Shaping an alternative smart city discourse through Twitter: Amsterdam and the role of creative migrants

Paola Monachesi

Utrecht University, Trans 10, 3512JK Utrecht, the Netherlands

A B S T R A C T

Smart urbanism is driven by a discourse promoting technological solutions for urban problems often neglecting social needs. The aim of this paper is to identify signs of an alternative smart city discourse in the communication of creative skilled migrants active in The Netherlands. We employ a language analysis of the (geo-tagged) Twitter data in combination with a social network analysis. We show that creative migrants contribute to the smart city discourse by relating technology to common good. They broadcast globally information about innovative projects, social initiatives and environmental issues, setting the basis for the experimental city. We conclude that a social media analysis, based on the innovative methodology proposed, provides valuable knowledge that can inform urban planners on a more socially driven use of (digital) technology in the development of smart cities.

1. Introduction

Cities have become data producers through the communication practices and the connectivity that characterizes people and their digital devices. These data are being used by IT corporations to create technological solutions that should solve challenging urban problems (Fernandez-Anez, Fernández-Güell, & Giffinger, 2018), setting the basis for the smart city, as eco-efficient city structure (Allen, Lampis, & Swilling, 2016; Kitchin, 2015). We follow Morozov and Bria (2018, p. 4) in defining *smart* as referring to 'advanced technology deployed in cities with the intent of optimizing the use of resources, producing new resources, changing user behavior, or promising other kinds of gains in terms of, for example, flexibility, security, and sustainability'.

As argued by Söderström, Paasche, and Klauser (2014), the smart city represents the utopic urban model of the 21st century. It is not based on a revolution in spatial form, as was the case in classical utopianism, but it relies on (big) data analysis and monitoring, giving rise to an algorithmic urbanism (Swilling, 2016). This utopic model is shaped by a discourse essentially driven by IT corporations, government and knowledge institutions (cf. triple helix model (Leydesdorff & Deakin, 2010)).

Storytelling is at the basis of the smart city discourse: stories are created to highlight the problems that need to be solved, playing thus an important role also in urban planning. Stories can be a 'powerful tool of a democratic, progressive planning practice.' (van Hulst, 2012, p. 304). The smart city discourse is based on a strategic communication

that revolves around themes such as governance reform, digital innovation, economic growth, resource efficiency (Joss, Cook, & Dayot, 2017) and concepts such as: 'technology', 'smart grids', 'big data', 'efficiency', 'infrastructure', and 'information' (Söderström et al., 2014, Hajer, 2016).

Previous works have analyzed the smart city discourse through media surveys and interviews to disclose how storytelling has been shaped by the leading corporations (Söderström et al., 2014), from an historical perspective (Hajer, 2016) and in relation to the notion of citizenship (Joss et al., 2017; de Waal and Dignum, 2017). The smart city discourse that emerges from these works promotes the image of a functioning urban society based on efficiency and safety while often failing to address inconvenient themes such as environmental sustainability (de Jong, Joss, Schraven, Zhan, & Weijnen, 2015; Gargiulo Morelli et al., 2013; Viitanen & Kingston, 2014), social justice (Harvey, 2008; Lefebvre, 1996; Soja, 2010) and resilience to future shock (Hajer, 2016; Joss et al., 2017). However, since cities are capable of innovation and creativity, we expect that they can give rise to a counter-hegemonic discourse able to tackle these issues, contributing thus to a more inclusive smart urbanism. Storytelling can play an important role also in this context since it can trigger change and the creation of an alternative discourse (Sandercock, 2003, 18).

The aim of this paper is to identify signs of an alternative storytelling able to relate the (smart) city utopic model based on technology and efficiency to a broader social agenda since an inclusive vision of the smart city can be achieved if technology is employed to improve social

---

conditions (Angelidou, 2014, 2015). To this end, we focus on a group of citizens that is attracted to the city for its innovation potential, that is *creative skilled migrants* active in the Netherlands. Since they are bridging figures between top-down and bottom-up approaches to urban development, we expect that they should engage in a different discourse from that of the IT corporations that have shaped the current smart city storytelling, as argued by Söderström et al. (2014).

We analyze the digital communication of creative migrants and the way it contributes to the smart city discourse (cf. Nadler, 2013; Polson, 2015; Sun Sun Lim, Tabea Bork-Hüffer, & Brenda SA YeohLin, 2016). The innovative methodology we propose combines a *language* analysis of the (geo-tagged) Twitter data (i.e. hashtags) of the creative migrants with a quantitative investigation of their *communication patterns* through social network analysis. While the former reveals the interests and activities of the creative migrants, we limit the social network analysis to a geographical visualization of the communicative interactions.

