions:

- Is theory, along with abstractions, practices and informed strategies
- Entails a critique of instrumental reason
- Emphasizes the disjuncture between the actual and the possible
- Is reflexive: defined as endemically contextual and, enables its own and others' forms of critical consciousness

For that reason, we present the following exploration to provide a critical layer that departs from our research in the three objects of study that are places, objects and empathy (see Introduction).

4.5.1. Motivations

For this exploration, we focus our inquiry on a bigger scenario to explore the affects of enchantment (Bennett, 2001) in an entire neighbourhood. Affects were defined as 'capacities to affect and be affected' (Massumi, 2015), or 'force of existing' (B. Anderson, 2014; Deleuze, Guattari, & Guattari, 1987). Accordingly, affective encounters have 'the potential to augment or diminish one's capacities' (Duff, 2010, p. 154), depending on the spatial and temporal experiences of places.

We have explored in Chapters 2 and 3 the possibilities of re-enabling memories of places and the capacities of affect of such places in terms of mundane objects as well as technologically enhanced artifacts. In this case, we inquiry the affects that, beyond all the corporeal encounters, emerge over discursive and political expressions. Consequently, we discuss how habits and practices condition and are conditioned by the attachment of affects to/with/in-between spaces as modes of geographies of empathy. Even when 'atmospheres can be understood as the ongoing sensory and affective engagement with our lives and their impressions, sensations and feelings and the environments' (Sumartojo & Pink, 2018, p. 15), we question: First, that affects, as an emergent phenomenon, belong to certain atmospheres; second, that atmospheres belong to certain spaces; And, third, we put under inquiry the possibilities of manipulating atmospheric qualities.

Festivals of light

Festivals of lights and mappings on building façades are now standard practice in many metropolitan cities. 'The temporary use of light to create festive or contemplative atmospheres

is now a widespread phenomenon and rests on an aesthetic de-familiarisation of urban space: the navigational and perceptual possibilities of the city are altered to produce novel kinds of urban atmospheres' (Gandy, 2017, p. 367). Contemporary events like Vivid Sydney, Playable City or LlumBCN are well beyond of the nostalgic affects of Blackpool Illuminations (Edensor, 2012), and dress cities with the latest technological advances in lighting and projection effects that seek to amaze and surprise.

The affects arising from these large-scale interventions are sought and to a certain extent provoked by a political intention, to explore the experience of being in contact with the urban infrastructure. In the Playable City's website, the organisers, a foundation in alliance with the local council, promise that their installations 'unlocks a social dialogue, bringing the citizens into a city development conversation'[6]. As the original event in Bristol has been expanded to other cities, the organisers have become curators of these installations, fostering a 'networked knowledge bank of local insight, experience and impact, generating a worldview of smarter city development conversations'. Unlike the Playable City foundation, Vivid Sydney and LlumBCN are organised by the government themselves, resulting in a very different position from which the cities builds up value for itself.

Our interest lies in the LlumBCN festival, which has been held annually in Barcelona since 2012. The festival usually forms part of or is close to one of the city's popular *festes* or celebrations called Santa Eulalia, and coincides with the carnival season in many other cities around the world during February. Moreover, the development of LlumBCN was an intention of the local government to modernise a festival that already had classic parades and elements from traditional popular culture. This context leads to an attunement interlinked with tradition, mixing the effects of this event with contemporary artistic technologies. It is not about modernising the old festival but rather a separate event in the context of the traditional one.

LlumBCN was traditionally held in the heart of Barcelona, the Ciutat Vella neighbourhood. In 2018, the location was changed for the first time to a different neighbourhood, the post-industrial Poblenou. This decision was a deliberate one, as many disputes had occurred. The Poblenou neighbourhood was the core of the industrial city and cotton production of the 18th century and, after many of the factories closed during the period of globalisation; it became the ideal place for creating a new digital and creative district, called 22@, in response to modern urban development policies. But with the advent of a local administration representing the lower levels of society, the *BCN en Comú* party, driven by the struggle against gentrification processes and the *touristification* of the city, a new perspective was given to the city. As a result, two policies came into play. On one hand, the organisation of forms of transport and the neighbourhoods themselves, giving back the streets to pedestrians, led to a very radical and controversial pilot project in Poblenou, called a Superilla [7], whose aim was to reduce space for cars and make streets more pedestrian-friendly, with playgrounds. On the other, a city-wide policy of decentralisation was intended to distribute city attractions equally across the entire city, creating activities in different neighbourhoods instead of making all of them in the city centre[8]. In this context, LlumBCN is presented in 2018 as a lighting festival with art installations and a familiar place, with a focus on experimentation and innovative works

[6] *Playable City*. Available at: https://www.playablecity.com/vision/
[7] *Superilles*, Ajuntament de Barcelona. Available at: http://ajuntament.barcelona.cat/superilles/ca
[8] *Pla de Barris*, Ajuntament de Barcelona. Available at: http://pladebarris.barcelona/es

Figure 4.9: A sequence of atmospheres orchestrated by the effects of different light installations.

of local schools of design, art and architecture.

4.5.2. Deployment

For our study, we attended during the three days the event took place (16 to 18 February 2018), observing, capturing and taking notes of the different phenomena around the festival. We split our inquiry to understand (1) How do habits interfere with the affective capacities of different atmospheres? Also, (2) how do affects and emotions in public light festivals generate structures of feeling that are conveniently used as by discursive apparatuses? (B. Anderson, 2014).

4.5.3. Data collection

This exploration is an ethnographic work based on photographies, recordings and researcher notes taken during the event. For the analysis, we first recovered the atmospheric methods used in Chapter 2 to study the atmospheres, but we also analysed geographies of empathy based on the translations of empathy presented by Pedwell (2014).

4.5.4. Findings

There is a difference between attending sites that are not part of one's routine and being in the same space where daily routines occur but which has undergone a dramatic transformation. At the same time, it could be uncomfortable to see too many people in sites that we are used to finding it easy to navigate, where signs and objects were easy to recognise in the *habituale*. Suddenly, its scale, its point of reference and its orientation to the world change. It becomes another space with different rules and orders. In that sense, the event produced an extraordinary space.

There was no particular way to walk through the event. There was a suggested route, proposed by the organisers which hardly anyone followed because everything was excitement; it became just a game of discovery. We accommodated ourselves to the unexpected, tolerating the clash between humans and the frenetic excitement of our senses to consume each of the experiences the event was expected to provide. The movements that we were forced to make were irrational in the usual routine of circulating the city. We went in circles, dodged obstacles that were not there before, stood in front of buildings and looked up to see the projections over them while avoiding bumping into people. We got distracted by sounds from afar, and it became hard to advance across the crowd to reach desired destinations (See Figure 4.9).

Figure 4.10: Buildings intervened by lights and projections while street lights are turned off, breaking the scale of the everyday architecture and urban landscape.

The atmospheres that we noticed collided rapidly with each another. Some installations were well defined because they were in closed spaces, but despite this, some people got still lost, while others were behind their smartphones recording everything they saw and, parents worried about the safety of their children. In the crowds, there was never homogeneity. Between installations, there were spaces of emptiness, where groups of people found lost members, where they exchanged impressions of the performances they have just seen and where people full of anxiety was trying to reach the next installation mix with those who were exhausted from such emotional and physical demands. The multiplicity of atmospheres was more than evident, and time seemed to be suspended between bodily capacities and the collective conditions of affects. A sensation of getting lost was overwhelming, even for locals in the neighbourhood. Space was transformed by the combination of light sculptures, crowds and the darkness generated by the street lights that were turned off for the occasion (See Figure 4.10).

Continuity was therefore lost and, time was broken into pieces within the rhythm of lights and sounds. Under these conditions, atmospheres are ingressive (Griffero, 2014) but also fragile. It became an atmosphere of strangeness, and we lost the notion of our bodily state of being-in-the-world.

Losing our connection with our spatial orientation is a stressful and energy-consuming situation as we have to find ourselves again. However, we become permeable and less rational and less attentive. Is this a condition of unconscious surrender to the experience in which we attune with others to explore the effects of the constant emergence of emotions and feelings? Edensor noticed that 'the communality of this emotional and affective sense of place is evident and is shaped by modes of travel' (Edensor, 2012, p. 1116). We agree on the fact that these multiplicities are embodied by the activity of walking or travelling by different means, placing everyone on the same level and giving people a common ground and pace. However, we must

consider that 'pedestrian movement is not the intermediary between two points or ways of being, instead of walking can be understood as a set of translations and a process in, or of, itself.' (Middleton, 2010, p. 590). Then, the arrangement of bodies is engaged in different assemblages of walking. Perhaps, the affects generated are many versions (B. Anderson, 2014) of themselves configured differently, overlapping in our memories of space.

4.6. The politics of affective atmospheres

The attractiveness of technological fairs and festivals often worked as an excuse for developing new urban areas. Olympic events and World Fairs, for example, have triggered races to fill the city with new development plans. Due to the radical transformation to host the 1992 Olympic Games, Barcelona's population suffered in the aftermath the consequences of gentrification and touristification (Garcia Ramon & Albet, 2000). In an era of politics of affects and emotions, we argue that cultural events become strategic means for promoting urban development and policies for participation and engagement. Breaking the routine, *i.e.* resignifying the infrastructure of mundane streets helps to bring people together and to rediscover life on the streets. It is the action and performance of the masses in the public space, the ambivalence of encounters between people, buildings and the saturation of the senses that makes reification the idea of what is implicit in the fight against speculation. It is no coincidence that the use of streets for different purposes offers a kind of *déjà vu* effect of the fights that took place over a century ago in the same streets of Barcelona to conquer the symbolic power of the city (Aibar & Bijker, 1997).

Speaking concerning apparatuses of discourse, LlumBCN can be seen as an affective approach to publicising the city and to combating the political conflict of urban development. It is a form of contestation through *simulation* (Bille et al., 2015), evoking what might have been; a process of imaginary reference to a possible future becomes a possibility for reassembling spatial references and embodied relationships. The incorporation of technology in urban spaces should be understood as a *collective process* for which 'multiplicity and diversity of ways that the digital divide manifests and reproduces social difference and inequality' (Elwood & Mitchell, 2015, p. 152). This implies that 'remembering and paying attention with and through social and spatial technologies play a critical role in shaping their implications for cultural knowledge, social relations, and politics' (Elwood & Mitchell, 2015, p. 152).

Massumi (2015) identified a political dimension that is carried by affects, the capacity of change. However, affects are proto-political because of their relational essence. Thus, affects 'politics must be brought out' (2015, p. ix). In other words, affects change the orderings and intensities of transformation in the relations with all the bodies in the world. Therefore, the encounters are the key to understand such changes, and how these politics of affects operate. To the problem of how we can account for the transitions, the answer is through feelings that 'take the "shape" of the contact we have with objects' (Ahmed, 2004, p. 5). However, the movement, its transition and the feelings are inseparable ones from another. That is to say that such intensities of feelings exceed the objective and subjective (Massumi, 2015). So that is where the difficulty of accounting for and inquiring the effect of affects resides.

4.6.1. The right to the city in urban encounters

The atmospheric methods adopted in the previous chapter are 'a way of recording, analysing, and writing that stays with the multiplicity of things that form an atmosphere and shape its capacity to change, instead of trying to immediately name an object or body as the central cause of affective transformation' (B. Anderson & Ash, 2015, p. 50). We, therefore, consider the similarities and dissimilarities in our analysis regarding the possible identification of atmospheres, taking into account their coexistence, their causal powers and the transformation of each one.

The transformation of the urban landscape as a means of brief intervention also affected our navigation through it, even if we were open to experiencing the affective forces in unexpected encounters.

We explored the effects of massive changes in the urban space and the considerable number of people circulating generated a disruption motivated by the intensity of the feelings. We also noticed that the repetition of multiple atmospheres extends through the territory, creating a mesh of overimposed atmospheres of high intensity but causing a homogenisation effect in a territory that is architecturally disparate (e.g., futuristic buildings at the 22@ district vs the 19th-century factories). A situation like this is not exclusive of this city, this usually happens in urban atmospheres very often, and becomes part of what city is.

We agree with Anderson that new arrangements between objects and people can prompt the transformation and change of atmospheres, but also due to the disruption generated by other atmospheres. We also take into account that repetition and coincidence with particular places, much of this has to do with specific arrangements in combination with habits. Atmospheres are therefore always open to change, even at collective and individual levels.

Pedwell discussed whether social structures, hierarchies and cultural conventions are intact or can be transformed through the translation of affects. She raised the importance of empathy because it can be regarded as 'an affective bridge between social and cultural differences and an emotional means of achieving social transformation in an international scale' (Pedwell, 2014, p. 21). Empathy is an affective force that circulates and becomes part of atmospheres but also politicises the capacities to affect and being affected. Beyond the temporary condition of the cases that we presented in this analysis, the effects of atmospheres remained for some time in different structures and discourses. Atmospheric effects are impregnated in memory and recollected (Bille et al., 2015) every time we remember the spatialised experience. Yet, we must consider that atmospheres and affects are not particularly correlated with structured spatial forms (Sumartojo & Pink, 2018), so psychological, emotional and sensory perceptions are always inscribed experiences in relation to our negotiated temporal and spatial experience (Duff, 2010). Affective conditions are therefore always mediated and organised in 'multiple, partially connected, apparatuses that attempt to structure the capacity to affect and be affected of people and groups' (B. Anderson, 2014, p. 36).

In this vein, we want to incorporate the discussion around the 'right to the city' and how affects and atmospheres can be accounted for a perspective around this post-Marxist critique. In the third chapter we introduced the notion that involves the fight for the collective rights in urban spaces. Firstly, we should understand that as Harvey (2014) understood, the right to the city is a bottom-up movement. Even more, the Lefebvre's idea of such fight is not a mere abstract concept, because 'political struggles are animated by visions as much as by practicalities' (2014, p. xvi). This is where affects and atmospheres enter in the discussion

because there is a constant force of action in these practices.

Secondly, the importance of 'in-between' spaces and diluted places resides not in the identification of symbolic and iconic places, but as spaces of struggle. Lefebvre himself described the idea of heterotopia that delineates 'liminal social spaces of possibility where "something different" is not only possible but foundational for the definition of revolutionary trajectories' (2014, p. xvii).

If we consider the contribution of these concepts and approaches to our thesis, we cannot skip the discussion about how technology transforms the spaces that feed the multiplicity instead of structuring a single possibility. Following Judith Butler's performative theory of assembly, Duff (2017) proposed that an affective turn to the right to the city has to do with the *right to appear*. This notion 'always presupposes a space of appearance inasmuch as space is central to the body's appearance, just as space is affectively transformed in the event of this appearance' (2017, p. 521). By studying the affective and material realities of homeless people, Duff discussed the meaning of such social and economic situations. He remarked that the use of materials and the encounters with them generate spaces of appearance. 'Inevitably this process enacts a politics by exposing the conditions of precarity that affect homeless bodies in the city' (2017, p. 257). He exposes the condition of 'still here', as a form of contesting the spatial configuration. The homeless condition, in non-representational terms, is expressed in the encounters by means of permanences, absences and transitions, that look for recognition and connections with others.

However, as Fainstein (2014) accounted, Harvey proposition is focused on a radical escape capitalist struggle. Both calls (the right to the city and the just city) works over more or less idealistic claims of equity and diversity. Specifically, the latter calls our attention regarding atmospheres.

In accordance to 'just city', defined as an invitation to 'deliberate about the nature of equality and opportunity in a particular society and how its members might go about changing existing arrangements' (Marcuse & Mayer, 2011, p. 242), atmospheres are *per se* a lived experience of a dynamic and diverse forms of anticipation and collective engagement Sumartojo and Pink (2018).

However, it remains open the question of how publics are open and inclusive, and how technology can be thought in terms of a just city. Even when atmospheres are not a form of providing equity or justice, it is a way to study their consequences in a different level that can include different publics, unveiling a new perspective on the 'public sphere' as a mesh of multiple affects and atmospheres.

Looking at the notion of empathy as an affective translation, we should pay attention to these assembles of quotidian life, that converges in meaningful expressions of space. We should consider that these encounters are present in every city, because inequality is in the nature of capital accumulation, and depends on us to giving the required attention to note how these relations interact with other bodies. Consequently, empathy in the context of affective atmospheres becomes an important concept and analytical device for studying the 'right to the city' from the performance in encounters.

4.7. Discussion

In our first exploration, we concluded with provocation on how an approach to mobilities and spatial assemblages can be an alternative to deploy digital and smart cities and to engage critically the emotional consequences and imaginaries created around embodied encounters. Approaching modes of ordering was an excuse to inquiry, but also as a form of analysis on the problem of spatial orderings, habits and practices (Q1). In the second exploration, we understood that the interaction between senses and atmospheres causes that the meaning of a place emerges from mundane and ordinary actions. In the interaction, places become diluted between body meaning, senses and memory, but lack any social definition or cultural reputation. We recovered the artifact ecologies approach to face the problem of usability and to understand the complexities of multiplicity in designing artifacts and other technological devices (Q3).

The third exploration turned from how spaces are mediated by atmospheres, and how the affective relations between different assemblages constitute multiple time and spaces, to how atmospheres can be analysed from a perspective of empathy where such affective translations are potentially part of discourses and other structures of feeling altering not only spaces but also habits, with ethical and political implications. The ambivalence of atmospheres does not allow us to anticipate their discursive powers; however, we can unveil the orderings that socio-technical systems and atmospheres are engaged with (Q3).

4.7.1. The political matter of interactions

So far, the observation of mundane objects can unveil local interactions with things (Giaccardi et al., 2016) and other urban artifacts. Objects are important not just because are instrumented as they meant to be. But there is a process of social configuration where objects become mechanisms to prevent, allow and penalise individuals for doing things, use them and to transit the city. 'It marks off changing publics' (H. Molotch, 2011, p. 69).

From this perspective, objects generate and reproduce power, participate in the orderings of life and create the *publics* by including and excluding others (as well as creating counterpublics that appropriate these technologies in many ways (Edensor & Sumartojo, 2018; Sumartojo & Pink, 2017)). In other words, objects participate in the co-production of atmospheres and public spaces, reproducing the normative with direct agency. As John Law stated, 'repurposing data or devices designed for "other" purposes (e.g., commercial) is a way to both do social research and to critically understand how research is being socially and technically redistributed in more implicit ways by digital technologies' (Law & Ruppert, 2013, p. 237).

Redefining the ontological and teleological perspective of researching by observing *devices*, Law argued that the orders generated by different socio-technical ensembles allow seeing their 'social life' because:

1. They are shaped by the social, and because 'the tools to hand are never innocent'.
2. They format social relations, and 'operate in ways that tend to enact particular structures or forms of organisation'.
3. They are also used opportunistically by social actors in the systematic pursuit of political, economic and cultural advantage.

The interesting point about objects, and particularly those that are part of the urban infrastructure, is that they are accumulated over space-times, creating different orderings. They are not just fitted one to another, but overlapped, generating a multiplicity effect and disturbing each other (Ash, 2013, 2015b, 2017) generating different assemblages and affective relationships. As we mentioned in the introduction of this thesis, we might avoid taking for granted any definition of our research objects. As we have learnt along this work, questioning the epistemology of each object took us to rethink how they relate with others, to analyse what they do and how do we know about them. We explored the relational realm, the affective and the atmospheres that put them and us in-relation. This form of experience was also an ontological one, where we put in question the spaces and places, as long with cities and publics, to rediscover dimensions and forms of analysis. Whether an object has, or not, an effect over the affects, atmospheres, habits and practices, is contingent to how we treat the 'coming into being', and especially how they empathise each other.

In our last exploration, we describe how these relations with urban infrastructure could not only direct our attention and affect our habits, but also act as discursive structures and how these changes can alter our spatial memories. Massumi correctly pointed out that habits are 'ways to not attending-to, while still acting according-to' (Massumi, 2015, p. 64). The awareness that we are looking for is not in the conscious form of analysing an event, but in the ways that the body becomes sensitive to what is coming, becoming a creative force with new capacities.

Regarding the user/interface duality (or user-centred design), it has been useful to many experiments and to test specific technologies in certain environments. Although, given the role of artifacts as political agents, design practices should go beyond that dichotomy. In current trends in technology design, scholars tend to include social and cultural values as something additive. It is not a matter of swapping the user for another term (humans, volunteers, participants or, just people). Instead, feminist and post-colonialist scholars have been working for decades on the analysis of power relations. Those who are concerned about the relations in design research, called for a movement of design justice that 'aims to ensure a more equitable distribution of design's benefits and burdens; fair and meaningful participation in design decisions; and recognition of community based design traditions, knowledge, and practices', focusing 'on the ways that design reproduces, is reproduced by, and/or challenges the matrix of domination (white supremacy, heteropatriarchy, capitalism, and settler colonialism)' (Costanza-Chock, 2018, p. 1).

It is true that is impossible to embrace the entire realm of publics and avoid any reductionism, although, the methods that we presented showed some insights on how to design from the messiness of the affective and orderliness life. In our first version of the framework we started with a similar account, considering humans and non-humans as equals, but enclosing our scope on the relationship between them.

