

## PLAYFUL MEDIATION OF PERCEPTION AND ENGAGEMENT

Urban Space and Location-based Augmented Reality Applications through the Lens of Play

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Supervisor: Dr. M.H. Nagenborg

Second reader: Dr. N. Gertz Deai mo areba wakare mo aru nan te Dare ka ga kimeta kisetsu ni Mata ne to ookiku te wo futte Sayonara jya nai to tashikameta Kotoba ni naranai kimochi wa Kono hanabira ni nosereba iin da yo Tte kimi ga oshietekureta koto Ima demo chanto oboeteiru kara

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In a season of partings and new greetings In such tradition made up by somebody I wave my hand well for future reunion To confirm this isn't farewell Feelings that can't be worded Can travel through these flower petals This you've told me I still remember well

,,

"

SCANDAL Departure, 2014, para. 4.

#### "

#### SUMMARY

This thesis contributes to the comprehension of the influence of location-based augmented reality applications (LARA) on the perception of and engagement with urban space. Within the domain of playable city initiatives, initiatives geared towards urban engagement and social dialogue, and set against the technological focus of smart city rhetoric, the author aims to assess how LARA can foster deep relations between people themselves and urban space. Within the discourse of smart and playable cities, there has been comparatively little research done on how LARA influence one's experiences of and engagement with urban space. As the use of both (non-)informational LARA is variously argued to result into both less urban engagement and more citizen engagement, an inquiry was deemed valuable. In particular, the following research question is addressed:

How do location-based applications, that use augmented reality on mobile phones in an urban environment, affect one's perception of and engagement with urban space?

This thesis analyses the contemporary relation between play, LARA, and the city, the challenges to understanding the relation between virtual and non-virtual spaces, the new practices that emerge when using LARA, the ways LARA bring about new forms of mediation, and how to design LARA for urban engagement. To analyse our interactions with LARA and urban space a framework of play is developed that includes both an anthropological and artefactual concept of play anchored in three dimensions of *engagement, mediated*, and *networked play*).

Play as a heuristic lens is deemed appropriate as play is involved in the interaction between people and their environment, is incorporated in contemporary everyday life, and can account for the performative capabilities of technologies in the construction of experiences and engagement. The hybridity of space facilitated by LARA is what demarcates LARA from other technologies. Urban space is connected, mobile, and social, and the boundaries between physical and virtual spaces has been blurred. New tensions between materiality, information, and augmentations in non-virtual spaces that emerge by the use of AR interfaces are discussed. The intertwinement of virtual and non-virtual spaces and entities affirms the dynamic relation between the two and explains how LARA mediate between these actual and potential levels of reality. The complementary virtual layers induced by LARA mediate (1) the way users relate to each other; (2) how certain spaces are experienced; and (3) how users understand a particular place.

An inquiry into the practices of LARA will point out the specific qualities of LARA including, amongst others, their role in communication, memorialising urban space, turning urban space into a background of play, and translating 'using urban space' into 'engaging with urban space'. LARA allow for playful tactics to re-appropriate meaning and experiences of space. Some users create augmentations that interact through places, while other users create content of spaces and places themselves.

These overcodings include pluralised forms of authorship of augmented space that promote certain actions and perceptions. This thesis suggests to distinguish between informational LARA that 'read' the world and non-informational LARA that constitute autonomous entities, thereby highlighting that what makes LARA, especially non-informational LARA that do not adhere to non-virtual equivalents, stand out. Each type entails different relations of mediation between the world and those who experience the world. Informational LARA adhere to a *relation of augmentation,* which includes both *hermeneutic* and *embodiment* relations, whereas non-informational LARA adhere to a *relation of engagement*, which includes both *alterity* and *embodiment relations*.

This thesis concludes that LARA affect our perception of and engagement with urban space in a variety of manners. The potentiality of LARA to position the augmentation and urban space on the same level highlights an important feature in developing LARA that stimulate urban engagement and citizen dialogue. Depending on the type of LARA different forms of mediation are established which may or may not have positive influences. Various design guidelines are presented to evoke thoughtful discussions to stimulate the development of LARA for meaningful play. Ideally, informational LARA bring people to unexpected places and support the contact between people by connecting people, both users and non-users, to a similar narrative. Non-informational LARA would, ideally, direct the attention of users to both the augmentation and urban space. The augmentations should ((in-)directly) connect with their environment and bring, thereby, urban space to the fore. When these connections are not centralised or when the focus is directed to external goals such as productivity or efficiency or elements of play (agôn, alea, mimicry, or ilinx), the development of a deep relation with urban space and urbanites is obstructed. Finally, one should remind oneself that the mediations are a unilateral process. It is in the interplay with LARA, people, and urban space that perception and engagement are influenced. When one is aware of this interplay, one can unravel the various elements within this hybrid space to design for particular forms of mediation.

**Keywords** Augmented Reality; Location-based Augmented Reality Applications; Urban Space; Play; Playable City; Philosophy of Technology

### PREFACE – GOTTA CATCH 'EM ALL!

Something with virtual worlds, games, and identity. That was my initial plan when I was searching far and wide for a thesis supervisor. After a long journey which took me along various offices, I finally 'caught' a rare supervisor in the person of Johnny Hartz Søraker. Soon thereafter, however, I had to trade him for another supervisor as Johnny decided that he would rather go to Google in Dublin than supervising me – which is, actually, the most rational choice. I decided to throw my idea into the garbage bin and develop a new and more sophisticated proposal in order to catch another rare supervisor. I ended up with Michael Nagenborg (or he ended up with me) writing about augmented reality, play, urban space, and Pokémon.<sup>i</sup> A unique combination if you ask me. I mean, who can say that he or she has written a master's thesis in which Pokémon, games, and augmented skeletons are prominently featured?

I should probably thank Michael for allowing me to write about this crazy yet interesting topic of location-based augmented reality applications and urban space. Apart from the freedom and guidance he has given me during the process of writing, I would like to thank him for the fruitful meetings we have had. Every meeting provided me with inspiration and the necessary critical thoughts to improve my work. Especially the discussions about flying unicorns, shopping malls disguised as old villages, and bottles of Coke Zero that are engaged in a battle over space stimulated me to investigate the peculiarities of AR in urban space. I would also like to thank my second supervisor Nolen Gertz for his portion of nihilistic commentary. A big thank you to Nicola Liberati who gave valuable insights into postphenomenology and AR. Furthermore, I would like to thank my parents for their support in every way possible. I should also thank Boris, my cat, for allowing me to cuddle him to comfort myself and for being the furriest scarf around my neck while writing - my apologies to those I have skyped with and saw me being distracted by a living and purring scarf. Lastly, I would thank my grandfather Gerrit Kroes and grandmother Jannie Kroes in whose memory I have written this thesis. Your kindness and devotion has supported me during my years of studying at the University of Twente. During these years, you were always interested in the projects I did. Your support helped me to strengthen my belief and focus to use, develop, question, evaluate, and investigate technologies and technological developments. Thank you, grandpa and grandma, hereby a 'Volle Vijf'.

Rests me to say, I hope you will enjoy reading this thesis and will, the next time you go and scan the city for virtual beings, consider how location-based augmented reality applications open up new forms of mediation that influence your way of perceiving and engaging with urban space.

Gerald Munters August 2017

<sup>&</sup>lt;sup>i</sup> I should, in retrospect, also thank Google as without their interference, I would not have had Michael as my supervisor.

## TABLE OF CONTENTS

CHAPTER 1   INTRODUCTION	1
CHAPTER 2   PLAY AND THE CITY	17
2.1   AN INQUIRY INTO PLAY	18
2.1.1   THE BASICS OF PLAY	18
2.1.2   TYPES AND ATTITUDES OF PLAY	20
2.1.3   EVERDAY LIFE AS PLAY	22
2.1.4   FROM PLAY TO GAMES, PLAYFULNESS, AND PLAYABILITY	23
2.1.5   DIMENSIONS OF PLAY AND LARA	24
2.2.1     CONTEMPORARY PLAY WITHIN URBAN SPACE	26
2.2.2   PLAY, THE CITY, AND AR	29
2.3   MEANINGFUL PLAY	30
2.4 CONCLUSION	32
CHAPTER 3   AUGMENTED REALITY AND LOCATIVE MEDIA AND THE CITY	34
3.1   LOCATIVE MEDIA AND AUGMENTED REALITY	35
3.1.1     TYPES OF LOCATION-BASED AUGMENTED REALITY APPLICATIONS	35
3.2   THE VIRTUAL, THE NON-VIRTUAL, AND THE CITY	37
3.2.1   VIRTUAL SIMULATION AND REPRESENTATION	38
3.2.2   VIRTUAL COMPLEMENTATION OF POTENTIALITIES	41
3.3 A PLAY WITH BOUNDARIES	44
3.3.1   BETWEEN LUDUS AND PAIDIA	44
3.3.2     SYNCHRONOUS PLAY OF TIME AND SPACE	45
3.3.3     TEMPORAL PLAY WITH NARRATIVES	45
3.4 CONCLUSION	46
CHAPTER 4   NEW MEDIATIONS OF RELATIONS BY LOCATION-BASED AUGME	NTED
REALITY APPLICATIONS	48
4.1   MEDIATED PLAY AND LARA	51
4.1.1 A COMMUNICATION OF PRESENCE AND PLAY	52
4.1.2 MEMORIALISING URBAN SPACE INTO URBAN PLACE	53
4.1.3 URBAN SPACE AS A BACKGROUND OF PLAY	56
4.1.4 A SUBJECTIFICATION OF URBAN SPACE	57
4.2   NETWORKED PLAY AND LARA	59
4.2.1   BLINDED BY PLAY	60
4.2.2   PLAYFUL TACTICS	61
4.2.3 THE END OF ACCIDENTAL DISCOVERY?	62

4.3   AR, URBAN SPACE, AND POSTPHENOMENOLOGY	. 63
4.4   CONCLUSION	. 67
CHAPTER 5     DESIGNING LARA FOR MEANINGFUL URBAN ENGAGEMENT	. 69
5.1   MEANINGFUL PLAY REVISITED	. 70
5.2   MAKE THE CITY PLAYABLE AGAIN!	. 71
5.3   DESIGNING FOR PLAYFULNESS: BETWEEN STIMULATION OF ENGAGEME AND DIRECTING PERCEPTION	ENT 72
5.3.1   NON-INFORMATIONAL LARA	. 73
5.3.2   INFORMATIONAL LARA	. 74
5.4 CONCLUSION	. 76
CHAPTER 6   CONCLUDING REMARKS	. 78
6.1   IMPLICATIONS	. 80
6.2   LIMITATIONS	. 82
6.3   FUTURE RESEARCH	. 84
6.4 AFTERWORD	. 85
CHAPTER 7   BIBLIOGRAPHY	. 86

## LIST OF FIGURES

FIGURE 1. AFFILIATIONS BETWEEN IHDE'S HUMAN-TECHNOLOGY-WORLD RELATIONS.	. 14
FIGURE 2. SCHEME OF ROGER CAILLOIS' FOUR TYPES AND TWO ATTITUDES OF PLAY. ADAP	TED
VERSION OF CAILLOIS, R., & HALPERIN, E.P. (1955, P. 74). PLEASE NOTE THAT IN EACH VERTIG	CAL
COLUMN THE ACTIVITIES ARE CLASSIFIED IN SUCH AN ORDER THAT THE ELEMENT OF PAI	DIA
DECREASES, WHILE THE ELEMENT OF LUDUS INCREASES	. 21
FIGURE 3. PRACTITIONERS OF PARKOUR IN ACTION. DAFFA ALLA, M. (2012)	. 27
FIGURE 4. PIECES OF BERLIN. BURKE, E., & MAHARAS, L. (2011).	. 28
FIGURE 5. URBANIMALS IN THE CITY OF BRISTOL. BLAKEMORE, P. (2015).	. 29
FIGURE 6. IMPRESSION OF WALLAME WITHIN URBAN SPACE. IMAGE COURTESY OF WALLAME L	LTD.
(2015)	. 38
FIGURE 7. HIDDEN AR PROTEST MESSAGE IN BUDAPEST. (ALLITSUKMEG, 2017)	. 43
FIGURE 8. LAYAR ALLOWS ONE TO READ (LEFT) AND CONSTRUCT URBAN SPACE. IMAGE COURTESY	í OF
LAYAR (LAYAR, 2009).	. 49
FIGURE 9. MAGIKARP UNEXPECTEDLY TURNING UP IN A FRYING PAN. E. MOORE (2016)	. 50
FIGURE 10. MEMORIALISING IMPORTANT INHABITANTS; CITY EVOLUTION; IMPORTANT EVENTS. IM.	AGE
COURTESY OF STADSARCHIEF ROTTERDAM (2017).	. 53
FIGURE 11. BORDER MEMORIAL: FRONTERA DE LOS MUERTOS, MEXICO AND US BORDER CROSSING	G. J.
C. FREEMAN AND M. SKWAREK (2011).	. 55
FIGURE 12. PERSONIFICATION AND USER-CENTRING OF URBAN SPACE IN LAYAR AND POKÉMON	GO.
IMAGE COURTESY OF LAYAR (LAYAR, 2009) AND NIANTIC (NIANTIC, 2016)	. 57
FIGURE 13. GENERAL DESIGN GUIDELINES (NON-)INFORMATIONAL LARA FOR URBAN ENGAGEM	ENT
AND PLAYFULNESS	. 75
FIGURE 14. SPECIFIC DESIGN GUIDELINES (NON-)INFORMATIONAL LARA FOR URBAN ENGAGEM	ENT
AND PLAYFULNESS.	. 75

## LIST OF ABBREVIATIONS

AR	Augmented Reality
GIS	Geographic Information System
GPS	Global Positioning System
ICTs	Information and Communication Technologies
LARA	Location-based Augmented Reality Application(s)
LBS	Location-based Systems
QR	Quick Response

## CHAPTER 1 | INTRODUCTION

"We too often forget while living in cities that we can search for pleasure, that life can be more than traversing spaces, that we can play, and that play is precisely what makes the world ours. So don't wait for the app, the service, the cleverly designed instrument: Open the door, get out on the street and play."

> Miguel Sicart Play and the City, 2016, p. 37.



w to stimulate the integration of refugees in a new and unfamiliar environment? How to establish contact between two different cultures and understandings? Governments and municipalities in various countries in (Western) Europe were confronted with these particular challenges due to a rapid increase of refugees over the past few years (Hansen, 2016; von Beyme, 2016). Studies concerning these challenges report that (Syrian) refugees are facing problems to get in contact with locals, to overcome cultural presuppositions held by locals, and to understand and navigate their new environment (Hansen, 2016; Neuenhaus & Aly, 2017). Moreover, municipal decisions concerning the shelter of refugees in separated areas or the individualised language classes further complicate possible interactions between refugees and locals (Neuenhaus & Aly, 2017).

Both in Germany and the Netherlands a variety of initiatives emerged to investigate possible ways to improve the connection between refugees and their urban environment and to develop a public understanding of both cultures so that locals and refugees are brought together. In Utrecht, a group of refugees played a selfie-based treasure hunt to explore the city (de Smale, 2015a, 2015b). The researchers aimed to stimulate refugees to explore the city of Utrecht in a safe and playful manner. The use of a location-based play as a way to establish a connection also resonates in the German *Empathy* Up project (Neuenhaus & Aly, 2017). To reach as many people as possible and to solve a disconnection between Germans and refugees, Neuenhaus and Aly developed an augmented reality (AR) application to tell a fictional narrative that intertwines German-Syrian cultural differences and commonalities with the physical arrangement of urban space. German players embark on a quest in "Syrdland" to carry out tasks to collect sufficient points so that they can return to 'reality'. Tasks inform players about certain customs of both cultures and involve engagement with the physical arrangement of cities. A digital character called "Ziad" explains players about Syrian culture and the problems refugees are facing while integrating in Germany. Ultimately, Ziad directs the player to the final goal. While moving towards this goal, the German player is approached by a refugee who is similarly dressed as the digital character. This moment represents, according to Neuenhaus and Aly, the transition from AR to reality as both German and Syrian players meet in reality after an in-game encounter (ibid, p. 88). AR is used in this study to dissolve psychological barriers that can emerge between Germans and refugees by informing players about cultural differences. The developers allowed players to participate in a narrative that could not have been told in such a way before.

The promising use of AR to solve societal challenges such as integration seems to be more feasible as the field of AR applications comprises a growing sector with, according to market intelligence firm Tractica, a forecasted installed base growth from 292 million in 2015 to 2.2 billion in 2019 (Tractica, 2015). Statistics company Statista (2014) forecasted that, by the end of 2017, the majority of people use AR for gaming (987.7 million), information retrieval (361.3 million), or product visualisations (383.4 million). According to Tim Merel, managing director at AR consultancy firm Digi-Capitalist, the majority of the AR applications will be developed for mobile devices such as smartphones (Merel, 2017).

Merel states that smartphones solve four challenges for a widespread adoption of AR, namely mobile connectivity, an ecosystem of applications, all-day battery life, and cross-subsidisation (ibid, para. 17). In the Netherlands, four out of five people own a smartphone (Oosterveer, 2015). On a global level, more than half of the world's population (55%, 4.42 billion) uses a smartphone (We Are Social & Hootsuite, 2017, slide 72). So, both AR and mobile phones show potential to support initiatives that stimulate integration or social dialogue, but is that all there is to say?

#### PROBLEM STATEMENT

The application of both AR and mobile phones to stimulate integration, urban engagement, and social dialogue is not undisputed. First of all, the use of both AR and mobile phones create a dichotomy between those who have access to them and those who do not have access to them. Another important issue with AR relates to control. To take over someone's vision comes with great responsibility as one can literally decide which augmentations are visible to users (Wolf, Grodzinsky, & Miller, 2016). The aforementioned initiatives construct the world from a particular viewpoint and express particular ideas about, amongst others, culture and integration. Although the viewpoints within these studies were based on observations and interviews, developers could develop applications that advocate less founded or more controversial ideas. Users have to significantly trust companies and AR applications. Malicious applications can use the immersive feedback to deceive users about their environment (Roesner, Kohno, & Molnar, 2014). Companies could overflow users with advertisements or, even more pressing, hackers could compromise the augmentation and trick users into believing that these new augmentations are genuine (Abuloff, 2016). People with malicious intent can display false information or use augmentations to lure people to unsafe places (Roesner et al., 2014; Yuhas, 2016). Faulty applications can share the location of users or their vision as AR applications require access to various types of data.

A first step to solve a selection of these issues is to balance the access that AR applications require for their functionality with the potential risk of such applications misusing the collected data. Individual applications could be designed such that they only have access to sensors and data that are required for their functionality. For instance, rather than granting applications access to the entire camera feed, one could only grant applications access to certain portions of a screen when an object or user is within that particular location (Roesner et al., 2014). Besides the faulty design or malicious intent of people, the augmentations themselves can bring about problems that move beyond individual use.

A major issue with these applications is that they can lead to a decontextualization of urban space. People are interacting with their environment via a screen that is positioned between users and other people (Wolf et al., 2016). A recent and popular example of AR within urban space that illustrates this decontextualization is *Pokémon GO* (Niantic, 2016). During the summer of 2016, Niantic launched *Pokémon GO*, an AR application that allowed people to capture virtual monsters in their immediate environment. Although the application was very popular in the beginning, the daily user numbers have dropped from 28 million users in 2016 to 5 million users in 2017 (Arif, 2017). Even though the mass

market has lost their interest in Pokémon GO (Niantic, 2016) - the novelty factor wore off due to a lack of features – the application introduced and popularised AR to the world (Arif, 2017; Hranleh, 2016). Pokémon GO (Niantic, 2016) blurred the distinction between a separated game-environment and the physical world. The monsters are virtual entities incapable of physically influencing the physical environment. However, the way these virtual entities were positioned in a non-virtual environment had implications for how various players interacted with their environment. Rather than seeing their environment as dynamic and potentially dangerous, the environment had become a playground in which players solely focused on 'catching them all'. Various players explicated that they did not thought of their location and simply wanted to catch Pokémon (CBS & Peterson, 2016). This, amongst others, resulted in people playing at the Holocaust Memorial Museum in Washington (Peterson, 2016). Other people played the game while driving which has resulted in more than 110,000 road accidents caused by both drivers and pedestrians in the United States in ten days (Borland, 2016). Consequently, municipalities have taken various measures such as placing warning signs and putting restrictions on places where one could catch Pokémon (BBC News, 2016; Kerr, 2016). A more unsettling consequence of Pokémon GO (Niantic, 2016) is the reinforcement of existing geographically-linked biases (Akhtar, 2016; Colley et al., 2017; Rosenblatt, 2016). As such, the application inexplicitly informs that (non)users who live in those areas are living in a part of the city that is not popular. AR then alters one's understanding of the city as one is not portrayed as citizen, but as a visitor or inhabitant of the periphery.

Despite of having the aim to establish connections between people and their environment, which were occasionally formed (Hicks-Logan, 2017), *Pokémon GO* did not necessarily resulted in more urban engagement. For the majority of players, urban space has become a backdrop in the game (Guarino, 2016; Hatchett, 2016). People passively follow where their device urges them to go. Applications such as *Pokémon GO* (Niantic, 2016) and *Layar* (Layar, 2009) seem to suggest that people are in a desperate need of a technology to experience the city. People passively 'watch' urban space rather than engaging with urban space as if it were a book that requires one to think for oneself. AR is then portrayed as a gadget to experience an exciting and fresh perspective of the city which, after a while, becomes familiar so that people start losing their interest and enthusiasm (Bayle, 2017). For better or worse, location-based applications transform a particular space into a new space that is framed by the application and device one uses in, for instance, a functional or playful way. These new representations give rise to new relations one can have with the world. By augmenting the non-virtual world with a virtual layer, *Pokémon GO* (Niantic, 2016) negatively transformed the public space of, amongst others, transportation into a space of entertainment and play.

When discussing location-based augmented reality applications (LARA), the question arises where the technology ends and the world itself begins. The world as such, a particular environment for example, is transformed by both the mobile device and the AR application, thereby blurring the distinction between the mediating technology and the world. Moreover, the intertwinement of virtual and non-virtual environments becomes more prominent in urban spaces with the development of 'smart city' initiatives (de Waal, 2014; Mattern, 2014). The notion of AR suggests an interesting duality, namely a reality that is unenhanced and a reality that is enhanced. The discourse around AR portrays a world that is enhanced by a multitude of technologies or, said differently, a "reality, only better" (Wall, 2016, para. 6). For game designer Jane McGonigal, video games and virtual worlds are fulfilling needs of human beings that the real world is, in its current state, unable to satisfy (McGonigal, 2011). Feelings of heroic purpose, power, community, and complete focus and engagement with each moment can be almost constantly experienced when one is playing within a virtual world. This in contrast to the real world in which people might experience these feelings every now and then (ibid, p. 3). McGonigal describes how people, when facing problems within the virtual world, are, in contrast to the real world, not frustrated or depressed and this particular difference between virtual and non-virtual worlds describes that, as such, *reality is broken* (TED, 2010). Virtual worlds can improve reality in such a way that we, by means of enhancing reality, interact with the real world as one would do in a virtual world, for example, being motivated to clean the house or inspired to tackle that difficult problem you were facing. However, Pokémon GO (Niantic, 2016) distorted reality and reduced the engagement of people with their environment leading to inappropriate play and accidents (Borland, 2016; CBS & Peterson, 2016; Guarino, 2016; Hatchett, 2016). The opposite, the enhancement of virtual realms by non-virtual realms, is also subjected to this duality – virtual realms are then supplemented by non-virtual realms. From this point of view, the virtual world of Pokémon GO (Niantic, 2016) was enhanced by the non-virtual world as the narrative of Pokémon GO was placed within the real-world environment of its users. The physical world is then primarily considered as a backdrop of the game.

In sum, LARA seem to further increase the division between those who have access to mobile devices and those who do not have access to them. People do not only have access to mobile devices, they also have access to an augmented world provided by AR. People can, consequently, be categorised based on whether they live in 'just' reality or in an augmented reality.

#### THE PLAYABLE CITY AS STEPPING STONE TO MEANINGFUL AR

Although LARA establish a divide from the start, they can, when applied thoughtfully and meaningfully, also lead to less polarisation and more comprehension between people. The aforementioned *Empathy Up* project temporarily created a divide between German and Syrian players. However, at the end of the game, they were brought together in a conversation that circumvented existing barriers of prejudices and separation. The people behind initiatives such as *Empathy Up* have a clear understanding of what they want to achieve and how play and AR can, despite their negative implications, be used to establish, maintain, and analyse relations between people themselves and their environment. Initiators are aware of these possible divisions between users and aim to develop installations or projects that are accessible or can be enjoyed by a large number of people.

Some temporarily divisions between users or nonusers could arise, however, these divisions are partly circumvented by either having public installations or stimulating the desire of people to work together with those who do not have access to the project. This use of AR and play resonates with the intentions of 'playable city' initiatives. The playable city, a notion that contrasts with so-called 'smart cities', focuses on interaction between people and bottom-up initiatives that allow visitors and residents to reconfigure places and services (Aurigi, Willis, & Melgaco, 2016; de Lange, 2015b).

Although the understanding of what a 'smart city' describes and defines is much debated, the general rhetoric of smart cities has been framed by, amongst others, governments and tech corporations, and includes computing technologies that make the city more efficient, predictable, and sustainable (Alfrink, 2015; KPN-Lokale-Overheid, 2015; Nam & Pardo, 2011). According to this rhetoric, cities are becoming smart when Information and Communication Technologies (ICTs) are applied to solve societal challenges, such as safety or sustainability. While the city is subject to a process of digitising by means of sensors, cameras, and interconnected digital infrastructures, citizen dialogue and the engagement of the city-dwellers with the urban environment are becoming more and more impeded (de Lange, 2015b; Vestergaard, Fernandes, & Presser, 2016). Using sensors and interconnected digital infrastructures to make the city more efficient and productive is not an unacceptable desire per se. Certainly, when one can move from point 'A' to point 'B' in an efficient manner is an important aspect of enjoying city life, as one does not want to spend three hours walking around the streets just to get from your house to your local grocery store. Moreover, walking around the streets is also more convenient when certain events are predictable so that you do not have to take all the various occurrences into consideration that might take place on your way home. That being said, once these conditions have been, to a certain extent, satisfied, there are dimensions beyond predictability and efficiency that make a city a place to live in, such as urban space itself or the interaction with other citizens (Alfrink, 2015).