We consider skilled creative migrants living in the Randstad, an area comprising the four largest Dutch cities (i.e. Amsterdam, Rotterdam, The Hague and Utrecht), being one of the most important and densely populated economic areas in northwestern Europe. Amsterdam, constitutes our case study, since this city is very active in attracting new talent from abroad and in branding itself as one of the global creative hotspots and innovative smart cities (Angelidou, 2014). We follow Flyvbjerg (2011) in assuming that case studies are useful for generating and testing hypotheses and can provide reliable information about the broader class to which the cases belong (i.e. smart cities).

This paper is innovative in several respects. At the *methodological* level, it relies on social media data to investigate actors (i.e. creative skilled migrants) whose narrative has not yet been analyzed in relation to the smart city. It does so through an analysis that combines in a novel way language and social network analysis. Our research differs from existing work that has focused mainly on elicited data such as focus groups or interviews (i.e. Fernandez-Anez et al., 2018; Söderström et al., 2014), instead we analyze spontaneous and authentic data, produced by creative migrants to promote their work, ideals and activities. The smart city discourse driven by government and big tech corporations is often one-way: introducing a social media analysis is innovative and necessary since social media allow for a participative, interactive and open form of communication that involves various stakeholders and could reveal different narratives.

At the *theoretical* level, the paper contributes to the human-centered, smart city literature in which citizens are asked to participate in innovation processes (Castelnovo, Misuraca, & Savoldelli, 2015; Dameri, 2013; Joss et al., 2017; de Waal & Dignum, 2017). We analyze the engagement of creative migrants in this respect and we show that they contribute to highlight social activities and projects for the common good, with the urban designers being the most active in this respect. Furthermore, the paper contributes to the research on global cities as destination for (skilled knowledge) migrants (Angelidou, 2015; Florida, 2002; Hu, 2014; Kaplan, Grünwald, & Hirte, 2016; Sassen, 1991; Yigitcanlar & Lönnqvist, 2013).

At the *policy* level, we show that a language analysis of social media communication can offer a novel tool to urban planners and policy makers that can thus acquire valuable empirical knowledge about cities. Successful smart cities have tried to find a balance between corporate driven solutions and those ones arising from the needs and participation of the citizens (Angelidou, 2015). Our paper, contributes to this view, with the case study of Amsterdam, as a smart city that attempts to connect high tech interventions with co-creation experiments to involve citizens in socially engaged projects (Angelidou, 2014; ASC, 2014). The development of more inclusive smart cities might require the creation of strategic alliances among urban centers that share similar policies (Morozov & Bria, 2018). Amsterdam can inspire best practices through the city branding carried out by creative skilled migrants on social media (Zhou & Wang, 2014).

2. Smart cities, creative migrants and digital spaces

In this section, we critically review the three main strands of literature that provide the necessary background information to address our research question and to anchor the empirical findings of our work: the smart city, skilled creative migrants and the relation between digital and urban spaces.

2.1. Smart cities

The smart city vision originates from the reorientation of major technology firms, such as IBM, towards consulting and selling services (Morozov & Bria, 2018). Storytelling played an important role in the creation of the smart city vision: in the IBM campaign, the narrative relied on a utopian discourse based on urban problems and their technological solutions (Söderström et al., 2014).

The smart city is a data-driven space (Gitelman, 2013) and by connecting and analyzing the data it becomes possible to regulate urban processes and increase their efficiency (Hancke, de Carvalho e Silva, & Hancke Jr., 2013). Smart urbanism combines data and digital technologies with urban sites in a neoliberal vision that is triggered by the need to remain competitive in a period of economic crisis and limited resources.

However, this technocratic vision of the smart city has been subject to criticism (Kitchin, 2014; Hollands, 2015; Vanolo, 2014, Carugliu and del Bo, 2019). Concerns have been expressed with respect to its utopian vision that lacks connections with real-word problems. It also raises privacy issues related to big data collection, including data ownership in hands of few ICT multinationals that set the agenda with respect to urban policies. In this vision, the less technological members of society are excluded and citizens are not put at the core of the development process.

Hajer (2016) advocates for a shift, in the smart city discourse, towards broader engagement and social issues that reflect the needs of the citizens (cf. also Castelnovo et al., 2015; Dameri, 2013; Joss et al., 2017; de Waal & Dignum, 2017). A way to achieve this goal is by supporting grassroots communities of innovators and startups as well as by promoting cooperative models for services. It would be desirable to employ technology and innovation capacity to tackle social challenges in critical areas such as health, education, transportation and energy transition (Hajer, 2016; McFarlane & Söderström, 2017; Morozov & Bria, 2018).