The relations that can be traced between bodies are just some of the many that order our lives. Even the most unnoticed things have the capacity 'to animate, to act, to product effects dramatic and subtle' (Bennett, 2004, p. 351). Even more, agency is not only thought in terms of direct manipulation, 'it does not mean that it is a cause generating effects; it can also be an occasion for other things to start acting' (Latour, 2006, p. 60). Also, that is the point where the agency of objects is a *matter of concern*.

Following this, 'the user' becomes a blurred distinction because '[the user] singularizes

what is a multiplicity and fails to differentiate actors with very different relations to a given artifact' (L. A. Suchman, 2007). Therefore, Suchman already suggested one decade ago that '*intentionality* needs to be understood not as an attitude of mind located within the individual but as a field of socially and materially mediated relations within which persons act' (2007, p. 256 [emphasis is ours]) .

Bennett differentiated the *body materialism* with *thing-power materialism* in order to focus on the agency of objects, and not so much on the human bodies and practices. In our explorations, we tried to spin around these points of view. We presented three different ways of relating objects and bodies in different arrangements and spaces. The three had different types of agency and hierarchies between them. Ultimately, we offered these perspectives to understand how they operate over the idea of 'becoming together'.

4.7.2. Memories and geographies of empathy

Pedwell (2014) discussed empathy from a transnational perspective, where the cultural and psychological powers that influence our current and past politics in many ways are entangled with affects, emotions and feelings. She suggested the use of 'affective translations' as a means of a transformative encounter with alterity based on synchronisation, attunement and rhythmic solidarity, but also engaging emotionally, psychologically and sensory, and to critically approach ethical-political sensibilities. This synchronisation or emotional attunement with other bodies, she argued, is not deliberate, and encounters have the power to affect and transform the networks or *circuits of power*, which operate political systems and brain/body systems. Similarly, Thrift (2008) accounted for the effects of *neuropolitics* on the use of technologies to influence our embodied capacities, our perception and on our sense of attunement with the world.

Together with Anderson's affective encounters, Thrift and Pedwell discussed the use of affective forces as relational powers that change the potential capacities of bodies and objects to alter not only the encounters but also our memories and preferences in many levels. In other words, 'affect is a kind of frivolous or distracting background to the real work of deciding our way through the city' (Thrift, 2008, p.172).

We already addressed how the affects can impact on our practices and habits. Considering affective atmospheres as a way by which affective life can be understood (B. Anderson, 2014), the atmospheres become a promising way of analysing the spatial configurations of the affects and their influence on our conviviality with other bodies and objects. Moreover, affective translations in the realm of our experiments allowed us to analyse the causes and consequences of encounters and translate the understanding of affects to other levels.

Rose et al. (2010) argued that judgements (an important part of our societal interaction) are based on reflections of previous encounters with other places. In this vein, the role of *co-production* and *co-performance* is to brought up memories and previous experiences to action. In that sense, 'judgements can counter affects. In this case, as well as emotions, memories give rise to diverse assessments of an affect' (2010, p. 31).

4.7.3. Atmospheric transformations

Atmospheres emerge as a process of collective affective forces that exceed our capacities to constrain the social and cultural in a simple overview. As a consequence, 'the cultural premises are often overlooked in atmosphere research, departing from the assumption that

a contemporary, Western philosophy of atmosphere is universal' (Bille et al., 2015, p. 36).

We would suggest that the place of affects in urban life is contingent on the relationships of bodies, objects, habits and practices. We agree with Sørensen, who explored archaeological places considering the same question, in that '[an] atmosphere is not reducible to subjective experience, but rather integrates subject and object, creating a sense of pre- or post-reflective presence in the act of moving', but 'at the same time material infrastructure and implements may occasionally inform us about other aspects of atmospheric frameworks than those described subjectively without implying that atmosphere can be reduced to objective facts' (T. F. Sørensen, 2015, p. 71).

We provided some conceptual tools, atmospheres and structures of feeling, for studying the emergence of affects in the way presented by Anderson, and took the analysis to a geography of affective translations in order to study how affects are involved and could be analysed from the point of view of urban conditions, political capacities and apparatuses of discourse.

In that sense, it is necessary to explore more these relationships in order to comprehend the influences in our daily lives and, at the same time, to what extent affects and atmospheres can act as part of other apparatuses. We highlight the importance and the opportunities that come into being in studying affective relations with mundane objects, within habits, and the spatialities that those relations enable and mediate.

4.8. Outlook: The city of intensities

Massumi (2015) described affects as *intensities of feelings*, something that is inseparable from the living body. An intense city is one that accounts for the multiple relations that take place in the city, conceived from the understanding of the *new materialism* (Coole & Frost, 2010).

For such an intense city, we should first recognise the role of time and space. Specifically the *openness* of spaces, and the *transitions* (and the feeling of change in capacity (Massumi, 2015)) that are primarily effects of time.

> If you really were to take a slice through time it would be full of holes, of disconnections, of tentative half-formed first encounters. 'Everything is connected to everything else' can be a salutary political reminder that whatever we do have wider implications than perhaps we commonly recognise. (Massey, 2005, p. 107)

We should examine how time and space constitute these intensities, movements and transitions, which can be studied through reconfigurations. What are the effects of studying reconfigurations between technologies, bodies and places in the form of empathic relations? (RQ4) Any speculation about our reality comes up with new forms of co-performance. The forms of power and intensities that bring life orderings evidently would determine present and future relations, with enough consequences to be considered an important issue. Focusing on the other, whether a citizen, a user or a volunteer, can unveil how designers and researchers rule the presences and absences in order to build our judgements. For that reason, a city of intensities is a city that pays particular attention to reconfigurations at multiple levels.

> 'Cities' may indeed pose the general 'question of our living together' in a manner more intense than many other kinds of places. However, the very fact that

> cities (like all places) are home to the weavings together, mutual indifference and outright antagonisms of such a myriad of trajectories, and that this itself has a spatial form which will further mould those differentiations and relations, means that, within cities, the nature of that question - of our living together - will be very differentially articulated. The challenge of the negotiation of a place is shockingly unequal. Moreover, the politics, economics and cultures of space - through white fight, through gated communities, through the class-polarising geographies of market relations - are actively used in the production of that inequality. (Massey, 2005, p. 169)

In summary, intensities are shaped in forms of collective affects. One such forms are the structures of feelings (B. Anderson, 2014) that reflect not less than the societal values and the reproduction of its inequalities. A city of intensities should force us to think also about the characteristics of attentiveness, delight and meaning, described in the previous chapters.

Conclusions

During this thesis, we have moved from the notion of *empathic relations* to analyse *geographies of empathy* in depth, being the latter a study of 'becoming together' by different means.

In the first chapter, we explored how to 'being together' with artificial devices with the use of language. In the second chapter, the spatial relevance of 'sensing together' helped us to understand the use of technological enactments of the *sensorium* to explore affective atmospheres. Atmospheres is used as an approach to studying the lived experience of togetherness. In the third chapter, we got charged by the spatiality to the urban landscape, by the use of maps, as a corporeal experience of emotions and feelings. We got mobilised by 'placing together' as we studied the co-performance and co-production of mapping practices. In the fourth and last chapter, we presented some explorations to politicise these *modes of togetherness*, and following Pedwell, to consider the controversies and conflicts that emerge in-between bodies and spaces configuring the apparatuses of discourse and structures of feelings.

Empathy understood as a 'becoming together' destroys the ontological idea of the self-other dichotomy. Starting from there, the 'affective computing' approach and cognitive sciences have less to do in the realm of the nonconscious and more-than-representational. Rather, we think that studying how socio-technologies influence and resonate on our senses and, unravel relations with others will be valuable for improving citizens' quality of life in urban environments. Nevertheless, life thought in relational terms (following Whitehead), the idea of 'quality of life' and well-being should not be understood as a goal or something to be acquired by the process of commodification. Instead, is a continuous process of enrichment, or *liveliness*. Following the 'just city' proposal, we incentive to take the idea of the quality of life in cities thought regarding opening possibilities, rather than something accountable and measurable.

What we can recognise as the main factor of this empathic approach is the importance of paying attention to orderings and the multiplicity of publics. In chapters 2 and 3, we worked with different forms of embodied activities and representations to unveil such orderings. However, more 'ands, ands, ands...' are added to the descriptions, and it is never sufficient. Contrary to the attraction capacities of magnets, life generates attractions by forces that are less rigid than those of the laws of nature.

The collective processes (Elwood & Mitchell, 2015) empowered by the use of digital media (Rose & Hall, 2016) are key to understand these forces and move toward richer studies of empathies. Nowadays, the 'databodies' (Mattern, 2018) allows us to study, beyond our cognition and our capacities of understanding how these technologies transform the spatial and temporal realms. We shall abandon the idea of *utopia* (More, 2012) as ideal space-times to reach as a society. Rather, we should look for the condition of post-human agency, as an *always already* digitally socio-technical (Rose, 2017), in the form of a continuous present.

Digital mediated cities, as Rose pointed, is not to look at the enhancements of technologies in the sense of control, efficiency and performance. These nouns, like goals, are only tearing

apart the society and manifested in feelings of dispossession (B. Anderson, 2017), which are contrary to the notion of empathy. On the contrary, the post-human being is co-produced with the digital and in the digital. Thus, 'is only possible through the devices and practices of technics[9]' (Rose, 2017, p. 11). However, as Latour pointed, we should stay sceptic about putting the human at the centre of the discussion.

In sum, our focus on objects and places was not casual, but part of the agenda of cultural geography and, in consequence, it should be translated to other disciplines as well. Urban Informatics, GeoInformatics, and Digital Sociology must face the controversies raised in this thesis, as a common ground.

Results

Our primary research questions [RQ] were oriented to understand the relation between the three objects of research, i.e. place, object, and empathy. We next summarise how the results of this thesis contribute to answering them:

RQ1: How do artifacts/objects offer new ways of engagement, and what consequences have in our daily life practices?

For this question, we put objects in the centre of our analysis, relegating the study of places and facing a precarious form of empathy. The forms of engagement are driven by an intimate relation with socio-technologies in the affective realm but also in the visceral level. Considering a change in current experiences of life in a city, we should look at how these experiences affect our liberties and opportunities. The results of the first experiment show us that considering digital enhanced technologies can be a way to provide more human-like responses that entangle stronger social relations. Additionally, we addressed that engagement goes deeper than a cognitive and emotional correlation, but an affective flow that should not be drawn under a Euclidean understanding. Instead, it is a matter of quality of experience and intensities that leads the capacities to change our practices. Thus, empathy appears as an aesthetic experience that relates bodies in terms of affects and affordances.

RQ2: How do atmospheres change our capacities in relation to our place-based practices and habits?

In this question, places and objects were equally treated, leading to a discovery of new forms of empathy in their relation. Stimulating the sensory realm is one form of changing the way that affective atmospheres affect bodies. These alterations provide the stimuli that change spaces but also the practices that are situated in-between of such space-time relations. However, the effects of atmospheric transformation are unexpected and remain in the capacities of individual and collective anticipation. The findings of the second experiment helped to address the transformation of atmospheres and as an example of how illumination can work for public intervention. Thus, empathy appears in this chapter as a form of attunement and sensory experience with places and everyday practices.

RQ3: How do the affective qualities of places relate to the process of representation?

For this question, the place came to the centre of our analysis as an excuse to use empa-

[9]Described by Stiegler as means to externalise knowledge such that it can be transmitted across time and space (Elwood & Mitchell, 2015)

thy as a device of meaning, knowing and understanding. We addressed a third experiment, where objects were relegated. We oriented our inquiry towards a study of symbolic and relational forms that resulted in a study of the ontology of spaces and places and their constant reconfiguration. By exploring the in-betweenness of places is to unveil the processes of representations and meaning creation. Collective practices affects and are affected by the qualities of places. Therefore, the study of representations is to study the translation of affects into other forms of existence. The third chapter treats empathy more closed to affects and emotions that are drawn over time-spaces.

RQ4: What are the effects of studying reconfigurations between technologies, bodies and places in the form of empathic relations?
For our last question, our dialectical approach to our explorations allowed us to treat the three objects of research equally. In three explorations, we addressed different perspectives and disciplines about public objects that resulted in valuable insights for researching and designing future digital cities. The study of forms of co-performance provides a sort of active critique. It allows practitioners to understand how empathic relations shape the reality that we live in, how intensities are structured and how their work can be socially responsible for the consequences of what is designed. Here empathy is addressed from an ethical point of view, that addressed not only objects' affordances but the social relations that are assembled in public spaces. As a result, we concluded our approach towards a Geography of Empathy.

In this thesis, we have studied the 'in-between' of the three objects as forms of empathy. We developed a balanced work between empirical and experimental tasks with theoretical background by using the RITW model. We proposed a framework to study empathic relations, classified a set of definitions that empathy can be formed as modes of inquiry, and addressed the transformation of spaces through the notion of empathy.

Results from the RITW model

RITW's goal is to rethink the role of theory to inform the design and frame the analysis. So, we adopted this model to evaluate the contribution of each experiment efficiently. The aggregation of the three experiments resulted in a balanced interplay between the practical and the theoretical, which can be considered satisfactory concerning interdisciplinary studies.

RITW approaches are divided into participatory and provocative (Rogers & Marshall, 2017), and both are also in the essence of this thesis. That is to say that we treated technologies for co-producing knowledge on an empirical basis, and asserted the utility of each method under a theoretical inquiry. Hence, the contribution from, and to, each discipline can be reflected in the results presented in the next section.

Re-framing the Empathic Relations Framework

In the first chapter, we introduced the Framework [DAD] to work with the unexplored concept of *empathic relations* as reconfigurations. The framework was initially developed during the first year of research (Portela & Granell-Canut, 2016) to also integrate divergent approaches and methods from different disciplines. Later, we incorporated progressively new concepts and approaches, such as atmospheric methods and artifact ecologies. We also tested it by developing the presented experiments and explorations.

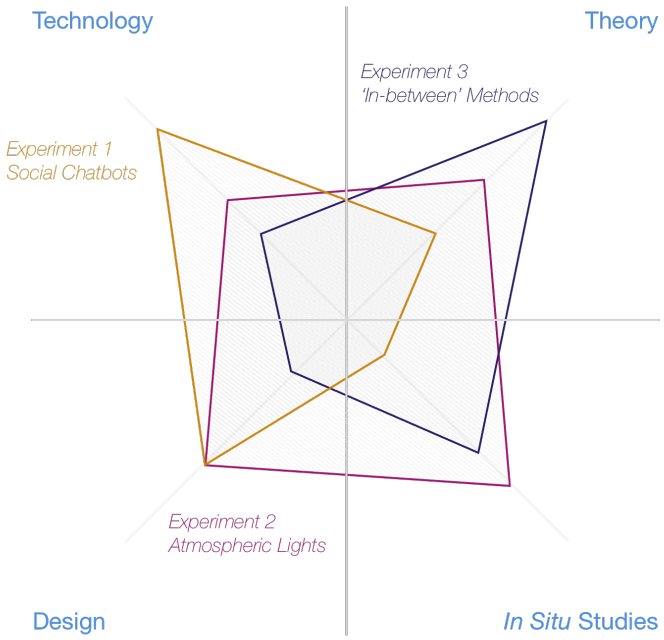


Figure 4.11: The results of overlapping the RITW from the three experiments

As a process of learning, we re-framed the framework to incorporate new knowledge and to put under inquiry our first ideas. We believe that it is possible to use this framework as a model of assessment for socio-technical assemblages rather than a way of structuring relationships in a single manner. This model puts different ontologies in relation to explore and research in creative ways. In this thesis, we have decided to put things in-relation, paying attention to the in-between, and have proposed speculative approaches to escape from determinism that exist in many practices. Thus, this model should serve for the same purposes.

In this second version of this framework (Figure 4.12), we take into account the virtual, as the latent multiplicity of liveliness, to address a broader scope of the analysis based on what we learnt in our research process. Firstly, we incorporated new dotted lines to show that the affective forces of both bodies can be in-relation in multiple ways. From the perspective of speculative materialism, this addition helps to delineate possible futures that exceed our realities. These lines also show that these relations and the changes are not always smooth and they can be abrupt, uncomfortable and unexpected.

Secondly, we added atmospheric configurations in the form of spheres. We already explained the conceptualisation of affective atmospheres as spheres in Chapter 2. Atmospheres can be assembled by one or many bodies and can affect such relationships depending on how affects are experienced or lived. However, we have to take into account that atmospheres are thought in performance practices and have no apparent limits. Spheres should not be considered as correlative with their multiple realities. Additionally, we should not forget that affects and atmospheres may not go together. Instead, affects may participate in atmospheres, where atmospheres may be constituted partially or totally, in temporary forms, by affects. Affects are present in the model as intensities (or differentials) that relate and also cross through bodies.

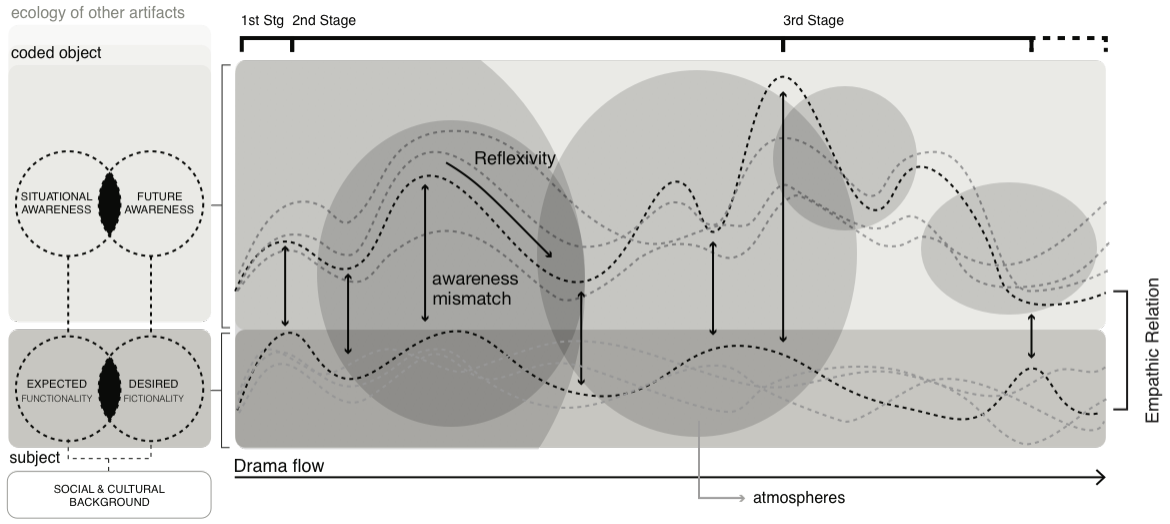


Figure 4.12: The Empathic Relations Framework re-framed

Thirdly, HCI carries the assumption that artifacts are always embedded in ecologies of other artifacts in many ways. Practitioners can choose to narrow their scope and to study just particular actions and practices. However, its conviviality with their multiple virtuals is undeniable. For that reason, we put in conflict the notion of *use* to reflect that it depends on how we observe such configurations, realities will actualise with virtualities differently. With modes of orderings, also implicit in this framework, we demonstrate that material effects are part of such ecologies and must be taken into account. Whereas affects and atmospheres are part of orderings and structures of feelings, ecologies of space and ecologies of artifacts are always interweaved. After all, we cannot address all modes, all ecologies, either virtualities at the same time. Moreover, 'methods cannot assume to be "one size fits all."' (Springgay & Truman, 2018a, p. 8)

Finally, it is essential to acknowledge that when we came up with the idea of addressing the notion of place, as a situated experience, we never expected to exhaust the descriptive resources. We wanted to help others to imagine the relations that 'take place' within public spaces, as a process of 'drawing things together' (Latour, 2011a).

In sum, empathies are forms of articulating these configurations in separate realities that bring, gather or haunt bodies together. Empathies as affective translations, take place continuously in the ongoingness of spatial re-configurations.

Forms of empathy

We argued that there is not one but a set of empathic relations that correspond to different reconfigurations. We addressed empathy as a research process to unveil, in the form of speculation, different approaches that permitted us to put under question certain forms of relations and their ontologies. Following each research question, and each chapter, empathy appeared differently as a multi-layered ontology to address the issue of what holds us together in the world, or how do bodies 'becoming together'. However, as a result, we acknowledge multiple forms of empathies that can be evidenced.

These forms of empathy do not deny the varieties identified by Aaltola (2018), instead, work as complementary and extend the discussion along what she proposed as 'reflective empathy',

but adding a multidisciplinary perspective (with the strong influence of the affective theory) and with the focus on a more-than-human approach.