In contrast, the aim of playable cities is to initialise social dialogue and motivate residents and visitors to share and develop their experiences related to the urban space by using art installations and games. Apart from strengthening and creating relationships between city-dwellers themselves, relations between people and places are essential in playable city projects (de Lange, 2015b, p. 427; Gnat, Leszek, & Olszewski, 2016). A recent study by Michiel de Lange, co-founder of the Mobile City initiative, has indicated that the participation of the public and their relationship with the places in which various installations were placed improved by using artistic interventions (de Lange, 2015a).

Due to their focus on social dialogue and urban space, playable city initiatives do not oppose an 'unaugmented' reality to an augmented reality in which people are clearly separated from those who do not have access to this reality. Projects move beyond individual use as AR should ultimately stimulate urban engagement and social dialogue by means of play or interaction. It is this use of AR and play that I would like to get out of LARA while avoiding the negative consequences such as division, escapism, and decontextualization. To solve these problems of obstructed urban engagement, an inquiry into how LARA mediate our perception of and engagement with the world is required.

Following these playable city initiatives, I use, within this thesis, the notion of play as a heuristic lens to identify and analyse the relations that are facilitated by LARA. I consider play as suitable to analyse digital technologies and their role in playful initiatives as play is both incorporated in contemporary everyday life and involved in the interaction between people and their environment (Goffman, 1959; Sicart, 2014, 2016). Digital and mobile technologies in playable city initiatives profoundly changed the appearance of urban space and influenced the way people interacted with one another and their environment by providing playful stimuli. Digital and mobile technologies should, therefore, be understood as (1) performative technologies in construction of experiences and engagement; (2) entities that have spatial capacities that both connect and separate daily practices; and (3) devices that have both potential and actual (virtual) space generating settings.

Play can be used, I believe, to address these characteristics of digital and mobile technologies. First, the performative and appropriative aspects of play demonstrate how digital technologies are used to construct experiences. Personalising mobile phones by means of character tokens, backgrounds, and dangles, for instance, illustrate a theatrical experience of oneself (Frissen, Lammes, de Lange, de Mul, & Raessens, 2015, p. 37). Second, play is often related to activities that both take place within and outside everyday life. Playable city initiatives have demonstrated that play can intertwine everyday life and separated playspaces by, amongst others, turning mundane objects into hubs of play. Rezone the game, for instance, connects the activity of urban planning with the separated playspace of a board game (de Lange, 2013). An AR layer of real-time information about a particular neighbourhood displays potential differentiations in real estate when users move and reposition buildings disguised as game pawns on a physical representation of their neighbourhood. Third, as devices that allow for pervasive games, digital and mobile technologies intertwine both virtual and non-virtual spaces. Thereby, a combined space is generated. Similar to play, digital technologies form both separated and integrated spaces. The mobile phone, for instance, connects one to a variety of people, while, at the same time, also disconnects one from one's environment when one is listening to music through earphones (Ito, Okabe, & Anderson, 2009).

Play as a hermeneutical lens to analyse human-technology relations has also been used by, amongst others, Hans-Georg Gadamer (1989) and Miguel Sicart (2016). For Sicart, play is a particular mode of being in the world, namely a particular phenomenological stance to the world (Sicart, 2014, 2016). The act of play has its own purpose which is defined by the very activity and in constant negotiation with the world. Gadamer, on the other hand, asserts that an artefact reveals a space in which one's being in the world and the world itself are brought together in a playful manner (Gadamer, 1986). The subject, which is seen as a player, merely shows the way the artefact is revealed (Gadamer, 1989, pp. 92, 98). Where Sicart prioritises the subject, Gadamer takes the artefact itself as a starting point. Within this thesis, I want to move beyond the dichotomy between play as either exclusively human or artefactual as the concept of play centralised within playable city initiatives cannot be attributed to either people or installations and games.

The use of play is, similar to the use of AR and mobile devices, not undisputed. In her book "*Creating Capabilities: The Human Development Approach*" (2001), political philosopher Martha Nussbaum coins play as one of her ten basic capabilities that emphasise the "most important aspects of people's quality of life" (p. 18). Nussbaum uses these capabilities to compare societies and assess them based on what each person is able to do. For Nussbaum, people should, next to nine other capabilities, be able to play. That is, people should "be able to laugh, to play, [and] enjoy recreational activities" (ibid, p. 34). According to Nussbaum, societies in which people can play are more preferable than societies in which people do not have the time or the capabilities to play. Although play is a desirable component of human life, not everyone can play. Even less people can play with AR. In its current state, only people who can afford mobile devices, AR headsets, or AR glasses can play with AR. This is, again, where playable city initiatives show a way to be as inclusive as possible. Installations are deployed in public space and a large number of projects can be enjoyed by a larger group without the necessity for everyone to own a mobile device. Said differently, projects use urban space as a playground in which people of various backgrounds and social status are, ideally, treated equally (Edirisinghe, Nijholt, & Cheok, 2017; "The Playable City," 2014). As such, people use play on multiple levels that move beyond a single application.

#### **RESEARCH OBJECTIVES**

The relation between urban space and play is not a contemporary phenomenon that emerged with the introduction of playable city initiatives. From Baudelaire's *flâneur*, a person who wanders around the city while observing his or her environment, to playgrounds or skate-parks, play and the city have always been connected to one another. Apart from the relation between citizens and their environment, interactions between citizens themselves have been viewed through the lens of play. Sociologist Erving Goffman (1959) describes interactions between citizens as a role-play in which information is exchanged. So, historically seen, notions of the playable city have been identified across both spatial and social dimensions of urban life. In some of these historical strands play is classified as entertainment and implicitly addressed as childish or not serious. Moreover, the realms of play and daily life have been addressed as two separate realms in which play is portrayed as a separate activity (Huizinga, 1992). This narrow understanding of play and daily life, however, has been criticised as the increased use of mobile and digital technologies in urban space has intertwined both urban space and playful activities. This intertwinement is exemplified by pervasive or location-based applications in urban space. Applications such as Layar (Layar, 2009) and Pokémon GO (Niantic, 2016) frame urban space as a playground that moves beyond a singular device and can be played in a hybrid space in which physical, digital, and virtual realms come together (de Souza e Silva, 2006). These AR applications then generate an environment that can be used for playful interactions with the world.

Although it is clear that there are potential prospective uses of AR for citizen engagement and interaction, and even though scholars, technology companies, and municipalities have already explicated their interest in using playful initiatives for stimulating this engagement, there has been comparatively little research done on how AR can influence the experience of and engagement with urban space. When LARA can be used to support social dialogue, urban engagement, and integration, an investigation of how AR mediate the urban space around us and how AR can be applied to such meaningful relations between people themselves and urban space may be in order.

Within this analysis, my primary aims are to determine how LARA influence our perception of and engagement with urban space and how LARA can be applied such that a deep relation between citizens themselves and their environment can be established while avoiding the negative consequences such as division and decontextualization. These aims translate into the following main and secondary research questions:

#### How do location-based applications, that use augmented reality on mobile phones in an urban environment, affect one's perception of and engagement with urban space?

- Play is used as a concept to counter the technocratic rhetoric of smart cities by fostering a deep relation between people themselves and their environment. However, what does the concept of play addresses and how does play relate to urban space? The first sub-question is concerned with how proponents of a playful culture that use play as a concept of interaction and engagement conceptualise play and what is understood as 'playing the city': *What concept of play is proposed by proponents of a playful culture and how does play relate to urban space and AR*?
- AR applications may initiate new experiences of or ways of engaging with urban space. The developed framework of play can be applied to identify meaningful applications of interaction and engagement with urban space. However, before one can address the normative position of LARA, one needs to understand the mediating role of AR applications in urban space. The second sub-question is concerned with the mediating role of informational AR applications: *How are LARA mediating the relation between virtual and non-virtual urban space*?
- There is a multitude of AR applications that can mediate between users of AR applications and urban space. However, what can be said about new ways of perceiving or engaging with urban space? The third sub-question is concerned with the differences in perceptive and interactive capabilities between AR applications and more traditional manners of engaging with and perceiving urban space: *How do LARA allow for new ways of perceiving and engaging with urban space and how do the practices of play apply here?*

• The previous sections elucidate how AR applications mediate and change perception of and engagement with urban space. Moreover, the section demonstrates how these changes and ways of interacting can be understood from the concept of play. The developed framework of play allows one to normatively assess AR applications in terms of meaningful experiences. The fourth sub-question is concerned with how playfulness initiated by AR applications connect with meaningful experiences: *How can LARA be designed to mediate a meaningful interaction with urban space*?

Virtual worlds provide a point of departure for understanding social and personal experiences, however, as the discussions move on, the particular technologies that bring these experiences forward become the backdrop of the discussion. They are addressed as the enabler of new possibilities or as a medium for pursuing other intentions. In both scenarios, the technology itself is reduced to a secondary condition for discussion. The aim is to make these secondary conditions visible and bring them to the fore of active inquiry by using insights from philosophy of technology. Before addressing the outline of this inquiry, I will briefly address some key notions and relations between concepts.

#### HOW TO UNDERSTAND AR AND WHAT DOES AR DO?

AR can be understood as a complement to the physical world by means of a digital overlay. A device, a smartphone for example, can use computer-generated input such as textual information, sound, and graphics to augment one's physical environment. In contrast to early developments of AR as researched by Ivan Sutherland (1965; 1968, p. 757), who wrote about the possibilities of moving beyond a graphical display to make the results of computational output tangible, AR has moved beyond the display of technical tasks and made the use of virtual worlds in public space more prominent (de Lange, 2009b).

AR requires several hardware components such as a display, processors, sensors, and an input device in order to function properly (Woodrow & Thomas, 2001). The sensors are often positioned on the exterior of the AR device to sense the environment the user is seeing and interacting with. This data is communicated to the processors of the device to be interpreted and to construct the augmentation. Cameras, for instance, scan the environment and collect data about the environment. Certain cameras perform, depending on the modalities of the device, specific actions, such as depth and movement sensing. In its totality, the system allows for six degrees of freedom to maintain alignment of an object in three dimensional space, including forward/back, left/right, up/down, yaw, pitch, and roll (Butchart, 2011). The system, which can range from mobile phones and projectors to glasses and headsets, captures the information and determines where physical objects within the direct surrounding of the user are located in order to produce an appropriate augmentation. This process is also known as image registration (Azuma et al., 2001b). Each system can display a variety of augmentations, including information, audio, video, and navigation. There are several categories of AR that each have their own objectives and mechanics. One can distinguish between marker-based AR and 'markerless' AR (Butchart, 2011). The first, also known as image recognition, uses the camera(s) on one's device to read a marker that displays a particular pattern. The marker, usually a Quick Response (QR) code is sensed by the camera and interpreted by the processors to determine the position and the orientation of the marker such that the audio-visual augmentation is rendered in a natural manner. AR can also be used in absence of such markers. This type of AR uses a velocity sensor, an accelerometer or a Global Positioning System (GPS) embedded in the device used to collect and display data based on one's location. The majority of the AR applications are markerless as most mobile devices, in particular smartphones, have integrated location detection systems (Reality-Technologies, 2016).

This thesis addresses and analyses a variety of LARA. These particular applications are selected based on the following criteria: (1) their popularity (past and present); (2) their appearance in other (empirical) studies; (3) their compliance with my notion of meaningful play (see chapter 2.3); (4) their artistic value or motivation of the developer; or (5) their particular mediation that presents different or peculiar interpretations. A more elaborative motivation for the two case studies of *WallaMe* (WallaMe-Ltd., 2015) and *Layar* (Layar, 2009) can be found in chapter 3 and 4 respectively.

#### ON URBAN SPACE AND CITIZENS AND PLAY AND MOBILE PHONES

The previous discussions around the concepts of play and AR have highlighted that different authors have different understandings of notions like urban space, virtual, AR, and play. I acknowledge these differences in understanding and address these dissimilarities when clear differences in meaning arise between my vision and the vision of the authors.

Throughout this study, I will use the term "urban space" in a loose sense to refer to the city environment. However, I am not merely discussing the physical structure of a city as such. In "*The Production of Space*" (1991), Lefebvre describes space as being created through social interactions. Thus, urban space is not solely about a physical space created by planning and structuring, but also includes the result of various interactions. The social dimension accounts for the difference between places and non-places. Marc Augé (2008) states that "if a place can be defined as relational, historical and concerned with identity, then a space which cannot be defined as relational, historical and concerned with identity will be a non-place" (pp. 77-78).<sup>1</sup> Both infrastructures required for transportation of people (e.g. stations and motorways) and the modes of transportation (e.g. cars and trains) are considered as non-places by Augé (ibid, p. 121). The examples initiate a tension between Augé and Lefebvre as for Lefebvre these spaces of transition should be examined as concrete locations of everyday life rather than as gaps between. Moreover, an elaborative definition of non-places by Augé also states that non-places are not governed by any norms which does not correspond to some examples given by Augé.

<sup>&</sup>lt;sup>1</sup> Lefebvre has also coined the notion of the non-place to describe an elsewhere, which can be anywhere (Lefebvre, 2003, p. 38) – "the place … for that which has no place of its own." (ibid, p. 129).

To circumvent the problematic consequences of the elaborative definition (Arefi, 1999; Lemos, 2008), I use the broader understanding of non-places stated before to distinguish, from a social perspective, between places with an identity and places without an identity and complement Lefebvre's concept of social space. Chapter 4 investigates the interplay between places and non-places in more detail.

To address the users of LARA and their relation with urban space, I will use the term "citizen" in a loose sense in combination with the notions of "urbanites" and "city-dwellers". I am aware that the notions of "citizen" and "urbanites" are not undisputed as they, amongst others, exclude visitors, refugees, or people living in towns (Bloemraad, 2006; Heater, 1990; Isin, Brodie, Juteau, & Stasiulis, 2008). When I discuss the users of LARA by means of these notions, I aim to address all the individuals within urban space. Thereby, I am not concerned whether they are visitors or inhabitants of a place.

In this thesis, the concept of play is used for understanding how one's experiences of and engagement with the world, in particular urban life, are affected by means of LARA. When thinking of what the term could refer to, several applications and situations come to mind. Play is, amongst others, used within economy (Easley & Ghosh, 2016), education (Villagrasa, Fonseca, Redondo, & Duran, 2014), and communication studies (Goffman, 1959). This study is in itself, however, not about play or games, but about playful engagement with and perception of urban space mediated by LARA. As a result, I explore the relevance of play and derivable notions, such as games and playfulness. This investigation will result into a framework of play that can be used for further analysis.

The framework of play can clarify the interplay between virtual, digital, and non-virtual worlds initiated by LARA. Understanding how these various realms relate to and influence each other is crucial as the boundaries between the various realms are becoming less visible with the development of AR applications and the integration of AR in urban space. Moreover, addressing the potentialities of LARA in urban life does not only provide insights into the particular mediation of experiences, but also gives rise to the opportunity to reflect upon the characteristics of the new spaces virtual worlds can create.

Besides urban space and play, the mobile phone and LARA are reoccurring technologies throughout this thesis. Within this thesis, I focus on mobile devices such as smartphones as current LARA are mostly rendered on these devices (Merel, 2017). As such, I focus on the virtuality enabled by technologies, including AR and virtual worlds. There are, however, other systems, such as glasses or headsets, that can render AR. Due to a low affordance and a high penetration rate (Merel, 2017; We Are Social & Hootsuite, 2017), smartphones are taken as the main facilitator of LARA within this thesis.

I am aware that the functionalities and use of LARA are not undisputed in relation to privacy and control. Francisco Klauser, Anders Albrechtslund, and Peter Lauritsen, amongst others, have addressed the consequences of location-based applications and the role of urban space in relation to these tracking technologies for privacy and autonomy (Albrechtslund, 2013; Albrechtslund & Lauritsen, 2013; Klauser & Albrechtslund, 2014). The networked ability of mobile devices has posed new questions related to surveillance, privacy, and ethics.

The interconnectedness of these networks, amongst others, has complicated matters concerning accountability and transparency as there is no clear boundary between those who survey and those who are surveyed (Klauser & Albrechtslund, 2014, p. 277). Besides blurring the distinction between actors, the constant localisation of people and objects, which provides users with place and practice specific services and information, can be used to organise and condition people and objects involved (Gilmore, 2015; Klauser & Albrechtslund, 2014; Lanzing, 2016). The latter point also refers to how LARA establish new forms of power-relations between the AR service provider and the user. I discuss this particular relation in chapter 2.1.5 in which the dimension of *networked play* is presented as one of the three dimensions of play related to digital technologies. Other aspects, including the normative dimensions of LARA concerning whether or not data should be gathered, how companies relate to one another, and how this relation affects the LARA themselves and the experiences of the user fall, despite their relevance and importance, outside the direct scope of the thesis. Furthermore, the role of screens in producing space, also known as urban materiality, which Klauser and Albrechtslund (2014) discuss, is not a central theme within this thesis (see also Verhoeff, 2012).

#### APPROACHES TO THE RELATION BETWEEN TECHNOLOGY, PERCEPTION, AND ENGAGEMENT

One can identify two boundary positions within the debate concerning the relation between technology and humans, respectively technological determinism, the interpretation that technology influences society such that society adapts to the arrangements technology requires and that technological developments are the result of an intrinsic mechanism (Winner, 1980, p. 122), and social constructivism, the conception that technology is a responsive process that is directed by social circumstances (Klein & Kleinman, 2002, p. 29). From this perspective, technologies do not have intrinsic properties, as they are defined by people. A knife can be a kitchen utensil, or a murder weapon.

Within postphenomenology a more elaborative account emerged that addressed the relation between technologies and human beings: *technological mediation* (Kiran, 2012; Verbeek, 2005, 2008b). The belief that technological artefacts, objects, and human beings, subjects, determine one another in a deterministic way presupposes that one can discuss technologies independently of the people that engage with it (Verbeek, 2005, p. 117). This is, from a postphenomenological perspective, inconclusive as it is the relation between humans and technologies that allows one to comprehend these technologies (ibid).

In contrast to classical phenomenology, postphenomenology, as developed by Verbeek and Ihde, addresses how human-world relationships are constituting the world as it is and what the subjects in this world "are", rather than describing these connections as relations between pre-defined entities who perceive and interact with a static world full of objects (Ihde, 1995, p. 7; Verbeek, 2005, pp. 111-113). When trying to understand LARA from a postphenomenological perspective, their function as mediators does not take place "in-between" subjects and objects (Verbeek, 2005, p. 130). Instead, mediation should be understood as a way in which subjects and objects mutually constitute one another (ibid, pp. 129-130). As such, mediation both constitutes how reality appears to us and how we appear in the world.

Someone who experiences the world through a LARA, for instance, does not have the same experience as without the system. When interacting with the world through LARA, I can catch see unicorns in the city-park. As such, LARA profoundly shape how the world and I are present.

Inde has categorised underlying forms of the interrelations to describe how one's perception of the world is mediated by technologies, namely *alterity* and *background relations* and *mediation of relations* (Verbeek, 2005, pp. 123-128). This categorisation of mediations is visualised in Figure 1 and ranges from the artefact as 'quasi-me', when an artefact can be seen as an extension of myself, to the artefact as 'quasi-other', an artefact with a level of independence. The first describes how I relate to the world by means of an artefact, which can be further divided into two categories, and the latter describes how I relate to the world via an artefact.



Figure 1. Affiliations between Ihde's human-technology-world relations.

The situation in which one relates to an artefact as 'quasi-me' is what Ihde has labelled an *embodiment* relation. The artefact becomes translucent and one experiences the world through the technology without directing one's attention to the technology itself, for instance, eyeglasses or LARA. The *hermeneutic relation* also addresses experiences of the world via an artefact, however, in contrast to *embodiment relations*, one directs one's attention to the thing itself. Rather than adjusting reality to one's senses without changing the type of sensation, reality is transformed (or distorted) to something that can be experienced with one's senses. For instance, a thermometer allows one to measure and 'see' temperature. On the other side of the spectrum, Ihde describes *alterity relations*: relations in which technology is seen as 'other', for instance, artificial intelligence. *Background relations*, in contrast to the other mediations, take place in a more marginal sense as they are not deeply experienced. Technologies, then, influence the context in which we experience in an unnoticed manner, for instance the barely noticeable hum of domestic appliances.

Verbeek (2008a, pp. 391-392) proposes two other human-technology relations, namely *cyborg* and *composite relations*, to expand Ihde's framework. *Cyborg relations* address technologies that physically alter the human body, whereas *composite relations* address how technologies construct reality. Although the latter relation is a promising manner to conceptualise virtual worlds as constructing entities, it fails to address the relation between relation between people interacting with one another in this world (Søraker, 2012, p. 504). AR introduces virtual elements to one's environment, however, in doing so, virtual entities are becoming both world and technologies, both mediating and constructing reality.

AR facilitates a *relation of augmentation* that constructs a second field of attention (Verbeek & Rosenberger, 2015, p. 22). The *relation of augmentation* addresses both the *embodiment relation* to our environment and the *hermeneutic relation* to the information that AR provides (ibid). This specific relation, however, seems to primarily address informational LARA. Different forms of AR, especially those that do not provide an explanation of urban space, seem to adhere to another relation as one does not 'read' the world in LARA such as *Pokémon GO* (Niantic, 2016). Nicola Liberati (2016) describes these augmentations as autonomous and non-peripheral that demand the attention of users. The potentiality of AR to develop objects that are unrelated to objects in the non-virtual world, thereby embedding our environment with a new materiality, allows users to reach new parts of their environment (ibid, pp. 26, 27). I should state that, from a postphenomenological perspective, the technology is in itself hard to define as it comprises multiple micro-mediations including screens, devices, and cameras.

The analysis within this thesis is informed by a postphenomenological approach, that is, I consider a postphenomenological stance to be competent of providing the constructive understanding of the role of technologies as mediations between reality and humans that I deem necessary to understand the role LARA and virtual entities play in everyday life. Furthermore, both AR and mobile phones inspire discourses in postphenomenology and urban life which are in line with the central question of my thesis. The asset of postphenomenology is that both the relation between human beings themselves and between human beings and objects are addressed. When addressing urban space and LARA from this perspective, one can say that we shape urban space and LARA, while urban space and LARA also shape us. The developed framework of play can expand the postphenomenological framework of relations by providing new insights that address how AR applications mediate one's perception of and engagement with the world. The dimension of *mediated play* in particular encompasses the postphenomenological framework of mediated relations.

#### THESIS OUTLINE

To conclude this introduction, I provide an outline of what I will investigate in this thesis. In order to answer the main research question "*how do location-based applications, that use augmented reality on mobile phones in an urban environment, affect one's perception of and engagement with urban space?*", I will, in chapter 2, first aim to investigate the notion of play by developing an answer to the first subquestion "*what concept of play is proposed by proponents of a playful culture and how does play relate*  *to urban space and AR?*". The foundation of this chapter will be an extension of the four types and the two attitudes of play presented by Caillois (2001). This analysis is complemented by an understanding of play as a hermeneutical concept by contrasting the works of Gadamer (1986, 1989) and Sicart (2014, 2016). As such, play is presented as neither exclusively human nor exclusively artefactual. Three dimensions of play are proposed to explain our engagement with LARA: the dimensions of *engagement play, mediated play,* and *networked play.* The developed understanding of the notion of play is used as an overarching methodology to identify and evaluate how play can be used as a mediator of perceptions and engagement, and to distinguish between meaningful and non-meaningful applications of play and AR in an urban environment. To clarify the relation between urban space and the notion of play, an overview of playful initiatives within urban space is provided.

In chapter 3, I classify locative AR media practices to interpret the technology in question. I will then establish an understanding of the relation between virtual and non-virtual realms by using the work of, amongst others, Baudrillard (1994), Deleuze (1994), and Kitchin and Dodge (2011) as readopted by literature within media studies. I analyse the role LARA have in mediating the relation between these dimensions and urban space to answer the second sub-question "*how are LARA mediating the relation between virtual and non-virtual urban space?*". Ultimately, I portray virtual realms and augmentations of physical space as complementary dimensions of physical space. This view moves beyond the interpretation of virtual as being unreal or representing a 'better' reality. Throughout the chapter, I use *WallaMe* (WallaMe-Ltd., 2015) to explore the dimensions of AR in relation to each perspective. In the remainder of the chapter, I inquire how AR involves a play with boundaries.

In chapter 4, I discuss the mediation of urban space by LARA to answer the third sub-question "*how do LARA allow for new ways of perceiving and engaging with urban space and how do the practices of play apply here?*". This chapter demonstrates, by discussing concrete practices that emerge from the use of LARA on the dimensions of *mediated* and *networked play*, that LARA distinguish themselves by the ability to provide new means of materialisation. Due to their complexity, two types of LARA are distinguished, namely LARA that 'read' the world and LARA that constitute the world. Furthermore, a *relation of engagement* is proposed to account for this distinction. Several AR applications are discussed to understand how urban space is reduced to a background and how, by re-appropriation, urban space is transformed from space to place.

The results from chapter 4 will be used in chapter 5 to provide guidelines for the practical design of LARA such that one can avoid reducing the city to the background of one's attention, thereby providing an answer to the fourth and final sub-question "*how can LARA be designed to mediate a meaningful interaction with urban space?*". These guidelines, which are based on the playfulness initiated by LARA and the developed understanding of play, can be used by designers or developers to develop meaningful experiences that allow people to engage with and perceive urban space in a meaningful manner.

Finally, chapter 6 concludes and discusses the implications and limitations of the study, as well as suggestions for potential future research.

# CHAPTER 2 | | PLAY AND THE CITY

"The players are drawn into the play in such a way that they are unburdened, released from the strain of taking the initiative, and "play takes over," as a pure self-display. But even though "the play's the thing," it still needs the players as those to whom it displays itself, who begin by playing only to become played in the process."

Theodore Kisiel The Happening of Tradition: The Hermeneutics of Gadamer and Heidegger, 1969, p. 371.