In Europe, movements are arising at the city level to reclaim urban resources and to produce social impact that can contrast the dominant privatization of services in the hands of corporations. European smart cities such as Barcelona and Amsterdam are at the forefront in exploring alternative models especially at the level of data management, promoting grassroots innovation and empowering local communities (Angelidou, 2014; Calzada, 2018). An example is the emergence of urban 'makerspaces' that can function as incubators for innovation and entrepreneurship, contributing to a more inclusive and participatory vision of the smart city (Niaros, Kostakis, & Drechsler, 2017).

2.2. Skilled creative migrants

The data-driven smart city provides the infrastructure to stimulate new forms of entrepreneurship and to drive innovation and creativity (Kitchin, 2014). These urban spaces are home to creative industries, as is the case for Amsterdam (Bontje & Lawton, 2013; Bontje, Pethe, Petrasch, & Tuppinger, 2009; Georgiou, 2012), which is at the core of the creative industries in Europe (ASEF, 2014). At the same time, Amsterdam exhibits a growing number of initiatives arising from local needs and driven by civic society that can be inspiring for other smart cities (Angelidou, 2014). Amsterdam is a regional hub for knowledge creation and exchange and it has historically been so due to its status as harbour city (AEB, 2014). As argued by Fainstein (2005), Amsterdam is

a city that has found the right trade-offs among equity, diversity, growth and sustainability (cf. Uitermark, 2009, however, for a more critical view). More specifically, the smart city agenda promoted by Amsterdam provides an interesting mix of high-tech intervention and experiments involving citizens, providing at the same time, support for SME's and local initiatives (Hajer, 2016). It is for these reasons that we believe it can be a relevant case study for our paper.

Amsterdam has been very active in attracting skilled migrants, giving rise to liquid migration processes and a mobile workforce that links meaningful work with urban lifestyles (Engbersen, 2012; Nadler, 2013). Global cities compete in attracting and retaining knowledge workers to increase their competitiveness, generate innovation and consequently economic growth (Angelidou, 2015; Florida, 2002; Hu, 2014; Kaplan et al., 2016; Yigitcanlar & Lönnqvist, 2013). These migrants are "transversal enablers" (Wise, 2009; Wise & Velayutham, 2014) that have the potential to connect people of different backgrounds due to their diversity as well as their digital connectedness. They link places through physical presence and digital flows of information and knowledge exchange and they heavily rely on media to do so. Previous studies have shown that they combine transnational and local communities (Nadler, 2013). It is for these reasons that their communication is object of analysis in this paper. We show, that they take part in an alternative smart city discourse due to the temporality of their presence and a differentiated relationship with the nation they live in.

2.3. Digital spaces

Space is a social product with spatial phenomena influencing social ones (Hillier, 1996) and vice versa (Castells, 1996; Massey, 2005). As argued by Castells (1996), society is based on flows that represent global processes dominating the economic, political and symbolic life. Information technology creates a fluid network of exchanges between places mediated through communication (*space of flows*), which coexists with the local experience (*space of places*). However, the former has an impact on the latter and it alters the meaning and dynamic of places. The effect is evident in cities where the two spaces are closely connected through (mobile) social media that play an increasingly important role in the digitization of the city and in contributing data to the smart city together with sensors and digital devices (Castells, 2012; de Souza e Silva & Firth, 2010; de Waal, 2013; Farman, 2012). This is evident also in Amsterdam, that is linked to global networks of power, connecting global cities (as centers of production and consumption of services) through digital communication (*space of flows*), at the risk of disconnecting them from their local context. The Netherlands are at the forefront in Europe with respect to social media and Internet users, being thus strongly digitally connected (Monachesi, 2019).

The communication practices and the connectivity that characterizes the people and digital devices make cities as big data producers. The digitization of communication that emerges as result opens the way to new methods for data collection and analysis that are employed in the smart city vision but only partially exploited in current urban planning practices. An analysis of social media data can provide a way to understand the smart city discourse and the storytelling which is at the basis of its vision and inspire new policies and practices.

Twitter is particularly relevant in analyzing the communication of creative skilled migrants since they employ it to promote their activities, discuss events and build their network. In Twitter, users can provide information about their location either by attaching co-ordinates or a place name, making it possible to locate users (and their tweets) geographically. This possibility makes the platform increasingly being used in urban studies that exploit the available geo-location information to uncover city dynamics and to carry out demographic analyses. (cf. García-Palomares, Salas-Olmedo, Moya-Gómez, Condeço-Melhorado, & Gutiérrez, 2018; Andrienko et al., 2013; Lansley & Longley, 2016; Mocanu et al., 2013).