The forms of empathy identified in this thesis are the following:

1. **An aesthetic experience:** It is embodied as a visceral relation with other bodies (in chapter 1).
2. **A form of attentiveness:** In a way to be permeable by the other bodies' capacities of affect (in chapter 1 and 2).
3. **A mutual attunement:** As a corporeal and sensory relation with other bodies and the environment (in chapter 2).
4. **An emotional bonding:** Shared experiences as intensities of feelings (in chapter 2).
5. **A form of affect in circulation:** As the effect caused by the affects in movement and transition (in chapter 2 and 3).
6. **A becoming together:** Following Heidegger's Being-in-the-world, we become part of it with other bodies and in relation with the others (in chapter 3).
7. **An event in-between places:** As a matter of conviviality in space and time (in chapter 3).
8. **A mediation between structures of feeling and feelings of structure:** Following Anderson and Pedwell, how reality is manifested as emotionally structured (in chapter 3).
9. **An ordering force:** As a matter of ordering the spaces and interactions (in chapter 4).
10. **As affective translation:** Following Pedwell's definition of empathy (in chapter 4).
11. **A Co-Performance:** Following Gillian Rose, producing practices and habits together (in chapter 4).

We started this thesis as a provocation, as a way of anticipating the present-future, a form of speculation. With the analysis of empathic relations and the forms of empathy, we invited readers to think the future of cities in these terms. We know how to map what is tangible, what already existed, but we lack the capacities to map what is at the door to 'what is coming'. An ethic and political approach to smart cities should have empathies as drivers. The forms of empathy are not exhausted but can work as a map of how conviviality of bodies, discourses and structures are immanently reconfigured in a post-human era.

The ontologies and methods presented in this thesis implied to leverage broad perspectives and to put many concepts into conflict. Even more, as we acknowledged in the introduction, working with different disciplines put us in trouble at the time of publishing, while not all disciplines accepted to withdraw ontologies from others. By accomplishing it as a successful approach to what came to be our goal, we believe that this is one of the main contributions of this text. Even further, we acknowledge that precisely because we dodged to establish perspective with more weight on the others during the whole work, it was possible to address the diversity of approaches with enough depth, which constituted a highly valuable knowledge.

Further, we present the following contributions of this thesis and the implications for the different disciplines that we approached:

Resume of contributions

Major contributions

- A multi-ontology approach to urban studies
- Descriptive: Forms of empathy
- Propositive: Empathic relations Framework

Minor contributions

- Affective atmospheres as method to study places (Chapter 2)
- A multi-layer approach to representations (Chapter 3)
- The notion of diluted places (Chapter 3)
- The modes of ordering approach to artifact ecologies (Chapter 4)

Implications for other disciplines

So far, this thesis was conceived as a multidisciplinary approach to the problem of the relations between objects and places. As a result, we believe that the contributions of this thesis can also provide valuable insights and implications for other related disciplines.

Atmospheric studies

Atmospheric methods evaluate the continuous, non-linear, multiple dimensions, and unstable atmospheric qualities of space. To the question of where to locate affects, we conclude that practices within habits and the cultural reproduction of patterns help to stabilise specific affects. However, the transformations that we considered could provide new experiences, and opportunities to alter these relations. The opportunities to raise place-based affects could be devised only concerning becoming, rather than coherent apparatuses and discursive devices.

Therefore, we contribute to the definition of places by accounting those that hold their identity by re-enacting memories, practices and affective relations. Where urban infrastructure seems to attach them to the ground, the process of repeating and recollecting to generate a cognitive continuity of unique events that are not equal one to another. Atmospheres work like glue, meshing and ensnarling the bodies around, placing them in a relation of a constant potential of 'becoming together' in many ways. As Deleuze and Hurley (1988) remarked on Spinoza's definition of affects, 'one will obtain a classification of beings by their power' (as the capacity for affecting or being affected). The same occurs to the exercise of locating affects in the sense of understanding places by their strong qualities and capacities. Moreover, transformed spaces, like the scenarios that we analysed, can be considered forms of transitions between capacities by different means, creating new relational powers. Therefore, atmospheres not only constitute the empathic powers that gather bodies to spatial configurations but also are the transition from one mode to another.

Artifact ecologies studies

The explorations and experiments developed in this thesis provide examples to designers and HCI practitioners on how to create interactions by inquiring the effects of affective atmospheres and modes of ordering. Designing interactions as a means of landscape engineering leads to new forms of space and time interconnections in which thick places are cultivated. However, practitioners should take care of falling into the mirage believing that publics can become one and intelligible user. Given the possibilities of analogue and digital devices, we take Thrift's call 2014; 2016 to explore the range of possibilities that these technologies enable: playing with all the corporeal memories and processes of emotional learning, and taking the perception of space and time as a matter of political inquiry. Instead of homogenising users and practices of use, data and computing power might be used to exacerbate individual experiences and collective atmospheres.

Artifact ecologies approach was conceived of as a way to analyse the use of those artifacts in specific activities, our contribution would lie in extending the boundaries of ecologies to what is part of our lives but goes unconscious. As we stated before, artifacts are in constant relation to other ontologies in subtle ways. Moreover, we should consider this proposal as a call for social responsibility in the HCI community, regarding how we generate, include and exclude these publics by design (see Bødker and Klokmose (2011)). By engaging concepts from other fields, we emphasise the need for understanding the consequences of design from a different viewpoint. Modes of ordering and affective atmospheres perspectives are currently under research towards embracing urban development and interactions, which may notably contribute to novel HCI methods to expand the boundaries of the field.

We should never forget that design is a deliberative practice, that drags a path dependence[10] from other practices and social assumptions. We are not the first on spotting this concern[11], neither to propose methods or critiques as a contribution to the practices of urban and artifact design. However, as researchers and designers, we took what it is available to create new relations; therefore our proposal from the anthropology and the cultural geographies is a contribution to close gaps between fields by unveiling their controversies.

On a final note, the analysed artifacts invite to develop new practices and to take advantage of places differently. An encouraging way to promote new interactions and make them publicly available is to enabling daily life activities in different ways and creating the environment for new practices in collaboration with other digital artifacts.

Urban studies

This thesis is not only about artifacts, but social life in the streets. Cities are machines of growth (Logan & Molotch, 1987), and their growth seems unstoppable (Kallis, 2011), even when many claims an urban revolution (Harvey, 2014). However, we prefer to look beyond the analogies and metaphors.

Nowadays, much of the efforts is on developing a movement of citizen science as forms of analysis (as means of citizen-centred approach) in urban planning and urban studies. We found that the ideas of 'democratisation' of scientific methods and tools go together with the advancement of algorithmic lives and Moore's law (cheaper microprocessors). These

[10] By path dependence, historians of technology are describing the influence past events have over 'technological paths' adopted, with the consequence that taking alternative paths becomes more difficult and costly to do over time MacKenzie and Millo (2003).

[11] Lucy Suchman (2018).*Design*, Cultural Anthropology. Available at: https://culanth.org/fieldsights/1355-design

are, above all, advances over the ideas of volunteering geographic information and other attempts to engage citizens in the task of understanding the world. In Chapter 3, we analysed the structures of power, and the force of representations, walk-alongs and mapping reading techniques that can help to understand better the affective, subjective and relational configurations of places. We proved that space is not only an empty landscape that is full of bodies' characteristics but a relational one. We encourage to take this representations-in-relation approach for future studies on citizen science.

The implications for the individuals are to raise their spatial awareness, not only regarding territoriality but as assemblages that constitute and transform their practices and relations. At the same time, researchers should pay attention to atmospheres in their many expressions that 'take place'. Paying particular attention to bodies, rhythms, sensory reactions, affective translations and circulations, atmospheric qualities, modes of ordering, and other reconfigurations, would help escape from the boundaries of classical cause-effect practices. Therefore, as many other critical researchers did, we encourage to look for a deeper understanding of the forms of power that those relations bring together.

Anticipatory studies

We want to recover a lecture that was given by Latour (2008) a decade ago at the Design History Society. He highlighted five advantages of design in comparison with other terms like build, construct, and create. In design, there is a *modesty* in claiming to design something anew, with an attention to the details where the importance is given to *skilfulness*. A design has a question of meaning and semiotic importance (even in contradiction), it is always a process of *redesign*, and necessarily involves an *ethical dimension*, suggesting that there is a moral understanding of the thing that is designed. In this sense, to design is to be 'radically careful, or carefully radical' (2008, p. 7). That is, we have to be attentive to the consequences, but at the same time, to challenge whatever we are designing.

We started by describing empathies to understand the relations with place and objects better. However, this distinction has nothing to do with the reality we live. Following Latour's Sloterdijk reference, designers and scientists generate *envelopes* as the system that supports life, and as a form of being 'thrown into the world'. Thus, 'we are enveloped, entangled, surrounded; we are never outside without having recreated another more artificial, more fragile, more engineered envelope. We move from envelopes to envelopes, from folds to folds, never from one private sphere to the Great Outside' (2008, p. 8).

In other words, Latour invited the audience to put under a *matter of concern* the tools that we build to design and, to set the practices under an inquiry of its own contradictory and controversial nature. Next, Puig de la Bellacasa (2017) called for a *matter of care* that we followed to place empathy in the centre of the discussion. The contribution of this thesis to anticipatory practitioners is, therefore, the notion of empathy, as a form of building futures to understand that *we are us with the other*, and that is unavoidable.

GeoInformatics

The themes and approaches that we touched in this thesis are in a radical concordance with the trends of GeoInformatics. Even when long-standing geographers (Martin Dodge, Rob Kitchin, Muki Haklay, among others) touched what falls between informatics and human geography, it is unclear how both universes can be articulated to contribute to the practice

of developing digital maps.

One major implication of this thesis is how knowledge and representations are conceived. In chapter 3 we presented a multi-layer study on how representations become more-than-representations. In other words, tools are excuses for other purposes, from building new socio-technical networks (seen in the case of Caminos de la villa), or to understand personal and collective arrangements and configurations of places (in the presented experiment).

Similar to our critique over affective computing, we argue that information is not just information. Especially in research practice, information is not data and methods are should not only means to gather data (Springgay & Truman, 2018a). Whether there are historical and cultural backgrounds that build up representational tools, there is also performances that enact events of creation. The different stages of production, consumption and interpretation of geographical tools, are part of networks that are articulated in one or other ways. Digital maps are coded-objects, as we defined them in the first chapter, and can be thought as [DAD] as well. Here, the questions that matter is not which symbols represent what, or what is the meaning of some mechanisms. Under our approach, the fundamental questions are, how these tools are used? How they build narratives in-relation? How they engage? How they reproduce networks of power? How are they unfolded in practice? Also, who has access to these unfolds?

Thinking on the vision that European Union is trying to accomplish in future scientific programs, where open science and citizen participation are central pillars, we have to face these questions to understand who benefits from the tools and how are they performed.

Even though, we should consider questioning how the created knowledge is valuable and meaningful for the population all over the world. Finally, we should think about how these tools help to gather and contribute to the empathic relation with others.

Recommendations for alternative smart cities

We offered four alternatives to Smart Cities in the final section of each of the main four chapters. These four approaches are not even exhaustive to the possibilities. Attentiveness, delight, meaning, and intensity are the four critical characteristics identified in our work that relate directly to the forms of empathy.

- An **attentive city** remains sensitive to others, creating an effect of attunement;
- A **delight city** is nourished by the aesthetic experience in the multiplicity of public life and it orderings;
- A **meaningful city** generates events in-between its spaces that are emotionally bounded to habits;
- And, an **intense city** mediates our life, generating new forms of affective translations.

We can conclude that, together with the forms of empathies proposed in this chapter, paying attention to these four characteristics of cities is a proposition to remain critique to 'what happens'. The arrangements between objects and places, cities are continuously reconfigured to form different empathies or dispossessions.

Contributions to Open City Toolkit

The Open City Toolkit Degbelo et al. (2016); Granell et al. (2018) is one of the outcomes of the GEO-C Project. The idea was to transform the research outcomes in services and products that can be relevant for city developments and urban planning[12].

Our contribution is threefold:

1. The source code for the chatbot platform[13] (Experiment 1).
2. The source code for controlling the atmospheric lights[14] (Experiment 2).
3. A set of guidelines for empathic cities[15] in form of comic strip, to be distributed and understood easily between non-academic audience.

As part of the idea of 'open' cities, we believe that we have to move from a unidirectional to a multi-directional artifact approach. The tools provided should be conceived of under the Do it With Others (DIWO) movement[16], as something that is in constant change. Therefore, it is a way to empathise with the experience of the objects provided and to ensure its openness.

[12] *Goals*, GEO-C. Available at: http://geo-c.eu/goals
[13] *Chatbot platform*, Github. Available at: https://github.com/GeoTecINIT/GeoTec-Bot-
[14] *Atmospheric lights*, Github. Available at: https://github.com/GeoTecINIT/atmospheric-light-controller
[15] *Emphatic Cities Guidelines*, Github. Available at: https://github.com/manuchis/affective-cities-guidelines
[16] *DIWO*. Available at: http://diwo.bq.com

List of Figures

List of Tables

Appendix I: List of projects analysed for the Framework

In this annex we present a list of some objects and projects held by third parties that were analysed to compare with our first attempt to build the Framework for studying devices[DAD] and empathic relations. This list is a compilation that include some mundane objects, prototypes and other more artistic and ad-hoc projects made for making spaces more interesting. We also highlight in each description the correlation of place competences analysed in Chapter 2.

Unfortunately, most of these experiments are not permanent, therefore, the effect caused eventually disappeared. Thrift itself call to understand non-representational theory as an experimentation, and highlights that the kinaesthetic knowledge 'is projected through objects which are based on maximizing movement experiences through the application of particular sequences of movement which engage the visceral sense as well as the proprioceptive and fine touch, rather like hieroglyphs of the kind found in dance and other performing arts'(Thrift, 2008, p. 73).

A Fork in the Road

A Fork in the Road is a city based storytelling system that uses the road and path network to create branching narratives. It is a narrative adventure platform where the story advances depending on the route you take in the real world. It uses the road and path network of urban spaces as options in multiple choice, branching narratives.

Since it works as a mobile application, people can contribute to the stories while they navigate the city. **Memory** is the main component that this project plays with, by involving these narratives to build memories of the space. PAN Studio Limited (2014)

Airport Park

The Airport of Amsterdam (Schiphol) had installed what they called Airport ParksRoyal Schiphol Group (2017). These spaces are built to simulate the landscape of a natural place, or a park. With a clear discourse on sustainability aesthetics, they provide spaces to relax and bikes to generate energy for charging mobile phones.

Differently to a natural space, it plays with our familiarity to it and uses the same **Language** by reproducing fake trees and wooden furnitures. Even the sound of birds that go out from speakers placed in the trees, or the butterflies projected in the floor. The ambience generated reproduce a natural place located in a totally anthropomorphic one. It breaks with regular disposition of an Airport, letting people lay down, read and enjoy, leading from a oppressive and anxiety situation of being on an airport, towards a place for getting relaxed.

This change the utility of the space, giving a new functionality and changing the way that we feel the place. It becomes a workplace or a leisure place, it provide new openness that allows to be appropriated. We left this example as the last because we started our definition

of place giving the example of an airport. As we can see, the intention of changing the space by the Schiphol administrator was to cultivate new places.

Automatic door openers

Basic sensors to open doors automatically are very common in public spaces. The main functionality is to keep the climate and prevent animals and insects to enter closed spaces. Usually, doors are made of glass, as part of an aesthetics of modernity. The simple idea to enter the space through this doors, means that people expects a change in the temperature (colder or hotter, depending on the weather), playing with **Emotions** enacted by the embodied sensation. But also to change the navigation behaviour (from an open-bigger space to a closer-smaller space), building a new spatial **Language**. Lastly, doors play an important role on ordering the space, the work of H. Molotch (2011) regarding subway doors are useful to understand the effect of them. The automation and the use of glass, helps to provoke more inclusion as an effect of the **Thing** competence.

As we stated above, the effects of cultivating thick places of this kind of this example lacks of intensity. Although, it is possible to observe people standing inside shopping malls waiting for others while they are protected from the outside weather. At the same time, others use to go outside to smoke. This kind of activities are recurrent, promoted by the agency of such door and other relations. As doors, they are points for meeting people and generate a familiarity for those that are frequent visitors of malls.

Binoculars to... Binoculars from...

The project was developed by Varvara Guljajeva & Mar Canet in the year 2013 and had a simple goal. There were placed binoculars in different cities, that "instead of seeing the scene physically in front of you, you are transported to a different site"Guljajeva and Canet (2013). This is, they changed the expected use of an urban furniture, to a different one by using a different technology.

This project is interesting because it reuse an existing object, changing its materiality in the sense that changes what was made for (**Thing**). It also takes advantage of the use of connection between cities (**Language**) and changing the sensorial experience by virtually traveling to another place (**Emotions**).

HelloLampPost

The project, developed by the PAN studio and produced by the Watershed Foundation in Bristol for the Playable City project and reproduced in other cities, was meant to deploy a set of chatbots as it were the utilities of the city. The main goal of this project was to provide the opportunity to talk with those objects in the city, and it is presented as "an opportunity to rediscover your local environment, share your memories of the city and uncover the stories that other people leave behind"PAN Studio Limited, Galik, and Armitage (2013).

The interfaces were mounted on SMS servers, that were exchanged with the participants by their own phones. By using an code for identification (similar to the system used in bus stops), the participants could have conversations with the objects in the streets.

The use of such implementation offered a unique opportunity to be related directly with the city itself, building personalized conversations and a fictional scenario by generating new ways to relate with the city infrastructure.

The competences that are modified here to empathize, are: **Language**, by building a narrative by providing a connection with the objects and uncertainty on their behaviour; **Memory**, by providing new memorizable experiences with these new relations; And **Thing**, where feedback provided by the objects generate new type of inclusive relationships.

Hugging Face

The Hugging Face project is a conversational bot and Machine Learning project (or, social AI) that attempts to provide more contextual Natural Language Processing. It works mainly on the **Language** competences. Available at: https://huggingface.co

Likeways

Likeways Traunmueller, Gallacher, and Krejcik (2015) is a mobile application that intend to explore the city differently. It is not the first application that have the same commitment, there are several applications that proposed to get lost or to navigate the space with different motivations or gamification strategies. What this application does is to use third party data of places to build new routes, suggesting new places.

But for our understanding, what helps to cultivate new places is to provide certainty in a different way than other navigation assistants, while it connect people with new places. It provides an opportunity than a certain transformation. But for us is a clear example how technology can act in different levels, and break the regular path by assigning new rules to the activity of walking.

Little Printer

This is an artifact based on a printer with a more friendly response. The printer is aesthetically attractive. It is small and has a face. It prints whatever you need in the moment. It is just a buddy friend that works over the **Thing** competence but with an an effect on **Emotion** too. Unfortunately is no longer available but there is an interesting article about it available at: https://medium.com/a-chair-in-a-room/little-printer-a-portrait-in-the-nude-4a5659ea731

Pokemon Go

The first mobile version of the Nintendo's famous game created a disruption in the use of augmented reality (AR) capabilities. It also disrupted the Geogames' field in terms of massive availability and interactions around the world. The use of AR in combination with strategies of geogames covered the full set of competences, creating an interesting use between the emotional changes with the relation of time and visual language. Avaliable at: https://www.pokemongo.com and http://mashable.com/2016/07/10/john-hanke-pokemon-go/

Public Like Displays

This project was held as part of the Organicity project. Similar to HelloLampPost, it was conceived to create a dialogue with the urban infrastructure and objects. In this case, small displays were placed to visualize different type of data fed by the interaction with citizens. The main idea is that citizens could publish data that they care about and open it to discussion in public spaces. http://rxd.architectuur.kuleuven.be/organicity/

Shadowing and Katusepoid

Two different projects that play with lights are mainly playing with **Emotions**, changing the landscape of the city, but also with the Language of shadows. By one side, Shadowing commissioned by the Watershed foundation for the Playable City program, and Katusepoid, developed by Varvara Guljajeva & Mar Canet for the NUKU Theater in Tallin.

In the first, shadows 'capture the movements of pedestrians passing beneath and echo them back as shadows to the next passerby, leaving a glimpse of those who walked the same path moments before.' Rosier and Chomko (2014) **Memory** also plays a role, enacting the shared manifold by giving the idea that other passed by the same place.

In the second, the authors played with the object (**Thing**), by giving it a human face and providing feedback as it were a fictional character. In the installation, when someone is under, 'it gets activated and the artwork starts playing with the person moving its light to the left or right and then moving it away again and again until it finishes its ludic cycle and returns to the original position' Canet and Guljajeva (2017).

Super Gestures

This project was also developed by Umbrellium and was held as a participative process and a street performance. The project used wearables to help question how much tangible impact smart city technology can have on future generations. The co-creation work culminated in a large-scale outdoor multimedia performance through which people expressed their relationship to the city and their visions for the future with body gestures performed using wearable technology. Available at: http://lingql.com/supergestures/ and www.supergestures.com

Tokio Train Departure Melodies

Japan train stations have their own melody. Rather than one simple sound to alert passengers, each melody provides a form of identification to each of the places where the train arrives. Moreover, each melody is iconic. The composer Minoru Mukaiya design each melody according to the lived experience of the station (i.e., how people enter the station, how the train enters and how it takes the curve). The melodies are not only in synchronization with the train movements, but are in a sequence. From one station to the next one, it is possible to listen an entire melody. These melodies resonates with the station, creating a unique identity with the town or place where the station is placed. Available at: http://www.thejakartapost.com/life/2018/04/10/jingle-bells-japans-unusual-station-music.html and https://www.youtube.com/watch?v=nSG5IkRA9BE

Touching Masterpieces

This projects plays with the senses by a Virtual Reality (VR) experience adapted to visually impaired people. The project translates the notion of VR as a visual system to a multisensory system. It is based on a set of gloves that reacts with to the maps of art sculpture pieces. Depending on the texture and shape of the virtual object, different vibrations are sent. https://touchingmasterpieces.com

Uncovered World

The Uncovered World project was installed in the Vivid Sidney festival during 2017 and developed by The Propaganda MillThe Propaganda Mill (2017). This projects plays with the

remembrance in places. The simple installation unveil what happened in the exactly same place time before when a person step over it. It is not a individual **Memory**, but a collective approach to historical moments. Replacing virtually, materials and events that happened centuries ago.