PLAY AND THE CITY || 17

o understand the relation between play, urban space, and AR, one needs to grasp what play, games, and playfulness refer to. This understanding is based on three sections. First, I will start my inquiry into play with the field-setting work of Johan Huizinga, complemented by the description and discussion of Miguel Sicart's, Roger Caillois', and Hans-Georg Gadamer's<sup>2</sup> notions of game, play, and playfulness. After concluding with the presentation of an extended concept of play that includes both the artefactual and the anthropological dimensions of play, I will, in the second section, connect this concept to urban space. Finally, I will explain in the third section how play can be meaningfully applied to foster a deep relation between citizens themselves and their environment.

### 2.1 AN INQUIRY INTO PLAY

The classic works addressing play within the field of game studies are the starting point of this inquiry. As this study focuses on LARA, I highlight the relation between play and urban space.

#### 2.1.1 | THE BASICS OF PLAY

In his classic study "*Homo Ludens: A Study of the Play-Element in Culture*" (1992)<sup>3</sup>, historian Johan Huizinga is concerned with the essence of play and reveals how play constitutes social practises that shape norms and values. Play is, for Huizinga, a free and meaningful activity that is being undertaken for its own sake and which is spatially and temporarily disconnected from everyday life (ibid). A self-governing system of absolute rules bounds the activity of play. Huizinga's philosophical point of departure is the thought that play is related to meaning. When playing a game, the game itself makes sense to the player. In general, games presuppose players who are consciously aware of the objective they should accomplish and of the conditions under which these objectives can be completed. When one is pretending to be a police officer who is chasing a criminal, one obviously understands that one's actions are only make-believe. Every ludic activity or experience can be, at least for Huizinga, identified by means of a reference to the various rules and means of play available to the player.<sup>4</sup>

Although the rules of play may vary, all plays take place in a confined space that is spatially and temporarily disconnected from everyday life: the *magic circle* (ibid, p. 10). The worlds created by play are temporary worlds within the physical world and the activities that emerge from playing are dedicated to the performance of activities separate from normal social practices (ibid). Unlike interpreted by some, the magic circle is not an inherent characteristic of playful activities (Egenfeldt-Nielsen, Smith, & Tosca, 2016; Stenros, 2014), but an emphasis of the player's ability to initiate, or *toveren* (Dutch for "to enchant"), a circle around playful actions.

<sup>&</sup>lt;sup>2</sup> This section has been created based on the interpretations of Charles Byrum (1975) and Richard Detsch (1985) of Gadamer's work in the context of philosophy of play. As such, I focus on the application of Gadamer's notion of play in the context of game studies. The readopted interpretation of Gadamer's is used as a heuristic to understand the artefactual dimension of play. <sup>3</sup> The original version of *Homo Ludens* was written in 1938 which, in turn, was based on his oration in 1933 which addressed "the boundaries of play and of work in culture" (*Over de grensen van spel en ernst in de cultuur*) (Caillois & Halperin, 1955). <sup>4</sup> Huizinga does not make, in contrast to other theorists of play, a clear distinction between play and games. The relevance of the provide the section of the provide the section of the play. The relevance of the play and games. The relevance of the play and play and games. The relevance of the p

French philosopher Roger Caillois (2001) criticised Huizinga's definition of play as both too expansive and too restricted. On the one hand, the definition is too expansive as it falsely includes "the secret and mysterious" (ibid, p. 4), meaning religious practices or rituals. These may comply with Huizinga's definition of play, but are not commonly called or considered as 'play'. Conversely, the definition is too restricted as it falsely excludes non-rule-based games and games of chance (ibid, pp. 4-7). In order to include other types of play, Caillois extends the categories of play proposed by Huizinga, which posed that play is free, separated within the limits of time and space, and rule based, by arguing that play is also uncertain, unproductive and make-belief (ibid, pp. 9-10). The addition of play as being unproductive allows Caillois to circumvent Huizinga's claim that play is not compatible with gaining material interests or profit<sup>5</sup>. Moreover, this addition excludes professional players, such as athletes or those who play video games on a national or international level, from being players as they are considered as workers (ibid, p. 6). Similar to Huizinga, Caillois (2001) poses a strict opposition between everyday life, or 'real' life, and play or the real and the imaginary. This position is, however, contestable. In "*Homo Ludens Revisited*" (1968) Ehrmann, Lewis, and Lewis oppose the idea that play is a 'luxury' that stands apart from everyday life:

[I]f play as the capacity for symbolization and ritualization is consubstantial with culture, it cannot fail to be present wherever there is culture. We realize then that play cannot be defined as a luxury. Whether their stomachs are full or empty, men play because they are men (Ehrmann et al., 1968, p. 46).

The claim of both Caillois and Huizinga that play takes place in a separated realm apart from daily life is, according to Ehrmann et al., inconsistent with their argument that play is a ritual with cultural configurations or part of social structures (ibid). In chapter 3, I will argue that location-based play, in particular facilitated by LARA on mobile devices, erodes a clear and definitive boundary between 'real' everyday life and 'unreal' play. Another aspect of Caillois' understanding of play that seems to be too radical is the idea that play is unproductive and involves a return to an 'original' or pre-defined state (Caillois, 2001, pp. 9-10). In contrast, Hans-Georg Gadamer (1986, 1989) understands play not as an activity that in some way or another goes back to an equilibrium, but rather displays itself through constantly being in motion.

In "*Truth and Method*" (1989), Gadamer aims to comprehend the nature of understanding by establishing a philosophical hermeneutics that analyses the foundations for understanding. In doing so, he rejects the pursuit to ground such a foundation on any method (Detsch, 1985). As such, Gadamer insists on limiting the role of a method and prioritises the role of situated and relational activity. This situated and relational aspect of understanding can be clearly seen in Gadamer's use of play (ibid).

<sup>&</sup>lt;sup>5</sup> For Caillois, gambling, with or without involving financial risks, falls between games of chance and games of skill (Caillois, 2001, p. 7).

For Gadamer, play is a "to-and-fro movement", a movement that "has no goal that brings it to an end; rather, it renews itself in constant repetition." (Gadamer, 1989, p. 104). As such, Gadamer emphasises that play should not solely be understood as a disconnected and disinterested activity of a subject. Elements as intention, equipment, players, and spectators are drawn together within the act of playing a game. Said differently, the game in itself is independent from the subjectivity of those playing or watching the game. For Gadamer, play precedes a player, that is to say that the player merely shows the way a game, or artefact, is revealed (Detsch, 1985, p. 157). The involvement in a real game is characterised by an understanding that one is not playing a game, but that one is played by a game. For example, when playing a game of sports, the structure of play assimilates players into the game such that the "burden of taking the initiative" is removed (Gadamer, 1989, p. 105). Apart from the artefactual dimension of play, the to-and-fro movement seems to also refer to the leeway (Dutch: speling) between games, or artefacts, and players.<sup>6</sup> Rather than being a unilateral process between player and a game, play is a process that takes place in-between those who play and, from the standpoint of Huizinga and Caillois, that what is supposed to be being played. The to-and-fro movement draws players into the play – players may have the intention to participate in a game – then play takes over.

What distinguishes Gadamer from Huizinga and Caillois is that the former articulates, in terminology of philosopher Charles Byrum, a philosophy of *play of ideas*, where the latter two articulate a philosophy of *play with ideas* (Byrum, 1975, pp. 316-318). Play with ideas includes an anthropological stance that addresses the subjective role of human beings, whereas play of ideas refers to how ideas or artefacts can play with us in the interaction that takes place. As is demonstrated later, neither of these two concepts, play of ideas and play with ideas are, on their own, sufficient to explain the way play can be applied to understand the interaction between people and their environment. Hence, an account of play is needed that addresses both the anthropological and artefactual dimensions of play. While the artefactual dimension of play is based on Gadamer, the anthropological dimension of play is based on Caillois' classification of types and attitudes of play.

#### 2.1.2 TYPES AND ATTITUDES OF PLAY

Caillois distinguishes between four types and two attitudes of play. The four types of play are *agôn* (competition), *alea* (chance), *mimicry* (simulation/imitation), and *ilinx* (vertigo) (Caillois, 2001, p. 12). *Agôn* relates to activities of challenge and skill. *Pokémon GO* (Niantic, 2016), for instance, involves competitive elements such as catching all the monsters or defending as much gyms (special places within the game) as possible. For each player involved, the aim is to satisfy the desire to be superior and gain recognition for their ability to be superior (Caillois & Halperin, 1955, p. 66). The players have to be committed to the game as they can solely rely on their own capabilities and resources (ibid, p. 66).

 $<sup>^{6}</sup>$  Gadamer's interpretation of play as a mode of being of an object itself – its interpretation – is, according to Richard Detsch, related to Martin Heidegger who influenced Gadamer's work, in particular his understanding of truth as a movement that is produced by the tension between concealment and unconcealment (Detsch, 1985, p. 164).

*Alea*, in contrast, relates to play that involve chance. The role of the player is passive as one cannot primarily rely on one's own capabilities. Contrary to *agôn*, *alea* eliminates personal qualifications and skills. Examples of *alea* are casino games or games of dice. *Agôn* and *alea* each symbolise contrasting attitudes, however, both change, in one way or another, the world by making it 'other' (ibid, p. 68). Moreover, both aim to substitute the disorder of reality by a reality in which all the players are equal to another as all have the same possibilities and chance to prove their own skills (*agôn*) or to win (*alea*).

The third type of play, *mimicry*, is different from the other two as *mimicry* allows one to substitute the disorder of reality by making oneself different (ibid, p. 68). *Mimicry* relates to the temporarily recognition of imaginative worlds in which one makes other people believe that one has become someone else. A prime example of this type of play is role-playing, for example, a child who pretends that he or she is a steam locomotive by imitating the sounds of the steam whistles. *Mimicry* is, similar to *agôn*, representative of a type of play that requires control and skill.

The fourth and final type of play coined by Callois is *ilinx*, which includes an attempt to temporarily destruct the reality by engaging in activities that lead to a confusion of the senses, such as expressive dance. Similar to *alea*, *ilinx* entails uncontrollable movements as the control resides outside the player.

Each of these four types of play can range along an axis from *paidia*, the attitude of spontaneous and unstructured play, to *ludus*, rule-governed and structured play. Figure 2 provides an overview of the various possibilities mentioned by Caillois.

		Agôn	Alea	Mimicry	Ilinx
		(competition)	(chance)	(simulation/imitation)	(vertigo)
1	Paidia 🔺	races*	head or tails	childish imitations	children's swings
	free play	athletics*		masks	dance
	laughter	combats*		illusions	music
	dance	(* not regulated)	betting		
	solitaire		roulette		skiing
	game of patience	soccer		theatre	outdoor sports
∣ n	rule-governed games	boxing	lotteries	spectacles	
	Ludus	contests		*	

*Figure 2.* Scheme of Roger Caillois' four types and two attitudes of play. Adapted version of Caillois, R., & Halperin, E.P. (1955, p. 74). Please note that in each vertical column the activities are classified in such an order that the element of *paidia* decreases, while the element of *ludus* increases.

By using this matrix of the four types and two attitudes of play, Caillois can construct and organise various types of play and variations of games.

Following Huizinga's endeavour to explain culture by means of play, Caillois argues that in our history there has been a transformation from less developed societies based on *mimicry* and *ilinx* to civilised societies founded upon *agôn* and *alea* (Caillois, 2001, p. 101).

This is, however, where I disagree with Caillois as his attempt to describe societies based on four game categories seems highly selective and idealised. Moreover, as I will discuss in the following sections, *mimicry* and *ilinx* are profoundly present in what Caillois would describe as 'modern societies' and both can be related to LARA. Furthermore, *mimicry* demonstrates how (urban) play is connected to social roles, norms, and values (Goffman, 1959).

#### 2.1.3 EVERDAY LIFE AS PLAY

Caillois' four categories of play can be interpreted as metaphors for understanding interaction with other people in everyday life. The competitive element in economic liberalism can be seen as the element of agôn present in life. The element of *alea* depicts life as fate or the unpredictable play of diverse determinants. These unanticipated moments are important for our self-understanding and social interactions (Giddens, 2004). Today, *ilinx* has a digital side as video games and virtual worlds deceive our senses while providing players with a sense of escapism. The metaphor of mimicry relates to how role-playing and being playful is present in daily life and illustrates how one's location is of influence for one's interactions. The work of sociologist Erving Goffman can be used to exemplify this carnivalesque understanding of life. In "The Presentation of Self in Everyday Life" (1959), Goffman generalises a theory of performativity in everyday life to understand the importance of social interaction. I want to highlight this relation in particular as the way one is related to a particular environment, be it other people, artefacts, or one's surroundings, influences how one acts. The phrase "[o]ne man in his time plays many parts." in William Shakespeare's "As You Like It" (Shakespeare, 1623, p. 194) exemplifies Goffman's dramaturgical understanding of human interaction, as, according to Goffman, people display various masks to other people as they play various roles. For example, I am, at the moment of writing, a student, a guitar player, and a fan of SCANDAL. Depending on in which situation I may find myself in, I will regulate and try to control how I appear to others. When I am at a concert I may highlight the fact that I am a guitar player and present myself as an open and careless person. When I am attending a lecture at my university, I will not highlight that I am careless, and adapt my appearance and role such that they fit the formal and dedicated environment of a university. Insofar, I am in control of the *front stage*, that is, I can control how the audience can experience me (Goffman, 1959). My clothes, manners, use of language, and so on, co-constitute my front stage and, as we will see in chapter 4, LARA complicate being in control of that front stage and re-address the role of space in interaction between people themselves and their environment. When I am comfortable in a particular situation or group, I can show my back stage self (ibid, p. 112), for example, by articulating to those belonging to the formal context of university that I am a gamer or wear silly clothes when I am with my friends.

Goffman's interpretation of interaction as a playful act of switching masks allows one to understand the world as a space or stage that provides one with various props or means to perform. Moreover, other people are addressed as an audience or other players that take part in the 'interaction game'. Furthermore, similar to Gadamer and Ehrmann et al. and in contrast to Huizinga and Caillois, Goffman poses that one cannot make a clear distinction between spaces of play and everyday life – a relation that I will further investigate in chapter 2.2. Another important result of Goffman's analysis is that the form of interaction, the interaction itself, the experience of the performer (the player), and the experience of the observer ((non-)player), are depending on one's socio-cultural context and position in time and space. Said differently, depending on where we are, with whom we are, and with what we interact, our masks keep changing.

#### 2.1.4 FROM PLAY TO GAMES, PLAYFULNESS, AND PLAYABILITY

In the previous sections, I have demonstrated how play can be understood and how play can be related to everyday life. However, besides play, there are other, related, concepts that can be used to understand the complex relation between play and interaction and engagement.

Caillois' two attitudes of play can be used to distinguish between game and play, respectively rulebound play (*ludus, games*) and free play (*paidia, play*). From this perspective, one can say that games have an ending, as games have an aim that the player must fulfil. Once fulfilled, for example, reaching a particular amount of points, the game ends. Play, however, does not have a particular end-goal as play has its own purpose that is defined by the activity itself.

This distinction is also used by philosopher Miguel Sicart, who argues that games are part of a larger discourse of play in which games are materialised agreements that define certain boundaries, for instance, which actions yield to a particular score (Sicart, 2014). Play is, for Sicart, a particular stance to the world, a particular mode of being, that is appropriative, expressive, personal, and autotelic (Sicart, 2016, p. 28). In chapter 2.2.1, I will illustrate how urban life can be expressed in these terms and how AR can be used to support this mode of being. This understanding of play, which connects with certain understandings of Caillois and Huizinga, also allows me to distinguish between play and playfulness. Sicart (2014, p. 31) classifies play as an activity that takes place in the world and addresses playfulness as an attitude towards the world. In contrast to play, which takes place within specifically designed spaces such as playgrounds or arenas, playfulness takes over a certain situation or context, while, at the same time, respects the situation or context. The Maastricht Urban Trail exemplifies this difference. The Maastricht Urban Trail is a parkour course through the city of Maastricht that depicts the city as a giant playground in which the runners experience a different perception of the city ("Maastricht urban trail," 2017). This activity can be considered as play, since the parkour has been developed specifically for this trail. The trail can be seen as an area or playground. When one would run through the city while jumping over benches and turning the streets into a running field without considering a particular route or endgoal, one can say that one has playfully interacted with the space around one. The runners playfully appropriate the streets to 'take over' the situation, while simultaneously respect the streets as infrastructures that have a particular function.

The parkour example also highlights how a situation or a particular arrangement of people and objects can evoke certain playful activities. The ability to evoke play is what Julian Kücklich has called *playability* (Kücklich, 2004, pp. 21-23). Besides parkour, one can think of a slide that invites people to glide from it or a virtual monster that stimulates people to scan the environment in search for more of them. I will further address the element of play evoked by objects, in particular LARA and mobile phones, in chapter 2.1.5.

Differentiating between play and playfulness is necessary as both can prompt various ways of addressing play within urban space. When designing for particular areas or situations of play, that is, the development of locations and objects that allow people to engage in the activity of play, one complies to the realm of play (Sicart, 2016, p. 29). The playability of artefacts or situations will evoke the activity of play. One can use games to foster playability, however, a stronger connection between people and their environment is made when a game discloses the playability of the environment. When designing for playfulness, one focuses on designing spaces that allow people to appropriate these spaces without creating demarcated areas of play that conform to particular methods for designing the play activity (ibid, p. 29). As such, playfulness moves beyond the design of applications or spaces that aim to stimulate the activity of play and aims to encourage players to appropriate the artefact or the situation.

#### 2.1.5 DIMENSIONS OF PLAY AND LARA

Within this thesis, I will use Caillois' types of play (agôn, alea, mimicry, and ilinx) as a framework to describe how LARA introduce playful characteristics in our perception of and engagement with urban space. Sicart's understanding of play as a particular mode of being in the world that is appropriative and expressive further complements this understanding and use of play. I do, however, not agree with Caillois and Huizinga that play can be seen as exclusively human, as this perspective is insufficient to explain the interaction between people and their environment. Rather than addressing the sole role of a subject, the player, I cite Gadamer to describe the role objects have in establishing playful interactions. To account for both the artefactual and anthropological sides of play, I propose that our engagement with LARA resides on three 'dimensions of play'.7 The three dimensions each address a certain understanding of LARA as being playful. The first dimension, engagement play, describes how LARA can be used to provide an interface to engage in playful activities. The second dimension, *mediated play*, portrays the AR applications and the platforms they operate on as artefacts that are playful and evoke playful interactions with and perceptions of the applications, ourselves, other people, and the world. The third and final dimension is networked play. This dimension addresses how LARA are connected to a larger network that evokes new power-relations between designers, entrepreneurs, policymakers, and users. In the following, I will present a brief explanation of each dimension in which play is incorporated in influencing perception of and engagement with urban space.

<sup>&</sup>lt;sup>7</sup> Parts of this section incorporate reworked fragments of Munters, G. *Digital and Mobile Media Technologies and Playful Identities: Moving beyond Narratives*. Unpublished manuscript. University of Twente, Enschede, NL.

#### ENGAGEMENT PLAY

Various mobile or digital technologies provide users with an interface of playful activities. Said differently, these technologies allow people to engage with a variety of games. One can think of solitary games, games that can be played on one's own without concentrating on other actions or interactions, and pervasive games, games that are related to one's geographical position and tend to focus on fostering interaction between players and their environment. Casual games, such as *Candy Crush* (King, 2016) and *Angry Birds* (Rovio-Entertainment, 2016), do not necessarily require one to interact with one's environment and, due to their casualness, these games are not radically diffused from practices in everyday life. This can be exemplified by situating oneself, a player, in urban space. While on the move from home to school one can easily throw birds at castles in *Angry Birds*. One should keep an eye out for other people or objects, but, in general, the player can solely interact with the events on screen.

In contrast, pervasive games aim to facilitate a more engaging relation between the player and his or her environment. An example of such a game is *Pokémon GO* (Niantic, 2016) as the LARA aimed to stimulate players to engage with their local environment by turning local sights into hubs where one could catch virtual monsters (Fahey, 2016). By using the non-virtual world as a playground for the virtual layer of monsters, Niantic attempted to decrease the distinction between a separated gameenvironment and the physical world. The blending of virtual and non-virtual spaces and the use of teambased gameplay portray *Pokémon GO* as an application that connects people and provides a community based experience. Despite the connection between players themselves, a meaningful or deep relation with their environment was not established (see Borland, 2016; CBS & Peterson, 2016; Peterson, 2016). The use of LARA to foster this relation and the role of *Pokémon GO* will be discussed more elaborately in chapter 2.3 and chapter 4.

#### MEDIATED PLAY

This dimension of play addresses the specific characteristics of LARA and mobile devices as artefacts. The dimension of *mediated play* posits that one does not solely relate to oneself, others, and one's surrounding via a medium, but also to them as artefacts. The relation with LARA and urban space can be seen as playful in the sense that both are not unambiguous in their meaning or usage. As artefacts they are continuously adapted and reinterpreted as a result of what postphenomenologists have called 'multistability' (Ihde, 1990; Verbeek, 2005) and, in turn, they can influence how one perceives his or her environment (Böhme, 2012). *Pokémon GO* (Niantic, 2016) can be, again, taken as an example to clarify this dimension. On the one hand, *Pokémon GO* can be seen as a collaborative and competitive game in the non-virtual world, while on the other hand, the use of *Pokémon GO* may result into new interpretations of the relation between virtual and non-virtual spaces (de Lange, 2015b) or between players and (virtual) objects (Blascovich & Bailenson, 2011; de Souza e Silva & Sutko, 2011).

#### NETWORKED PLAY

Applications and devices imposes rationales on LARA, thereby connecting them and users to a larger network. The embeddedness of these devices and applications in various landscapes can evoke new power-relations that result in an interplay between individualism and conformity. Designers, AR service providers, and third parties can condition and organise those using the application or device by tracking, amongst others, one's position and activities (Gilmore, 2015; Klauser & Albrechtslund, 2014; Lanzing, 2016). *Layar*, a company that develops AR applications, developed the similarly-titled application *Layar* that allows users to add a visual overlay over the non-virtual world. One's experience and interaction with the world and other people is then not only coordinated by oneself or the medium, but also by the designers or service facilitators of the particular application or device. The network as such shapes the character and nature of interaction and engagement and the extent to which one is connected influences the amount of control one has (Kounavis, Kasimati, & Zamani, 2012; Liao & Humphreys, 2014). The social surveillance may lead to conformity or standardised implementations of AR. One can subvert conformity and re-establish the formed network by playfully interacting with the network, for instance, by playing a different role or using the device for different purposes.

I will explore the first dimension of play in more detail in chapter 3 with regards to LARA and urban space. I will address the second and third dimension in chapter 4 in which I investigate how LARA afford practices and new mediations of perception and engagement.

#### CONCEPT OF PLAY

Within this thesis, I use play as an anthropological and artefactual concept. Anthropological as play is appropriative, expressive, personal, and autotelic, thereby addressing a particular stance to being in the world. Moreover, Caillois' four types and two attitudes of play can be used to understand elements of play that can be seen in our engagement with urban space. Play is also artefactual as artefacts can evoke feelings of play by means of their configuration and appropriateness. As such, I use play as a lens to investigate the mediating capacities of LARA on our perception of and engagement with urban space.

#### 2.2 CONNECTING URBAN SPACE AND PLAY

To obtain an improved understanding of play, playfulness, and games as means to foster a (meaningful) relation between urban space and citizens, I deem it worthwhile to identify various examples of urban space and play.

#### 2.2.1 CONTEMPORARY PLAY WITHIN URBAN SPACE

From the Olympic sports in ancient Greece to parkour in metropoles, cities have been, throughout history, a locus of play. Chapter 2.1.3 illustrated that, besides particular activities and actions, people can understand everyday life in terms of play. In particular Goffman (1959) argued that the interactions between citizens exhibited carnivalesque or theatrical elements.
Hereof, urban space can be seen as the facilitator of means for playful activities and behaviours, particular games, or props that allow one to behave in a playful manner. Urban planners and policymakers, amongst others, may have the possibility to develop or design urban spaces that provide clear means for activities of play, such as playgrounds, parks, or arenas. However, play is not necessarily limited to specifically designed playspaces.

Street sports like BMXing allow people to 'take over', or appropriate, a situation and make it their own. This appropriative aspect of play connects with Sicart's (2016) vision and unveils a new way of developing new spaces that players, in contrast to playgrounds or playspaces, design and develop themselves. An example of this type of play is parkour, a training discipline in which practitioners aim to move from one point to another in a complex environment while avoiding obstacles, such as benches, staircases, or walls (see Figure 3).



Figure 3. Practitioners of parkour in action. Daffa Alla, M. (2012).

While doing parkour, one can see the entire city as a playground in which one swiftly moves from 'A' to 'B' by using the obstacles that one comes across, thereby experiencing a thrill of excitement (*ilinx*) (WFPF, n.d.). People interpret and use urban space, thereby, differently than what policymakers or urban planners have planned. Practitioners of parkour make good use of the playability of the city by having a playful attitude. In parkour, we can see how the anthropological and artefactual dimensions come together. People have an expressive and appropriative stance to the world, while the urban space evokes people to be part in a play. By adopting nicknames and character tokens to distinguish themselves from other practitioners, people exhibit elements of agôn and *mimicry*.

Parkour also demonstrates that the separation of the space in which play takes place is less absolute than Huizinga seems to suggest. In fact, this demarcation is not completely separated from everyday life. While playing, we may accept special rules that explain or prescribe certain patterns of behaviour, for example, stepping on the lines between the pavements of the street as each line represents a rope over a pit of lava – the sidewalk. In this example, the distinction between make-belief and belief has faded.

Besides appropriation of urban space, one can identify a subversive counter-play against societal developments. Using play to object to and reconsider urban societal developments is what the Situationists, in particular Guy Debord, have called the dérive (de Certeau, 1984; Debord, 2006; Sicart, 2016). In their pursuit of challenging the commercialised nature of urban space, Situationists coined the strategy of the dérive. This strategy entails that one, being guided by one's position, wanders through the city without any particular purpose to develop a close relationship to one's environment. Eventually, this close relationship should evoke a feeling of wonder (*alea*) of being at a place that dismantles the attitude of 'taking the world for granted'. Rather than 'mindlessly' moving from shop 'A' to shop 'B', the dérive provided people with a strategy to discover and reinterpret urban space. As such, cities are used as an interface through which people engage with the world through the act of subversive play.

The aforementioned dérive has, besides being a move against a dominant hegemony, aimed to get people to look at their surroundings from a different perspective. The *Pieces of Berlin* project (see Figure 4) is a good example of *engagement play* that uses play as an interface to engage with urban space and increase the playability of the environment.



Figure 4. Pieces of Berlin. Burke, E., & Maharas, L. (2011).

The game, which could be played during the Invisible Playground festival in 2011, was an explorative expedition through the city of Berlin in which players were invited to engage with the city from a new perspective by looking at architecture and graffiti. Players were given various details and hints about buildings or places in their environment. Their goal was to locate these buildings or locations and only by standing in the right place the tracings given at the beginning of the game would correctly align with one's view. Players should, therefore, closely observe the city landscape in order to find the view that corresponded with the hints given at the beginning of the game. The expressive element is further enhanced by the playfulness of the city as certain descriptions by the game could be related to multiple skylines or graffiti paintings, thereby evoking appropriation of the game and city.

Another example in which play has become a centralised term to foster a connection between citizens and their environment is the 'playable city' organisation in Bristol ("The Playable City," 2014). This organisation aims to develop projects that augment public (urban) space through play.

This augmentation of public space though play can be done by focusing on the level of urban planning, by using digital technologies to develop playful environments, or by using play to intervene in the planning process. The *Urbanimals* project in 2015 projected a variety of origami-like animals in places across the city of Bristol, waiting to engage with people ("Urbanimals," 2015). Figure 5 (see next page) shows a kangaroo that invites people to jump the rope together.



Figure 5. Urbanimals in the city of Bristol. Blakemore, P. (2015).

*Urbanimals* is a good example of *mediated play* in which virtual entities are unexpectedly introduced (*alea*) to people in their daily life. The playful entities evoke playful interactions between people and urban space. Designers Sebastian Dobiesz and Anna Graijper wanted to use play to bring people together in areas of the city that have received little attention. By projecting virtual animals they wanted to stimulate the senses of people who see the animals, thereby incorporating *ilinx*, and surprise them by projecting wonder into the everyday urban landscape (Bristol24/7, 2015).

# 2.2.2 | PLAY, THE CITY, AND AR

Although the development of making cities more playful is a way of connecting people with their environment and other people, Sicart argues that this change is still centred around the old paradigm of focusing on physical environments (Sicart, 2016, p. 30). That is, initiatives like the playable city are not sufficiently taking into account the role of the informational layers cities deal with (ibid). When taken into consideration, the playability is often solely related to a device or the information itself, and not to the environment (Sicart, 2016).

Play facilitates sufficient ways to make also use of newer paradigms that address this informational layer. For Alfrink (2015, p. 536), play and games can be applied in three domains: (1) the physical form of the city; (2) the digital networks pervading a city; and (3) the social practices of urbanites. AR connects both the digital layer of information and the physical form of a city on these levels.

In the Amsterdam *PlayReal* project, the virtual and the non-virtual world come together in a so-called massive multiplayer and offline game ("PlayReal," 2014). The game, addressing people at the age of 15, establishes a connection between online social network sites and offline assignments that correspond to an interactive narrative that requires players to work together and solve existing local problems.

The virtual playspace is a social hub where players form groups to find a solution for the given challenge. Although *PlayReal* portrays the project as an artefact that evokes playful interactions by embedding virtual spaces in non-virtual spaces (*mediated play*), the playability is centred around the device rather than focusing on enhancing the playability of the environment. Moreover, the application is connected to a larger network of stakeholders which is taken as the prime motivation behind the system, a clear example of how *networked play* is applied inappropriately – the system establishes new power-relations that are not per se related to fostering deep connections with one's environment.

Besides large and simulated environments that aim to challenge people to develop potential solutions and stimulate engagement with one's urban environment in a playful manner, there are applications that aim to simply connect individuals with their local environment. AR applications like *CityViewAR* (Lee, Dünser, Seungwon, & Billinghurst, 2012) use data gathered from sensors in mobile devices and services like Google Maps to provide a glimpse of the history and possible future of a location. The application provides playful reminders that we, as urbanites, are living in a space formed by people in the past and that we are creating the foundations for future developments. It mediates our perception and interaction by turning urban space into a museum in which we can view the history or future of a city and alter our perception by tapping on a screen, and allows us a different way of interacting with urban space.

An important issue that is raised by these applications is that whether or not we should want them to guide us in what we are doing, where we are going, and so on. This concern is presented as a desirable development as is stated by consumers of the explore application *FieldTrip* (Murray, 2014; Niantic, 2015). One simply has to tell the application about one's interests and the application will suggest where one should go to. AR can provide us with experiences that can foster a deep connection between our environment, however, one runs the risk of using the applications as a prop for including playability to conceal desires and needs from designers or policymakers. These applications can become the ones that tell you what to do and where to look at. Rather than being engaged with our environment, we stare at an application on our screens. To this extent, I propose an inquiry that uses play to distinguish between uses of AR that foster *meaningful play* and *non-meaningful play*.

# 2.3 | MEANINGFUL PLAY

What has become more prevalent, especially in policymaking, is the use of media and games to gamify situations to stimulate the development of certain skills or behaviours, or raise awareness about a certain fact (Hogendoorn, 2013; Kazhamiakin et al., 2015; Su & Cheng, 2015; Wismans, 2014). Gamification as a facilitator of play should be dealt with caution, as this use of play can result into the objectification of social interactions, for instance by using other citizens in *Pokémon GO* to score more points and catch more Pokémon.<sup>8</sup> When play is used in a non-meaningful manner, urban space and other citizens are only used to get ahead in an activity or game. Rather than enjoying the presence of other people and engage

<sup>&</sup>lt;sup>8</sup> See Bogost (2011) for a critical analysis of gamification that questions the necessity of gamifying certain procedures.

with one's environment, one solely focuses on becoming the best player within the game and, thereby, one ignores the environment to effectively increase one's score or digital reward.

Non-meaningful play in conjunction with AR is exemplified by *Pokémon GO* (Niantic, 2016). Thousands of players around the world are searching for virtual monsters and do everything to 'catch them all', from playing at places that are socially characterised as inappropriate playspaces (Peterson, 2016) to ignoring traffic and traffic regulations (Borland, 2016; Kerr, 2016). These observations suggest that, similar to what Gadamer (1989, pp. 92, 98) stated, players do not necessarily play games, but are played by the games themselves. In our interaction with these applications, a 'magic' circle is drawn by the artefact that obliges people to focus on the application that inspires their actions.<sup>9</sup>

To deny this influence would be short-sighted, however, to reduce play as solely artefactual would be too radical. As has been highlighted in section 2.1.5 and 2.2.2, the device and AR are constraining one's vision. To speak metaphorically, they are the glasses that one looks through when one interacts with urban space. However, in our interaction with these devices we can also appropriate the context and the devices themselves to investigate new means of use. For instance, by using *Layar* (Layar, 2009) to tell and hide fictional stories about and within particular environments within urban space.

After resolving the constraints and concerns around non-meaningful play, one can address what meaningful play would entail. One dimension of meaningful play can be identified when examining the motivations behind playable city initiatives, namely encouraging social dialogue and motivating people to share experiences that are related to urban space. Said differently, those applications that create and strengthen relationships between people and between people and urban space can be described as facilitators of meaningful play (Gnat et al., 2016). In light of playable city initiatives, people have to be able to appropriate a situation and express themselves. In other words, urban engagement has to become a consequence of the interplay between the city and citizens appropriating the city (Sicart, 2016). Imagine a public park, once a space for leisure and public gathering and now an environment like any other where we stare at our portable screens browsing the latest review about that Italian ice cream parlour you are facing at the moment. Now imagine a park in which AR is used to provide a personal tour through the park developed by local people. Depending on how many people are taking the tour, people are brought together at geographical spaces that invite people to interact or discuss with one another, for instance, near a statue of which background story raises discussion. This process should be transparent such that people can appropriate the system, for instance, by adding own experiences of the park or a story about a memorable discussion. Another example of meaningful play can be applied to the gathering of personal data. Rather than simply gathering and storing data about the country of origin of people when, for example, they visit a particular place, the data can be visualised by intertwining local sights with the history of the people visiting the city. For example, Spanish people visiting the Rijksmuseum in the Netherlands are informed about the influence of Spain on the paintings on display.

<sup>&</sup>lt;sup>9</sup> This in contrast to Huizinga who argued that people create a space that is separate from other activities (Huizinga, 1992)

For meaningful augmentation, the city and its visitors and inhabitants should be the focal point, rather than a game or goals of efficiency or productivity one wants to satisfy. One can think of using AR to allow people to interact with the city by allowing them to see how the city has transformed over time and how the city may look like in the future, as when applied in a right way, the aim of the augmentation is to connect the citizen and urban space. AR and urban space should work together, rather than using each other as a means for making an activity more interesting or more refreshing. A meaningful application of play allows (non-)players to deploy different manners of participating or traversing urban space such that people start to think playfully about the space around them.

# 2.4 CONCLUSION

This chapter started with an inquiry into play to understand how play can be used as a methodology to identify and evaluate the mediating capabilities of LARA and their influence on one's perception of and engagement with urban space. The concept of play is, as was made clear throughout chapter 2, ambiguous and not easily defined. Play is deliberately framed as a heuristic that includes various dimensions of play which are used as a lens to investigate LARA and their mediating capacities.

I turned to, amongst others, Sicart and Caillois to understand the anthological understanding of play. For Sicart, play is a particular stance to the world. This stance is appropriative, expressive, personal, and autotelic. Caillois complements this understanding by describing four types (*agôn, alea, mimicry,* and *ilinx*) and two attitudes of play (*ludus* and *paidia*). This categorisation of play is used as a framework to describe playful characteristics that can be seen in our engagement with and perception of urban space by means of LARA. Other authors such as Goffman and Ehrmann et al. explained that location and one's socio-cultural context are of importance for one's interactions with other people and one's environment, thereby moving beyond the claims of Caillois that play stands apart from everyday life.

Although an anthropological understanding of play is fruitful to analyse how we interact within urban space, for example by parkouring through urban space, play does not solely address anthropological dimensions. To this end, I used Gadamer's understanding of play. His artefactual approach of play as a to-and-fro movement allowed me to address the role an object has in establishing playful interactions.

I have constituted a framework that includes the artefactual and anthropological understandings of play and describes three dimensions of play that address a particular understanding of LARA as being playful. The dimension of *engagement play* articulates how LARA can be used to provide an interface to engage in playful activities. The dimension of *mediated play* describes the AR applications and the devices they operate on as playful artefacts that evoke playful perceptions of and interactions with ourselves, other people, and our environment. The final dimension of *networked play* addresses how LARA are connected to a larger network that evoke feelings of being played.

This particular understanding of play was applied to understand the relation between play and urban space. I turned to traditional forms of entertainment and subversion – an attitude that can be seen as being appropriative – within urban space. Urban space and play have been closely related from various forms of sports to urban designs that aim to evoke playful actions. In more recent years, playful city initiatives have emerged to foster deep connections between people themselves and their environment.

The use of technological artefacts to foster this deep relation has raised concerns of whether or not these applications condition people in such a way that they simply follow the instructions on the device, rather than experiencing the city for themselves. To make a distinction between meaningful and non-meaningful use of play, I suggested to investigate to which extent urban space, inhabitants, and visitors are the focal point of the augmentation. Furthermore, meaningful play includes an augmentation that allows (non-)players to deploy different manners of participating or traversing urban space such that people start to think playfully about the space around them. These augmentations can be playful narratives that let people experience their city in a different manner. Another way of establishing this augmentation is to use AR. In contrast to other forms of augmentation, for example, a narrative told by a guide, AR applications have the ability to add a virtual layer of sound and information. Moreover, AR provides a different form of immersion. LARA and the platforms they operate on initiate a playspace for engaging with ourselves, others, and the world around us. Simultaneously, they develop a coded environment that steers and prescribes the regulations for these engagements and experiences.

The aim of this thesis is to understand how these LARA influence our perception of and engagement with urban space. Before one can understand this influence, the relation between AR and the non-virtual world should be investigated. What are locative media and what can be said about the augmentation of urban space? Questions like these will be answered to comprehend how the virtual layer of AR relates to the non-virtual environment that the technology augments. Hence, a vision that includes an account of how LARA involve playing with physical, virtual, social, and spatiotemporal boundaries is required. Insights into these relationships will allow me to articulate new ways of perceiving and engaging with urban space.

# CHAPTER 3 AUGMENTED REALITY AND LOCATIVE MEDIA AND THE CITY

"The virtual is fully real in so far as it is virtual."

Gilles Deleuze *Difference and Repetition, 1994, p. 208.* 

ugmented reality within urban space suggests an intriguing duality of an 'unaugmented' and augmented reality. This classification implies that AR improves reality. Alongside this discourse, there are voices that portray virtual elements as non-existing or simulations of real-world entities, thereby opposing virtual realms to the physical world (Scott, Mottarella, & Lavooy, 2006; Woolley, 1992). These discourses uphold a dichotomy between virtual and non-virtual realms that does not adequately address our perceptions of and interactions with AR within urban space.

This chapter contains in three sections. The first section addresses the relation between locative media and AR and includes a classification of LARA. The second section develops a complementary understanding of AR in order to move beyond the opposing virtual and non-virtual dichotomy. Rather than portraying virtual elements as plain simulations, I depict the virtual as something with a real existence. The final section addresses how engaging with LARA involves a play with physical, virtual, social, and spatiotemporal boundaries – the dimension of *engagement play*. Throughout the chapter, I will use the LARA *WallaMe* (WallaMe-Ltd., 2015) as a case study to support my arguments.

# 3.1 | LOCATIVE MEDIA AND AUGMENTED REALITY

People use location-based systems (LBS) for various practices such as wayfinding, planning, and accessing information (Schiller & Voisard, 2004). They include, amongst others, mobile devices, networks, and geographical location measuring systems such as GPS. Apart from personal use, commercial associations can use LBS to collect information, provide location-based advertisements, or facilitate personalised city-tours (Axel, 2005; Kjeldskov et al., 2005). Within the classification of LBS, one can consider LARA as a particular subset. LARA use the location of the users and their surroundings to enhance the application or their environment (Burrus, 2013; Wang & Canny, 2006). LARA such as *Layar* (Layar, 2009) are distinguishable from other LBS in that they display real-time and interactive virtual information based on user's their location.

## 3.1.1 | TYPES OF LOCATION-BASED AUGMENTED REALITY APPLICATIONS

In the following, I will provide a classification of LARA to understand the practices and scope around AR within urban space. Each category highlights a particular use and, therefore, the classification is not absolute and does not entail strict boundaries between applications that have multiple practices. The classification includes (1) navigation; (2) visualisation; (3) geotagging 2.0; and (4) pervasive gaming. One can address the element of play within each of these dimensions. Moreover, each category encourages us to reflect on the space around us.

#### LARA & NAVIGATON

In navigating our environment, LARA can help us in finding our destination by providing a virtual overlay. As the destination is known, the visualised route is based on pre-determined criteria such as time, aesthetics, or comfort. Besides guiding people to pre-known locations, LARA can guide people to

unknown destinations. *FieldTrip* (Niantic, 2015), for instance, enables people to be navigated around in cities that are unknown to them. The application gives information and suggestions based on the users their preferences. There are more opportunities for playful interactions as the end-point is unclear and users may diverge from their exploration when interesting events or places are encountered. Although LARA and navigation can bring one to unexpected places or events, there are concerns that, when following optimised directions of LARA, people will lose their connection with their environment as they are following the 'commands' of the application. This concern has been addressed in chapter 2.3.

#### LARA & VISUALISATION

LARA can also be used to visualise information about a particular location that would otherwise remain invisible. Based on collected information about a particular environment, for instance, thermal emission of buildings or carbon footprint, LARA can make visualisations to provide insights into the dataset (Malkawi & Srinivasan, 2005; Memarzadeh & Golparvar-Fard, 2012) Another example is the aforementioned *CityViewAR* which projected buildings that were destroyed by the earthquake in Christchurch (Lee et al., 2012). Projects like *CityViewAR* portray how LARA and related practices are rooted in urban space.

LARA can further augment the visualised information by means of sound and animation. For example, a variety of museums used AR, including imagery and sounds, to convey a story to their visitors (Ioannidis, Balet, & Dimitrios, 2014). LARA translated additional information about the exhibition into audio that guided users through the overarching narrative of the exhibition (ibid).

#### LARA & GEOTAGGING 2.0

LARA are also rooted in personal and communal use. LARA such as *Layar* (Layar, 2009) and *WallaMe* (WallaMe-Ltd., 2015) enable users to attach information to physical places by writing personal stories or adding pictures. The practice of connecting information complies with the practice of geotagging (Casey, Lawson, & Rowland, 2008). However, LARA provide new possibilities of displaying this information and ways for users to interact with that content. This particular practice of LARA invites users to playfully engage with their environment, from hiding messages in *WallaMe* (WallaMe-Ltd., 2015) to expressing personal experiences of a place in *Layar* (Layar, 2009). Interaction with urban space through the interface of these applications raises questions concerning authority and representation, as whose interpretation of space is illustrated and who is 'writing' space? This dimension of *engagement play* is highlighted in section 3.3.

#### LARA & PERVASIVE GAMING

The fourth category describes how LARA can be used to transform urban space into a playground that introduces elements of play in everyday life. In contrast to traditional games, the element of play in pervasive games is related to a status of ambivalence. The boundaries between virtual and physical realms are blurred and, consequently, people cannot develop a clear-cut understanding of who is playing

and who is not (McGonigal, 2011; Montola, Stenros, & Waern, 2009). *Pokémon GO* (Niantic, 2016) is a prime example that uses one's physical environment as an area of play. Applications such as *WallaMe* (WallaMe-Ltd., 2015) and *Layar* (Layar, 2009) are more ambiguous, as can one considered them as games? LARA seem to evoke playfulness as they involve the challenging of boundaries. In the following, I use *WallaMe* (WallaMe-Ltd., 2015) as an example of *engagement play* to investigate these boundaries.

# 3.2 | THE VIRTUAL, THE NON-VIRTUAL, AND THE CITY

The classification of LARA above has outlined the various practices of LARA and their relation to urban space. The interaction between the various dimensions involved in LARA has remained unexplored. We should, therefore, take a closer look at the relation AR within urban space establishes between virtual and non-virtual realms.

Within literature, researchers have investigated mobile phones that use AR as devices that bring distant people together or disconnect people from their physical location as these devices position users in a space in-between participants (Ito et al., 2009; Jensen, 2013; Vries, 2012). On the contrary, researchers consider digital spaces on these devices, such as chatrooms or online videogames, as virtual environments as they authorise users to interact with each other in a non-physical or simulated space (Hjorth & Kim, 2005; Vries, 2012). A consequence of this understanding is that virtual environments and objects and digital information are separated from physical spaces, thereby not addressing practices that involve a combination of humans, devices, and virtual elements (Poster, 2001). As such, the virtual has become a synonym for a representation of the physical world that lacks certain features. However, LARA seem to move beyond this categorisation as users see their physical surrounding and a 3D addition or representation of that environment mapped on their devices. LARA transform physical locations into digital information and vice versa, which illustrates a dynamic and hybrid process of becoming (de Souza e Silva, 2006).

To conceptualise the virtual dimension in LARA, I refer to two philosophical practices. The first practice includes Guy Debord's (1967), Jean Baudrillard's<sup>10</sup> (1994), and a Platonic<sup>11</sup> (Pappas, 2016; Silverman, 2014) understanding of the virtual as a representation of our ideas and a copy and simulation of the real-world, which is, as I will argue, insufficient to understand LARA. The second practice, based on Gilles Deleuze's<sup>12</sup> (1994) work, conceptualises the virtual in terms of potentiality and actuality.

<sup>&</sup>lt;sup>10</sup> This section has been created based on the influential interpretations of Paul Hodkinson (2011) and Martin Lister, Jon Dovey, Seth Giddings, Iain Grant, and Kieran Kelly (2008) of Baudrillard's work in the context of media studies. As such, Baudrillard's work is readopted and is, as a consequence, decontextualized from its original position. His work is used as a heuristic to understand the particular interpretation of the virtual as simulation.

<sup>&</sup>lt;sup>11</sup> This section uses the interpretation of Plato by Nickolas Pappas (2016) and Allan Silverman (2014) to address the interpretation of the virtual as a representation. The Platonic concepts are positioned within the field of media studies.

<sup>&</sup>lt;sup>12</sup> The section on Deleuze's interpretation of the virtual as potential has been created based on the respected interpretations of Mark Deuze (2012) and Lister et al. (2008). Their readopted interpretation of Deleuze applied within media studies could, therefore, divert from Deleuze's original concepts and application of the virtual in relation to the actual.

#### 3.2.1 VIRTUAL SIMULATION AND REPRESENTATION

The meaning of 'virtual' has had various connotations, including references to 'simulation' and a state that was 'as good' as reality (Shields, 2003). From a philosophical standpoint, the first has, as I see, a strong affiliation with what has been described by Silverman (2014) and Pappas (2016) as a Platonic view on reality. In this view, various levels of reality are distinguished: ideal (ideas), sensible (the physical world, a duplicate of the ideal), and represented (secondary duplicates of sensible reality) (Silverman, 2014). Objects that merely represented the world were ridiculed by Plato, as they were duplicates of a duplicate (Pappas, 2016). A representation is, from this Platonic perspective, then nothing more than a reflection of an ideal and holds, therefore, less value than the physical equivalent. Virtual entities created by AR technologies can, following this Platonic view, be understood as representations that want to represent more than reality itself. Plato's analysis of reality prompts the question of whether or not the relation between AR and one's physical location is an example of a mere representation in which one's physical location is primary to the virtual representation of that location. To investigate this relation, the LARA WallaMe (WallaMe-Ltd., 2015) is taken as a case study. WallaMe (ibid) can, despite its relatively small user base of 50K users (Prioiridata, 2017), be considered as a representative of a particular use of AR within urban space that allows users to project personal information within their environment. FieldTrip (Niantic, 2015) and Monocle (Yelp, 2014) can also be related to this use of AR.

*WallaMe* (WallaMe-Ltd., 2015) allows users to create and share both images and text messages within urban space. Users create a message – a Wall – by taking a picture of the space around them. They can add text, stickers, drawings, and photos to their Wall and share their message with other users. The message stores the geolocation and can be visualised when users use the *WallaMe* application. Users can also share Walls with particular users, thereby making them only accessible to specific people. Players can find public Walls in a feed that shows where the Walls are hidden. Users can select a Wall and a map illustrates where a Wall is located. People can interact with these Walls by adding comments and sharing them with other users. Figure 6 displays various functionalities of *WallaMe*.



Figure 6. Impression of WallaMe within urban space. Image courtesy of WallaMe Ltd. (2015)

AUGMENTED REALITY AND LOCATIVE MEDIA AND THE CITY || 38

*WallaMe* users are stimulated to create personal narratives around various locations ("Hide messages in the real world and tell your story!" is one of *WallaMe's* statements (WallaMe-Ltd., 2017)). Users, therefore, not only share where they are, but also disclose a personal perspective of that location.

In this regard, *WallaMe* (ibid) shares similarities with graffiti tags. For Baudrillard (2010), graffiti, both simple and repetitive tagging and skilfully sprayed paintings, imprints its own semiotic order as a counterscheme to officially designed city signs, for instance advertisements or wayfinding signs. The 'white' or unpainted city is invaded by graffitists to reclaim their identity and claim urban space (ibid). Graffitists free space from their architecture as graffiti runs from walls to pavements and from subway interiors to houses. That is, tags, paintings, and names superimpose and take away the functions and institutions allocated to these walls or objects (ibid, pp. 35-36). In contrast to graffiti, virtual messages in *WallaMe* (WallaMe-Ltd., 2015) are more fragile in nature. Where graffiti remains the same for those sharing the same location, unless someone removes the tag, messages in *WallaMe* (ibid) vary more often per same location and certain messages are, depending on one's server, not displayed. Besides the weaker claim on urban space, virtual entities do not have to fight for a certain space. Graffitists have to overlap other tags to present their message on the same wall, whereas users of LARA can each have their own display of various messages at the same time and place.

When interpreting these location-based narratives, including their images, textual references, and their position on a map, from the aforementioned Platonic perspective, the connection as a representation of the sensible world is highlighted. The map that displays one's position is a duplicate of the physical world and, in contrast to other representations, the map contains abstractions of the reality it represents. Therefore, the map can, from this Platonic perspective, been addressed as a copy of a copy that is inferior to the original. The message itself can be seen as a first order copy, rather than a second order copy as one superimposes ideas on the real world by means of AR. This understanding of the virtual, however, cannot account for the potentiality of these virtual entities. LARA connect the physical world with digital information that is accessible by means of an interface. As such, the visualised information on displayed may change the physical space it is related to and vice versa. As Plato is concerned with the ontological status of the world, he does not address the context dependent interpretations of, for instance, the relation between urban space, narratives, and pictures. The experiences of AR models facilitated by LARA do not require one to change one's ontological distinctions. One may see virtual monsters; this does not make them exist. Virtual objects, and AR in particular, challenge these fundamental distinctions between things that exist or do not exist as both the physical and the virtual have similar consequences or values (Brey, 2003; Gualeni, 2014; Mooradian, 2006). Baudrillard (1994) complements this perception of 'virtual' by articulating how 'virtual' as a simulation can become even more than reality.