Voice Over

The Voice Over project, developed by the creative group Umbrellium, consist on a situated communication system, based on series of radio antennas. A sort kind of local radio system, where the broadcasting is emitted from a cabin and the neighbors can listen to, connecting unknown people in the close space. The antennas are illuminated by RGB LEDs, making the network and the broadcasting accountable, where "each fragment lights up in response to the different voices and sounds passing through it, making explicit the lines of communication, and connecting together people who, in many cases, were never connected to each other before" Umbrellium Limited (2016).

The temporal appropriation of the broadcasting cabin and, in consequence, the broadcasting signal, offers a local and temporary collaboration between the participants of the network. As a community owned system, the involvement and participation in the system is to being part of such community.

We found that there are two uses of **Language**. Firstly, it generates a specific narrative in the exchange of messages. But also the lights constitute a language itself that coordinate visually the intervention. Time is definitely important, since the signal spreads through territories changing the perception of space and location of the transmitter. Meanwhile, the message is ephemeral in time, playing also with our senses and **Emotions** creating an effect of synesthesia between lights and sound. Finally, the placement of antennas in the outside part of the homes, make an effect of typicality, transforming the neighborhood intervention as a common style, and adding distinction regarding others.

Appendix II: List of lighting projects

For our second technological deployment, Atmospheric Lights, we got inspired by diverse festivals and projects that use lights for creating different atmospheres and/or interactions. We contrasted the constructs mentioned in Table 2.1 to study them.

Projects

Átomo Tecnopolis

This is a project made in 2011 by Manuel Portela. The work was deployed in a public technology fair in Argentina. It consisted in an installation with the form of an atom. It was programmed to react to people's presence and movement, making the lights go faster according to the stimulus. Available at: https://vimeo.com/28244144

Bruum Ruum

Bruum Ruum is a permanent installation placed outside the Barcelona's Museum of Design. Several LED lights were placed along the esplanade. With a set of microphones, people can stimulate the lights to change in colour and speed. Available at: http://ajuntament.barcelona.cat/museudeldisseny/es/actividad/bruumruum

DreamHamar

The project was a temporary installation to involve neighbours in the design of a new square in Norway. The installation consisted in a grid of helium inflated balloons with ultra bright LEDs inside controlled by a computerized system that allows multiple interactions and working modes that can be changed at any moment. Available at: http://sergio.eclectico.net/portfolio/dreamhamar.html

Pulse Room

Pulse Room is an interactive installation featuring one to three hundred clear incandescent light bulbs, 300 W each and hung from a cable at a height of three metres. The bulbs are uniformly distributed over the exhibition room, filling it completely. An interface placed on a side of the room has a sensor that detects the heart rate of participants. When someone holds the interface, a computer detects his or her pulse and immediately sets off the closest bulb to flash at the exact rhythm of his or her heart. Available at: http://lozano-hemmer.com/pulse_room.php

Under my Umbrella

Part of the Vivid Sydney festival, Under My Umbrella was created as an art installation by using reactive leds inside umbrellas. Available at: https://www.youtube.com/watch?v=e-ZOG5j6SiU

Voice Array

As a participant speaks into an intercom, his or her voice is automatically translated into flashes of light and then the unique blinking pattern is stored as a loop in the first light of the array. Each new recording pushes all previous recordings one position down and gradually one can hear the cumulative sound of the 288 previous recordings. The voice that was pushed out of the array can then be heard by itself. Available at: http://lozano-hemmer.com/voice_array.php

Festivals

We also explored a set of festivals that include light performance and installations.

Blackpool Illuminations

Available at: https://www.visitblackpool.com/things-to-do/blackpool-illuminations-and-lightpool/

LlumBCN

Available at: lameva.barcelona.cat/santaeulalia/llumbcn/

Playable City

Available at: https://www.playablecity.com

Tartu Valgus

Available at: https://www.tartuvalgus.ee/en/

Vivid Sidney

Available at: https://www.vividsydney.com/archive/type/light

Research Questions

How do artifacts/objects offer new ways of engagement, and what consequences have in our daily life practices?

1. What type of engagement can we find between the individual psychological mindset and the reaction with chatbot conversation?
2. Where can we find insights of engagement?
3. How can the user experience with chatbots be measured?

How do atmospheres change our capacities in relation to our place-based practices and habits?

1. How do the interactive lights generate different reconfigurations of the space differently?
2. Are the interactive lights part of the affective atmospheres?
3. Which feelings and emotions are expressed through the presence and absence of lights?
4. How do the spatial configurations alter the activities and practices that take place in the station?

How do the affective qualities of places relate to the process of representation?

1. How does lived experiences and enacted memories act in the process to understand the multiple and overlapping definition of places?
2. How we can acknowledge the sense of place as a simultaneously enacted, performed and re-imagined?
3. How we can approach the process of signification and sense of place with an in-relation approach?

What are the effects of studying reconfigurations between technologies, bodies and places in the form of empathic relations?

1. How can we unveil assumptions behind their design and usage by understanding the effects of interactions with mundane objects order our lives?
2. How can we reconfigure the use of artifacts to understand the modes of orderings for designing better urban systems?

3. How can we understand the transformation of atmospheres and our habits as a matter of political importance?

References

Aaltola, E. (2018). *Varieties of empathy: moral psychology and animal ethics*. London: Rowman & Littlefield International.

Acedo, A., Mendoza Silva, G. M., Painho, M., & Casteleyn, S. (2017). One tool to spatialize all: sense of place , social capital and civic engagement. In A. Bregt, T. Sarjakoski, R. v. Lammeren, & F. Rip (Eds.), *Societal geo-innovation : short papers, posters and poster abstracts of the 20th agile conference on geographic information science. wageningen, may 9-12, 2017* (p. 5). Wageningen, Netherlands. Retrieved from https://agile-online.org/index.php/conference/proceedings/proceedings-2017

Acedo, A., Painho, M., & Casteleyn, S. (2017, 6). Place and city: Operationalizing sense of place and social capital in the urban context. *Transactions in GIS*, *21*(3), 503–520. Retrieved from http://doi.wiley.com/10.1111/tgis.12282 doi: 10.1111/tgis.12282

Adey, P. (2009). Facing airport security: Affect, biopolitics, and the preemptive securitisation of the mobile body. *Environment and Planning D: Society and Space*, *27*(2), 274–295. doi: 10.1068/d0208

Agnew, J. (1993). REPRESENTING SPACE. Space, scale and culture in social science. In J. Ducan & D. Ley (Eds.), *Place/culture/representation* (p. 251). London: Routledge.

Ahmed, S. (2004). *The Cultural Politics of Emotion*. New York: Routledge. doi: 10.4324/9780203700372

Aibar, E., & Bijker, W. E. (1997, 1). Constructing a City: The Cerdà Plan for the Extension of Barcelona. *Science, Technology, & Human Values*, *22*(1), 3–30. Retrieved from http://journals.sagepub.com/doi/10.1177/016224399702200101 doi: 10.1177/016224399702200101

Allen, J. F., Ferguson, G., & Stent, A. (2001). An Architecture for More Realistic Conversational Systems. In *Proceedings of intelligent user interfaces (iui-01)* (pp. 1–8). Santa Fe, New Mexico.

Almquist, J., & Lupton, J. (2010). Affording Meaning: Design-Oriented Research from the Humanities and Social Sciences. *Design Issues*, *26*(1), 3–14. doi: 10.1162/desi.2010.26.1.3

Alt, F., Schneegass, S., Girgis, M., & Schmidt, A. (2013). Cognitive effects of interactive public display applications. *International Symposium on Pervasive Displays*, 13–18. Retrieved from http://dl.acm.org/citation.cfm?doid=2491568.2491572 doi: 10.1145/2491568.2491572

Alt, F., Schneegass, S., Schmidt, A., Müller, J., & Memarovic, N. (2012). How to evaluate public displays. *2012 International Symposium on Pervasive Displays (PerDis'12)*, #17. doi: 10.1145/2307798.2307815

Altman, I. (1992). *Place Attachment* (I. Altman & S. M. Low, Eds.). Boston, MA: Springer US. Retrieved from http://link.springer.com/10.1007/978-1-4684-8753-4 doi: 10.1007/978-1-4684-8753-4

Amin, A., & Thrift, N. (2002). Cities: Reimagining the Urban. *Urban Policy and Research*,

21(2), 217–222. doi: 10.1098/rsnr.2002.0171

Anderson, B. (2004). Time-stilled space-slowed: How boredom matters. *Geoforum*, *35*(6 SPEC.ISS.), 739–754. doi: 10.1016/j.geoforum.2004.02.005

Anderson, B. (2006). Becoming and being hopeful: Towards a theory of affect. *Environment and Planning D: Society and Space*, *24*(5), 733–752. doi: 10.1068/d393t

Anderson, B. (2014). *Encountering affect: capacities, apparatuses, conditions*. Ashgate Publishing, Ltd. Retrieved from http://www.tandfonline.com/doi/full/10.1080/14649365.2015.1078146

Anderson, B. (2017). Cultural geography 1: Intensities and forms of power. *Progress in Human Geography*, *41*(4), 501–511. doi: 10.1177/0309132516649491

Anderson, B. (2018). Cultural geography II: The force of representations. *Progress in Human Geography*, 1–13. doi: 10.1177/0309132518761431

Anderson, B., & Ash, J. (2015). Atmospheric Methods. *Nonrepresentational Methods: Re-envisioning Research*, 34–51. Retrieved from http://www.academia.edu/10294576/Atmospheric_Methods

Anderson, B., & Harrison, P. (Eds.). (2010). *Taking Place: Non-representational Theories and Geography*. Ashgate Publishing, Ltd.

Anderson, B., Horvath, B., & Kaemingk, M. (2016). *Tell the 'Bots' Your Secrets*. Retrieved from https://scout.ai/story/ai-bots-mental-health-and-privacy

Anderson, B., & McFarlane, C. (2011). Assemblage and geography. *Area*, *43*(2), 124–127. doi: 10.1111/j.1475-4762.2011.01004.x

Anderson, K., & Smith, S. (2001). Editorial: Emotional geographies. *Transactions of the Institute of British Geographers*, *26*(1), 7–10. doi: 10.1111/1475-5661.00002

Andrews, G. J., Chen, S., & Myers, S. (2014). The 'taking place' of health and wellbeing: Towards non-representational theory. *Social Science and Medicine*, *108*, 210–222. Retrieved from http://dx.doi.org/10.1016/j.socscimed.2014.02.037 doi: 10.1016/j.socscimed.2014.02.037

Angeles, L. C., & Pratt, G. (2017). Empathy and Entangled Engagements: Critical-Creative Methodologies in Transnational Spaces. *GeoHumanities*, *3*(2), 269–278. Retrieved from https://www.tandfonline.com/doi/full/10.1080/2373566X.2017.1364655 doi: 10.1080/2373566X.2017.1364655

Armony, J. L. (1998). Affective computing. *Trends in cognitive sciences*, *2*(7), 270. Retrieved from http://www.sciencedirect.com/science/article/pii/S1364661398011905 doi: 10.1016/S1364-6613(98)01190-5

Armstrong, C. E. (2016). Teaching Innovation Through Empathy. *Management Teaching Review*, *1*(3), 164–169. Retrieved from http://journals.sagepub.com/doi/10.1177/2379298116636641 doi: 10.1177/2379298116636641

Ash, J. (2013). Rethinking affective atmospheres: Technology, perturbation and space times of the non-human. *Geoforum*, *49*, 20–28. Retrieved from http://dx.doi.org/10.1016/j.geoforum.2013.05.006 doi: 10.1016/j.geoforum.2013.05.006

Ash, J. (2015a). *The Interface Envelope: Gaming, Technology, Power*. London: Bloomsbury Publishing.

Ash, J. (2015b). Technology and affect: Towards a theory of inorganically organised objects. *Emotion, Space and Society*, *14*(1), 84–90. Retrieved from http://dx.doi.org/10.1016/j.emospa.2013.12.017 doi: 10.1016/j.emospa.2013.12.017

Ash, J. (2017). *Phase Media: Space, Time and the Politics of Smart Objects*. London: Bloomsbury Academic.

Ash, J., Kitchin, R., & Leszczynski, A. (2015). Digital turn, digital geography? *SSRN*, 1–26. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2674257

Ash, J., Kitchin, R., & Leszczynski, A. (2018). Digital turn, digital geographies? *Progress in Human Geography*, *42*(1), 25–43. doi: 10.1177/0309132516664800

Atkinson, J. M., & Heritage, J. (1984). *Structures of social action: Studies in conversation analysis*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511665868

Attridge-Stirling, J. (2001). Thematic networks: an analytic tool for qualitative research. *Qualitative Research*, *1*(3), 385–405. doi: 10.1177/1468794107085301

Auge, M. (1996). *Non-places: Introduction to an Anthropology of Supermodernity* (Vol. 20) (No. 402). Verso Books. doi: 10.1177/030981689606000111

Balestrini, M. (2017). *A City in Common: Explorations on Sustained Community Engagement with Bottom-up Civic Technologies* (Doctoral dissertation). doi: 10.1145/3025453.3025915

Balestrini, M., Cornejo, R., Marshall, P., Tentori, M. E., Bird, J., & Rogers, Y. (2016). Jukebox: Coordinating Shared Encounters in Public Spaces. In *Proceedings of the 19th acm conference on computer-supported cooperative work & social computing - cscw '16* (pp. 38–49). New York, New York, USA: ACM Press. Retrieved from http://dl.acm.org/citation.cfm?doid=2818048.2835203 doi: 10.1145/2818048.2835203

Balestrini, M., Diez, T., Marshall, P., Gluhak, A., & Rogers, Y. (2015, 10). Community Technologies : Leaving Users to Their Own Devices or Orchestration of Engagement? *EAI Endorsed Transactions IoT*, *1*(1), 1–11. Retrieved from http://eudl.eu/doi/10.4108/eai.26-10-2015.150601 doi: 10.4108/eai.26-10-2015.150601

Ballard, H. L., Robinson, L. D., Young, A. N., Pauly, G. B., Higgins, L. M., Johnson, R. F., & Tweddle, J. C. (2017). Contributions to conservation outcomes by natural history museum-led citizen science: Examining evidence and next steps. *Biological Conservation*, *208*, 87–97. Retrieved from http://dx.doi.org/10.1016/j.biocon.2016.08.040 doi: 10.1016/j.biocon.2016.08.040

Barile, N., & Sugiyama, S. (2015). The automation of taste: A theoretical exploration of mobile ICTs and social robots in the context of music consumption. *International Journal of Social Robotics*, *7*(3), 407–416. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc11&NEWS=N&AN=2015-04923-001 doi: 10.1007/s12369-015-0283-1

Barnes, B. (2001). Practices as collective action. In T. R.Schatzki, K. K. Cetina, & E. v. Savigny (Eds.), *The practice turn in contemporary theory* (pp. 25–36). London and New York: Routledge.

Barrera Lobatón, S. (2009). Reflexiones sobre Sistemas de Información Geográfica Participativos (SIGP) y cartografía social. *Cuadernos de geografía*, *18*, 9–23.

Benford, S., Schnadelbach, H., Koleva, B., Anastasi, R., Greenhalgh, C., Rodden, T., ... Steed, A. (2005). Expected, sensed, and desired: A framework for designing sensing-based interaction. *ACM Transactions on Computer-Human Interaction (TOCHI)*, *12*(1), 3–30. doi: 10.1145/1057237.1057239

Benjamin, W., & Tiedemann, R. (1999). *The arcades project*. Cambridge: Harvard University

Press.

Bennett, J. (2001). *The Enchantment of Modern Life. Attachments, Crossings, and Ethics*. Princeton, New Jersey: Princeton University Press.

Bennett, J. (2004). The force of things: Steps toward an ecology of matter. *Political Theory*, *32*(3), 347–372. doi: 10.1177/0090591703260853

Bennett, J. (2010). *Vibrant Matter, A Political Ecology of Things* (Vol. 64) (No. 1). Retrieved from http://journals.sagepub.com/doi/10.1177/2381336915617618 doi: 10.1177/2381336915617618

Bhala, A., & Tayde, K. (2015). Context Awareness in Mobile Computing. *International Journal of Advance Research in Computer Science and Management Studies*, *3*(7), 29. Retrieved from http://www.slideshare.net/bhardian/context-awareness-in-mobile-computing

Bickmore, T., & Cassell, J. (2005). Social Dialogue with Embodied Conversational Agents. In J. C. J. van Kuppevelt, L. Dybkjær, & N. O. Bernsen (Eds.), *Advances in natural multimodal dialogue systems* (pp. 23–54). Dordrecht: Springer Netherlands. doi: 10.1007/1-4020-3933-6{_}2

Bijker, W., Hughes, T., Pinch, T., & Douglas, D. G. (2012). *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Massachusets: MIT Press. Retrieved from https://books.google.es/books?id=B_Tas3u48f8C

Bijker, W., & Law, J. (Eds.). (1992). *Shaping technology/Building society: Studies in Sociotechnical Change*. Cambridge: The MIT Press.

Bille, M. (2015a). Hazy worlds: Atmospheric ontologies in Denmark. *Anthropological Theory*, *15*(3), 257–274. doi: 10.1177/1463499614564889

Bille, M. (2015b). Lighting up cosy atmospheres in Denmark. *Emotion, Space and Society*, *15*, 56–63. Retrieved from http://dx.doi.org/10.1016/j.emospa.2013.12.008 doi: 10.1016/j.emospa.2013.12.008

Bille, M. (2017). Ecstatic things: The power of light in shaping bedouin homes. *Home Cultures*, *14*(1), 25–49. Retrieved from https://doi.org/10.1080/17406315.2017.1319533 doi: 10.1080/17406315.2017.1319533

Bille, M., Bjerregaard, P., & Sørensen, T. F. (2015). Staging atmospheres: Materiality, culture, and the texture of the in-between. *Emotion, Space and Society*, *15*, 31–38. Retrieved from http://dx.doi.org/10.1016/j.emospa.2014.11.002 doi: 10.1016/j.emospa.2014.11.002

Bille, M., & Sørensen, F. T. (2007). An anthropology of luminosity: The agency of light. *Journal of Material Culture*, *12*(3), 263–284. doi: 10.1177/1359183507081894

Bissell, D. (2010). Passenger mobilities: Affective atmospheres and the sociality of public transport. *Environment and Planning D: Society and Space*, *28*(2), 270–289. doi: 10.1068/d3909

Bissell, D. (2015). Virtual infrastructures of habit: the changing intensities of habit through gracefulness, restlessness and clumsiness. *Cultural Geographies*, *22*(1), 127–146. doi: 10.1177/1474474013482812

Blandford, A. (2013). Semi-Structured Qualitative Studies. In M. Soegaard & R. F. e. Dam (Eds.), *The encyclopedia of human-computer intreraction.* Aahrus, Denmark: The Interaction Design Foundation.

Bleecker, J. (2009). Design Fiction: A Short Essay on Design, Science, Fact and Fiction. *Near Future Laboratory*(March), 49. Retrieved from http://tinyurl.com/nfl-dfiction

Bloom, P. (2017). *Against Empathy: The Case for Rational Compassion*. Random House.

Blythe, M., & Buie, E. (2014). Chatbots of the Gods: Imaginary Abstracts for Techno-Spirituality Research. *Proc. NordiCHI 2014*, 227–236. doi: 10.1145/2639189.2641212

Boal, A. (2000). *Theater of the Oppressed*. London: Pluto Press.

Bødker, S. (2006). When second wave HCI meets third wave challenges. In *Proceedings of the 4th nordic conference on human-computer interaction changing roles - nordichi '06* (pp. 1–8). New York, USA: ACM Press. Retrieved from http://portal.acm.org/citation.cfm?doid=1182475.1182476 doi: 10.1145/1182475.1182476

Bødker, S. (2017). Meaning and Ubiquitous Technologies. In S. Diniz Junqueira Barbosa & K. Breitman (Eds.), *Conversations around semiotic engineering* (pp. 13–20). Cham: Springer International Publishing. Retrieved from http://link.springer.com/10.1007/978-3-319-56291-9http://link.springer.com/10.1007/978-3-319-56291-9_3 doi: 10.1007/978-3-319-56291-9{_}3

Bødker, S., & Christiansen, E. (2012). Poetry in motion. *Proceedings of the 30th European Conference on Cognitive Ergonomics - ECCE '12*, 78. Retrieved from http://dl.acm.org/citation.cfm?doid=2448136.2448152 doi: 10.1145/2448136.2448152

Bødker, S., & Klokmose, C. N. (2011). The Human–Artifact Model: An Activity Theoretical Approach to Artifact Ecologies. *Human–Computer Interaction*, *26*(4), 315–371. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/07370024.2011.626709 doi: 10.1080/07370024.2011.626709

Bødker, S., & Klokmose, C. N. (2015). A dialectical take on artifact ecologies and the physical-digital divide. In *Proceedings of the 33rd annual acm conference extended abstracts on human factors in computing systems* (pp. 2401–2404). New York: ACM.