Simulation in this regard is seen as the replacement of the relations between reality and socio-cultural practices, thereby creating a realm that replaces reality. The replacement of this relation has been addressed by Guy Debord (1967), see chapter 2.2.1, who argued that mass consumption had resulted in a society that was defined by spectacular relations rather than real relations. The inability to distinguish

reality from a simulation of reality is what Baudrillard (1994) has called "hyperreality". For Baudrillard, the information that is transmitted by media channels, LARA within this thesis, is increasingly oriented to instantaneous stimulation, as it is only by doing so that the information is able to attract our attention (Hodkinson, 2011, p. 268). Meaning and understanding are rendered meaningless as society has become saturated by infinitely malleable constructs (Lister et al., 2008, pp. 38-39). The level of saturation by the barrage of messages within everyday life suggests that the boundaries between such representations and daily life are fading, ultimately leading to representations without a referent - a simulacrum. The disconnection appears, for Baudrillard (1994, p. 6), in four stages. The first phase addresses referents that have a clear connection to our environment, for example, the maps in WallaMe (WallaMe-Ltd., 2015) refers to locations in the physical world. This phase shows similarities with the representational perspective discussed earlier. In the next phase, the signs do not faithfully represent the physical world, but represent a distorted reality. For instance, the idealised way LARA present a particular location by means of likes, shares, and positive images. The third stage, the stage of simulation, is defined by the absence of an unmediated reality underneath the simulation. The avatar in Pokémon GO (Niantic, 2016) is an example of this stage that misleads one into thinking that this is a representation of something real. The final stage entails a reality in which there is no relation to any reality at all. Applications such as Pokémon GO (ibid) do not solely falsely represent reality, they conceal the idea that reality is no longer real, thereby constructing a reality that can be considered as 'enhanced'.

In analysing *WallaMe* (WallaMe-Ltd., 2015), this understanding of the 'virtual' in LARA as simulacra is present when users are searching for a particular Wall. Assume that this location is a bridge in a large city. When standing on the bridge, users are simultaneously standing in front of a hidden message that is viewable through *WallaMe* (ibid). The physical location of the bridge that is used as a notebook for a message has become the indicator for that message. The physical world contains signifiers to find AR messages that are not visible to the naked eye and pretend to be physical signs that refer to real locations, thereby they refer to simulacra – signs have become simulations of signs. This relation is reverted, as normally information around a particular location refers to that particular place. The reverted use of referents is made possible through the interface of LARA, hence a prime example of *engagement play*. This relation to urban space is what made *Pokémon GO* (Niantic, 2016) an inappropriate application of meaningful play as the application transformed the real into the hyperreal.

The simulation facilitated by LARA concerns the carrier of the information, rather than the message or visualisation itself. The use of ICTs as housings for information and the conception that information needs materiality, render technologies, similar to other physical objects such as books or papers, as containers in which information is stored and accessed (Richardson, 2009). A CD, for instance, can store a whole concert. Space itself is, within this narrative, also addressed as a container for physical objects, for instance, buildings, benches, and flyers. In this understanding of urban space, maps or visualisations are just means to understand the location of objects in space or to measure the distance between objects (Richardson, 2012). However, following the postphenomenological perspective that underlies this

thesis, our understanding of urban space and the materials located in urban space are constituted by the particular technologies and devices that we interact with. When people hide physical letters somewhere in the world – the 'non-augmented' version of *WallaMe* (WallaMe-Ltd., 2015) –, people use discrete containers. AR, in contrast, leaves the message itself intact and virtualises the materialised medium – a paper, a book, or a screen – and reduces the medium to bits 'located' in urban space. The boundaries of once discrete containers have become indistinct as, with LARA, any object or location can become a medium for conveying messages. *WallaMe* (ibid) separates information from physical materiality, while limiting the access to information based on one's location. One has to go to that location with a device that can retrieve the information. From a Baudrillardian perspective, urban space has become a simulation of urban space in which augmented messages simulate traditional ways of wayfinding or sending messages. For example, *FieldTrip* (Niantic, 2015) users who ignore physical signs or buildings and simply follow the recommendations of the application when visiting a new city illustrate how LARA construct urban space around virtualities or simulations that are more valued than the non-simulated signs. The simulated reality has replaced the non-simulated reality.

Posing, from a Baudrillardian point of view, that LARA transform the real into the hyperreal only highlights one limiting dimension of LARA. LARA have, in contrast to physical maps that represent and inform physical space, the ability to influence physical space, that is, a change within urban space results into a change in the virtual space. This relation also works the other way around, as each change within the virtual environment, for example, a protest image in *WallaMe* (WallaMe-Ltd., 2015), influences how other users navigate, experience, and interact within that urban space. Rather than being mere representations or a replacement of physical reality, LARA can complement physical reality. This complementary understanding of 'virtual' can be seen in the work of Deleuzean inspired authors within media studies (see Deuze, 2012; Lister et al., 2008).

#### 3.2.2 VIRTUAL COMPLEMENTATION OF POTENTIALITIES

The dynamic relation between virtual and physical realms facilitated by LARA implies that the use of the notion of 'real' as if it were the opposite of 'virtual' is inaccurate. A contemporary advocate of this perspective is Lev Manovich who claims that AR provides an 'augmented space' when digital elements are added to the physical space (Manovich, 2006, p. 4). However, the use of 'augmented space' suggests that the 'unaugmented' space is a primary space that is made more functional by LARA with the addition of an augmented layer. As such, this understanding reduces the complementary relation between the two spaces. By articulating a complementary perspective, one can distinguish between various levels within reality. This complementary understanding of 'virtual' is maintained by Deleuze (1991, 1994).<sup>13</sup> The dichotomy between real and possible is, following the Deleuzean perspective, inaccurate, as it

<sup>&</sup>lt;sup>13</sup> Deleuze's conception of virtual entails more than just technology enabled virtuality as it includes ideas and thoughts as well. However, within this thesis his readopted perspective is applied to virtuality enabled by technology, including virtual worlds, cyberspace, and AR.

presupposes that all that is real should also be possible which rules out conceptual inventions by reducing them to the realm of the unreal – the virtual. From a Deleuzean perspective, the virtual can be considered as real, but 'inactual' (Lister et al., 2008, p. 389). That is, the virtual has real existence, but has a different arrangement than physical objects around us. Physical objects have, in contrast to virtual entities, a concrete existence. The categorisation of actual and potential capacities can also be seen in WallaMe (WallaMe-Ltd., 2015): the Wall may only exist on our phones or in our head, the effects are real and actual. When using WallaMe (ibid), a user will not interact with all the Walls present within his or her environment. These Walls are real – they have the potential –, however, the interface of the application does not actualise the messages for the user. Those who are not capable of, or not interested in, using WallaMe (ibid) lack the potential to see the WallaMe environment. Thereby, pointing out how various people can experience the same location differently depending on which virtualities LARA actualise and whether or not users have access to these virtualities. Although Plato also distinguishes between levels of reality, a Platonic application of the term 'virtual' is distinct from a Deleuzean application. Following the Platonic representational application, virtual entities resemble the idea to which they relate: there is a one-on-one relation. Following a Deleuzean perspective, however, the virtual is dynamic and can be actualised in a variety of manners (Lister et al., 2008). Each user actualises the virtual dimension of LARA differently, thereby actualising some of the applications' potentialities. One's position and available messages determine what will appear on the interface in WallaMe (WallaMe-Ltd., 2015). The virtual as such is real and awaits to be actualised.

The interface of the LARA, the dimension of *engagement play*, mediates between augmentations and physical space, therefore, a change in one domain will also result into a change in the other domain. Awarding a restaurant with one star with Yelp's Monocle (2014) or hiding political messages in urban space with WallaMe (WallaMe-Ltd., 2015) illustrate that a change in the AR layer evokes a change in the physical layer, for instance, less visitors for that restaurant or a gathering of people around that hidden message. Likewise, an adjustment in one's position leads to different messages, ratings, or availability of virtual monsters. Instead of having two separated realms, theorized as the virtual representation or simulation and the real physical space, a Deleuzean framework addresses both realms as being part of one entity - the real (Lister et al., 2008). When WallaMe users create personal narratives around a particular location, they do not simply add a layer of information. They also change the location that is centralised within the narrative as the narrative becomes an inherent element of that location awaiting to be actualised by other users. The complementary virtual layer that depends on the interface of LARA to be actualised can influence (1) how *WallaMe* users relate to each other by means of the application; (2) how a particular space is experienced through WallaMe; and (3) how WallaMe users understand a particular place. The interaction, or process of becoming in Deleuzean terms, between urban space, augmentations, interfaces of devices, and people, highlights the dynamic nature of space. This hybrid nature of space that is constituted by virtual elements is explored by, amongst others, de Souza e Silva (2006), Graham (2004), and Kitchin and Dodge (2011).

#### LOCATION-BASED AR APPLICATIONS AS INTERFACES TO HYBRID SPACES

For de Souza e Silva (2006), the use of locative media as interfaces to urban space has given rise to socalled 'hybrid spaces': spaces that are connected, mobile, and social in which the boundaries between physical and virtual spaces have been blurred (ibid, p. 262). A hybrid space is, therefore, a space that locative media create by dissolving the boundaries between physical and virtual spaces. This, however, does not imply that simply adding a virtual overlay would be sufficient to transform a physical space into a hybrid space as such a change would only include quantitative changes. Hybrid spaces are developed by "the connection of mobility and communication and [are] materialised by social networks" that are established at the same time in virtual and physical spaces (ibid, pp. 265-266). Hybridity from this perspective, should not be understood as two separate entities that some way or another intersect, but as a dynamic process of becoming in which the actual and the potential intertwine. Thereby including experiences and social interactions that simultaneously take place in both spaces and which cannot exist in each individual space alone.

Kitchin and Dodge (2011) adhere to this perspective by arguing that the relation between code/space – the virtual and the actual – is mutual, as is made evident by the disappearance of places in case the code is removed. For instance, if a Wall in *WallaMe* (WallaMe-Ltd., 2015) located at a plain street is removed, the particular location reverts to a space of traversing, one without a personal narrative. This mutual relation is exemplified by a hidden protest message by *WallaMe* user Allitsumeg (see Figure 7).



Figure 7. Hidden AR protest message in Budapest. (Allitsukmeg, 2017)

The message, meant for Hungarian politician Orbánt, was spread throughout Budapest in a similar fashion as Orbánt's propaganda billboards ("National consultation, 2017: "Let's stop Brussels!"," 2017). As a hybrid space, the message and the location became intertwined and constituted a space of protest. However, when this message is removed from this particular location, the code/space of protest ceases to exist and becomes a normal passage point. The protest message is, in contrast to graffiti, only visible for those who use the application, thereby nonusers cannot see the message or just see people holding their phones. To circumvent this problem, Allitsumeg used *WallaMe* (WallaMe-Ltd., 2015) to create the message and used other social media platforms to distribute the protest messages.

These particular patterns of media use have been extensively researched by Zeynip Tufecki (see Tufekci, 2014a; Tufekci, 2014b; Tufekci & Wilson, 2012) in the context of, amongst others, the protests in Egypt in 2011. She highlighted the importance of using specific applications for specific purposes such as the distribution and gathering of information and the communication about activities. Allitsumeg used the strengths of *WallaMe* (WallaMe-Ltd., 2015) – the creation of narratives in one's immediate environment – and social network platforms – a wide range of distribution – to spread his protest in hybrid space.

For Kitchin and Dodge (2011), the development of space in cooperation with code and LBS, including those using AR, has extended the code/space, the potential and actual space, or the hybrid space relationship, into urban areas and public spaces (Crang & Graham, 2007). To speak about using LARA in urban space is to speak about continuously playing with boundaries.

# 3.3 A PLAY WITH BOUNDARIES

Throughout the analysis of the virtual dimensions of LARA, I have used *WallaMe* (WallaMe-Ltd., 2015) as a case of *engagement play* in which *WallaMe* (ibid) was analysed as an interface that allows one to interact with hybrid spaces. In this interaction, *WallaMe* (ibid), or LARA in general, involve playful interactions between spatiotemporal dimensions and the boundaries of play itself. In the following, *WallaMe* (ibid) is related to these boundaries.

## 3.3.1 BETWEEN LUDUS AND PAIDIA

The status of WallaMe (WallaMe-Ltd., 2015) as a game is ambivalent. As I articulated in chapter 2.1.4, Caillois' two attitudes of play, *ludus* and *paidia*, can be used to distinguish between *game* and *play*. In contrast to games, play has not a pre-set state of completion and, therefore, the moment a player defines such a state, *paidia* becomes *ludus*. Similar to other informational LBS, *WallaMe* (ibid) allows users to 'write' information on urban space. However, WallaMe (ibid) is different from informational LARA such as FieldTrip (Niantic, 2015) or Monocle (Yelp, 2014). Unless users set a specific goal for themselves, WallaMe (WallaMe-Ltd., 2015) does not have a pre-set aim such as "locate the most popular statue" or "find the best Japanese restaurant". As such, WallaMe (ibid) complies more with paidia than ludus and, thereby, can be best addressed as a playspace (Sicart, 2014). Although WallaMe (ibid) cannot be classified as a game following Caillois' definition, users may initiate small games. Play within pervasive games can, according to Montola (2005, p. 3), make the boundaries between the playspace and 'normal' everyday life indistinct as they expand spatial and temporal boundaries, thereby reducing distinctions between situations of play and non-play and play and games. As play and game in WallaMe (WallaMe-Ltd., 2015) become frequently intertwined, addressing the locus of play becomes complicated. I propose that the playful element in WallaMe (ibid) revolves around playing with the boundaries that WallaMe (ibid), the interface to playful interaction with one's environment, creates. For instance, when the application alternates between developing a protest tour and hiding personal stories around popular tourist spots.

## 3.3.2 SYNCHRONOUS PLAY OF TIME AND SPACE

As a playful interface, *WallaMe* (WallaMe-Ltd., 2015) shapes the way users playfully interact with their surroundings by enabling users to move between the potential and actual realm virtual and non-virtual entities form. *WallaMe* (ibid) allows users to create and decipher messages located in urban space. The inscriptions of urban space *WallaMe* (ibid) collects form a narrative of that particular place. As an interface to these hybrid spaces, *WallaMe* (ibid) involves an exchange between virtual and non-virtual layers of reality. Users can share their physical location and experiences of urban space as information that is displayed as a virtual overlay when using the application. Contrarily, the LARA actualises the virtual information within urban space in relation to a particular time and location. In sum, what occurs in *WallaMe* (ibid) coexists simultaneously in both virtual (potential) and non-virtual (actual) spaces.

Rather than merely extracting information from urban space carefully produced by urban planners, policymakers, or architects, and within the boundaries of the application, citizens can now inscribe and form hybrid places based on their own subjective beliefs and experiences. LARA do not reshape the production of physical space, thereby upholding the asymmetrical power-relations between those who bring urban space into being and those who traverse urban space. However, LARA open up new possibilities to reinterpret and reproduce urban space. For instance, navigation through and interaction with urban space come to include dynamic and temporal understandings of space – narratives and hidden messages vary per location and date –, and dismantle the perspective of urban space as static – a particular object, for instance the Eiffel Tower, remains the same.

#### 3.3.3 TEMPORAL PLAY WITH NARRATIVES

The temporal understanding of space is further intensified as LARA such as WallaMe (WallaMe-Ltd., 2015) include a continuous flow of information about locations, people, and messages. This barrage of data and its relation to urban space is distinct. Imagine that you are visiting Paris and you are sending a postcard of the Eiffel Tower to your family at home. The Eiffel Tower then acts as the landmark of Paris. On the back of the postcard you write what happened while you were visiting the Eiffel Tower, for instance that you tripped over the stairs while ascending the tower. The lasting and spectacular mark of the Eiffel Tower constitutes the personal narrative addressed to a particular audience, your family, and inscribes meaning to your particular story. WallaMe (ibid) and other informational LARA reverse this process as these applications continuously publish the particular experiences of places described by its users. Rather than developing a grand narrative or essence of a place in which one plays a particular role - connecting your accidental trip to the general narrative of the Eiffel Tower -, people use LARA to share the casual and accidental experiences of everyday life activities (de Waal, 2014; Schwartz & Halegoua, 2014). In contrast to the aforementioned postcard of the Eiffel Tower that people used to develop a coherent and lasting narrative, people can now use the bricolage of text, pictures, comments, and tags in LARA such as WallaMe (WallaMe-Ltd., 2015) to develop small narratives that are both spatially and temporally highly fragmented and fluidic in nature.

# 3.4 CONCLUSION

This chapter began with a classification of LARA based on their primary function to address the relation between AR and LBS. The classification of LARA in terms of (1) navigation; (2) visualisation; (3) geotagging 2.0; and (4) pervasive gaming demonstrated that LARA differentiate themselves by the way they provide augmentations through a virtual overlay and allow users to 'write' personal narratives on urban space. Throughout the chapter, I used *WallaMe* (WallaMe-Ltd., 2015) as an example of *engagement play* – an interface that actualises virtual entities and is used for playful interactions within urban space. Moreover, I have argued that location-based *engagement play* involves a play with boundaries: boundaries of play and games, spatiotemporal boundaries, and boundaries of reality. Another central theme that I addressed, was the relation between the virtual overlay – the augmentation – and the non-virtual, physical world. Following two philosophical interpretations of Plato (Pappas, 2016; Silverman, 2014) and Baudrillard (Hodkinson, 2011; Lister et al., 2008), the virtual was addressed as a representation and a simulation. By using the LARA *WallaMe* (WallaMe-Ltd., 2015), these two understandings of the virtual were criticised for overlooking the bilateral relation between virtual and non-virtual realms. Changes made in *WallaMe* (ibid) affect the corresponding physical location and changes in the arrangement of urban space influence what is displayed through LARA.

I used a Deleuzean conception of the virtual as potential was used to address the complementary aspect of virtual entities and their connection to the physical world. This conception stated that virtual entities are as real as physical objects. What differentiates the two is their arrangement. The distinction between virtual and non-virtual in terms of potentiality and actuality recognises the dynamic relation between the two and explains how LARA mediate between these two levels of reality. The effects of the virtual layers induced by LARA are real and actual, whereas the messages virtually exist on our phones awaiting to be actualised by an interface. Each person actualises the virtual dimension of LARA differently, thereby actualising some of the applications' potentialities. Depending on where you are positioned and which messages are available to you, the interface of *WallaMe* alters.

The complementary virtual layers that LARA induce mediate (1) the way users relate to each other; (2) how certain spaces are experienced; and (3) how users understand a particular place. The process of becoming of urban space, virtual information, interfaces of devices, and people highlights the dynamic nature of space. I addressed the intertwinement of virtual and non-virtual layers of reality as 'hybrid spaces' in which AR is one of the many layers. It is in these hybrid spaces that LARA involve a play with boundaries. Rather than solely extracting information from urban space that has been produced by policymakers and architects, citizens can inscribe and produce these hybrid places based on their own subjective experiences and beliefs. The element of play revolves around playing with these boundaries that LARA constitute: the interfaces to playful interactions with one's environment. Until now, I have investigated the relation between play and the city which has resulted in an inquiry into the relation between virtual and non-virtual entities. The complementary relation between the virtual and non-virtual in terms of potentiality and actuality exemplified how virtual entities, induced by LARA as interfaces, are positioned within urban space. An understanding of how LARA evoke playful interactions with our environment and influence how places are experienced and understood, allows me to investigate the new ways of perceiving and engaging with urban space induced by LARA that move beyond the dimension of *engagement play*. In the next chapter, I will analyse the mediating capabilities of LARA from a postphenomenological perspective. Will LARA discourage accidental discoveries? Is urban space merely used as a backdrop of applications? Who has authority over urban space? Do LARA change interactions with other citizens? These and more questions are addressed in the following chapter to understand how LARA mediate our perception of and engagement with urban space. Developing such an understanding provide the necessary knowledge to develop LARA that will stimulate meaningful use of AR to support engagement with urban space.

# CHAPTER 4 | | NEW MEDIATIONS OF RELATIONS BY LOCATION-BASED AUGMENTED REALITY APPLICATIONS

"The world outside games cannot be conquered and if we are going to expect that we can, we will experience the world in a different manner. The capability of us to see that we are using a medium will gradually disappear."

Mark Deuze All in the Game, 2017, min. 23:38.

y blending virtual and non-virtual dimensions, LARA alter the perception of and interaction with urban space. I will address three sections to understand these differences and capabilities of LARA. The first two sections provide an overview of practices and engagement with AR and urban space from the perspectives of *mediated* and *networked play*. The first inquires how LARA influence one's perception of urban space in relation to LARA as artefacts, whereas the latter illustrates how LARA evoke feelings of being played and how people engage with these constraints. Mediated play addresses LARA with a modest focus on the anthropological dimension of play, while *networked play* focuses on the artefactual dimension of play. This inquiry brings the specific qualities of LARA to the fore and poses that a distinction between informational and non-informational LARA is required. I propose that informational LARA 'read' the world, whereas non-informational LARA constitute autonomous entities. This distinction highlights that what makes AR, especially noninformational LARA that do not adhere to non-virtual equivalents, stand out, thereby reaffirming the significance of this thesis. Moreover, understanding what LARA do to one and urban space provides insights into how one can design LARA that stimulate urban engagement. The third and final section is fundamentally informed by a postphenomenological approach to articulate how people can relate to their environment and how one's perception is informed by LARA. These insights inform the debate on how to design LARA that support urban engagement and social dialogue by means of LARA and play.

Throughout the chapter, I use the LARA *Layar* (Layar, 2009) to explain how interaction with LARA influence one's practices with urban space. *Layar* (ibid) displays user-created annotations, graphics, or points of interests based on the location and orientation of the camera of the mobile device. Users can select various layers of content, including those that provide information and those that construct virtual entities, that are displayed by pointing one's screen at a location (see Figure 8).



Figure 8. Layar allows one to read (left) and construct urban space. Image courtesy of Layar (Layar, 2009).

Besides its popularity, *Layar* has, excluding users of *Layar-based* applications, 1.2 million active users and 45 million overall users (Cameron, 2014; Ghosh, 2017), *Layar* includes both (non-)informational augmentations that allow, as is concluded within this chapter, for different forms of mediation. Moreover, a large variety of other applications, both commercial and non-commercial, are *Layar-based*.

NEW MEDIATIONS OF RELATIONS BY LARA 49

Chapter 3 addressed LARA as interfaces – the dimension of *engagement play* – that present a play with boundaries. Boundary play is, however, not solely limited to the dimension of *engagement play*. Caillois' (2001) fourfold categorisation of play allows one to further indicate how boundary play with LARA is also profoundly present on the other two dimensions. Interaction with *Layar* (Layar, 2009), for instance, involves the merger of experiences of the environment with experiences of the play world. As such, everyday life becomes part of the play, and vice versa. With *Layar* (ibid) one has access to mastery (agôn) over this hybrid space (de Souza e Silva, 2006). People can move between the layer of augmentation and everyday life, or suspend the play whenever they want to do so. Moreover, they can inscribe spaces with personal narratives, thereby transforming space into place (Tuan, 1977). Non-informational LARA can also result into strong competitive understandings of the world, for instance when one competes with other players in *Pokémon GO* (Niantic, 2016). Consequently, virtual entities can inform us on how we relate to them differently from the 'dominant' stability that portrays them as irrelevant visualisations (Mack, 2012). Another aspect of interacting with (non-)informational LARA lies in *alea*. LARA insert a distinct element of chance and unexpectedness in daily life, as AR has the potential to visualise surprising inscriptions or unexpected encounters, see Figure 9, at any moment.



Figure 9. Magikarp unexpectedly turning up in a frying pan. E. Moore (2016)

In *mimicry*, the play with boundaries is expressed most clearly. People are pretense in presenting themselves by means of comments and likes before other users – their audience. Investigating LARA and AR as artefacts demonstrates how they perform as a stage prop and relate to one's context and the presence of other people and objects. The private back stage experiences Goffman (1959) describes, are brought to the fore by means of personal inscriptions or actions resulting from creating and publishing narratives and own overlays. One's stage is enlarged as people can use LARA to turn each object or space into a carrier of information. New spaces of play emerge that intertwine everyday normalcy, for instance traveling to work, with playful encounters, such as videos, memories, or virtual entities. LARA such as *Layar* (Layar, 2009) foreground understandings and questions that normally remain hidden in everyday life, understandings and questions about the conditions of one's performance: Who is my audience? Who is playing and who is not? What is my stage? The movement along the boundaries of play, the ongoing barrage of inscriptions and autonomous entities, and the uncertainty between who is co-playing and who is not, contribute to a confusion of the senses (*ilinx*).

Boundary play is endless and consists of investigating the digitally mediated and physical interactions through LARA. The play aspect arises from investigating the boundaries between mediated and nonmediated interactions through LARA. The relation with LARA is playful. As artefacts, LARA unveil a playspace that includes a diverse range of alterations and interpretations. LARA could be used to retain information or interact with autonomous entities, but also as a way of communicating, to memorialise urban space, or to visit places one cannot physically visit, and so on. Engaging with LARA is, therefore, not merely instrumental, but also an end in itself. In the following, I direct the focus to concrete human-technology relations of LARA and reflect on the, both positive and negative, changing conceptions of urban space and communication that are being developed with the use of LARA.

# 4.1 | MEDIATED PLAY AND LARA

Chapter 3 concluded that urban space can be considered to coexist with the digital barrage of images, virtual entities, sounds, and narratives developed and facilitated by people, devices, and LARA. Urban space is, therefore, redefined as it is changing both its appearance and the way people access, use and experience it. On first sight, LARA such as Layar (Layar, 2009) and WallaMe (WallaMe-Ltd., 2015) represent space by including maps or geographical information. On a second level, LARA reproduce space in cooperation with digital overlays that can be used to navigate or position the user in space (see chapter 3.1.1). The AR is superimposed onto the image of actual space and provides a mediated view of one's immediate urban environment. As I discussed in chapter 3.2.2, LARA can augment elements within one's immediate environment to facilitate navigation of actual space, for instance, visualising historical information about a building. Conversely, LARA can also manipulate the mediated view of the world. The augmented layer of digital graphics on the view of actual space has implications to the manners in which users perceive and engage with the urban environment. One dwells in the same places, but with a new meaning that is augmented onto the familiar, thereby shedding new lights to (un)familiar environments. In the following, the influence of LARA as artefacts – the dimension of *mediated play* – on one's perception of and engagement with urban space is investigated. To circumvent a deterministic outlook, I restate that play is both an artefactual and anthropological concept and that the playfulness in interactions with LARA is bilateral. The attitudes and practices of users towards LARA are playful while, simultaneously, properties of LARA elicit play. In Gadamer's terminology, in a to-and-fro movement of co-constitution the playfulness of users meets the playability of LARA.

The discussion on the concept of play, including Caillois' fourfold, Goffman's dramaturgical account of human interaction, and Sicart's understanding of play as personal and appropriative, pointed out how play and LARA are related to communication, turned urban space into a playground, allocated memories to locations, and personalised urban space. Goffman (1959) connected everyday life to play by describing how people move back and forth between a front and back stage of the self (see chapter 2.1.3), thereby addressing the relevance of play to communication. Chapter two also demonstrated that play is personal and entails elements of agôn.

Play is used to re-appropriate urban space and to make it one's own, for instance while doing parkour. As such, play subjectifies urban space while, at the same time, also constitutes a *background relation* with other people or one's location. As hybrid spaces, urban spaces intertwine virtual and non-virtual spaces (see chapter 3.2.2). As such, they open the potential for AR to pose questions that remain hidden and highlight the temporal narratives that were discussed in chapter 3.3.3. This personal play with narratives and boundaries facilitated by LARA expressed the significance of attaching memories to urban space. In the following, I address the influences of LARA within urban space on these aspects of communication, memory constitution, and subjectification within the context of urban space and LARA as artefacts.

#### 4.1.1 A COMMUNICATION OF PRESENCE AND PLAY

The potentiality of LARA to transform every space, or entity within this space, into a carrier of information allows for new means of private or public conversations which are, as Goffman (1959) keenly observed, characterised by theatrical play. One communicates about a place through a place by using LARA. Informational LARA produce messages that are fluidic in nature as, depending on one's server, different messages or narratives are displayed (see chapter 3.2.1). The narratives in, amongst others, Layar (Layar, 2009) and WallaMe (WallaMe-Ltd., 2015) remain accessible to other people long after the authors of the narratives have moved along. As such, LARA contribute to a separation of participants and urban space. Messages do not require one to be spatiotemporally present in order to remain visible. This separation highlights, according to Goffman (1959, p. 7), an interesting asymmetry between an audience, those who witness the performances or messages of others, and performers, those who engage in managing their representation by means of revealing information, as, due to the separation of participants and urban space, one has little control over who will see a message and how it is interpreted. The audience sees both the intentional and unintentional impressions that are given, while the performer can only control the first. These impressions, including the user's understanding of a location, their socio-cultural context, and biases that emerge from their participation, reveal a temporal durability that can have an ongoing impact on urban space. Again, to use Goffman's terminology, LARA open up a playspace that intertwines both back stage behaviour, that what one does when one is freed from the norms and expectations that constitute our behaviour when we are taking part in the play of everyday life, and front stage behaviour, that what one does when one is aware that others are watching you, by blurring the boundaries between those who are part of the game and those who are not (Goffman, 1959). Alea is clearly present as one has little control over who will see and engage with one's narrative.

Although the impact of the narrative may be ongoing, for instance when people use *Layar* (Layar, 2009) to give personal birthday gifts by putting Darth Vader in bedrooms (Liao & Humphreys, 2014), they are temporal and easily replaced. When the narratives and virtual augmentations connect with events or people within urban space, however, they seem to form valuable memories and increase the engagement with urban space.

In mediated play, the type of LARA matters for the situated performance. While some applications aim to avoid interaction with other users, for example *FieldTrip* (Niantic, 2015), others, such as *CLIO*, promote the interaction with other people. *CLIO*, a *Layar-based* urban computing system, is a system that promotes intergenerational dialogue by turning one's environment into a hybrid space of role-play and space appropriation (Christopoulou, Ringas, & Stefanidakis, 2012). Although people from various generations may have played on the same square, the environment, including shops and roads, has changed over time. *CLIO* allows people from younger generations to recreate and experience the urban environment of their grandparents. Users playfully re-appropriate urban space as they relive the urban space of the past. *CLIO* constitutes urban space as a *memory reviver* (see also 4.1.2). Urban space is made present as an entity with a past, rather than representing the static and present perception that one has when one interacts with that space in everyday life. As such, *CLIO* contributes to the coming about of what has been referred to as "the enhanced collective city memory": the captured memories are accessible and tangible for users, thereby preserving a segment of city culture (ibid, p. 60).

## 4.1.2 | MEMORIALISING URBAN SPACE INTO URBAN PLACE

In the play of space re-appropriation and expression of personal experiences, one can identify a translation of 'using space' into 'engaging with space'. As I demonstrated in chapter 3, LARA are interfaces to hybrid spaces that consist of both virtual and actual entities. I contrasted hiding tags or spraying graffiti with virtual messages and tags and highlighted the separation of information and physical materiality. The potential of LARA to transform every space into a carrier of narratives allows people to share casual and accidental experiences and memories of everyday life. In non-augmented urban space, recollections of memorable events or people become part of the urban memory by means of narratives, memorials, or structures, see Figure 10, that preserve memories for current and future generations (Christopoulou et al., 2012).



*Figure 10.* Memorialising important inhabitants; city evolution; important events. Image courtesy of Stadsarchief Rotterdam (2017).

Urban memory can be expressed as the collective memory that is created within a certain place as time passes (Ringas, Christopoulou, & Stefanidakis, 2010, p. 326). As such, urban memory expresses relations between the present and the past of a place.

The aforementioned *CLIO* uses *Layar* (Layar, 2009) to offer a new approach to shape the collective city memory by blending memories with the actual space they refer to - a hybrid space pur sang. Along with the content of the memory, *CLIO* incorporates the context, for instance, time, place, tags that describe the memory, and comments that are attached by viewers. *CLIO* categorises the contextual information in themes and groups the information based on relevant memories. Each person will, therefore, experience different memories.

To see how *CLIO* transforms 'using urban space' into 'engaging with urban space, one can apply the concept of 'non-place' by Augé (2008), see chapter 1. By using *CLIO*, users are marking and interacting with places such as leisure parks and train stations as places with an identity by either incorporating them in *CLIO* or by interacting with the virtual memories that other users created. Therefore, the non-place of the train station becomes a place through the use of *CLIO*. *CLIO* gives an identity to the place that users can recognise. The interface obscures the non-augmented perspective and, even though AR is experienced while walking and observing our environment, the overlay becomes transparent. Movement through urban space enables the overlay to update itself and unveils new entities or information, but the movement is in itself not the primary focus of users their attention. For *Pokémon GO* (Niantic, 2016), the space around one while playing can be considered a non-place, thereby disrupting urban engagement. However, applications such as *CLIO* are different as the augmented space in these applications establishes a relationship with its users and provides an identity through the overlay.

Michael Sacasas, director of the Centre for the Study of Ethics and Technology, states that AR individualises people and discriminates between users and nonusers as people are disconnected from those in their immediate environment (Sacasas, 2012). However, AR can establish a common ground that would otherwise be difficult to create. An empirical study by Morrison et al. (2009) demonstrated that AR facilitates place-making that encourages the establishment of a common ground and inspires discussions and collaborative use. Although one cannot literally experience a place or situation as if one was there in a turbulent period, for instance when people use LARA while walking around in camp Westerbork and say that they experienced the terrors of those times, LARA can generate an understanding of the situation and, thereby, lead to a more informed dialogue between people (see also Christopoulou et al., 2012).

As LARA allow for every object or space to become a carrier of information or materialisation of the virtual, they can use the immediate potential of every space to convert them from space to place. Yi Fu Tuan (1977, p. 71) asserts that when one feels highly familiar to a space it becomes a place. Both (non-) informational LARA can make one, one way or another, thoroughly familiar to a space. *CLIO* differentiates itself as the application transforms personal memories – personal places – into a collective urban memory – collective urban place. While traversing the urban environment, *CLIO* users selected memories that were close to their location as well as memories related to the character of the space they were in (Christopoulou et al., 2012, p. 60).

One should notice that, similar to the dissimilarities between real and virtual graffiti (see also chapter 3.2.1), virtual memorials have a stronger element of competition -agôn – and re-appropriation attached to them. Despite being limited to a group of users who have access to the augmented public space and the fact that virtual memorials do not 'claim' urban space as physical memorials do, people can decide for themselves who or what should be memorialised and when and where this memory should be placed. For physical memorials, for instance a statue, a municipality or government should actively decide who will be memorialised and when this statue is placed and removed. As such, memorials are political artefacts and people use, as I will discuss in chapter 4.2.2, the strength of LARA to criticise and question these motivations by authorities.

Another *Layar-based* application that highlights the spatial relationships of augmentations and the development of urban places is *The Border Memorial: Frontera de los Muertos*. The project, initiated by John Craig Freeman, visualised augmented Oaxacan skeletons on places near the Mexico and US border, see Figure 11, where remains have been discovered (Freeman, 2011).



*Figure 11*. Border Memorial: Frontera de los Muertos, Mexico and US border crossing. J. C. Freeman and M. Skwarek (2011).

Dedicating his work to immigrants who lost their lives while crossing the desert, Freeman aims to visualise their memories in order to memorialise and politicise the site (Liao & Humphreys, 2014).

Both *CLIO* and *Border Memorial* highlight the mutually constitutive connection between code/space discussed in chapter 3.2.2. Were the augmented skeletons to be removed from those places, the places would gain a different meaning. Freeman (Liao & Humphreys, 2014) states that "you could see the way the person must have walked out into that point and so the landscape itself starts to be meaningful ... where before it was just a place in the desert" (p. 408). The augmented overlay allows users to 'read' physical space, adapt the narratives of that place, and develop an understanding of the objects positioned in that place, thereby stimulating new sensory impulses (*ilinx*). These entities, or living memories, also demand the attention of their viewers in themselves as objects to be interacted with. Evidently, the role of LARA is ambivalent, as on the one hand, they transform urban space into urban place, allowing users to have engaging relationships. Conversely, LARA may transform urban place into non-places by portraying places as efficient routes towards the augmented entity, thereby removing its identity and historical roots.

The memorialising of urban space into urban place represents a particular tactic of traversing a city as *Layar* (Layar, 2009) and LARA in general allow users to shape and change the nature of their relationship with urban space around them. The availability of AR content can also motivate people to access information or engage with virtual entities in the process of experiencing place – even when they are not looking for specific interactions or information. Urban space becomes the playful prompt for users to look for interactions and information. Said differently, LARA provide users with the capacity to become a dérive by gaining a strategy to discover and reinterpret urban space.

## 4.1.3 URBAN SPACE AS A BACKGROUND OF PLAY

Against the growing presence of LARA that stimulate wandering the city and engagement with playful discoveries, LARA emerge that position urban space in the background of one's attention. In the discussion of meaningful play in chapter 2.3, I presented Pokémon GO (Niantic, 2016), an example of non-meaningful play, as a LARA that constitutes an *alterity relation* with the virtual augmentations, thereby depicting the environment as, in Ihde's terminology, a *background relation*. One is directed to the virtual monsters that appear on screen, rather than the environment itself, which has led to several accidents and misplaced play (Borland, 2016; CBS & Peterson, 2016). This use of non-informational LARA is not well-designed to stimulate meaningful augmentations and engagement as the city and the urbanites and visitors are not the focal point of the LARA. Instead, the application centralises goals such as productivity or efficiency. Ian Sinclair (2003, p. 75) has coined the term 'stalker' to describe those wandering the streets with an intent. Various users of Pokémon GO (Niantic, 2016) intentionally stalk urban space with a purpose as they are trying to locate new virtual monsters (Guarino, 2016). Wandering or enjoying urban space has moved to the background as users do not value transitioning urban space in the reward of discovering non-captured monsters. As such, AR constitutes a distortion of space. Through LARA one can reset space through each play and, despite certain location-bound appearances, there is, in Pokémon GO (Niantic, 2016), no strong attachment to particular objects or parts of the space where entities to be captured or found may lie. A qualitative study by Liu, Wagner, and Suh (2017) demonstrated that users focused more on the augmentations and the narrative than on their environment.

The display of specific information and the fact that, unwillingly or willingly, users are traced, highlight a scenario in which urban space directs users to the nearest monster or highlight. Instead of walking in the city as a practice that provides people with alternative experiences of the city, LARA such as *Pokémon GO* (Niantic, 2016) and *Ingress* (Niantic, 2013) translate the city into an irrelevant space that centralises play or is populated by commercial interests source (Shum & Tranter, 2017). The location itself does not matter as the augmented layer is tailored to the needs of the user. As a result, urban space becomes a space of effectively traversing between one augmented point to another. Although *Pokémon GO* (Niantic, 2016) turned space into place for some (Hicks-Logan, 2017), due to its impoverished connection to urban space the process remains flexible and can take place independently of where one is positioned.

The visual layers of information and autonomous entities transform urban space into an area of play in which one can compete with other users to become the strongest, fastest, or best player. The element of agôn is given more priority than the development of a deep relationship between people and their environment, and, as such, the application seems less appropriate to stimulate urban engagement.

## 4.1.4 A SUBJECTIFICATION OF URBAN SPACE

The use of LARA in urban space is, following the findings of the previous sections, related to a boundary play that oscillates between collective and shared narratives and memories and the centralisation of the individual by highlighting the competition and irrelevance of space. I propose that LARA emphasise a fluctuation between a 'collective self within urban space' and a 'centred self within urban space'. In contrast to positioning oneself by means of a map, where people have to locate themselves on a Cartesian grid, LARA provide a subject-oriented positioning. One's individual location is no longer one among many possible locations. Instead, one's location has become the focal point of the map and the arrangement of urban space on screens adapts to your movement. Said differently, 'you' are the centre of attention (Kent, 2014). People see how the augmented environment revolve around themselves and with a simple press or click the overlay adjusts itself around the individual (see Figure 12).



*Figure 12.* Personification and user-centring of urban space in Layar and Pokémon GO. Image courtesy of Layar (Layar, 2009) and Niantic (Niantic, 2016).

The abstract Cartesian grid, the underlying GPS technology that renders every place in the same manner, is replaced by a lived space that contains experiences of and for the user. As such, LARA replace the old framework that frames LBS as placeless – obliterating the importance of location – as they render every object in the same space (Downey & McGuigan, 1999; Graham, 2004). The aforementioned mutual constitution of code/space Kitchin and Dodge (2011) described, illustrates how LARA and urban space are intertwined and attached to a certain location.

There are, however, also negative implications for the development of urban engagement. Customising the vicinity of people by including commercial representations or pre-selected information further enhances the user-centred and personalised experience (Drakopoulou, 2013; Tuters, 2012) Especially free LARA tend to frame the user's perspective by commercial stimuli as advertisements and recommendations generate revenue (Brenzo, 2014). LARA constitute a personalised urban space that combines visual, sensual, and (non-)physical spaces in its establishment. In Baurdrillard's terminology, urban space has become a simulation of urban space just for oneself. As such, one's perception of the world is remodelled, thereby amplifying the importance of the subject in urban space. People can act passively as LARA take care of urban space and provide personalised streams that correspond to one's wishes. As such, LARA frame urban space and guide people to specific locations. As a result, LARA may frame particular areas as 'unworthy' or 'uninteresting' and influence, thereby, one's thoughts about spaces and people that live in or visit these spaces (Akhtar, 2016; Eastham & Dunphy-Moriel, 2016).

Layar-based LARA Tweeps Around (TAB-Worldmedia, 2010) is a prime example of an application that centralises the user. By using the device's camera, the application allows one to see location-based Twitter tweets in one's environment. Apart from exposing the ephemeral nature of these messages – changing the identity of a place within a minute –, one receives insights into one's immediate environment. A 3D map of tweets in your peripersonal space identifies who is in your neighbourhood, what they are discussing, and what might be of interest for you. Tweets that capture your attention are highlighted and an efficient trail is set forth to be followed. Conversely, there are applications that strongly evoke the feeling that urban space is not solely inhabited by or established for individuals. Individuals are dependent on others as their individuality emerges in interaction with other people and places. In Goffman's terminology, people perform in a team as they play together while LARA foster the aforementioned 'collective self within urban space', an interdependency that is formed through the interactions with other people and encounters with diverse locations. Developers can use the establishment of this collective self to increase the engagement of people and their environment.

Within urban space, a variety of people have their own knowledge, experiences, or thoughts about their environment. For urban planning, these thoughts and opinions are valuable as they are a source of information (Drohsel, Fey, Höffken, Landau, & Zeile, 2010). *Nexthamburg Mobile* (Nexthamburg, 2010) encourages citizens to share their opinions or ideas concerning the environment they are traversing or living in. Although the application collects personal experiences and opinions, the ultimate aim of the municipality is to develop an interactive collective urban memory that expresses the diversity and collective nature of urban space. In other words, urban space is not there 'just' for you, but represents the collective thoughts of the city or place you are located. Visualised objects and information allow users to follow the planning discussion of their position. As such, *Nexthamburg Mobile* (Nexthamburg, 2010) broadens one's vision. It allows one to see beyond the built environment that directly surrounds one. This translation becomes evident when using the notions of 'voyeur' and the 'walker' by de Certeau (1984, p. 92). For de Certeau (ibid), the walker represents the first-person perspective of those

experiencing the city from street level, whereas the voyeur addresses the vision of overall structure of the city from above. Through using *Nexthamburg Mobile* (Nexthamburg, 2010) one can experience both visions simultaneously. The awareness of one's environment through the application allows one to become the walker of urban space, while the two-dimensional map and the augmented objects allow one to grasp urban space in its totality, thereby representing the voyeur. In contrast to applications that personify urban space, *Nexthamburg Mobile* (Nexthamburg, 2010) encourages one to explore and wander by allowing one to experience different areas (Drohsel et al., 2010; Gazzard, 2011). Both places and objects usually hidden to us – both virtually and actually – become viewable through LARA. The voyeur and walker perspectives direct one to the city and virtual objects displayed within the city: presences that one must interrelate with while maintaining an *embodiment relation*. The city is seen as a collective entity that needs care and citizen participation (Drohsel et al., 2010), whereas the virtual entities are seen by users as presences that reside within urban space.

When users are engaging with LARA as artefacts, the dimension of *mediated play*, new types of materiality that modify one's environment and provide information that opens new interpretations or narratives of objects and spaces around one constitute and alter urban space. Yet, simultaneously, these mediations limit new interpretations. That is to say that the device 'thinks' for us and, therefore, users are being played by the device. Hence, the dimension of *networked play*.

# 4.2 | NETWORKED PLAY AND LARA

The discussion of LARA on the dimension of *mediated play* explained how interacting with LARA as artefacts can result into playful ways to re-appropriate space or establish engaging relations amidst the distortion of space by directing users to the augmented overlay as a result of *agôn*. These insights are informed by how people interact with (non-)informational LARA within certain circumstances. Although the artefactual dimension of play was addressed, for instance when discussing the subjectification of urban space, it was not taken as the starting point of investigating practices facilitated by LARA. In the following, I address the dimension of *networked play* to investigate how LARA induce a feeling of 'being played', thereby focusing on the artefactual dimension of play. As playspaces, LARA allow for free play (*paidia*), whereas as rule-based applications, LARA set boundaries and limits (*ludus*). Playful interactions emerge in this to-and-fro movement of freedom and force.

This dialectic clarifies how one is not the sole master over the interaction with or perception of the augmented overlay. People are drawn into play, tempted to publish personal information such as location and habits which is stored on the servers of the LARA. The platform can also be (mis-)used as a tool for surveillance by both service providers (Albrechtslund, 2013; Albrechtslund & Lauritsen, 2013) and people with malicious intent (Yuhas, 2016). As such, players have become figurants in networks that display themselves as user-centred, while, in the end, control is taken out of peoples own hands. Although important, central in this thesis are the questions of how people playfully engage with these constraints of being played by LARA and how being played influences one's perception of urban space.

Gadamer (1989) keenly observed that players, despite their intention to participate in a game, are soon taken over and played by the game – this relation is exemplified by contemporary applications such as *Pokémon GO* (Niantic, 2016) and *WallaMe* (WallaMe-Ltd., 2015). In a response to these artefactual plays, people can use the playability of these LARA to circumvent the play and provide alternative forms of organising places, people, and artefacts (de Waal, 2013, 2014) – the leeway in the to-and-fro movement between games, artefacts, players, and their environment. Rather than being a unilateral process between player and a game, play is a process that takes place in-between those who play and LARA. Users of *WallaMe* (WallaMe-Ltd., 2015), *Nexthamburg Mobile* (Nexthamburg, 2010), and *Border Memorial* (Freeman, 2011) have, as has been discussed in earlier sections, playfully appropriated urban space while taking a stance with their augmentations and question, amongst others, who has authority over space. In the following, I highlight the play by LARA and the tactics that arise to circumvent this play.

### 4.2.1 BLINDED BY PLAY

Under the disguise of play, one may disclose information that one would rather not share or publish within the LARA environment, such as habits, location, and preferences (Roesner et al., 2014). The devices that mediate, repress, and follow users by facilitating LARA include both virtual and actual elements combined into a single perspective (Ribeiro, Barranha, & Pereira, 2015). The blurring of boundaries becomes evident when addressing commercial informational LARA that commodify the spatial experience (Drakopoulou, 2013). By combining commercial information and intents – among which advertisements and transaction models – with the experience of wandering the city, LARA may prompt users to a certain direction. In other words, users merely follow the screen, blinded by the play of the application. Non-informational LARA also inspire this behaviour. One may have the intention of, for example, playing *Pokémon GO* (Niantic, 2016), as soon as one plays, however, users are played by the LARA that stimulates them to investigate the world searching for monsters. These concerns are, to a certain extent, viable as interactions with certain LARA have resulted in a negligence of urban space as users simply followed where the application urged them to go (Davis, 2016; Guarino, 2016). Carelessness is, according to Keisha Hatchett (2016), what marks certain *Pokémon GO* players as they continue to play the game at inappropriate places while being "glued" to their screens. Play is prioritised and, therefore, the environment is reduced to the background and engagement with urban space is minimalised as these types of LARA frame urban space in terms of competition or subjectification.

Besides being played by LARA, the merging of boundaries also provided manners for users to develop alternative narratives and experiences of urban space to stimulate urban engagement. Urban interactive screens (urban materiality), augmented graffiti (see chapter 3.2.1), and augmented entities ("Urbanimals," 2015) all allow users to re-appropriate urban space, thereby circumventing the disinterested spatialisation presented by certain LARA.

## 4.2.2 | PLAYFUL TACTICS

Reading, writing, and playing urban space and interacting with virtual overlays have, as I discussed in chapter 4.1.2, a political dimension. Users creating *Layar-based* content implicitly or explicitly communicate and form an opinion about urban space. As such, LARA reconstruct historical and political meaning in urban space – transforming urban space into urban place – and raise questions regarding those who have authority over space. In these playful interactions, users subvert and re-appropriate urban space. As I discussed in chapter 3, the unbalanced power-relations between those who traverse space and those who bring spaces into being (architects, urban planners) are still present. However, according to Liao and Humphreys, AR opens up, in Sicart's terminology, new tactical strategies for reinterpreting and reproducing space (Liao & Humphreys, 2014, p. 1430). First, users alternate between a variety of representations of urban space, for example the various layers of Layar (Layar, 2009), and change what their environment looks like to them by, amongst others, adding objects and entities to urban space and change the structure of buildings by means of historical overlays. Second, the augmented creations are only revealed when people choose to look for them which allows users to tell private and public narratives that are simultaneously personal and temporal. The AR layer is non-exclusive as one augmentation does not prohibit another one from being displayed in the same space. Therefore, a certain space can simultaneously tell a multitude of narratives. Third, the augmented content is nested in place. To experience the augmented layer, one has to be physically near that location. In absence of each element – the AR entity itself, the motivation or knowledge to access it, and being physically near the location - the creation remains 'hidden'.

As such, LARA allow for playful tactics to re-appropriate meaning and experiences of space. Some users may create augmentations that interact through places, while other users may create content of spaces and places themselves, for instance by placing memories or historical overlays. AR artist Tamiko Thiel describes how AR allows her to visit places that are risky or physically impossible to visit and to make statements that transcend limitations such as country borders and political climates (Liao & Humphreys, 2014, p. 1430). The augmented creations of Thiel, augmented shadows of persecuted artists, altered the dynamics of the location as Thiel was not invited to expose physical objects at the Venice Biennial. For Thiel, the tactic was conscious as it deliberately questioned the authority to curate, problematise who had the power to speak at that location, and bring in the voices of those who were not allowed to speak. By using AR, Thiel playfully re-appropriated urban space – pretending *as if* she was there – that was excluded from her by external forces. She 'overcoded' the narrative carefully placed by an established order.

These overcodings include pluralised forms of authorship of augmented space that promote certain actions and perceptions. Although the overcodings do not have the ability to claim urban space as physical equivalents have, graffiti for instance, they stimulate both a collaborative dialogue with space, for example to see how people remember a place, and a critical dialogue with urban space, as is illustrated by *Border Memorial* (Freeman, 2011) and *Nexthamburg Mobile* (Nexthamburg, 2010).

These political statements make only sense if people are aware that these messages are present. People would see an empty space when they do not possess an AR system. However, when used in combination with other media such as video, websites, and social network platforms, a larger audience can be reached. The AR project of Thiel, for instance, enabled her to evade censorship and gain more public attention as she made people aware of her work that did and did not have access to AR systems. The use of media is not always empowering as governments or companies have developed methods to counter these new movements of protest (Tufekci, 2014b).

Liao and Humphreys (2014, p. 1431) describe how places are not just physically overcoded, but that artists use physical artefacts within that place to highlight stories that have disappeared or are underrepresented. Especially in areas in which institutions or governments attempt to dictate their own history and understanding of places or monuments (see also chapter 3.2.2 and 4.1.2), LARA work to reappropriate space by playing with the boundaries induced by the hybrid spaces. For example, the aforementioned *Border Memorial* (Freeman, 2011) gives a voice to underrepresented histories and memories of a highly political space by augmenting, on first sight, irrelevant objects such as water bottles and campsites, and presents users with untold narratives and hidden knowledge.