Bødker, S., Korsgaard, H., & Saad-Sulonen, J. (2016). 'A Farmer, a Place and at least 20 Members- The Development of Artifact Ecologies in Volunteer-based Communities. *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing - CSCW '16*, 1140–1154. Retrieved from http://dl.acm.org/citation.cfm?doid=2818048.2820029 doi: 10.1145/2818048.2820029

Bødker, S., Lyle, P., & Saad-Sulonen, J. (2017). Untangling the Mess of Technological Artifacts. *Proceedings of the 8th International Conference on Communities and Technologies - C&T '17*, 246–255. Retrieved from http://dl.acm.org/citation.cfm?doid=3083671.3083675 doi: 10.1145/3083671.3083675

Boehner, K., DePaula, R., Dourish, P., & Sengers, P. (2005). Affect: From Information to Interaction. *Proceedings of the Fourth decennial conference on Critical Commputing*, 59–68. doi: 10.1145/1094562.1094570

Boehner, K., DePaula, R., Dourish, P., & Sengers, P. (2007). How emotion is made and measured. *International Journal of Human Computer Studies*, *65*(4), 275–291. doi: 10.1016/j.ijhcs.2006.11.016

Boehner, K., Sengers, P., & Warner, S. (2008). Interfaces with the Ineffable: Meeting Aesthetic Experience on its Own Terms. *ACM Transactions on Computer-Human Interaction*, *15*(3), 1–29. Retrieved from http://portal.acm.org/citation.cfm?id=1453155&dl=GUIDE&coll=GUIDE&CFID=28066560&CFTOKEN=33786385# doi: 10.1145/1453152.1453155

Böhme, G. (1993). Atmosphere as the fundamental concept of new aesthetics. *Thesis Eleven*(36), 113–126. doi: 10.1177/072551369303600107

Böhme, G. (2014). Light and Space. On the phenomenology of Light. *Dialogue and Universalism*, *4*(4), 62–73.

Borgmann, K., & Sneep, D. (2016). Innovative Methods and New Technology in Urban Research : An Interdisciplinary Reflection on the ' Action Camera ' -Approach. In *Proceedings of 11 th international forum of knowledge assets dynamics 2016, towards a new architecture of knowledge: Big data, culture and creativity* (pp. 2084–2097). Dresden, Germany.

Bourdieu, P. (1989). Social Space and Symbolic Power. *Sociological Theory*, *7*(1), 14–25. Retrieved from http://www.jstor.org/stable/202060

Bourdieu, P., Accardo, A., Balazs, G., Stéphane, B., Bonvin, F., & Bourdieu, E. (1999). *The Weight of the World. Social Suffering in Contemporary Society*. Stanford, CA: Stanford University Press.

Bouvin, N. O., Brodersen, C., Bødker, S., Hansen, A., & Klokmose, C. N. (2006). A Comparative Study of Map Use. In *Chi '06 extended abstracts on human factors in computing systems* (pp. 592–597). New York, NY, USA: ACM. Retrieved from http://doi.acm.org/10.1145/1125451.1125575 doi: 10.1145/1125451.1125575

Brahnam, S. (2009). Building Character for Conversational Agents : Ethos, Credibility and Believability. *PsychNology Journal*, *7*(1), 9–47.

Brambilla, G., Picone, M., Cirani, S., Amoretti, M., & Zanichelli, F. (2014). A Simulation Platform for Large-Scale Internet of Things Scenarios in Urban Environments. *Proceedings of the The First International Conference on IoT in Urban Space*, 50–55. Retrieved from http://dl.acm.org/citation.cfm?id=2694768.2694780 doi: 10.4108/icst.urb-iot.2014.257268

Brenner, N. (2009, 6). What is critical urban theory? *City*, *13*(2-3), 198–207. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/13604810902996466 doi: 10.1080/13604810902996466

Bryan, J. (2011). Walking the line: Participatory mapping, indigenous rights, and neoliberalism. *Geoforum*, *42*(1), 40–50. Retrieved from http://dx.doi.org/10.1016/j.geoforum.2010.09.001 doi: 10.1016/j.geoforum.2010.09.001

Bull, M. (2013). The End of Flânerie: iPods, Aesthetics, and Urban Experience. *Throughout: art and culture emerging with ubiquitous computing*, 351–364.

Bulley, D., & Johnson, H. L. (2018, 12). Ethics at the airport border: Flowing, dwelling and atomising. *Environment and Planning D: Society and Space*, *36*(2), 217–235. Retrieved from http://journals.sagepub.com/doi/10.1177/0263775817747728 doi: 10.1177/0263775817747728

Butcher, M. (2017). Re-working encounter: the role of reflexivity in managing difference. *Social & Cultural Geography*, *9365*, 1–20. Retrieved from https://www.tandfonline.com/doi/full/10.1080/14649365.2017.1346198 doi: 10.1080/14649365.2017.1346198

Cadman, L. (2009). Nonrepresentational theory/nonrepresentational geographies. *International encyclopaedia of human geography*, 1–8. doi: 10.1016/B978-008044910-4.00717-3

Caldwell, G. A., & Foth, M. (2014). DIY media architecture: Open and participatory ap-

proaches to community engagement. *Proceedings of the 2014 Media Architecture Biennale*, 1–10. Retrieved from http://eprints.qut.edu.au/77903/5/77903b.pdf doi: 10.1145/2682884.2682893

Calvino, I. (1974). *Invible cities*. New York: Harcourt Brace Jovanovich.

Canet, M., & Guljajeva, V. (2017). *Katusepoid.* Retrieved from http://www.varvarag.info/katusepoisid/

Caquard, S. (2013). Cartography II: Collective cartographies in the social media era. *Progress in Human Geography*, *38*(1), 141–150. Retrieved from http://phg.sagepub.com/content/early/2013/11/27/0309132513514005.abstracthttp://phg.sagepub.com/cgi/doi/10.1177/0309132513514005 doi: 10.1177/0309132513514005

Carpiano, R. M. (2009, 3). Come take a walk with me: The "Go-Along" interview as a novel method for studying the implications of place for health and well-being. *Health and Place*, *15*(1), 263–272. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S1353829208000622 doi: 10.1016/j.healthplace.2008.05.003

Casey, E. S. (1998). *The Fate of Place: A Philosophical History*. University of California Press.

Casey, E. S. (2001). Between Geography and Philosophy: What Does It Mean to Be in the Place-World? *Annals of the Association of American Geographers*, *91*(4), 683–693. Retrieved from http://www.tandfonline.com/doi/abs/10.1111/0004-5608.00266 doi: 10.1111/0004-5608.00266

Casper, M. J., & Latour, B. (2000). Pandora's Hope: Essays on the Reality of Science Studies. *Contemporary Sociology*, *29*(5), 754. Retrieved from http://www.jstor.org/stable/2655272?origin=crossref doi: 10.2307/2655272

Cassell, J. (2000). Embodied conversational interface agents. *Communications of the ACM*, *43*(4), 70–78. Retrieved from http://dl.acm.org/citation.cfm?id=332075 doi: 10.1145/332051.332075

Cassell, J., Nakano, Y. I., Bickmore, T. W., Sidner, C. L., & Rich, C. (2001). Annotating and Generating Posture from Discourse Structure in Embodied Conversational Agents. *Workshop on Representating, Annotating, and Evaluating Non-Verbal and Verbal Communicative Acts to Achieve Contextual Embodied Agents, Autonomous Agents 2001 Conference*, *29*. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.21.171

Catenazzi, A., Quintar, A., Cravino, M. C., De Representaçao, N., & Novick, A. (2009). *El retorno político a la cuestión urbana. Teritorialidad y acción pública en el Área Metropolitana de Buenos Aires*. Los Polvorines: Universidad Nacional de General Sarmiento.

Clarke, A. J. E. (2010). *Design Anthropology: Object Culture in the 21st Century*. New York: Springer. doi: 10.1017/CBO9781107415324.004

Coole, D., & Frost, S. (2010). New Materialisms. Ontology, Agency, and Politics. *Duke University Press*, 347. Retrieved from http://read.dukeupress.edu/content/9780822392996/9780822392996 doi: 10.1215/9780822392996

Coote, J., & Shelton, A. (1992). *Anthropology, Art, and Aesthetics*. Oxford: Clarendon Press.

Cosgrove, D. (2008). *Geography & Vision: Seeing, Imagining and Representing the World*. London: I.B.Tauris.

Costanza-Chock, S. (2018). Design Justice: Towards an Intersectional Feminist Framework for Design Theory and Practice. In *Proceedings of the design research society*

2018. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3189696 doi: 10.21606/dma.2017.679

Coulton, P., Huck, J., Hudson-Smith, A., Barthel, R., Mavros, P., Roberts, J., & Powell, P. (2014). Designing interactive systems to encourage empathy between users. *Proceedings of the 2014 companion publication on Designing interactive systems - DIS Companion '14*, 13–16. Retrieved from http://dl.acm.org/citation.cfm?doid=2598784.2602770 doi: 10.1145/2598784.2602770

Coutard, O., & Guy, S. (2007). STS and the City: Politics and Practices of Hope. *Science, Technology & Human Values*, *32*(6), 713–734. doi: 10.1177/0162243907303600

Cox, A., Gould, S., Cecchinato, M., Iacovides, I., & Renfree, I. (2016). Design Frictions for Mindful Interactions: The Case for Microboundaries. *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, 1389–1397. Retrieved from http://dl.acm.org/citation.cfm?doid=2851581.2892410 doi: 10.1145/2851581.2892410

Crabtree, a., & Chamberlain, A. (2013, 7). Introduction to the Special Issue of "The Turn to The Wild". *ACM Transactions on Computer-Human Interaction*, *20*(3), 1–4. Retrieved from http://dl.acm.org/citation.cfm?id=2491501http://dl.acm.org/citation.cfm?doid=2491500.2491501 doi: 10.1145/2491500.2491501

Crabtree, A., Nichols, D., O'Brien, J., Rouncefield, M., & Twidale, M. (2000). Ethnomethodologically-Informed ethnography and information system design. *Journal of the American Society for Information Science*, *51*(7), 666–682. Retrieved from http://eprints.lancs.ac.uk/11825/

Crabtree, A., Rodden, T., Tolmie, P., & Button, G. (2009). Ethnography considered harmful. *Proceedings of the 27th international conference on Human factors in computing systems - CHI 09*(October 2015), 879–888. Retrieved from http://dl.acm.org/citation.cfm?doid=1518701.1518835 doi: 10.1145/1518701.1518835

Crampton, J. W., & Krygier, J. (2005). An introduction to critical cartography. *ACME: an International E-journal for Critical Geographies*, *4*(1), 11–33.

Crawford, K. (2016). *Artificial Intelligence's White Guy Problem - The New York Times.* Retrieved from http://www.nytimes.com/2016/06/26/opinion/sunday/artificial-intelligences-white-guy-problem.html?smid=tw-share&_r=0

Cunha, D. G., Marques, J. F., De Resende, J. C., De Falco, P. B., De Souza, C. M., & Loiselle, S. A. (2017). Citizen science participation in research in the environmental sciences: key factors related to projects' success and longevity. *Anais da Academia Brasileira de Ciências*, *89*(3 suppl), 2229–2245. Retrieved from http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0001-37652017000502229&lng=en&tlng=en doi: 10.1590/0001-3765201720160548

Damasio, A. R. (1999). *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. New York: Harcourt Brace. doi: 10.1176/appi.ps.51.12.1579

Davis, C. A., Varol, O., Ferrara, E., Flammini, A., & Menczer, F. (2016, 2). BotOrNot: A System to Evaluate Social Bots. In *Proceedings of the 25th international conference companion on world wide web* (pp. 273–274). Retrieved from http://arxiv.org/abs/1602.00975http://dx.doi.org/10.1145/2872518.2889302 doi: 10.1145/2872518.2889302

Davis, M. H. (1994). *Empathy: A social psychological approach.* London: Routledge.

Debord, G. (1955). Introduction to a Critique of Urban Geography. *Les Lèvres Nues #6*.

De Certeau, M. (1984). *The practice of everyday life*. California: University of California Press.

De Certeau, M. (2002). Spatial stories. In A. Ballantyne (Ed.), *What is architecture* (pp. 72–87). Psychology Press.

Degbelo, A., Granell, C., Trilles, S., Bhattacharya, D., Casteleyn, S., & Kray, C. (2016). Opening up Smart Cities: Citizen-Centric Challenges and Opportunities from GIScience. *ISPRS International Journal of Geo-Information*, *5*(2).

Degen, M., Melhuish, C., & Rose, G. (2017). Producing place atmospheres digitally: architecture, digital visualisation practices and the experience economy. *Journal of Consumer Culture*, *17*(1), 1–25.

Deleuze, G., & Guattari, F. (1991). *What Is Philosophy?* New York City: Columbia University Press.

Deleuze, G., Guattari, P., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia* (Vol. 19) (No. 4). doi: 10.1017/CCO9780511753657.008

Deleuze, G., & Hurley, R. (1988). *Spinoza: Practical Philosophy*. City Lights Publishers.

Depew, D. (2005). Empathy, Psychology, and Aesthetics: Reflections on a Repair Concept. *Poroi: An Interdisciplinary Journal of Rhetorical Analysis and Invention*, *4*(1), 99–107. Retrieved from http://ir.uiowa.edu/poroi/vol4/iss1/6 doi: 10.13008/2151-2957.1033

de Waal, M. (2014). *The City as Interface: How New Media Are Changing the City Reflect*. Rotterdam: nai010.

Dirksmeier, P., & Helbrecht, I. (2008). Time , Non-representational Theory and the " Performative Turn " — Towards a New Methodology in Qualitative Social Research. *FORUM: QUALITATIVE SOCIAL RESEARCH*, *9*(2).

DiSalvo, C., Jenkins, T., & Lodato, T. (2016). Designing Speculative Civics. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, 4979–4990. Retrieved from http://doi.acm.org/10.1145/2858036.2858505 doi: 10.1145/2858036.2858505

Dodge, M., Kitchin, R., & Perkins, C. (Eds.). (2009). *Rethinking Maps*. Oxon: Routledge. Retrieved from http://www.amazon.com/dp/0415461529http://phg.sagepub.com/cgi/doi/10.1177/0309132507077082

Dodge, M., Kitchin, R., Perkins, C., Dodge, M., & Perkins, C. (2011). *The Map Reader: Theories of Mapping Practice and Cartographic Representation*. Wiley-Blackwell. doi: 10.1007/s10980-013-9899-4

Don, A., Brennan, S., Laurel, B., & Shneiderman, B. (1992). Anthropomorphism: from Eliza to Terminator 2. *CHI '92: Proceedings of the SIGCHI conference on Human factors in computing systems*, 67–70. Retrieved from citeulike-article-id:133571%5Cnhttp://dx.doi.org/10.1145/142750.142760 doi: http://doi.acm.org/10.1145/142750.142760

Dotson, T. (2013). Design for Community: Toward a Communitarian Ergonomics. *Philosophy & Technology*, *26*(2), 139–157. Retrieved from http://link.springer.com/10.1007/s13347-013-0100-4 doi: 10.1007/s13347-013-0100-4

Dotson, T. (2015, 12). Technological Determinism and Permissionless Innovation as Technocratic Governing Mentalities: Psychocultural Barriers to the Democratization of

Technology. *Engaging Science, Technology, and Society*, *1*, 98–120. Retrieved from http://estsjournal.org/article/view/8 doi: 10.17351/ests2015.009

Dourish, P. (2001, 10). *Where the Action Is: The Foundations of Embodied Interaction* (Vol. 36) (No. 3). Cambridge, MA: MIT Press. Retrieved from http://www.mitpressjournals.org/doi/abs/10.1162/leon.2003.36.5.412 doi: 10.1162/leon.2003.36.5.412

Dourish, P. (2013). Epilogue: Where the Action Was, Wasn 't, Should Have Been and Migh Yet Be. *ACM Transactions on Computer-Human Interaction*, *20*(1), 10–13. Retrieved from http://dl.acm.org/citation.cfm?doid=2442106.2442108 doi: 10.1145/2442106.2442108

Dourish, P. (2016). Algorithms and their Others: Algorithmic Culture in Context. *Big Data & Society*(December), 1–11. doi: 10.1177/2053951716665128

Dourish, P., & Bell, G. (2007). The infrastructure of experience and the experience of infrastructure: Meaning and structure in everyday encounters with space. *Environment and Planning B: Planning and Design*, *34*(3), 414–430. doi: 10.1068/b32035t

Dourish, P., & Bell, G. (2011). *Divining a digital future: Mess and mythology in ubiquitous computing*. Cambridge: The MIT Press.

Dourish, P., & Bell, G. (2014). "resistance is futile": Reading science fiction alongside ubiquitous computing. *Personal and Ubiquitous Computing*, *18*(4), 769–778. doi: 10.1007/s00779-013-0678-7

Dourish, P., & Button, G. (1998, 12). On "Technomethodology": Foundational Relationships Between Ethnomethodology and System Design. *Human-Computer Interaction*, *13*(4), 395–432. Retrieved from http://www.tandfonline.com/doi/abs/10.1207/s15327051hci1304_2 doi: 10.1207/s15327051hci1304{_}2

Downey, D., Kinane, I., & Parker, E. (Eds.). (2016). *Landscapes of Liminality: Between Space and Place*. London: Rowman & Littlefield Publishers, Inc.

Duff, C. (2010). On the role of affect and practice in the production of place. *Environment and Planning D: Society and Space*, *28*(5), 881–895. doi: 10.1068/d16209

Duff, C. (2011). Networks, resources and agencies: On the character and production of enabling places. *Health and Place*, *17*(1), 149–156. doi: 10.1016/j.healthplace.2010.09.012

Duff, C. (2012). Exploring the role of 'enabling places' in promoting recovery from mental illness: A qualitative test of a relational model. *Health & Place*, *18*(6), 1388–1395. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S135382921200130X doi: 10.1016/j.healthplace.2012.07.003

Duff, C. (2017). The affective right to the city. *Transactions of the Institute of British Geographers*, *42*(4), 516–529. doi: 10.1111/tran.12190

Duneier, M., & Molotch, H. (1999). Talking City Trouble: Interactional Vandalism, Social Inequality, and the "Urban Interaction Problem". *American Journal of Sociology*, *104*(5), 1263–1524. doi: 10.1086/210175

Dunne, A. (2005). *Hertzian Tales. Electronic Products, Aesthetic Experience, and Critical Design*. Cambridge, Massachusets: The MIT Press. doi: 10.1017/CBO9781107415324.004

Edensor, T. (Ed.). (2010). *Geographies of Rhythm: Nature, Place, Mobilities and Bodies*. Manchester: Ashgate.

Edensor, T. (2012). Illuminated atmospheres: Anticipating and reproducing the flow of

affective experience in Blackpool. *Environment and Planning D: Society and Space*, *30*(6), 1103–1122. doi: 10.1068/d12211

Edensor, T. (2015). The gloomy city: Rethinking the relationship between light and dark. *Urban Studies*, *52*(3), 422–438. doi: 10.1177/0042098013504009

Edensor, T., & Sumartojo, S. (2018). Reconfiguring Familiar Worlds with Light Projection: The Gertrude Street Projection Festival, 2017. *GeoHumanities*, *4*(1), 112–131. Retrieved from https://doi.org/10.1080/2373566X.2018.1446760 doi: 10.1080/2373566X.2018.1446760

Ekman, P. (2004). *Emotions Revealed, Second Edition: Recognizing Faces and Feelings to Improve Communication and Emotional Life*. New York: Times Books.

Elwood, S., & Mitchell, K. (2015). Technology, memory, and collective knowing. *Cultural Geographies*, *22*(1), 147–154. doi: 10.1177/1474474014556062

Endsley, M. R. (1995). Toward a theory of situation awareness in Dinamic Systems. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, *37*(1), 32–64. doi: 10.1518/001872095779049543

Endsley, M. R., Bolté, B., & Jones, D. G. (2004). *Designing for Situation Awareness: An Approach to User-Centered Design*. CRC Press.

Erwine, B. (2012). Multidimensional space - Environmental poetics. In *Ambiances in action / ambiances en acte(s) - international congress on ambiances, montreal 2012* (pp. 577–582).

Erwine, B. (2016). *Creating Sensory Spaces: The Architecture of the Invisible*. London: Routledge. Retrieved from https://books.google.es/books?id=Si4lDwAAQBAJ

Escolar, M. (2003). Exploration, Cartography and the Modernization of State Power. In *State/space* (pp. 27–52). Malden, MA, USA: Blackwell Publishing. Retrieved from http://doi.wiley.com/10.1002/9780470755686.ch2 doi: 10.1002/9780470755686.ch2

Eubanks, V. (2018). *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York: St. Martin's Press.