Although hybrid space allows one to move beyond the initial reading of or interaction with a site, there are concerns that LARA are not liberating one to freely prescribe or wander space. The multitude of artefacts and narratives that LARA can attached to a space may present one with pre-established experiences of that urban space. Said differently, as users are being played by the application, they forget how to playfully interact with urban space. Understanding this relation can inform one on how to develop LARA that, besides augmenting urban space, allow people to freely engage with urban space.

## 4.2.3 | | THE END OF ACCIDENTAL DISCOVERY?

When users interact with LARA that display personal experiences of urban space or direct one a certain location as, for example, *Urbanimals* (see chapter 2.2.1) does, some of the explorative and spontaneous character in relating to other people and urban space is taken away. At first sight, (non-)informational LARA, narratives, experiences, and descriptions render (un)known spaces and places with the experiences of other people. As LARA render objects and spaces into potential carriers of augmentation, one should be aware that places are constituted through collective and personal memories, thereby providing less room for a direct and unique experience. Furthermore, these locations are presented as random or special, however, one's movements are controlled by a device one trusts and, thereby, one's passage to particular locations is pre-set. Discoveries are, therefore, less accidental as they appear on first sight. Moreover, there are concerns that, by using LARA, one does not genuinely engage with urban space as one only does so because applications present new and exciting experiences (Gazzard, 2011; Matsuda, 2010). Criticisms target the conceptualisation that one needs to have LARA to augment reality in order to make reality interesting enough to wander through. Urban space can become more exiting and more interesting through LARA and, as such, they could allow for new ways to experience one's
environment and gain a renewed sense of appreciation (Foth, Hudson-Smith, & Gifford, 2016; Hicks-Logan, 2017). However, are we only exploring urban space because LARA urge us to do so?

To a certain extent, this seems to be the case. Applications such as *Ingress* (Niantic, 2013) use their environment as a background for playing. People may feel more connected or more engaged with their environment while using these applications, the primary aim of both users and Niantic is not concerned with urban engagement (Guarino, 2016; Hatchett, 2016; Moore, 2016). Conversely, there are applications that have the primary aim to develop more urban understanding and engagement. The aforementioned *CLIO* (see chapter 4.1.3), for instance, induces spontaneity by inspiring people to divert from traditional routes, fixed paths, and know-how concerning a particular location. Users may let their movement through a city be guided by playful memories that the applications afford. Furthermore, LARA reinforce a sense of newness due to their actual use and their potential to transform spatial experiences into extraordinary experiences. Moreover, LARA such as *CLIO* and *Border Memorial* (Freeman, 2011) add a playful element of agôn (re-appropriation). LARA have the potential to map artistic practices and local knowledge onto places. As such, they bring alternative geographical information to the fore. People can inscribe their environment with own narratives, experiences, entities, and routes and turn urban space into urban place that can be shared with other people. LARA open up opportunities for mapping unknown regions and, simultaneously, create new unknown spaces.

Following the findings of the inquiry into the specific qualities of LARA to stimulate or obstruct urban engagement, a relation between the augmentation and urban space is deemed desirable. When the (non-)informational overlay has a(n) (in)direct connection to urban space, urban space is not primary positioned in the background of one's attention and people are able to use the augmentation for their own understandings. When there is no connection at all or when the augmentation demands all the users' attention, urban space is hidden behind a layer of competition, subjectification, or disinterest. These differences in relation to urban space differentiate non-informational LARA from informational LARA.

#### 4.3 | AR, URBAN SPACE, AND POSTPHENOMENOLOGY

The previous two sections discussed a selection of specific practices around LARA and exemplified how these practices bring about positive or negative implications for urban engagement. I demonstrated that, depending on their connection with urban space and whether or not the focus was directed to urban space and entities within, LARA can increase engagement with urban space. For instance, informational LARA that are used as guidance for citizen participation (*Nexthamburg Mobile* (Nexthamburg, 2010)), to develop memorials that allow people to comprehend the history of their environment, or to see beyond the built environment (*Nexthamburg Mobile* (ibid) and *CLIO*). Non-informational LARA do not necessarily have a direct connection to one's environment. In absence of such a connection, LARA pose an interesting question on how one can stimulate urban engagement while the focus is primarily directed to the augmentation. To further understand the differences between informational and non-informational LARA, I turn to a postphenomenological informed analysis. Understanding the differences in how these

two types of LARA mediate our relation to the world will inform one how one can best design LARA that bring about certain forms of perception and engagement.

From a postphenomenological perspective, AR clearly exemplifies an *embodiment relation* between the technology (the screen and LARA) and the user, as the user perceives the world via a technology. The augmentation inherent to AR mainly involves conceptual interpretation, albeit the world is also experienced through the application (Waterworth & Waterworth, 2001). As such, AR involves a double mediation: one by the device and one by LARA. As mobile devices exhibit a 'natural' incorporation in daily life, the first mediation remains often unnoticed and represents a frequently overlooked *background relation* (Ito et al., 2009). AR is based on multiple technologies that act simultaneously and involves, therefore, a variety of micro-mediations. For example, when interacting with augmentations through LARA, one perceives depth as shown through the mediation of the camera. LARA can, depending on use practices or context of use, establish a variety of relations. The conceptual interpretation as a consequence of AR, interpreting spaces in *Border Memorial* (Freeman, 2011) for example, implies a *hermeneutic relation*, whereas AR can also prompt *alterity relations*, for instance, while dating an AR girl (Mack, 2012).

Verbeek and Rosenberger (2015) address AR as a second layer of 'augmentation' that is added to our world. The *embodiment relation* is, thereby, complemented by a *hermeneutic relation* to the information that AR gives us about the world (ibid, p. 22). Informational LARA such as *WallaMe* (WallaMe-Ltd., 2015) and *FieldTrip* (Niantic, 2015) are examples of this *relation of augmentation*. While using these applications, users receive information displayed on buildings, objects, or – potentially – other people in their environment. People 'read' their environment by interacting with LARA that provide representations of the world. Informational LARA address two parallel relations that Verbeek and Rosenberger (2015, p. 22) have schematically visualised in the following manner:

> (I – Technology) → World ↓ (Technology – World)

Users are directed to two fields of attention as one is, at the same time, directed to the world through a technology and to the information that the technology provides.

This specific *relation of augmentation*, however, seems to primarily relate to informational LARA. Informational LARA provide users with various types of information, including imagery and text, about the objects in one's environment. Other applications of AR seem to initiate a different relation as they create digital entities that do not necessarily have a connection to one's environment, *Pokémon GO* (Niantic, 2016) for instance, and become, thereby, relevant in themselves (Liberati, 2016). Informational LARA are, therefore, different from those that generate entities that do not have an explanation of or relation to certain objects, for instance Pokémon in *Pokémon GO* (Niantic, 2016). In these instances, LARA constitute objects rather than 'reading' the world to unveil information about one's environment.

For Liberati (2016), informational AR draws the attention of users to the information on the user interface which, after a while, is directed again to the non-augmented object, thereby moving the augmentation to the background of one's perception. The potentialities of AR, however, arise, for Liberati, from the ability to shape our perception of and engagement with the world by introducing new objects (ibid, p. 24). The autonomous entities that are developed by non-informational LARA should, as Liberati poses, not be concerned with objects external to the augmentation (ibid, p. 26). Said differently, non-informational LARA should produce virtual entities for the presence in themselves. As such, Liberati's understanding of AR ascribes a particular role to the environment.

The virtual entity should be independent from external objects and, as such, the autonomous augmentation can be valued in itself. However, what is the role of the environment in relation to non-informational LARA? Is or should it be passive in order to develop a deep relation with urban space?

Unless one solely describes AR as a mediator that reveals computer states that are not visible to the naked eye, Liberati's conceptualisation can be applied to address the role of the environment as the environment is, in our perception, not necessarily related to the augmentation. As LARA, and AR in general, present the virtual object on the same level as the environment, the boundaries between virtual and non-virtual entities blurs. This intertwinement has consequences for how one perceives and interacts with one's environment. Media-scholar Ingrid Richardson (2009, 2012) investigated the hybridity of one's environment. Richardson argues that pervasive games on mobile devices demand a particular attitude that is characterised by "an understanding of the spatial arrangement of the physical environment, and a complex awareness of other people" (2009, p. 220), as LBS, including LARA, in particular combine "the corporeal schematics of actual and virtual worlds as they are actively negotiated on-the-move, effectively creating a hybrid mode of being where the boundary between game and real life collapses" (2012, p. 143, emphasis added). In our interaction with autonomous virtual entities, the environment and its relation to the virtual object are of importance in one's understanding of and one's interaction with urban space. For instance, one sees the skeletons in Border Memorial (Freeman, 2011) from a first person perspective and, as such, the device that we look through has become integrated in our bodily movements.

By directing our attention to both the environment, augmented by LARA, and the virtual entities located in our peripersonal space, a new parallel *relation of augmentation* can be identified for non-informational LARA, namely one in which the virtual entity, which is visualised at the same level as one's environment, is perceived as a presence with which one must interrelate – an *alterity relation*. Schematically this *relation of engagement* can be visualised as:

(I – Technology) → World → Technology ( – World) *Border Memorial* (Freeman, 2011) can clarify this relation. While one is directed to the world through the LARA, one is also directed to the virtual skeletons that are visualised.

The playful practices with LARA that I discussed in section 4.1 and 4.2 have illustrated that, depending on their connection with urban space, non-informational LARA often result into positioning urban space in the background of our attention as an articulation of competition or subjectification. When, from a postphenomenological perspective, urban space is considered as a *background relation*, people direct their focus to the augmentation rather than engaging with both. When there is a(n) (in)direct connection, however, the augmentation can bring the background, urban space, to the fore. Recall *Border Memorial* (Freeman, 2011). Two layers of analysis can be applied. First, people direct their attention or praxis to the autonomous skeletons. Second, the story behind the skeletons, which were the remains of travellers, connects with the background and turns space into a place. A(n) (in)direct connection does not necessarily lead to more engagement. As I discussed in chapter 4.1.3, *Pokémon GO* (Niantic, 2016) directed, despite having a slight connection to one's location, players their attention to the virtual monsters and not to both urban space and the Pokémon.

The extent to which LARA can establish a connection with urban space depends on whether the application affords re-appropriation or a multitude of narratives. One does not engage with urban space when one is, in Gadamer's terminology, played by LARA or when one simply follows the information on screen. When one diverges from the pre-set path by re-appropriating urban space or searches for new narratives, one's understanding of urban space is widened. For engagement with urban space, one should be able to interpret space in a variety of manners. Due to their playability, design, embeddedness, or use, some LARA stimulate a play with boundaries, whereas others limit the possible ways to interact with and interpret one's environment.

Understanding how LARA mediate or obstruct a multitude of interpretations and actions is key to develop LARA that stimulate engagement with urban space. The multistability of urban space, that is the ways in which urban space can be interpreted, is heavily influenced by AR. AR allows one to access the materialisation of virtual entities as they are characterised by the potentiality to be actively perceived and interacted with (Gualeni, 2014, p. 184). The increase in variations and the operations on various forms of mediation can be related to the removal of clear boundaries between virtual and non-virtual entities. Without this intertwinement, the materiality, or non-materiality in case of virtual entities, constrains the potential of virtual entities to establish 'stable' understandings of the environment. However, as LARA display both virtual and non-virtual entities involved in boundary play on the same level, virtual entities have the potential to display new forms of materiality. One increases the potential meaning of an environment by placing (virtual) objects in that environment. Imagine that you are in an office room. The room has, rationally speaking, a variety of possible interpretations that can be considered as reasonable. AR allows users to add objects or entities that could not be added or seen before, thereby increasing the potential understandings of how one can interpret one's environment (recall the skeletons that illustrated how a desert transformed into a memorial in *Border Memorial* 

(Freeman, 2011)). This increase in multistability of an environment seems, however, to apply more to non-informational LARA than to informational LARA. Informational LARA can be more suggestive in their meaning. As such, it might become harder for users to overcome the suggested reading of the device, therefore, these LARA reduce the multistability of the environment. As such, LARA present one with unique capabilities that demand users to critically engage with what they actually mediate. LARA afford new relations of mediation and, when designing for urban engagement, one should take into account what is expected and mediated in this play with boundaries.

#### 4.4 CONCLUSION

To understand how LARA allow for new ways of perceiving and engaging with urban space and how the practices of play apply, I gave an overview of practices related to LARA and urban space based on the two dimensions of *mediated* and *networked play*. I used Caillois' (2001) fourfold categorisation of play to demonstrate that the play with boundaries I discussed in chapter 3 was also present on the other two dimensions. From mastery over hybrid space to transforming space into place and from every object as a carrier of information to foregrounding experiences that normally remain hidden: LARA unveil a playspace in which a variety of alterations and interpretations are merging with the mediated and non-mediated interactions through LARA. Gadamer's play dialectic, Sicart's notion of play as re-appropriative, the distributed narratives by *WallaMe* users, and playful social interactions discussed by Goffman further informed the analysis of practices on the levels of communication, subjectification, memorialising, and subversion.

Depending on their form of mediation, LARA stimulate both positive and negative forms of urban engagement. Applications that are centralised around the element of *agôn* or around the user or introduce autonomous entities with little or no connection to urban space obstruct the development of a deep relation with urban space. The attention of the users is mostly directed to the entities on screen or the nearest highlight in town. Conversely, LARA are also capable of transforming using urban space into engaging with urban space. *Border Memorial* (Freeman, 2011), for instance, displayed two layers of analysis as people direct their praxis to the autonomous skeletons, while, simultaneously, connect to the narrative behind the augmentations. As such, LARA bring the background to the fore by displaying the background on the same level as the augmentation. This ambivalence of LARA is, following the analysis, due to a fluctuation between a 'collective self within urban space' and a 'centred self within urban space'. LARA present the user as the centre of attention by providing user-tailored content and positioning, while, simultaneously, strongly evoke that urban space is not solely inhabited and developed by individuals.

The second section described that one is also being played by LARA and that users, in a playful interaction with the mediations of LARA and urban space, circumvent these constraints by using AR to re-appropriate meaning and experiences of space. These overcodings include pluralised forms of authorship of augmented space that promote certain actions and perceptions. People can inscribe their environment with personal experiences and entities and turn urban space into urban place that can be shared with other people. Thereby, LARA open up opportunities for mapping unknown regions and, simultaneously, create new unknown spaces. A mutually constitutive connection between code/space is highlighted as were the augmentations to be removed, places would gain a different meaning.

The analysis of practices related to LARA demonstrated that a distinction between non-informational LARA that construct the world and informational LARA that can 'read' the world is required, as each type entails different relations of mediation between the world and those who experience the world. Informational LARA adhere to Verbeek's and Rosenberger's *relation of augmentation* and include both *hermeneutic* and *embodiment relations* as one is directed to the information of the world revealed by the technology. In contrast, non-informational LARA direct users their attention in a *relation of engagement* to both the world and the virtual entity that is visualised. From the postphenomenological perspectives advocated by Verbeek (2005, 2008a), Ihde (1995), and Liberati (2016), LARA can be understood as mediators with the potential to reveal new manners in which reality can manifest itself. Virtual augmentations then do not represent new ontological possibilities, but provide insights into new 'horizons of thought' to understand, amongst others, time, space, and location.

As LARA allow users to access the materialisation of virtual entities as they are characterised by the potentiality to be actively perceived, the multistability of urban space is heavily influenced. By positioning virtual objects in an environment, one increases the potential meaning of that environment. At the same time, one can also reduce the multistability as one complicates the attempt of users to overcome the suggested reading of the LARA.

Now that I identified a selection of new mediations of AR, as well as their influences on practices with LARA and urban space, the question arises of how one should develop applications that mediate one's perception of and engagement with urban space such that a meaningful relation is developed: a relation that circumvents the technocratic smart city narratives and uses play to stimulate urban engagement and social dialogue. While considering the mediating roles that LARA have or will have in society, one should assess whether the designed LARA has undesirable mediating capacities. That is, one should explicitly aim to stimulate specific forms of mediation, for instance those that stimulate urban engagement, and critically assess whether the design might obstruct urban engagement. It is this dynamic that I will further inquire in the following chapter.

## CHAPTER 5 DESIGNING LARA FOR MEANINGFUL URBAN ENGAGEMENT

"It is not enough that we build products that function, that are understandable and usable, we also need to build products that bring joy and excitement, pleasure and fun, and yes, beauty to people's lives."

Don Norman Introduction to This Special Section on Beauty, Goodness, and Usability, 2009, p. 312. he technocratic narratives of smart cities and proposed solutions to problems such as efficiency and productivity have impeded social dialogue and urban engagement (see chapter 1). Playful cities and the notion of play were presented as a way to stimulate urban engagement and social dialogue. AR and LARA in particular were seen as mediators to foster deep relations between urban space and urbanites and urbanites themselves. In the analysis that followed, the particular capabilities of LARA were addressed as well as their influence on constituting urban space. LARA have an ambivalent role. Chapter 4 explained that practices around LARA can stimulate urban engagement, while also distort space or impede social dialogue and urban engagement. The postphenomenological inquiry described how two types of LARA mediate their own relation to one's environment and require, thereby, their own design approaches to stimulate urban engagement and social dialogue.

So how to prevent the city from becoming a place in which people are moving around without being connected or engaging with the space around them and what is the role of LARA in this process? The previous chapter demonstrated that AR is often deployed with a short-term vision – reach this goal or find this location. Immediate augmentation of space or a direct stimulation of one's sensory capacities, LARA are focused on the here and now, rather than on the now and future. Within the following analysis, I argue that one should look beyond short-term use of LARA that are easily discarded.

The chapter contains three sections. The first section revisits the developed concept of meaningful play with regards to the gained insights of chapters 3 and 4. The second section discusses the ways to make cities playful again. The third and final section addresses the need to design for playfulness of both urban space and LARA. Non-informational and informational LARA are separately addressed as they include different design requirements. The purpose of this chapter is not to present a final framework for designing and using LARA. Instead, the aim is to provide entry points for further discussion and inspire a debate on the design of LARA that do not disrupt city life but help to understand urban space.

#### 5.1 | MEANINGFUL PLAY REVISITED

Before further investigating what the design of LARA for meaningful urban engagement could entail, I revisit the previous developed notion of meaningful play. Meaningful play was presented as practices of play and playfulness that direct the focus to urban space and urbanites, rather than a game or goals such as productivity or efficiency. LARA such as *Pokémon GO* (Niantic, 2016) and *Tweeps Around* (TAB-Worldmedia, 2010) focus either on the subject or the augmentation and, thereby, do not stimulate the playability of urban space. The aim of meaningful play and playable cities is to develop experiences related to urban space by means of playful interventions. As such, applications are required that strengthen and create relationships between citizens themselves and their environment.

The *Madison 2200* project, for instance, aimed to investigate whether AR and Geographic Information System (GIS) models would stimulate school students to develop an understanding of ecology and whether they would apply this understanding to develop designs for a more sustainable urban space (Beckett & Shaffer, 2005). In the research, the researchers placed students in a learning environment that asked students to deal with complex urban problems by interacting with a virtual model of their own city (ibid, p. 32). By using *mimicry* to investigate the work of policymakers, *Madison 2200* uses the virtual environment in a sophisticated manner. In contrast to traditional AR applications, the researchers described *Madison 2200* as being *augmented by reality*: a virtual simulation that is explicitly guided by real-world practices and tools (ibid, p. 36) – a genuine hybrid space. People use the game as an interface to stimulate thinking about their environment which, in turn, inspires them to engage with their environment in a playful manner. Such a connection is a meaningful application of LARA and play, as when people are able to develop their own solutions based on information and knowledge about their city, they will form a stronger connection with their environment and this relation motivates them to take action (ibid).

What can be learned from this and earlier discussed examples? Throughout the thesis, various examples of both meaningful and non-meaningful play demonstrated that their relation to urban space – both in type, information or non-information, and connection, direct, indirect, or none – influenced the potential for stimulating or obstructing urban engagement. LARA such as *WallaMe* (WallaMe-Ltd., 2015) and *Border Memorial* (Freeman, 2011) supported the playability of urban space and, therefore, a first step towards meaningful engagement seems to make the city playable again.

#### 5.2 | MAKE THE CITY PLAYABLE AGAIN!

While considering the mediating roles that LARA have or will have in society, one should, as a designer, be aware of the intended application of LARA. Said differently, one should know what to design for. As playful city initiatives, which were discussed in chapter 2 and 4, have illustrated, one can design games, applications, or installations that that allow for play in the city or stimulate urban space to become more playful in themselves. When designing LARA to make urban space more playable, one can design for two levels, namely the procedural and the conditional level. The first addresses playful urban infrastructures and services and the latter addresses playable forms of governance (de Lange, 2015b, p. 432). At the procedural level, urban infrastructures can be made playful to stimulate a particular mentality or form of interaction. The previous discussed *CLIO* is an example that seduces people to gain new understandings of spaces and places around them and engage in intergenerational dialogue instead of solely experiencing one's own interpretation of that service or space (Ringas et al., 2010). There are various LARA that open up urban space to fundamental change by urbanites at the conditional level. *Nexthamburg Mobile* (Nexthamburg, 2010), for instance, made collected datasets available for users to derive local policies by re-arranging the playing field or governance.

The development of playable cities is strongly connected to initiatives that support play in the city. The analysis of practices of LARA in chapter 4 presented at least three ways in which play and LARA can relate people and their environment in a meaningful way. First, LARA can be used to engage and deal with existing urban issues including urban planning or urban development. *Nexthamburg Mobile* (Nexthamburg, 2010) is an example of this as it allows for bottom-up initiatives to improve urban space and the collective regulation of urban space. Second, LARA such as *WallaMe* (WallaMe-Ltd., 2015) and *CLIO* inspire playful interactions and encounters with places and people by prompting play and serendipity. They draw people to certain locations or inspire dialogue with other urbanites. Third and, probably, most relevant, LARA are used to establish a feeling of relating to urban space and caring about its people through experiences of play. *Border Memorial* (Freeman, 2011) exemplifies such use. It brought the background space to the fore and induced a feeling of respect and recognition. As such, the playfulness of LARA and the environment inspired the formation of emotional and affective relations.

## 5.3 | | DESIGNING FOR PLAYFULNESS: BETWEEN STIMULATION OF ENGAGEMENT AND DIRECTING PERCEPTION

After clarifying the roles LARA can have in establishing meaningful engagement by means of play, I turn now to the development of design criteria to develop LARA such that meaningful experiences are facilitated. Knowing what to design for is one thing, knowing how to design for it is another. One may discover new places or establish emotional relations with urban space through LARA. However, chapter 4 explained that one could also not engage with urban space or miss other places due to the use of LARA. The multistability of LARA makes it demanding to predict the ways in which LARA will influence human actions. Even when LARA are used as the designers intended, unforeseen forms of mediation can emerge. *FieldTrip* (Niantic, 2015), for example, was designed to direct people towards interesting places in their environment. Simultaneously, players are also active participants. While being played by the device, they actively engage in the production of the game itself as they subvert rules, create derivatives, and tell stories about their own play. Designing for playfulness, that is designing for appropriation of spaces, LARA, and situations (see chapter 2.1.4), should balance the freedom and subversive nature of users and the force or intention endowed by designers and LARA themselves.

Designers should play with this oscillation between freedom and force by guiding users that need guidance or a gentle push to new places and set those users free that do not require these rules. The needs of users are diverse as some may want to be brought to new places that they would not discover otherwise (Boehret, 2013), whereas others want to discover new places for themselves (Christopoulou et al., 2012). Designers should unpack the needs of the user and use LARA to guide or evoke discussions or playful behaviour. Depending on the type of LARA, different measures should be considered to oscillate within this interplay.

#### 5.3.1 NON-INFORMATIONAL LARA

Chapter 4 demonstrated that non-informational LARA direct the attention of users to augmented entities and could, thereby, position urban space in the background of one's attention. To overcome this concern, I proposed that augmentations should at least have a(n) (in)direct connection to urban space. These connections do not necessarily exclude undesired mediations, but, in principle, form a base for engagement. Following Liberati's conception of 'good' AR coined in chapter 4.3, one uses the potential of AR to increase the multistability of urban space and the ways of interaction with new parts of the world when connecting the role of augmentations as subjects and the environment they are located in.

The virtual entities should not necessarily have a physical or non-virtual equivalent. Fictional narratives or entities can still connect people to urban space. A pet-like extra-terrestrial creature that lives in one's neighbourhood town hall can perfectly stimulate engagement with and the playfulness of urban space. When, for instance, the creature has memorabilia of the town hall, such as uniforms or narratives, a connection between the augmentation and its environment is established. New values and interpretations are formed by interacting with the augmented entity. The creature highlights the neighbourhood and vice versa. The AR layer can be seen, thanks to LARA that present it on the same level as the environment, as a 'common' pet that lives in a particular environment.

While developing LARA that stimulate user engagement, elements of *agôn* are often included (de Lange, 2009a; Gazzard, 2011). Although *agôn* and the other elements described by Caillois (2001) contribute to the development of playful interactions, from human interaction (Goffman, 1959) to space appropriation (Sicart, 2016) and from questioning authority (Liao & Humphreys, 2014) to hiding messages in *WallaMe* (WallaMe-Ltd., 2015), they should not become an end in themselves. Although *Pokémon GO* (Niantic, 2016) is a prime example of a non-informational LARA, its augmentations are not stimulating the playfulness of the city as the game layers are the primary focus of the augmentation. Urban space is then nothing more than a background of play. To avoid this, designers should give users a concrete relation between their environment and what is done with and seen through LARA.

The previous discussed *Border Memorial* (Freeman, 2011) exemplifies a non-informational LARA that establishes such a connection. The skeletons are autonomous entities that also constitute a connection to their surroundings. As such, users direct themselves to the augmentations and the context in which these entities emerge. The appropriation of urban space is highlighted by the augmentations that allow users to see the playability of their environment. Inspired by LARA, users playfully take over spaces and see beyond the emptiness of, in this case, the deserted space between Mexico and the USA.

Although *Pokémon GO* (Niantic, 2016) was presented as a non-meaningful application of play as it focused on game elements with a loose connection to urban space, it produced engaging relations to urban space (Hicks-Logan, 2017). To improve the application such that urban space is centralised, one can think of special Pokémon, for instance archbishop Pokémon nearby churches, that belong to a certain place. One's relation to that place changes as new values arise in which the place and the augmentation all have their share. The flexible relation to urban space is then replaced by a firm connection.