Fainstein, S. S. (2014, 1). The just city. *International Journal of Urban Sciences*, *18*(1), 1–18. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/12265934.2013.834643 doi: 10.1080/12265934.2013.834643

Fallman, D. (2008). The Interaction Design Research Triangle of Design Practice, Design Studies, and Design Exploration. *Design Issues*, *24*(3), 4–18. doi: 10.1162/desi.2008.24.3.4

Farías, I. (2011). The politics of urban assemblages. *City*, *15*(3-4), 365–374. doi: 10.1080/13604813.2011.595110

Fernandez González, M. (2015). *La Smart City Como Imaginario Socio-Tecnológico. La Construcción De La Utopía Urbana Digital* (Doctoral dissertation, Universidad del País Vasco). Retrieved from http://hdl.handle.net/10810/19301

Fernández-pinto, I., López-pérez, B., & Márquez, M. (2008). Empatía: Medidas, teorías y aplicaciones en revisión. *Anales de psicología*, *24*(2), 284–298. Retrieved from http://www.redalyc.org/articulo.oa

Ferrara, E., Varol, O., Davis, C., Menczer, F., & Flammini, A. (2016, 6). The rise of social bots. *Communications of the ACM*, *59*(7), 96–104. Retrieved from http://arxiv.org/abs/1407.5225http://dl.acm.org/citation.cfm?doid=2963119.2818717 doi: 10

.1145/2818717

Flores-Saviaga, C., Savage, S. E., & Taraborelli, D. (2016). LeadWise: Using Online Bots to Recruite and Guide Expert Volunteers. In *Proceedings of the 19th acm conference on computer supported cooperative work and social computing companion - cscw '16 companion* (pp. 257–260). New York, New York, USA: ACM Press. Retrieved from http://dl.acm.org/citation.cfm?doid=2818052.2869106 doi: 10.1145/2818052.2869106

Foth, M. (2008). Networking Serendipitous Social Encounters in Urban Neighbourhoods. In E. Eyob (Ed.), *Social implications of data mining and information privacy* (pp. 71–87). IGI Global. Retrieved from http://services.igi-global.com/resolvedoi/resolve.aspx?doi=10.4018/978-1-60566-196-4.ch005 doi: 10.4018/978-1-60566-196-4.ch005

Foth, M. (2009). *Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City*. Hershey, PA: Idea Group Inc (IGI). Retrieved from http://books.google.com/books?id=tZh3VimmzTgC

Foth, M. (2017). Participation, Co-Creation, and Public Space. *The Journal of Public Space*, *2*(4), 21. Retrieved from https://www.journalpublicspace.org/article/view/139 doi: 10.5204/jps.v2i4.139

Foth, M., Brynskov, M., & Ojala, T. (2015). *Citizen's right to the digital city urban interfaces, activism, and placemaking*. doi: 10.1007/978-981-287-919-6

Foth, M., Choi, J. H.-j., & Satchell, C. (2011). Urban informatics. *Proceedings of the ACM 2011 Conference on Computer Supported Work*, 1–8. doi: 10.1145/1958824.1958826

Fraser, N. (1990). Rethinking the Public Sphere: A Contribution to the Critique of Actually Existing Democracy. *Social Text*, *26*(25/26), 56–80. Retrieved from http://www.jstor.org/stable/466240?origin=crossref doi: 10.2307/466240

Frauenberger, C., Foth, M., & Fitzpatrick, G. (2018). On scale, dialectics, and affect. In *Proceedings of the 15th participatory design conference on full papers - pdc '18* (pp. 1–13). New York, New York, USA: ACM Press. Retrieved from http://dl.acm.org/citation.cfm?doid=3210586.3210591 doi: 10.1145/3210586.3210591

Freedberg, D., & Gallese, V. (2007). Motion, emotion and empathy in esthetic experience. *Trends in Cognitive Sciences*, *11*(5), 197–203. doi: 10.1016/j.tics.2007.02.003

Fritsch, J., & Jacobsen, M. (2017). The Voice Pump: An Affectively Engaging Interface for Changing Attachments. *Proceedings of the 2017 ACM Conference Companion Publication on Designing Interactive Systems*, 265–269. Retrieved from http://doi.acm.org/10.1145/3064857.3079158 doi: 10.1145/3064857.3079158

Fuller, M. (2005). *Media Ecologies: Materialist energies in Art and Technoculture*. Cambridge, Mass.: The MIT Press. Retrieved from https://books.google.pt/books?id=1FLIHNPucroC

Gajendar, U. (2016). Empathizing with the smart and invisible. *Interactions*, *23*(4), 24–25. Retrieved from http://dl.acm.org/citation.cfm?doid=2965632.2935195 doi: 10.1145/2935195

Gallagher, M., Kanngieser, A., & Prior, J. (2016). Listening geographies. *Progress in Human Geography*, *41*(5), 030913251665295. Retrieved from http://journals.sagepub.com/doi/10.1177/0309132516652952 doi: 10.1177/0309132516652952

Gallese, V. (2003). The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity. *Psychopathology*, *36*(4), 171–180. doi: 10.1159/000072786

Galloway, A. R. (2006). *The Interface Effect* (Vol. 18). Cambridge: Polity Press. doi: 10.1017/CBO9781107415324.004

Gandy, M. (2017). Urban atmospheres. *Cultural Geographies*, *24*(3), 353–374. doi: 10.1177/1474474017712995

Garcia Ramon, M. D., & Albet, A. (2000). Pre-Olympic and Post-Olympic Barcelona, a 'Model' for Urban Regeneration Today? *Environment and Planning A: Economy and Space*, *32*(8), 1331–1334. Retrieved from https://doi.org/10.1068/a3331 doi: 10.1068/a3331

Garfinkel, H. (2013). Introduction. In *Ethnometodology's program: working out durkheim's aphorism* (Vol. 53, pp. 1689–1699). doi: 10.1017/CBO9781107415324.004

Geertz, C. (1973). *The interpretation of cultures: selected essays*. New York: Basic Books.

Gehl, J. (2010). *Cities for people*. Washington DC: Island Press. Retrieved from http://books.google.pt/books?id=lBNJoNILqQcC

Geller, T. (2016, 4). Can Chatbots Think Before They Talk? *Communications of the ACM*, 13–14. Retrieved from http://cacm.acm.org/news/201579-can-chatbots-think-before-they-talk/fulltext

Gerlach, J. (2014). Lines, contours and legends: Coordinates for vernacular mapping. *Progress in Human Geography*, *38*(1), 22–39. Retrieved from http://journals.sagepub.com/doi/10.1177/0309132513490594 doi: 10.1177/0309132513490594

Geurts, P. K. (2003). *Culture and the Senses: Bodily Ways of Knowing in an African Community*. California: University of California Press.

Giaccardi, E., Cila, N., Speed, C., Caldwell, M., & Cruz, S. (2016). Thing Ethnography : Doing Design Research with Non-Humans. In *Proceedings of the 2016 acm conference on designing interactive systems* (pp. 377–387). New York: ACM.

Gibson, J. J. (1977). The Theory of Affordances. In *Perceiving, acting, and knowing: Toward an ecological psychology* (Vol. Perceiving, pp. 127–142). London: Routledge.

Gifford, R. (2014). Environmental psychology matters. *Annual review of psychology*, *65*(September), 541–79. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/24050189 doi: 10.1146/annurev-psych-010213-115048

Girardin, F. (2009). *Aspects of Implicit and Explicit Human Interactions With Ubiquitous Geographic Information* (Doctoral dissertation, Pompeu Fabra). Retrieved from http://www.girardin.org/fabien/publications/thesis/girardin_phd_dissertation.pdf

Goebel, R. (2012). Intelligent Virtual Agents. In Y. Nakano, M. Neff, A. Paiva, & M. Walker (Eds.), *12th international conference, iva 2012, santa cruz, ca, usa, september, 12-14, 2012. proceedings* (Vol. 7502). Berlin, Heidelberg: Springer Berlin Heidelberg. Retrieved from http://link.springer.com/10.1007/978-3-642-33197-8 doi: 10.1007/978-3-642-33197-8

Goffman, E. (2013). *Encounters: Two Studies in the Sociology of Interaction*. Mansfield Centre: Martino Fine Books. Retrieved from https://books.google.es/books?id=-c2SngEACAAJ

Gomez, R., Szapiro, D., Galindo, K., & Nakamura, K. (2018). Haru: Hardware Design of an Experimental Tabletop Robot Assistant. In *Proceedings of the 2018 acm/ieee international conference on human-robot interaction* (pp. 233–240). New York, NY, USA: ACM. Retrieved from http://doi.acm.org/10.1145/3171221.3171288 doi: 10.1145/3171221.3171288

Goodchild, M. F., & Michael F. Goodchild, U. O. C. (2007). Assertion and Authority : the Science User- Generated Geographic Content. In *Proceedings of the colloquium for andrew u. frank's 60th birthday* (pp. 1–18).

Goodspeed, R. (2015). Smart cities: moving beyond urban cybernetics to tackle wicked problems. *Cambridge Journal of Regions, Economy and Society*, *8*(1), 79–92. Retrieved from http://cjres.oxfordjournals.org/lookup/doi/10.1093/cjres/rsu013 doi: 10.1093/cjres/rsu013

Goth, G. (2016). Deep or shallow, NLP is breaking out. *Communications of the ACM*, *59*(3), 13–16. Retrieved from http://dl.acm.org/citation.cfm?doid=2897191.2874915 doi: 10.1145/2874915

Graham, S., & Marvin, S. (2001). *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*. Routledge London. doi: 10.4324/9780203452202

Granell, C., Bhattacharya, D., Casteleyn, S., Degbelo, A., Gould, M., Kray, C., … Trilles, S. (2018). GEO-C: ENABLING OPEN CITIES AND THE OPEN CITY TOOLKIT. *ISPRS - International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *XLII-4/W8*, 61–68. Retrieved from https://www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XLII-4-W8/61/2018/ doi: 10.5194/isprs-archives-XLII-4-W8-61-2018

Greenfield, A. (2013). *Against the Smart City (The city is here for you to use Book 1)*. New York City: Do projects.

Greenfield, A. (2017). *Radical technologies: the design of everyday life*. Verso. Retrieved from https://books.google.co.il/books/about/Radical_Technologies.html?id=qTOVDAEACAAJ&redir_esc=y

Griffero, T. (2014). *Atmospheres: Aesthetics of Emotional Spaces*. Surrey: Ashgate Publishing, Ltd.

Guljajeva, V., & Canet, M. (2013). *Binoculars to... Binoculars from...*. Retrieved from http://www.varvarag.info/binoculars/

Haklay, M. (2013). Neogeography and the delusion of democratisation. *Environment and Planning A*, *45*(1), 55–69. Retrieved from http://epn.sagepub.com/lookup/doi/10.1068/a45184 doi: 10.1068/a45184

Hall, P. (1988). *Cities of Tomorrow: An Intellectual History of Urban Planning and Design Since 1880*. Blackwell Publishing Ltd.

Harrison, S., Sengers, P., & Tatar, D. (2011). Making epistemological trouble: Third-paradigm HCI as successor science. *Interacting with Computers*, *23*(5), 385–392. Retrieved from http://dx.doi.org/10.1016/j.intcom.2011.03.005 doi: 10.1016/j.intcom.2011.03.005

Harrison, S., Tatar, D., & Sengers, P. (2007). The three paradigms of HCI. In *Alt. chi. session at the sigchi conference on human factors in computing systems* (pp. 1–18). San Jose, California. Retrieved from http://people.cs.vt.edu/~srh/Downloads/HCIJournalTheThreeParadigmsofHCI.pdf doi: 10.1234/12345678

Harvey, D. (2014). *Rebel cities. from the right to the city to the right to the urban revolution* (Vol. 40) (No. 119). London ; New York: Verso. doi: 10.4067/S0250-71612014000100013

Healy, S. (2014). Atmospheres of consumption: Shopping as involuntary vulnerability. *Emo-*

tion, Space and Society, *10*(1), 35–43. Retrieved from http://dx.doi.org/10.1016/j.emospa.2012.10.003 doi: 10.1016/j.emospa.2012.10.003

Helander, M., & Tham, M. P. (2003). Hedonomics–affective human factors design. *Ergonomics*, *46*(13-14), 1269–1272. doi: 10.1080/00140130310001610810

Heritage, J. (1991). *Garfinkel and Ethnomethodology*. Wiley.

Hinrichs, U., & Carpendale, S. (2011). Gestures in the wild: studying multi-touch gesture sequences on interactive tabletop exhibits. *Annual Conference on Human factors in computing systems (CHI'11)*, 3023–3032. Retrieved from http://dl.acm.org/citation.cfm?doid=1978942.1979391 doi: 10.1145/1978942.1979391

Hoenen, M., Lübke, K. T., & Pause, B. M. (2016). Non-anthropomorphic robots as social entities on a neurophysiological level. *Computers in Human Behavior*, *57*, 182–186. doi: 10.1016/j.chb.2015.12.034

Holloway, J. (2006). Enchanted Spaces: The Séance, Affect and Geographies of Religion. *Annals of the Association of American Geographers*, *96*(1), 182–187.

Holmes, M. (2018). *Face-to-Face Diplomacy: Social Neuroscience and International Relations*. Cambridge University Press. doi: 10.1017/9781108264761

Höök, K., Dalsgaard, P., Reeves, S., Bardzell, J., Löwgren, J., Stolterman, E., & Rogers, Y. (2015). Knowledge Production in Interaction Design. *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '15*, 2429–2432. Retrieved from http://dl.acm.org/citation.cfm?id=2702613.2702653 doi: 10.1145/2702613.2702653

Hubal, R. C., Fishbein, D. H., Sheppard, M. S., Paschall, M. J., Eldreth, D. L., & Hyde, C. T. (2008). How do varied populations interact with embodied conversational agents? Findings from inner-city adolescents and prisoners. *Computers in Human Behavior*, *24*(3), 1104–1138. doi: 10.1016/j.chb.2007.03.010

Hughes, T. P. (1987). The evolution of large technological systems. In W. E. Bijker, T. P. Hughes, & T. Pinch (Eds.), *The social construction of technological systems: New directions in the sociology and history of technology* (pp. 51–82). The MIT Press.

Husserl, E. (2012). *Investigaciones Lógicas* (Vol. XXXIII) (No. 2). Retrieved from http://www.scielo.cl/pdf/udecada/v15n26/art06.pdf doi: 10.1007/s13398-014-0173-7.2

Ishikawa, T., & Takahashi, K. (2013). Relationships between Methods for Presenting Information on Navigation Tools and Users ' Wayfinding Behavior. *Cartographic perspectives*, *75*(75), 17–28.

Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Vintage Books. doi: 10.2307/794509

Jaramillo, C. M., & Mora-Páez, H. (2004). APROXIMACIÓN A LA CONSTRUCCIÓN DE CARTOGRAFÍA SOCIAL A TRAVÉS DE LA GEOMÁTICA. *Ventana informática*, *enero-juni*(11), 129–146.

Jefferson, G. (2004). Glossary of transcript symbols with an introduction. In G. H. Lerner (Ed.), *Conversational analysis: Studies from the first generation* (pp. 13–31). John Benjamins Publishing Company.

Jenkins, T., Dantec, C. A. L., Disalvo, C., Lodato, T., & Asad, M. (2016). Object-Oriented Publics. In *Proceedings of the 2016 chi conference on human factors in computing systems* (pp. 827–839). Santa Clara, California, USA: ACM.

Jensen, C. B., & Morita, A. (2015). Infrastructures as Ontological Experiments. *Engaging*

Science, Technology, and Society, *1*, 81–87.

Joye, Y. (2007). Architectural Lessons From Environmental Psychology: The Case of Biophilic Architecture. *Review of General Psychology*, *11*(4), 305–328. doi: 10.1037/1089-2680.11.4.305

Jung, H., Stolterman, E., Ryan, W., Thompson, T., & Siegel, M. M. (2008). Toward a framework for ecologies of artifacts: how are digital artifacts interconnected within a personal life? *Proceedings of the 5th Nordic conference on Human-computer interaction: building bridges*, 201–210. doi: 10.1145/1463160.1463182

Kallis, G. (2011). In defence of degrowth. *Ecological Economics*, *70*(5), 873–880. Retrieved from http://dx.doi.org/10.1016/j.ecolecon.2010.12.007 doi: 10.1016/j.ecolecon.2010.12.007

Karrholm, M. (2007). The Materiality of Territorial Production: A Conceptual Discussion of Territoriality, Materiality, and the Everyday Life of Public Space. *Space and Culture*, *10*(4), 437–453. doi: 10.1177/1206331207304356

Kaye, J., & Dourish, P. (2014, 4). Special issue on science fiction and ubiquitous computing. *Personal and Ubiquitous Computing*, *18*(4), 765–766. Retrieved from http://link.springer.com/10.1007/s00779-014-0773-4 doi: 10.1007/s00779-014-0773-4

Kefalidou, G., & Sharples, S. (2016, 5). Encouraging serendipity in research: Designing technologies to support connection-making. *International Journal of Human-Computer Studies*, *89*, 1–23. Retrieved from http://dx.doi.org/10.1016/j.ijhcs.2016.01.003http://linkinghub.elsevier.com/retrieve/pii/S1071581916000045 doi: 10.1016/j.ijhcs.2016.01.003

Kidd, D. C., & Castano, E. (2013). Reading literary fiction improves theory of mind. *Science (New York, N.Y.)*, *342*(6156), 377–80. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/24091705 doi: 10.1126/science.1239918

Kientz, J. A., & Wobbrock, J. (2016). Research contributions in Human-Computer Interaction. *Interactions*, 38–44. doi: 10.1145/2907069

Kim, A. M. (2015). Critical cartography 2.0: From "participatory mapping" to authored visualizations of power and people. *Landscape and Urban Planning*, *142*, 215–225. Retrieved from http://dx.doi.org/10.1016/j.landurbplan.2015.07.012 doi: 10.1016/j.landurbplan.2015.07.012

Kinsley, S. (2012). Futures in the making: Practices to anticipate 'ubiquitous computing'. *Environment and Planning A*, *44*(7), 1554–1569. doi: 10.1068/a45168

Kitchin, R. (2013, 11). The real-time city? Big data and smart urbanism. *GeoJournal*, *79*(1), 1–14. Retrieved from http://link.springer.com/10.1007/s10708-013-9516-8 doi: 10.1007/s10708-013-9516-8

Kitchin, R., & Dodge, M. (2011). *Code/space: Software and Everyday Life* (Vol. 46). MIT Press. Retrieved from http://www.amazon.com/Code-Space-Software-Everyday-Studies/dp/0262042487 doi: 10.1080/00343404.2012.696477

Kitchin, R., Gleeson, J., & Dodge, M. (2013). Unfolding mapping practices: a new epistemology for cartography. *Transactions of the Institute of British Geographers*, *38*(3), 480–496. Retrieved from http://doi.wiley.com/10.1111/j.1475-5661.2012.00540.x doi: 10.1111/j.1475-5661.2012.00540.x

Knox, H., O'Doherty, D., Vurdubakis, T., & Westrup, C. (2008). Enacting airports: Space, movement and modes of ordering. *Organization*, *15*(6), 869–888. doi: 10.1177/

1350508408095818

Krüger, A., & Kuflik, T. (Eds.). (2012). *Ubiquitous Displays Environments*. New York: Springer. doi: 10.1007/978-3-642-27663-7

Kukka, H., Luusua, A., Ylipulli, J., Suopajärvi, T., Kostakos, V., & Ojala, T. (2014). From cyberpunk to calm urban computing: Exploring the role of technology in the future cityscape. *Technological Forecasting and Social Change*, *84*, 29–42. Retrieved from http://dx.doi.org/10.1016/j.techfore.2013.07.015 doi: 10.1016/j.techfore.2013.07.015

Kullenberg, C., & Kasperowski, D. (2016). What is citizen science? - A scientometric meta-analysis. *PLoS ONE*, *11*(1), 1–16. Retrieved from http://dx.doi.org/10.1371/journal.pone.0147152 doi: 10.1371/journal.pone.0147152

Lammes, S., Perkins, C., Gekker, A., Hind, S., Wilmott, C., & Evans, D. (Eds.). (2018). *Time for mapping: Cartographic Temporalities*. Manchester, UK: Manchester University Press.

Latour, B. (1996). On actor-network theory. A few clarificaitons plus more than a few complications. *Soziale Welt*, *25*(3), 1–16. Retrieved from http://www.bruno-latour.fr/sites/default/files/P-67ACTOR-NETWORK.pdf doi: 10.2307/40878163

Latour, B. (2004). How to Bring the Sciences into Democracy. *Politics of Nature*, 9–32. Retrieved from http://www.hup.harvard.edu/catalog.php?isbn=9780674013476&content=reviews doi: 10.1007/s10746-005-9016-z

Latour, B. (2006). *Reassembling the Social: An introduction to Actor-Network Theory*. Oxford: Oxford University Press, USA.

Latour, B. (2008). A Cautious Prometheus? A Few Steps Toward a Philosophy of Design (with Special Attention to Peter Sloterdijk). *Design History Society*, 2.

Latour, B. (2011a). Drawing things together. *The map reader: Theories of mapping practice and cartographic representation*, 65–72.

Latour, B. (2011b). Networks, societies, spheres: Reflections of an actor-network theorist. *International Journal of Communication*, *5*(1), 796–810. doi: 10.1111/1468-2427.00309

Latour, B. (2012). *We Have Never Been Modern*. Harvard University Press. Retrieved from https://books.google.es/books?id=xbnK8NzMsm4C

Latour, B. (2013). *An Inquiry into Modes of Existence: An Anthropology of the Moderns*. Cambridge: Harvard University Press.

Latour, B. (2014). Technical does not mean material. *HAU: Journal of Ethnographic Theory*, *4*(1), 507. doi: 10.14318/hau4.1.033

Latour, B., & Weibel, P. (2005). *Making Things Public - Atmospheres of Democracy* (B. Latour & P. Weibel, Eds.). doi: 10.1080/14649360903572382

Laurel, B. (1993). *Computers as Theatre*. Boston: Addison Wesley Longman.

Laurier, E. (2014). Noticing. In *The sage handbook of human geography* (pp. 254–276). SAGE Publications.

Laurier, E., Brown, B., & McGregor, M. (2016, 1). Mediated Pedestrian Mobility: Walking and the Map App. *Mobilities*, *0101*(March), 1–18. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/17450101.2015.1099900?journalCode=rmob20 doi: 10.1080/17450101.2015.1099900

Law, J. (1992). Notes on the Theory of the Actor-Network: Ordering, Stretegy, and Heterogeneity. *Systems Practice*, *5*(4), 379–393.

Law, J. (1994). *Organizing modernity: Social Ordering and Social Theory*. Cambridge: Blackwell Publishing.

Law, J. (2008). On sociology and STS. *Sociological Review*, *56*(4), 623–649. doi: 10.1111/j.1467-954X.2008.00808.x

Law, J., & Ruppert, E. (2013). THE SOCIAL LIFE OF METHODS: Devices. *Journal of Cultural Economy*, *6*(3), 229–240. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/17530350.2013.812042 doi: 10.1080/17530350.2013.812042

Lefebvre, H. (1968). *Le droit ala ville*. Paris: Anthopos.

Lemaignan, S., Fink, J., & Dillenbourg, P. (2014). The dynamics of anthropomorphism in robotics. *Proceedings of the 2014 ACM/IEEE international conference on Human-robot interaction - HRI '14*, 226–227. Retrieved from http://dl.acm.org/citation.cfm?doid=2559636.2559814 doi: 10.1145/2559636.2559814

Lerner, G. H. (2004). *Conversation Analysis: Studies from the first generation*. Amsterdam: John Benjamins Publishing Company.

Leszczynski, A. (2015, 12). Spatial media/tion. *Progress in Human Geography*, *39*(6), 729–751. Retrieved from http://phg.sagepub.com/cgi/doi/10.1177/0309132514558443 doi: 10.1177/0309132514558443

Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology*, *31*(3), 207–230. Retrieved from http://dx.doi.org/10.1016/j.jenvp.2010.10.001 doi: 10.1016/j.jenvp.2010.10.001

Liberman, K. (2012a). On Reflexivity. *Uma ética para quantos?*, *XXXIII*(2), 81–87. doi: 10.1007/s13398-014-0173-7.2

Liberman, K. (2012b). Semantic Drift in Conversations. *Human Studies*, *35*, 263–277. doi: 10.1007/s10746-012-9225-1

Liberman, K. (2014a). Following Sketched Maps. In *More studies in ethnomethodology* (pp. 45–82). Albany: State University of New York Press.

Liberman, K. (2014b). *More studies in Ethnomethodology* (No. 1). Albany: State University of New York Press. doi: 10.1007/s13398-014-0173-7.2

Lindley, J., & Sharma, D. (2014). An Ethnography of the Future. In *'strangers in strange lands' - an anthropology and science fiction symposium*. Canterbury: University of Kent.

Lindvig, K. (2018, 5). The implied PhD student of interdisciplinary research projects within monodisciplinary structures. *Higher Education Research & Development*, 1–15. Retrieved from https://doi.org/10.1080/07294360.2018.1474343 doi: 10.1080/07294360.2018.1474343

Lockton, D. (2013). *Design with Intent: A design pattern toolkit for environmental & social behaviour change* (Unpublished doctoral dissertation). Brunel University.

Logan, J., & Molotch, H. (1987). *Urban Fortunes: The Political Economy of Place*. California: University of California Press. Retrieved from http://mirlyn.lib.umich.edu/Record/005634570 doi: 10.2747/0272-3638.11.2.179

Lottridge, D., Chignell, M., & Jovicic, A. (2011). Affective Interaction: Understanding, Evaluating, and Designing for Human Emotion. *Reviews of Human Factors and Ergonomics*, *7*(1), 197–217. doi: 10.1177/1557234X11410385

Luger, E., & Sellen, A. (2016). "Like Having a Really Bad PA". In *Proceedings of the 2016 chi conference on human factors in computing systems - chi '16* (pp. 5286–5297). New York, New York, USA: ACM Press. Retrieved from http://dl.acm.org/citation.cfm

?doid=2858036.2858288 doi: 10.1145/2858036.2858288

Lupton, D. (2017). How does health feel? Towards research on the affective atmospheres of digital health. *Digital Health*, *3*, 205520761770127. Retrieved from http://journals.sagepub.com/doi/10.1177/2055207617701276 doi: 10.1177/2055207617701276

Lynch, K. (1960). *The Image of the City*. Cambridge: The MIT Press. doi: 10.2307/427643

Lynch, M. (1994). *Scientific practice and ordinary action*. Cambridge: Cambridge University Press. Retrieved from http://ebooks.cambridge.org/ref/id/CBO9780511625473 doi: 10.1017/CBO9780511625473

MacKenzie, D., & Millo, Y. (2003). Constructing a Market, Performing Theory: The Historical Sociology of a Financial Derivatives Exchange. *American Journal of Sociology*, *109*(1), 107–145. Retrieved from https://doi.org/10.1086/374404 doi: 10.1086/374404

Manzo, L. C. (2005). For better or worse: Exploring multiple dimensions of place meaning. *Journal of Environmental Psychology*, *25*(1), 67–86. doi: 10.1016/j.jenvp.2005.01.002

Marcuse, P., & Mayer, M. (2011). *Searching for the Just City: Debates in Urban Theory and Practice*. London: Routledge.

Marshall, G. R. E., & Hooker, C. (2016). Empathy and affect: What can empathied bodies do? *Medical Humanities*, *42*(2), 128–134. doi: 10.1136/medhum-2015-010818

Marshall, P., Antle, A., Hoven, E. V. D., & Rogers, Y. (2013). Introduction to the special issue on the theory and practice of embodied interaction in HCI and interaction design. *ACM Transactions on Computer-Human Interaction*, *20*(1), 1–3. Retrieved from http://dl.acm.org/citation.cfm?doid=2442106.2442107 doi: 10.1145/2442106.2442107

Massey, D. (2005). *For Space*. London: SAGE Publications.

Massumi, B. (2002). *Parables for the Virtual: Movement, Affect, Sensation*. Duke University Press. doi: 10.1215/9780822383574

Massumi, B. (2015). *Politics of Affect*. Cambridge, UK: Polity Press.

Mattern, S. (2018). Databodies in Codespace. *Places Journal*(April). Retrieved from https://doi.org/10.22269/180417 doi: 10.22269/180417

McAndrew, F. T. (1993). *Environmental psychology*. Thomson Brooks/Cole.

McCormack, D. P. (2003). An event of geographical ethics in spaces of affect. *Transactions of the Institute of British Geographers*, *28*(4), 488–507. doi: 10.1111/j.0020-2754.2003.00106.x

McCullough, M. (2013). *Ambient commons: Attention in the Age of Embodied Information*. Cambridge, Massachusets: The MIT Press.

McKeown, C. (2013). *Designing for Situation Awareness: An Approach to User-Centered Design* (Vol. 56) (No. 4). Retrieved from http://www.tandfonline.com/doi/abs/10.1080/00140139.2013.793052 doi: 10.1080/00140139.2013.793052

McLuhan, M. (1994). *Understanding Media*. Cambridge, Massachusets: MIT Press.

Mcshane, C. (1999). The Origins and Globalization of Traffic Control Signals. *Journal of Urban History*, *25*(3), 379–404. Retrieved from https://doi.org/10.1177/009614429902500304 doi: 10.1177/009614429902500304

Memarovic, N., Langheinrich, M., Alt, F., Elhart, I., Hosio, S., & Rubegni, E. (2012). Using public displays to stimulate passive engagement, active engagement, and discovery in public spaces. *Proceedings of the 4th Media Architecture Biennale Conference on Participation (MAB '12)*, 55–64. Retrieved from http://dl.acm.org/citation.cfm?id=2421076.2421086 doi: 10.1145/2421076.2421086

Merleau-Ponty, M. (1962). *Phenomenology of Perception*. London: Routledge.

Merriman, P. (2016). Mobility Infrastructures: Modern Visions, Affective Environments and the Problem of Car Parking. *Mobilities*, *11*(1), 83–98. Retrieved from http://www.tandfonline.com/doi/full/10.1080/17450101.2015.1097036 doi: 10.1080/17450101.2015.1097036

Mestre Escrivá, V., Navarro Frías, M. D., & García Samper, P. (2004). La Medida De La Empatía: Análisis Del Interpersonal Reactivity Index. *Psicothema*, *16*(2), 255–260.

Michael, M. (2000). These Boots Are Made for Walking...: Mundane Technology, the Body and Human-Environment Relations. *Body and Society*, *6*(3-4), 107–126. doi: 10.1177/1357034X00006003006

Michels, C., & Steyaert, C. (2017). By accident and by design: Composing affective atmospheres in an urban art intervention. *Organization*, *24*(1), 79–104. doi: 10.1177/1350508416668190

Middleton, J. (2010). Sense and the city: exploring the embodied geographies of urban walking. *Social & Cultural Geography*, *11*(6), 575–596. Retrieved from http://dx.doi.org/10.1080/14649365.2010.497913 doi: 10.1080/14649365.2010.497913

Misselhorn, C. (2009). Empathy with inanimate objects and the uncanny valley. *Minds and Machines*, *19*(3), 345–359. doi: 10.1007/s11023-009-9158-2

Molotch, H. (2002). Place in Product. *International Journal of Urban and Regional Research*, *26.4*(December 2002), 665–688.

Molotch, H. (2011). Objects and the City. In G. Bridge & S. Watson (Eds.), *The new blackwell companion to the city* (pp. 66–78). Oxford: Blackwell Publishing Ltd.

Molotch, H. L. (2012). *Against Security: How we go wrong at airports, subways, and other sites of amiguous danger*. Princeton and Oxford: Princeton University Press.

Montgomery, C. (2013). *Happy City: Transforming Our Lives Through Urban Design*. New York: Farrar, Straus and Giroux.

More, T. (2012). *Utopia*. Penguin Books Limited. Retrieved from https://books.google.es/books?id=vg-GUo9a9JIC

Mori, M., MacDorman, K. F., & Kageki, N. (2012). The uncanny valley. *IEEE Robotics and Automation Magazine*, *19*(2), 98–100. doi: 10.1109/MRA.2012.2192811

Morozov, E. (2014). *To save Everything, click here. The folly of Technological solutionism* (No. 1). doi: 10.1007/s13398-014-0173-7.2

Moser, I. (2005). on Becoming Disabled and Articulating Alternatives. *Cultural Studies*, *19*(6), 667–700. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/09502380500365648 doi: 10.1080/09502380500365648

Moser, I. (2006). Disability and the promises of technology: Technology, subjectivity and embodiment within an order of the normal. *Information, Communication & Society*, *9*(3), 373–395. doi: 10.1080/13691180600751348

Muller, M. J. (2003). Participatory Design: The Third Space in Human-Computer Interaction. In J. A. Jacko & A. Sears (Eds.), *The human-computer interaction handbook* (pp. 1051–1068). Hillsdale, NJ, USA: L. Erlbaum Associates Inc. Retrieved from http://dl.acm.org/citation.cfm?id=772072.772138

Münch, D. (1990, 1). The Early Work of Husserl and Artificial Intelligence. *Journal of the British Society for Phenomenology*, *21*(2), 107–120. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/00071773.1990.11006889 doi: 10.1080/

00071773.1990.11006889

Murdoch, J. (1998). The spaces of actor-network theory. *Geoforum*, *29*(4), 357–374. doi: 10.1016/S0016-7185(98)00011-6

Murphie, A. (1996). Computers Are Not Theatre. The Machine in the Ghost in Gilles Deleuze and Félix Guattari's Thought. *Convergence*, *2*(2), 80–110.

Najafi, M., Kamal, M., & Mohd, B. (2011). The Concept of Place and Sense of Place In Architectural Studies. *World Academy of Science, Engineering and Technology 56*, *5*(8), 1100–1106.

Nardi, B., & Kaptelinin, V. (2006). *Acting with Technology: Activity Theory and Interaction Design*. London, England: The MIT Press.

Nasar, J. L. (1994). Urban Design Aesthetics: The Evaluative Qualities of Building Exteriors. *Environment and Behavior*, *26*(3), 377–401. doi: 10.1177/001391659402600305

Nass, C. I., Steuer, J., & Tauber, E. R. (1994). Computers are social actors. In *Computer-human interaction (chi) conference: Celebrating interdependence 1994* (pp. 72–78). doi: 10.1145/259963.260288

Norberg-Schulz, C. (1980). *Genius Loci: Towards a phenomenology of architecture*. New York: Rizzolli.

Norman, D. A. (2004). *Emotional Design: Why we love (or hate) everyday things*. New York: Basic Books.

Nova, N. (2007). *The Influences of Location Awareness on Computer-Supported Collaboration* (Unpublished doctoral dissertation). École Polytechnique Fedérale de Lausanne.

Nova, N. (Ed.). (2014). *Beyond Design Ethnography. How Designers Practice Ethnographic Research*. Geneva: Geneva University of Art and Design.

Nova, N. (2015). Design Ethnography? Towards a Designerly Approach to Field Research. In D. Bihanic (Ed.), *Empowering users through design interdisciplinary studies and combined approaches for technological products and services* (pp. 119–128). Switzerland: Springer.

Nova, N., Girardin, F., & Dillenbourg, P. (2010). The effects of mutual location-awareness on group coordination. *International Journal of Human Computer Studies*, *68*(7), 451–467. Retrieved from http://dx.doi.org/10.1016/j.ijhcs.2009.12.007 doi: 10.1016/j.ijhcs.2009.12.007

November, V., Camacho-Hübner, E., & Latour, B. (2010). Entering a risky territory: Space in the age of digital navigation. *Environment and Planning D: Society and Space*, *28*(4), 581–599. Retrieved from http://www.envplan.com/abstract.cgi?id=d10409 doi: 10.1068/d10409

Okamoto, M., Yang, Y., & Ishida, T. (2001). Wizard of Oz Method for Learning Dialog Agents. In M. Klusch & F. Zambonelli (Eds.), *Cooperative information agents v: 5th international-workshop, cia 2001 modena, italy, september 6–8, 2001 proceedings* (pp. 20–25). Berlin, Heidelberg: Springer Berlin Heidelberg. Retrieved from http://dx.doi.org/10.1007/3-540-44799-7_3 doi: 10.1007/3-540-44799-7{_}3

Owens, J. (2016). *My friend, the bot.* Retrieved from https://medium.com/@hautepop/my-friend-the-bot-373e3b7dac60#.3f8amdycy

O'Hara, K., Harper, R., Mentis, H., Sellen, A., & Taylor, A. (2013). On the Naturalness of Touchless : Putting the " Interaction " Back into NUI. *ACM Transactions on Computer-Human Interaction*, *20*(1), 1–25. doi: 10.1145/2442106.2442111

PAN Studio Limited. (2014). *A Fork in the Road.* Retrieved from http://panstudio.co.uk/project/fork-in-the-road/

PAN Studio Limited, Galik, G., & Armitage, T. (2013). *Hello Lamp Post.* Retrieved from http://www.hellolamppost.co.uk

Paraskevopoulou, O., Charitos, D., & Rizopoulos, C. (2008). Prácticas artísticas basadas en la localización que desafían la noción tradicional de cartografía. *Artnodes, Revista de arte, ciencia y tecnología*, *8*(Locative media y práctica artística: exploraciones sobre el terreno). Retrieved from http://artnodes.uoc.edu

Partala, T., Surakka, V., & Lahti, J. (2004). Affective Effects of Agent Proximity in Conversational Systems. In *Proceedings of the third nordic conference on human-computer interaction* (pp. 353–356). New York, NY, USA: ACM. Retrieved from http://doi.acm.org/10.1145/1028014.1028070 doi: 10.1145/1028014.1028070

Pasquinelli, M. (2016). *Abnormal Encephalization in the Age of Machine Learning.* Retrieved from http://www.e-flux.com/journal/abnormal-encephalization-in-the-age-of-machine-learning/

Pearson, K. (1896). Mathematical Contributions to the Theory of Evolution. III. Regression, Heredity, and Panmixia. *Philosophical Transactions of the Royal Society of London. Series A, Containing Papers of a Mathematical or Physical Character*, *187*, 253–318. Retrieved from http://www.jstor.org/stable/90707

Pedwell, C. (2012). Affective (self-) transformations: Empathy, neoliberalism and international development. *Feminist Theory*, *13*(2), 163–179. Retrieved from https://doi.org/10.1177/1464700112442644 doi: 10.1177/1464700112442644

Pedwell, C. (2014). *Affective Relations: the Transnational Politics of Empathy*. London: Palgrave Macmillan.

Picard, R., Vyzas, E., & Healey, J. (2001). Toward machine emotional intelligence: analysis of affective,physiological state. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, *23*(10), 1175–1191. doi: 10.1109/34.954607

Picard, R. W. (1997). Affective Computing. *Affective Computing*, 304. doi: 10.1007/BF01238028

Pile, S. (2010). Emotions and effect in recent human geography. *Transactions of the Institute of British Geographers*, *35*(1), 5–20. doi: 10.1111/j.1475-5661.2009.00368.x

Plantinga, C., & Smith, G. M. (1999). *Passionate Views: Film, Cognition and Emotion*. Baltimore: The Johns Hopkins University Press.

Portela, M., & Granell-Canut, C. (2016). Methods to Observe and Evaluate Interactions with Everyday Context-Aware Objects. In *Ubiquitous computing and ambient intelligence* (pp. 385–392). Springer. Retrieved from http://www.springer.com/us/book/9783319487458 doi: 10.1007/978-3-319-48746-5{_}39

Preece, J., Rogers, Y., & Sharp, H. (2002). Interaction Design: Beyond Human-Computer Interaction. *Design*, *18*(1), 68–68. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0010448586800215 doi: 10.1016/S0010-4485(86)80021-5

Puig de la Bellacasa, M. (2017). *Matters of Care: Speculative Ethics in More Than Human Worlds*. Minneapolis: University of Minnesota Press. doi: 10.15713/ins.mmj.3

Purnell, C. (2017). *The Sensational Past: How the Enlightenment Changed the Way We Use Our Senses*. W. W. Norton. Retrieved from https://books.google.pt/books?id=P0t8DAAAQBAJ

Qaurooni, D., Ghazinejad, A., Kouper, I., & Ekbia, H. (2016). Citizens for Science and Science for Citizens. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16*, 1822–1826. Retrieved from http://dl.acm.org/citation.cfm?id=2858036.2858575 doi: 10.1145/2858036.2858575

Quercia, D., Schifanella, R., & Aiello, L. M. (2014, 7). The shortest path to happiness. In *Proceedings of the 25th acm conference on hypertext and social media - ht '14* (pp. 116–125). New York, New York, USA: ACM Press. Retrieved from http://arxiv.org/abs/1407.1031http://dl.acm.org/citation.cfm?doid=2631775.2631799 doi: 10.1145/2631775.2631799

Radicchi, A. (2017). The Notion of Soundscape in the Realm of Sensuous Urbanism: A Historical Perspective. In A. Wilson (Ed.), *Listen! sound worlds from the body to the city. cambridge.* Cambridge: Cambridge Scholars Publishing. doi: 10.1002/ddrr.12

Ratti, C., Claudel, M., Wells, H. G., & Lang, F. (2015). Futurecraft : Tomorrow by Design. *Techne: Journal of Technology for Architecture and Environment*, *10*, 28–33. doi: 10.13128/Techne-17498

Reckwitz, A. (2008). Toward a theory of social practices: A development in culturalist theorizing. *European Journal of Social Theory*, *5*(2), 243–263. doi: 10.1177/13684310222225432

Relph, E. (1976). *Place and placelessness.* London, England: Pion Limited.

Relph, E. (2016). The Paradox of Place and the Evolution of Placelessness. In R. Freestone & E. Liu (Eds.), *Place and placelessness revisited* (p. 278). Routledge.