#### 5.3.2 | INFORMATIONAL LARA

Despite similarities in design criteria, informational LARA require different guidelines, since they have a connection to urban space by default. The play with boundaries highlighted in chapter 3 stated that they do not only extract information from urban space that has been gathered by designers, but are also fuelled by information provided by users themselves.

While designing for informational LARA, one should understand the context in which the information is presented. Past research on information display highlighted the importance of presenting the right information in the right way to effectively engage users (Norman, 1986; Stedmon, Kalawsky, Hill, & Cook, 1999). Furthermore, due to their ability to lower the multistability of urban space by directing users towards certain interpretations, designers should consider balancing the display of necessary information to stimulate urban engagement and the number of options users have to diverge from these stipulations. Informational LARA should, therefore, present a plethora of narratives and prompt users to develop their own narratives. It is here that I see room for playful interventions by LARA. LARA should facilitate the use of the playful strategies of appropriation, subversion, and expression outlined in chapter 2.1.5 and prompt users to visit new locations while, at the same time, stimulate them when they diverge from the set path. LARA provide the augmentations, whereas users can use these augmentations for themselves to engage with or develop urban space.

As creating informational content implies an implicit or explicit opinion of that space, hence the potential to lower the multistability of the environment, designers and service providers should ask themselves whether or not their layer is of use for urban engagement. Simply guiding users from one highlight to another would not contribute to engagement between people and their environment. Connecting highlights to a larger narrative in which people have their own position could, for instance, turn the suggestive informational LARA into one that ties urban space and users together.

With regards to informational LARA, considering playfulness can encourage one to consider the development of informational LARA that stimulate the appropriation of urban space instead of informational LARA that are designed to stimulate the activity of play. The aforementioned *WallaMe* (WallaMe-Ltd., 2015) is an example that addresses both possibilities. On the one hand, *WallaMe* (ibid) constitutes a hybrid space in which the totality of urban space is framed as a playspace. On the other hand, the application allows users to personalise urban space and to subversively circumvent the existing narratives or conceptualisations of urban space. *WallaMe* (ibid) does not only focuses on playing a game within urban space or stimulating one's own senses, but also on stimulating interaction with and between other people and their environment. Unlike popular applications such as *FieldTrip* (Niantic, 2015) and certain layers of *Layar* (Layar, 2009) that all revolve around the tendency to create subjective worlds of information and interaction and prevent any form of spontaneous interaction with urban space, *WallaMe* (WallaMe-Ltd., 2015) mediates urban space in such a way that the make the city playful again.

I conclude this section by summarising the design guidelines to be considered when developing LARA for urban engagement and playfulness. Figure 13 and 14 contain a selection of suggestions.

#### General Design Guidelines for LARA within Urban Space

Grouping	Centralise users, their environment, and the augmentations.
Appropriation	Allow for re-appropriation and subversion of the application.
Exploration	Prompt users to diverge from the familiar path.
Balance	Do not limit the view of users by providing one perspective; allow for diversity.
Focus	Do not use <i>agôn</i> as the focal point of LARA; design for urban engagement.
Fair play	Do not play with people when they do not want to be played with.
Meaningful	Design for social dialogue and motivate people to share experiences that are
	related to urban space.
Spatialisation	Turn urban space into urban place.

Figure 13. General design guidelines (non-)informational LARA for urban engagement and playfulness.

#### Specific Design Guidelines for LARA within Urban Space

Involvement	Design for continuous active involvement with urban space (e.g. tags, photos,
	responsive augmentations, and interactions with other users or nonusers.
Connection	Design for (in)direct connections between augmentations and urban space (e.g.
	interdependence, complying with similar narratives, or the constitution of new
	and shared values); design for relations of augmentation and engagement.
Storytelling	Weave the use of LARA into city narratives. Positioning narratives of users and
	augmentations into urban space turns urban space into urban place.
Stimulation	Suggest other ways of traversing, inhabiting, or of participating in urban spaces
	so that one can think playfully about urban space (e.g. Urbanimals, and CLIO).
Layering	Remove existing boundaries of place by augmenting new layers onto one's
	immediate environment which allow users to look beyond the built
	environment (e.g. Nexthamburg Mobile and CLIO).
Playful Use	Make use of LARA to connect existing urban problems to playful applications
	(e.g. Madison 2200). The augmentations, complemented by elements of play,
	should then be explicitly guided by actual problems.
Boundary Play	Allow users to investigate the digitally mediated and physical interactions
	through LARA which, in turn, involve playful interactions between
	spatiotemporal dimensions and the boundaries of play itself.

Figure 14. Specific design guidelines (non-)informational LARA for urban engagement and playfulness.

These design criteria should not be seen as decisive criteria that need to be met when developing (non-)informational LARA. Instead, they should evoke discussion and thoughtful decisions when designing for (non-)informational LARA to stimulate urban engagement and social dialogue in playful ways. Play and the interaction with LARA are, as the previous chapters have pointed out, not the sole result of human decision or intent. The dimension of *engagement play* and the artefactual notion of play derived from Gadamer's readopted understanding of play illustrated how intention, players, spectators, environments, and applications are drawn together within the act of interaction. Each context or arrangement of people, LARA, and other entities require a different approach and mindset and deal, therefore, with different forms of mediation. Designers should assess upfront whether the applications support desirable mediating capacities that connect people and urban space to one another. When one is aware of how certain LARA mediate engagement and perception in specific contexts, one can specifically design for these capacities. Designers aim to stimulate certain behaviours or interpretations, but in the end play takes over and in a to-and-fro movement new interactions and interpretations arise.

#### 5.4 CONCLUSION

In this chapter, I argued that we should prevent the city from becoming a place in which people are moving around without being directed to their environment by designing LARA that stimulate playful behaviour and establish meaningful connections between people and their environment. I suggested to use meaningful forms of play to see how LARA can be designed to mediate meaningful forms of interaction with urban space. That is, play should be used to direct the focus to urban space, urbanites, and augmentations rather than centralising just the augmentations or particular narratives. Moreover, meaningful play also makes the city playable again. When designing LARA to make urban space more playable, one can design for two levels, namely the procedural and the conditional level. The first addresses the design for playful urban infrastructures or services and the latter addresses playable forms of governance. Complemented by the inquiry of chapter 4, I proposed three ways in which play and LARA can connect people to urban space in meaningful ways. First, LARA can be used to engage with existing urban issues or developments. Second, LARA can inspire playful interactions and forms of encounters with other people and places by prompting play and serendipity. Finally, LARA can be used to develop a feeling of relating to urban space or caring about its people through experiences of play.

In the third section, the necessity to consider certain design requirements for the development of (non-)informational LARA was addressed. I suggested that, based on the type of LARA, several design guidelines should be considered when developing (non-)informational LARA. In designing for playfulness, one should balance the guidance of users and the stimulation of new forms of engagement. On the one hand, designers want to guide people towards engaging situations. Conversely, users should be able to go their own way and discover urban space by themselves. In this balance, designers should consider the type of LARA they will use. When designing non-informational LARA, a(n) (in)direct connection between the augmentations and urban space is desirable.

One should design for playability and playfulness. LARA should spark ideas, narratives, or interactions and stimulate insights into one's environment. If products are to be designed to facilitate playful engagement with urban space, that is enhance the playability and playfulness of urban spaces, it is necessary to design them such that people deal with the environment itself and not only with what they signify. For informational LARA, designers should aim to facilitate the use of the playful strategies of appropriation and expression to stimulate users to visit new places while, simultaneously, inspire them to diverge from the pre-set path.

I presented several design guidelines that aim to counter smart city themes of efficiency and productivity that position urban space and citizen dialogue in the background of one's attention. The most relevant way to stimulate lasting forms of urban engagement consists in designing LARA that evoke a bond with their users and their environment by using meaningful forms of play that augment urban space in playful manners. Most informational LARA require little user engagement and present the augmentations as an interesting feature of their presentation and most non-informational LARA focus more on the augmentations or the aspects of gaming. As such, users are not invited to simultaneously interact with urban space and the augmentations. *WallaMe* (WallaMe-Ltd., 2015) and *Border Memorial* (Freeman, 2011), amongst others, demonstrate that this impedance of engagement can be subverted in a playful manner. LARA should invite users to interact with one another and their environment while being, at the same time, directed to the augmentations.

A final note should be addressed with regards to the users of LARA. Within urban space, playful citizens are not passive users of their city that simply walk from 'A' to 'B' while being guided by LARA. Instead, they adopt an active role as co-creators of urban space as playful operators engaged in a dance of being played by LARA and playing with LARA and urban space. As such, urbanites use LARA in playful manners to create their own and collective narratives and experiences of LARA. Designers, corporations, architects, and governments should take an active part in the development of LARA such that these playful interactions are not reduced to the background. By stimulating playful behaviour and re-appropriation LARA can be developed with a long-term perspective. Rather than being conceived in the here and now, LARA are conceived with regards to the future impacts they might have.

# CHAPTER 6 CONCLUDING

### REMARKS

"Putting people and play at the heart of our future city."

Watershed Playable City Vision Statement, 2017, para. 1.



his thesis has made a contribution to the comprehension of the influence of LARA on the perception of and engagement with urban space. I have set out to analyse the contemporary relation between play, LARA, and the city, the challenges to understand the relation between virtual and non-virtual spaces, the new practices that emerge when using LARA, the ways they bring about new forms of mediation, and how to design LARA for urban engagement. In the discourse of smart and playable cities, there has been comparatively little research done on how LARA influence one's experiences of and engagement with urban space. Playable city initiatives use AR and play to deal with societal challenges such as integration, impeded social dialogue, and a lack of urban engagement. As the use of mobile phones and AR is not undisputed – AR and phones can create a social division and can lead to a decontextualization of urban space – I deemed it valuable to investigate how LARA can contribute to the development of a deep relation between citizens themselves and their environment while avoiding the negative consequences such as division and decontextualization. The aforementioned aims translate into the following main and secondary research questions:

#### How do location-based applications, that use augmented reality on mobile phones in an urban environment, affect one's perception of and engagement with urban space?

To answer this question, I derived a working definition of play that I used as a heuristic to analyse LARA and their relation to urban space. By establishing both an anthropological and artefactual concept of play anchored in three dimensions of play (the dimensions of engagement, mediated, and networked play), I developed a framework to analyse our interactions with LARA and urban space. I deemed play as a heuristic lens appropriate as play is both incorporated in contemporary everyday life and involved in the interaction between people and urban space. Moreover, play can account for the performative capabilities of technologies in the construction of experiences and engagement and has both potential and actual space generating settings. The hybridity of space facilitated by LARA is what demarcates LARA from other technologies. Urban space is connected, mobile, and social, and the boundaries between physical and virtual spaces has been blurred. The intertwinement of virtual and non-virtual spaces and entities affirms the dynamic relation between the two and explains how LARA mediate between these two levels of reality. The complementary virtual layers induced by LARA mediate (1) the way users relate to each other; (2) how certain spaces are experienced; and (3) how users understand a particular place. I further investigated these complementary layers with regards to how LARA influence one's perception of urban space in relation to LARA as artefacts, how they evoke feelings of being played, and how people anticipate to these feelings of being played. The inquiry into the practices of LARA analysed the specific qualities of LARA including, amongst others, their role in communication, memorialising urban space, turning urban space into a background of play, and translating 'using urban space' into 'engaging with urban space'. With regard to the dimension of networked play, I concluded that, while LARA draw users into a play in which users are played by the application, users can subvert the practices set by designers and artefacts themselves and play with this leeway in a 'to-and-fro movement'. As such, LARA allow for playful tactics to re-appropriate meaning and experiences of space. Some users may create augmentations that interact through places, while other users may create content of places themselves. These overcodings include pluralised forms of authorship of augmented space that promote certain actions and perceptions. I also suggested to distinguish between informational LARA that 'read' the world and non-informational LARA that constitute autonomous entities. This classification highlights that what makes LARA, especially non-informational LARA that do not adhere to non-virtual equivalents, stand out. Each type entails different forms of mediation between the world and those who experience the world. Informational LARA adhere to a *relation of augmentation*, which includes both *hermeneutic* and *embodiment relations*, whereas non-informational LARA adhere to a *relation of engagement*, which includes both *alterity* and *embodiment relations*.

All-in-all, one can say, with regard to the main research question, that LARA affect our perception of and engagement with urban space in a variety of manners. The potentiality of LARA to position both the augmentation and urban space on the same level highlights an important feature in developing LARA that stimulate urban engagement and citizen dialogue. Depending on the type of LARA (informational or non-informational) different forms of mediation are established which may or may not have positive influences. Ideally, informational LARA bring people to unexpected places and support the contact between people themselves by connecting people, both users and non-users, to a similar narrative. Non-informational LARA would, ideally, direct the attention of the user to both the augmentation and urban space. The augmentations should connect (direct or indirect) with their environment and bring, thereby, urban space to the fore. When these connections are not centralised or when the focus is directed to external goals such as productivity or efficiency or elements of play (*agôn, alea, mimicry*, or *ilinx*), the development of a deep relation with urban space and its inhabitants is obstructed. A final point is to remind oneself that the mediations are a unilateral process. It is in the interplay with LARA, people, and urban space that perception and engagement are influenced. When one is aware of this interplay, one can unravel the various elements within this hybrid space to design for particular forms of mediation.

#### 6.1 | IMPLICATIONS

One of the purposes of this thesis is to illustrate the peculiarities of LARA within urban space, and how these peculiarities pose problems for those frameworks that do not account for the intertwined and coconstitutive interrelations between urban space, LARA, and people. I pointed out new tensions between materiality, information, and augmentations in non-virtual spaces that emerge by the use of AR interfaces. Traditional accounts concerning the virtual and non-virtual or AR uphold a dichotomy between virtual and non-virtual realms (Manovich, 2006; McGonigal, 2011). As LARA allow users to see and interact with augmentations and narratives from a range of locations, the users' location becomes essential for determining how people interact with digital information or augmentations, and what types of information are accessed. The Deleuzean informed interpretation of the virtual that describes the ongoing process of becoming and actualisation of the potential into the actual allows one to comprehend these convoluted relations between LARA, urban space, the gathered information, and the augmentations LARA create.

By investigating the practices and engagement with AR and urban space, I indicated that a distinction between non-informational LARA that construct the world and informational LARA that can read the world is required. These two types of LARA each come with a set of extraordinary characteristics as they entail different relations of mediation between the world and those who experience the world, and leave singular frameworks of AR ill-equipped. On a constructive level, I aimed to clarify how we can better understand these new mediations of perception and engagement by means of the *relations of augmentation* and *engagement*. Moreover, I provided generic and specific design guidelines to design for LARA that stimulate deep relations between people and their environment, and to start a discussion on how to design LARA for perceiving and engaging with urban space in playful manners.

By connecting this thesis to new media studies and postphenomenology, my thesis contributes to existing fields of inquiry concerning AR and smartphones, their relation to people and urban space, and the relation between virtual and non-virtual spaces. Moreover, as I positioned myself within the smart city debate, my findings can be used to improve the position of people in yet to be developed plans for turning cities into smart cities. To be more precise, to avoid the impedance of social dialogue and urban engagement, I investigated how LARA mediate the perception of and engagement with urban space, and how LARA can be used to stimulate and foster social dialogue and urban engagement. In my vision, LARA create a temporal division between those who have the privileges to play with LARA and those who do not have these privileges. By taking the interpretation of good use of AR as taken up by playable city initiatives, I aim to resolve societal challenges or barriers that are already present. The dimension of *mediated play* revealed that LARA can support the understanding of a certain experience which, in turn, can spark conversations between those who were previously separated.

The specific focus on play and playable cities deepens the shared understanding of LBS, including LARA, and citizen engagement in urban space. Despite a vast selection of literature on virtual worlds, AR, and playable cities, very few academic and commercial works have aimed to understand how LARA shift the way in which people perceive and engage with urban space. That is, when one's location in urban space becomes paramount to the way one approaches augmented entities, digital narratives, and urban space. While addressing the theoretical implications of LARA and their new mediations, these scholarly and commercial works particularly focus on describing the technological outputs, such as augmentations and messages, themselves. However, such an approach is, albeit fruitful in its own right, not sufficient to capture the totality of LARA within urban space as LARA also affect users, non-users, and designers in the ways they interpret and experience urban space. This thesis also resonates with scholarly works that address philosophy of technology, in particular human-technology relations, and computer science, specifically human-computer interaction. All-in-all, the thesis contributes to a collection of experiences and practices that is useful for understanding LARA and city life.

#### 6.2 | LIMITATIONS

This study has a number of limitations, some of which provide entry points for further research. Firstly, some of the authors introduced in this thesis are used in the readopted form of a particular research field. I use, amongst others, Deleuze and Baudrillard in terms of their use within media studies. The original context in which these authors have written their work is, thereby, not explicitly addressed. As such, another limitation arises as one could question the researchers' interpretation of the original works. As the interpretation of, amongst others, Deleuze and Baudrillard are developed by leading authors in the field such as Deuze (2012), Hodkinson (2011), and Lister et al. (2008), this concern has been restrained.

Secondly, the use of LARA for both entertainment and engagement has only recently received massive attention due to the appearance of Pokémon GO (Arif, 2017; Hranleh, 2016). Although Layar (Layar, 2009) and WallaMe (WallaMe-Ltd., 2015) each have their share of users, AR has not been 'present' in daily life for the general public. As such, one could question the relevance of this thesis. Although the 'breakthrough' of AR has been often announced (Azuma et al., 2001a; Butchart, 2011) and AR has been marketed to particular audiences, the costs of AR have decreased and due to a widespread diffusion of mobile devices, especially smartphones, AR applications become more and more available for people in their daily life (Merel, 2017; We Are Social & Hootsuite, 2017). I should state, however, that the experiences described in this thesis are, except for experiences related to Pokémon GO (Niantic, 2016), related to either early adopters of LARA or to those who participated in playable city initiatives. Nevertheless, I believe that my analysis of new mediations of the perception of and engagement with urban space contains relevant and important insights and is valuable for a wide audience. Studying the experiences of emerging users of LARA helps to deepen our understanding of how these technologies may complicate our relation with urban space and the people within urban space. The practices of these users are valuable to study as in the early stage of adoption many norms and practices of usage are articulated and negotiated (Silverstone & Haddon, 1996). With the adoption of LARA and its increased use, these early practices can shape prospective uses of LARA.

Thirdly, due to my focus on play and smartphones, I particularly address people that can play and have access to smartphones. As such, a potential divide between users and nonusers, and users themselves emerges. *CLIO*, for instance, temporarily separates those experiencing memories of the past and those who do not. However, after an initial division, *CLIO* stimulates a discussion between both users and nonusers (Christopoulou et al., 2012; Ringas et al., 2010). Using LARA entails a division from the start, however, certain mediations allow users to overcome other barriers or divisions and connect, thereby, people that were not connected before (Christopoulou et al., 2012; Neuenhaus & Aly, 2017). A related limitation is the fact that different devices have different modalities and, therefore, mediate our perception of the world in a different way. AR glasses, headsets, and smartphones have their own capabilities and augmentations will be experienced differently. As AR on smartphones is more diffused and as AR glasses or headsets are not yet widely available or have high costs, I focused on how LARA on smartphones mediate our perception of and engagement with urban space.

Fourthly, the perspective of play addresses a particular aspect of our interactions with LARA. In light of playable city initiatives and the role play has in everyday life, the concept of play was deemed appropriate as a framework to study the mediations of urban space by LARA. Play, however, does not capture all there is to say about LARA and their mediations. Not everyone has the capabilities to play in general or with LARA. Based on the intentions by playable city initiatives, I developed a notion of meaningful play that articulates that the motivations behind LARA should encourage social dialogue and motivate people to share experiences that are related to urban space. By means of public interventions or LARA that stimulate cooperative play with people that do or do not have access to AR, LARA can be made more inclusive and fruitful (Christopoulou et al., 2012; de Smale, 2015a). Although play is useful in this regard, there are other aspects of LARA within urban space that play does not address. For instance, the analysis of LARA and urban space from a normative or privacy perspective could inform people more about which data is collected and how this gathering of data affects the mediation of LARA. By developing the dimension of *networked play*, I aimed to incorporate a discussion on how LARA induce a feeling of 'being played' and how users circumvent these constraints. For instance, I addressed how LARA personify urban space by means of personalised advertisements or pre-defined routes and how this personification can shift one's perception of urban space. An actual analysis on the normative aspects concerning data collection, trust between users and companies, and relations between companies themselves has not been included as certain elements fall outside the direct scope of this thesis. However, this exclusion does not mean that these discussions are irrelevant.

Imagine a company that develops "Robberman GO", a LARA that uses the gathered data to inform users where rich people live and when one could break into their houses, or hackers that add zombies to your vision. As such, LARA allow for harmful mediations. A normative analysis that anticipates on these emerging uses of LARA could provide insights into how LARA ought to be designed. Although people with malicious intent are not withhold to develop these applications, (non)users should be protected by guidelines that prohibit the use and development of such LARA. The anticipatory technology ethics approach developed by Phillip Brey (2012) uses futures and forecasting studies to anticipate on possible ethical and societal implications of a technology. Especially the application level that addresses the particular ways of using a technology, LARA in this case, would be informative. Applications such as the imaginative *Robberman GO* would, on the base of their application level, be considered as immoral use of AR. A first step would entail that producers and developers clarify which data they are collecting and what the applications do with this data. Users should not passively use these applications either. They should evaluate these applications for themselves. Malicious intent of producers does not entail that users should use faulty applications, although the positive reputation of certain companies and the complexity of applications could discourage users to not use these applications. The potential misuse of LARA should not entail that they should not be developed, however, one should remain critical about their use and mediating capacities within urban space.

Fifthly and finally, my claim that augmentations should have a direct or indirect connection to urban space could suggest that the concept of meaningful play gives more value to pre-existing (actual) phenomena or objects, thereby prioritising urban space over, especially non-informational, augmentations. I advocate, as is stated in chapter 3, a complementary perspective of AR in which I refute a dichotomy between virtual and non-virtual elements. I do not claim that non-augmented urban space should be valued over augmented space. Moreover, I am convinced that new norms and values are formed in cooperation between augmentations and urban space. As new values arise, the relation one has with that particular space or place changes. As such, new connections can be made that were previously not available.

#### 6.3 | FUTURE RESEARCH

Besides the analysis of LARA from a normative angle, I suggest, in the context of future work, to continue to investigate the complexities of the relation between AR, people, and urban space, especially the practices of the new wave of users that emerged with the introduction of LARA such as Pokémon Go (Niantic, 2016) and Layar (Layar, 2009). Furthermore, an increased number of users also results into more narratives, messages, and interactions with augmented entities. Although I criticised the Baudrillardian conception of the virtual as simulation, the understanding addresses a valid point of concern. With the increase in messages, augmentations, and narratives, citizen dialogue and urban engagement might suffer as users are bombarded with information and interactions. Further research into how an overflow of augmented stimuli would influence our behaviour and relation to urban space could provide insights into how to design LARA to avoid this probable impedance of engagement. This also connects with the need for more firm and systematic research into how trust is established between users and AR service providers. Understanding which data is gathered and distributed and why people trust companies to provide genuine augmentations can account more elaboratively for my findings on the dimension of *networked play* and explain why certain applications do or do not result into engagement or decontextualization. In return, scholars can use the developed framework of play to investigate the other (micro-)mediations that various AR systems bring about. One could, for example, ask oneself how the mediations of AR glasses differ from those mediations facilitated by smartphones.

By providing some initial guidelines, I aimed to spark a discussion between (non)users, designers, researchers, and policymakers. Some valuable insights might also be gained from analysing LARA that have no connection with their surroundings and yet, one way or another, stimulate urban engagement or citizen dialogue. Although I labelled these LARA as not well-designed urban engagement applications as urban engagement is not their primary focus, they pose an interesting intertwinement of both engagement and disengagement with urban space. Investigating this interplay can support other design criteria for LARA specifically designed for urban engagement. Finally, I prompt designers and municipalities to develop LARA to playfully connect people and urban space such that dedicated case studies become available for those wanting to investigate the mediating capacities of LARA.

Based on my notion of meaningful play and AR, I aimed to support initiatives that use AR to stimulate urban engagement and social dialogue, and aim to include people who do not have access to these systems or are not included in the play. As LARA seem to create a (temporal) division from the start, I suggest that inclusion and interaction should be leading themes within further research into LARA and urban space.

As a final reminder, I should state that we ought to remain cautious with how we use LARA. One should not mindlessly use LARA just because they are there and allow us to see unicorns walking the streets. This thesis is not a plea to only use LARA to discover new places, establish urban engagement, or spark social dialogue – on the contrary, one should go outside once in a while. Instead, I aimed to develop a framework that analysed the mediating capacities of LARA from a playful perspective. By using play and AR in a meaningful way, one can avoid LARA that stimulate negative consequences such as division and decontextualization and foster meaningful mediations so that a deep relation between citizens themselves and their environment can be established.

#### 6.4 | AFTERWORD

My high school philosophy teacher Karen van Wichen once said that *the world is a playground in which you decide how you approach it.* I was always puzzled by this sentence as is the world really a playground? Who is this 'you'? And does he or she really decides for him- or herself? During my bachelor study Creative Technology, I investigated the first part of this premise as I approached the world as a playground that consists of various toys and tools that can be used to evoke certain thoughts and behaviours. As I was working on yet another installation, I felt that I should investigate the second part of the premise. My Philosophy of Science, Technology, and Society journey pointed out that this 'you' cannot be seen as an independent entity that decides whatever he or she wants to do. People, objects, and the environment all come together in an intermingle of mutual constitution. With these insights in mind, the involvement of LARA in urban space and social practices should be best implemented with the realisation that, like any other arrangement of mediation, they disclose reality in various manners and that such manners are always intrinsically both concealing – disrupting city life – and revealing – centralising urban life.

## CHAPTER 7 | | BIBLIOGRAPHY

"If you only face forward, there is something you will miss seeing."

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