Robertson, T. (2002, 9). The Public Availability of Actions and Artefacts. *Computer Supported Cooperative Work (CSCW)*, *11*(3-4), 299–316. Retrieved from http://link.springer.com/10.1023/A:1021214827446 doi: 10.1023/A:1021214827446

Roche, S. (2014). Geographic Information Science I: Why does a smart city need to be spatially enabled? *Progress in Human Geography*, *38*(5), 0309132513517365-. Retrieved from http://phg.sagepub.com/content/early/2014/02/06/0309132513517365.abstract doi: 10.1177/0309132513517365

Roche, S. (2016). Geographic information science II: Less space, more places in smart cities. *Progress in Human Geography*, *40*(4), 565–573. doi: 10.1177/0309132515586296

Rogers, Y. (2004). New theoretical approaches for HCI. *Annual Review of Information Science and Technology*(38), 1–43. doi: 10.1002/aris.1440380103

Rogers, Y. (2006). Moving on from Weiser's Vision of Calm Computing: engaging UbiComp experiences. *Ubicomp '06*, 404–421. Retrieved from http://www.springer.com/uk/home/generic/search/results?SGWID=3-40109-22-173677111-0 doi: 10.1007/11853565{_}24

Rogers, Y. (2011). Interaction design gone wild: striving for wild theory. *Interactions*, *18*(4), 58–62. Retrieved from http://discovery.ucl.ac.uk/1325107/ doi: http://dx.doi.org/10.1145/1978822.1978834

Rogers, Y., & Marshall, P. (2017). Research in the Wild. *Synthesis Lectures on Human-Centered Informatics*, *10*(3), i–97.

Rose, G. (2017). Posthuman Agency in the Digitally Mediated City: Exteriorization, Individuation, Reinvention. *Annals of the American Association of Geographers*, *4452*(March), 1–15. Retrieved from https://www.tandfonline.com/doi/full/10.1080/24694452.2016.1270195 doi: 10.1080/24694452.2016.1270195

Rose, G., Degen, M., & Basdas, B. (2010). More on 'big things': Building events and feelings. *Transactions of the Institute of British Geographers*, *35*(3), 334–349. doi: 10.1111/j.1475-5661.2010.00388.x

Rose, G., Degen, M., & Melhuish, C. (2014). Networks, interfaces, and computer-generated images: learning from digital visualisations of urban redevelopment projects. *Environment and Planning D: Society and Space*, *32*(3), 386–403. Retrieved from http://epd.sagepub.com/lookup/doi/10.1068/d13113p doi: 10.1068/d13113p

Rose, G., & Hall, W. (2016). Rethinking the geographies of cultural 'objects' through digital technologies: interface, network and friction. *Progress in Human Geography*, *40*(3), 1–31.

Rosier, M., & Chomko, J. (2014). *Shadowing.* Retrieved from https://www.playablecity.com/projects/shadowing/%0A

Royal Schiphol Group. (2017). *Schiphol Airport Park.* Retrieved from https://www.schiphol.nl/en/facilities/airport-park/

R.Schatzki, T., Cetina, K. K., & Savigny, E. v. (Eds.). (2001). *The practice turn in contemporary theory*. London and New York: Routledge. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0956522103000290 doi: 10.1016/S0956-5221(03)00029-0

Ruijten, P. A. M., Midden, C. J. H., & Ham, J. (2016). Ambiguous Agents: The Influence of Consistency of an Artificial Agent's Social Cues on Emotion Recognition, Recall, and Persuasiveness. *International Journal of Human-Computer Interaction*, *32*(9), 734–744. Retrieved from http://www.tandfonline.com/doi/full/10.1080/10447318.2016.1193350 doi: 10.1080/10447318.2016.1193350

Russell, J. A., & Lanius, U. F. (1984). Adaptation level and the affective appraisal of environments. *Journal of Environmental Psychology*, *4*(2), 119–135. doi: 10.1016/S0272-4944(84)80029-8

Sacks, H. (1992). *Lectures on Conversation* (Vol. 1). Wiley. doi: 10.1002/9781444328301

Sacks, H., Schegloff, E. A., & Jefferson, G. (1974). A Simplest Systematics for the Organization of Turn-Taking for Conversation. In *Language* (Vol. 50, pp. 696–735). Linguistic Society of America. Retrieved from http://www.jstor.org/stable/412243

Salim, F., & Haque, U. (2015). Urban computing in the wild: A survey on large scale participation and citizen engagement with ubiquitous computing, cyber physical Systems, and internet of Things. *International Journal of Human-Computer Studies*, *81*(Transdisciplinary Approaches to Urban Computing), 31–48. Retrieved from http://www.sciencedirect.com/science/article/pii/S1071581915000488 doi: 10.1016/j.ijhcs.2015.03.003

Santos, V. (2016). Artes e Cultura nas Cidades Inteligentes. In (p. 13). Retrieved from https://www.researchgate.net/publication/301231432

Satchell, C., & Dourish, P. (2009). Beyond The User: Use And Non-Use in HCI. *Proceedings of the Annual Conference of the Australian Computer-Human Interaction Special Interest Group (OZCHI '09)*(November), 9 - 16. Retrieved from http://douri.sh/publications/2009/nonuse-ozchi.pdf doi: 10.1145/1738826.1738829

Savage, S., Monroy-hernandez, A., & Hollerer, T. (2016). Botivist : Calling Volunteers to Action using Online Bots. *19th ACM conference on Computer-Supported Cooperative Work and Social Computing*, 813–822. Retrieved from http://research.microsoft

.com/apps/pubs/default.aspx?id=256068 doi: 10.1145/2818048.2819985

Scacchi, W. (2004). Socio-technical design. *The encyclopedia of human-computer interaction*(1), 656–659. Retrieved from http://services.igi-global.com/resolvedoi/resolve.aspx?doi=10.4018/978-1-60566-264-0 doi: 10.4018/978-1-60566-264-0

Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartite organizing framework. *Journal of Environmental Psychology*, *30*(1), 1–10. Retrieved from http://dx.doi.org/10.1016/j.jenvp.2009.09.006 doi: 10.1016/j.jenvp.2009.09.006

Schmidt, A. (2005). Interactive Context-Aware Systems Interacting with Ambient Intelligence. In G. Riva, F. Vatalaro, F. Davide, & M. Alcañiz (Eds.), *Ambient intelligence* (pp. 159–178). IOS Press. Retrieved from http://www.neurovr.org/emerging/book5/09_AMI_Schmidt.pdf

Segal, L. (2017). *Radical Happiness: Moments of Collective Joy*. New York: Verso Books.

Sengers, P., Boehner, K., Mateas, M., & Gay, G. (2008). The disenchantment of affect. *Personal and Ubiquitous Computing*, *12*(5), 347–358. doi: 10.1007/s00779-007-0161-4

Sennett, R. (1992). *The conscience of the eye: The design and social life of cities*. New York: WW Norton & Company.

Shamai, S. S. (1991). Sense of Place: an Empirical Measuremen. *Geoforum*, *22(3)*(3), 347–358. Retrieved from http://www.sciencedirect.com/science/article/pii/001671859190017K doi: 10.1016/0016-7185(91)90017-K

Sheller, M. (2004a). Automotive emotions: feeling the car. *Theory, Culture and Soceity*, *21*(May), 221–242.

Sheller, M. (2004b, 2). Mobile Publics: Beyond the Network Perspective. *Environment and Planning D: Society and Space*, *22*(1), 39–52. Retrieved from http://epd.sagepub.com/lookup/doi/10.1068/d324t doi: 10.1068/d324t

Sieber, R. E., & Haklay, M. (2015, 12). The epistemology(s) of volunteered geographic information: a critique. *Geo: Geography and Environment*, *2*(2), 122–136. Retrieved from http://doi.wiley.com/10.1002/geo2.10 doi: 10.1002/geo2.10

Smyth, M., & Helgason, I. (2013). Tangible possibilities—envisioning interactions in public space. *Digital Creativity*, *24*(1), 75–87. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/14626268.2013.769454 doi: 10.1080/14626268.2013.769454

Soja, E. W. (1985). The Spatiality of Social Life: Towards a Transformative Retheorisation. In D. Gregory & J. Urry (Eds.), *Social relations and spatial structures* (pp. 90–127). London: Macmillan Education UK. doi: 10.1007/978-1-349-27935-7{_}6

Soja, E. W. (1996). The Trialectics of Spatiality. In *Thirdspace* (pp. 53–82). Blackwell Publishing.

Sørensen, H., & Kjeldskov, J. (2014). Concepts of Multi-artifact Systems in Artifact Ecologies. In *7th international conference on advances in computer-human interaction* (pp. 141–146). IARIA. Retrieved from http://people.cs.aau.dk/~jesper/pdf/conferences/Kjeldskov-C74.pdf

Sørensen, T. F. (2015). More than a feeling: Towards an archaeology of atmosphere. *Emotion, Space and Society*, *15*, 64–73. Retrieved from http://dx.doi.org/10.1016/j.emospa.2013.12.009 doi: 10.1016/j.emospa.2013.12.009

Spiegelberg, H. (1981). “Intention” and “Intentionality” in the Scholastics, Brentano and

Husserl. In *The context of the phenomenological movement.* (Vol. 80, pp. 3–26). Dordrecht: Springer.

Springgay, S., & Truman, S. E. (2018a). On the Need for Methods Beyond Proceduralism: Speculative Middles, (In)Tensions, and Response-Ability in Research. *Qualitative Inquiry*, *24*(3), 203–214. doi: 10.1177/1077800417704464

Springgay, S., & Truman, S. E. (2018b). *Walking Methodologies in a More-than-Human World: WalkingLAb*. London: Routledge.

Steinbock, A. J. (2004). Affection and Attention: On the Phenomenology of Becoming Aware. *Continental Philosophy Review*, *37*(1), 21–43. doi: 10.1023/B:MAWO.0000049298.44397.be

Sterling, B. (2014). *The Epic Struggle of the Internet of Things*. Strelka Press. Retrieved from https://books.google.com/books?id=fBtorgEACAAJ&pgis=1

Storper, M., & Scott, A. J. (2016, 5). Current debates in urban theory: A critical assessment. *Urban Studies*, *53*(6), 1114–1136. Retrieved from http://usj.sagepub.com/cgi/doi/10.1177/0042098016634002 doi: 10.1177/0042098016634002

Subrahmanian, V. S., Azaria, A., Durst, S., Kagan, V., Galstyan, A., Lerman, K., ... Hwang, T. (2016, 1). The DARPA Twitter Bot Challenge. *CoRR*. Retrieved from http://arxiv.org/abs/1601.05140http://dx.doi.org/10.1109/MC.2016.183 doi: 10.1109/MC.2016.183

Suchman, L. (2015). SITUATIONAL AWARENESS: DEADLY BIOCONVERGENCE AT THE BOUNDARIES OF BODIES AND MACHINES. *MediaTropes eJournal*, *V*(1), 1–24.

Suchman, L. A. (2007). *Human-Machine Reconfigurations: Plans and Situated Actions* (2nd Editio ed.). New York: Cambridge University Press.

Sui, D., Elwood, S., & Goodchild, M. F. (2013). *Crowdsourcing Geographic Knowledge* (D. Sui, S. Elwood, & M. Goodchild, Eds.). Dordrecht: Springer Netherlands. Retrieved from http://www.springerlink.com/content/978-94-007-4586-5/contents/ doi: 10.1007/978-94-007-4587-2

Sui, D., & Goodchild, M. (2011). The convergence of GIS and social media: challenges for GIScience. *International Journal of Geographical Information Science*, *25*(11), 1737–1748. doi: 10.1080/13658816.2011.604636

Sumartojo, S., & Pink, S. (2017, 11). Moving Through the Lit World: The Emergent Experience of Urban Paths. *Space and Culture*. Retrieved from http://journals.sagepub.com/doi/10.1177/1206331217741079 doi: 10.1177/1206331217741079

Sumartojo, S., & Pink, S. (2018). *Atmospheres and the Experiential World: Theory and Methods*. Taylor & Francis. Retrieved from https://books.google.es/books?id=KiBtDwAAQBAJ

Surmenok, P. (2016). *Chatbot Architecture.* Retrieved from https://medium.com/@surmenok/chatbot-architecture-496f5bf820ed#.29q6brn2u

Tallyn, E., Fried, H., Gianni, R., Isard, A., & Speed, C. (2018). The Ethnobot. In *Proceedings of the 2018 chi conference on human factors in computing systems - chi '18* (pp. 1–13). New York, New York, USA: ACM Press. Retrieved from http://dl.acm.org/citation.cfm?doid=3173574.3174178 doi: 10.1145/3173574.3174178

The Propaganda Mill. (2017). *Uncovered World.* Retrieved from https://www.vividsydney.com/event/light/uncovered-world

Thibaud, J. P. (2015). The backstage of urban ambiances: when atmospheres pervade

everyday experience. Emotions. *Emotions, Space and Society*, 39–46. Retrieved from http://www.sciencedirect.com/science/article/pii/S1755458614000371

Thomas, H. (2013). Estructuras cerradas vs. Procesos dinámicos: trayectorias y estilos de innovación y cambio tecnológico. In A. Buch & H. Thomas (Eds.), *Actos, actores y artefactos: Sociología de la tecnología* (pp. 185–2016). Quilmes, Argentina: Universidad Nacional de Quilmes.

Thrift, N. (1999). Steps to an Ecology of Place. In *Human geography today* (pp. 295–323). Polity Press. doi: 10.1111/j.1745-7939.1999.tb00553.x

Thrift, N. (2004). Remembering the technological unconscious by foregrounding knowledges of position. *Environment and Planning D: Society and Space*, *22*, 175–190. doi: 10.1068/d321t

Thrift, N. (2008). *Non-representational theory: Space, Politics, Affect*. London: Routledge.

Thrift, N. (2009). Re-animating the place of thought: Transformations of spatial and temporal description in the twenty-first century. *Community, Economic Creativity, and Organization*, 90–119. doi: 10.1093/acprof

Thrift, N. (2014). The promise of urban informatics: some speculations. *Environment and Planning A*, *46*(6), 1263–1266. Retrieved from http://www.envplan.com/openaccess/a472c.pdfhttp://www.envplan.com/abstract.cgi?id=a472c doi: 10.1068/a472c

Thrift, N. (2016). Intensities of Feeling: Towards a Spatial Politics of Affect. *Geografiska Annaler. Series B, Human Geography*, *86*(1), 57–78. Retrieved from http://www.jstor.org/stable/3554460

Tintarev, N., Reiter, E., Black, R., Waller, A., & Reddington, J. (2016). Personal storytelling: Using Natural Language Generation for children with complex communication needs, in the wild.... *International Journal of Human-Computer Studies*, *92*, 1–16. Retrieved from http://dx.doi.org/10.1016/j.ijhcs.2016.04.005 doi: 10.1016/j.ijhcs.2016.04.005

Torres, I. V., Gaona, S. R., & Corredor, D. V. (2012). Cartografía social como metodología participativa y colaborativa de investigación en el territorio afrodescendiente de la cuenca Methodology in the Upper Basin of the Cauca River. *Cuadernos de geografía*, *21*(2), 59–73.

Townsend, A. M. (2013). *Smart Cities: Big data, Civic Hackers and the quest for a new utopia*. New York: W. W. Norton & Company.

Toxtli, C., Flores-Saviaga, C., Aguilar, F., Monroy, A., Flores, J., Herrejon, J., ... Savage, S. (2016). BotViz: Data Visualizations for Collaborations With Bots and Volunteers. *Proceedings of the 19th ACM Conference on Computer Supported Cooperative Work and Social Computing Companion*, 421–424. Retrieved from http://doi.acm.org/10.1145/2818052.2869132 doi: 10.1145/2818052.2869132

Traunmueller, M., Gallacher, S., & Krejcik, D. (2015). *Likeways*. Retrieved from https://likeways.wordpress.com

Tuan, Y.-F. (1977). *Space and Place: The Perspective of Experience*. (Vol. 7) (No. 4). doi: 10.2307/2064418

Turner, A. (2006). Introduction to Neogeography. In *Oreilly short cuts* (p. 54). O'Reilly Media. Retrieved from https://books.google.es/books?id=oHgDv4feV-8C

Tutton, R. (2016). Wicked futures: meaning, matter and the sociology of the future. *The*

sociological Review, *00*, 1–16. doi: 10.1111/1467-954X.12443

Umbrellium Limited. (2016). *Voice Over.* Retrieved from http://umbrellium.co.uk/initiatives/voiceover/

Vannini, P. (2015). *Non-Representational Methodologies: Re-Envisioning Research*. London: Routledge.

Vaughan, L., Clark, D. L. C., Sahbaz, O., & Haklay, M. (2005). Space and exclusion: Does urban morphology play a part in social deprivation? *Area*, *37*, 402–412. doi: 10.1111/j.1475-4762.2005.00651.x

Venturini, T., & Latour, B. (2010). The Social Fabric: Digital Traces and Quali-quantitative Methods. *Proceedings of Future En Seine 2009*, 87–101.

Wagner, P., & Wieland, B. C. (2017). *Sunvault*. Upper Rubber Boot Books.

Wallace, R. S. (2009). The Anatomy of A.L.I.C.E. In R. Epstein, G. Roberts, & G. Beber (Eds.), *Parsing the turing test: Philosophical and methodological issues in the quest for the thinking computer* (pp. 181–210). Dordrecht: Springer Netherlands. Retrieved from http://dx.doi.org/10.1007/978-1-4020-6710-5_13 doi: 10.1007/978-1-4020-6710-5{_}13

Whyte, W. H. (1980). *Social Life of Small Urban Spaces* (Tech. Rep.). New York: Project for Public Spaces.

Whyte, W. H. (1988). *City: Rediscovering the Center*. Philadelphia: University of Pennsylvania Press.

Wiberg, M., Ishii, H., Dourish, P., Vallgårda, A., Kerridge, T., Sundström, P., … Rolston, M. (2013). Materiality matters—experience materials. *Interactions*, *20*(2), 54. Retrieved from http://dl.acm.org/citation.cfm?doid=2427076.2427087 doi: 10.1145/2427076.2427087

Wiig, A., & Wyly, E. (2016). Thinking through the politics of the smart city. *Urban Geography*, *37*(4), 485–493. doi: 10.1080/02723638.2016.1178479

Wilkie, A., Michael, M., & Plummer-Fernandez, M. (2015). Speculative method and Twitter: Bots, energy and three conceptual characters. *Sociological Review*, *63*(1), 79–101. doi: 10.1111/1467-954X.12168

Williamson, J. R., & Sundén, D. (2015). Deep Cover HCI. *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '15*, 543–554. Retrieved from http://dl.acm.org/citation.cfm?doid=2702613.2732500 doi: 10.1145/2702613.2732500

Wilson, M. W. (2014). Continuous connectivity, handheld computers, and mobile spatial knowledge. *Environment and Planning D: Society and Space*, *32*(3), 535–555. doi: 10.1068/d14112

Wingu. (2015). *Lanzamos Caminos de la Villa, la primera plataforma online para dar visibilidad a los reclamos de las villas de Buenos Aires.* Retrieved from http://tinyurl.com/wingu2014

Withagen, R., de Poel, H. J., Araújo, D., & Pepping, G. J. (2012). Affordances can invite behavior: Reconsidering the relationship between affordances and agency. *New Ideas in Psychology*, *30*(2), 250–258. Retrieved from http://dx.doi.org/10.1016/j.newideapsych.2011.12.003 doi: 10.1016/j.newideapsych.2011.12.003

Wolff, A., Valdez, A.-M., Barker, M., Potter, S., Gooch, D., Giles, E., & Miles, J. (2017). *Playable Cities* (A. Nijholt, Ed.). Singapore: Springer Singapore. Retrieved from http://

link.springer.com/10.1007/978-981-10-1962-3 doi: 10.1007/978-981-10-1962-3

Wood, D. (2010). *Rethinking the power of maps*. New York: Guilford Press.

Wright, P., & McCarthy, J. (2008). Empathy and experience in HCI. *Proceeding of the twenty-sixth annual CHI conference on Human factors in computing systems - CHI '08*, 637. Retrieved from http://portal.acm.org/citation.cfm?doid=1357054.1357156 doi: 10.1145/1357054.1357156

Zahavi, D. (2001). Beyond Empathy: Phenomenological Approaches to Intersubjectivity. *Journal of Consciousness Studies*, *8*(5), 151–167.

Zanocco, G., De Marchi, A., & Pozzi, F. (2006). Sensory empathy and enactment. *International Journal of Psychoanalysis*, *87*(1), 145–158. doi: 10.1516/46Y5-AXJQ-YTTE-9VNA

Zimmermann, B., & Nova, N. (2015). Circulation: A Theoretical Toolkit. *Design and Culture*, *7*(2), 167–184. Retrieved from http://www.tandfonline.com/doi/full/10.1080/17547075.2015.1051786 doi: 10.1080/17547075.2015.1051786

Zinnbauer, D. (2012). *Ambient Accountability: Fighting Corruption When and Where it Happens*. Retrieved from http://ssrn.com/abstract=2168063

Zwillinger, D. (2002). *CRC Standard Mathematical Tables and Formulae, 31st Edition*. Chapman and Hall/CRC.