3. Methodology

The availability of social media data creates new opportunities for urban studies, but (big) data also raise questions on privacy, ethics as well as on research methodology that needs to be reframed (boyd & Crawford, 2012).

In this paper, we have developed an innovative methodology that is based on the creation of a sample to answer our research question: whether we can find signs of an alternative smart city storytelling promoted by creative skilled migrants. To this end, we have employed computational techniques to identify our sample based on the various users active in Twitter. Furthermore, the categories of creative migrants have been identified and data have been extracted, analyzed and interpreted (Lewis, Zamith, & Hermida, 2013). More specifically, we have focused on a hashtag analysis to investigate the communication topics of creative migrants (cf. also Bruns & Burgess, 2012). An additional innovative aspect of our approach is the integration of the language analysis of social media data with a social network analysis in order to visualize the geographical distribution of the communication patterns of the creative migrants. This methodology can make a relevant contribution to the use of Twitter geodata in the analysis of communication for urban studies research.

3.1. Data acquisition: identification of creative migrants in Twitter

The acquisition of data from Twitter constitutes a challenge since creative migrants, that don't usually characterize themselves as such, need to be identified in order to create a sample and extract their data automatically. Therefore, we have developed a methodology, which relies on Twitter's interface (i.e. API), to discover creative migrants among the followers of organizations that are active in the creative sector. To this end, we identified occupations related to creativity based on three resources: from the Confédération Internationale des Sociétés d'Auteurs et Compositeurs, we have singled out the relevant creative industries (i.e., architecture, design, art, software), while from the 2010 Standard Occupational Classification system, we have derived the corresponding occupations, integrating them with additional ones found in the UK National Career Service website. The result was a list of 164 creative professions that we have further categorized in 11 sectors, within the creative industries, that can be seen in Table 1. The professions identified have been matched with the profile description of Twitter users in order to select migrants that characterize themselves through their work. We hypothesized that this is an indication that they would be active in this platform professionally. The output was filtered on the basis of the location of the users in order to retain only those ones living in the Netherlands.

More specifically, the list of automatically selected users should satisfy a number of criteria: the user's screen name is not Dutch, the user clearly states in the profile description one of the creative professions we have selected, there is geo-location information attesting that the

Table 1
Frequency distribution of creative migrants by creative sector.

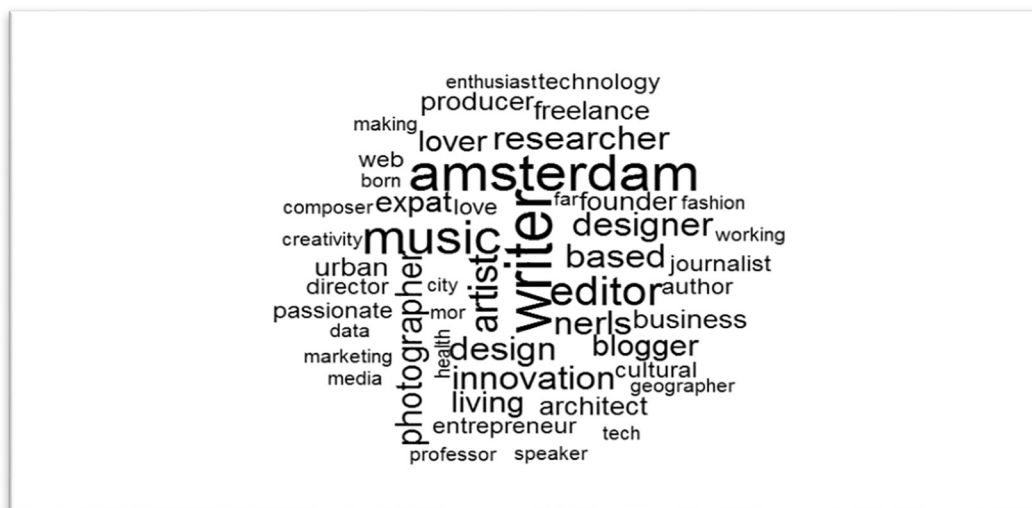| Creative sectors	Frequency	Percent
Architecture and Design	23	25.0
Creative Writing	15	16.3
Digital Transformation	2	2.2
Fine Arts	12	13.0
Game Design	1	1.1
ICT	5	5.4
News Media	4	4.3
New Media Arts	16	17.4
Performance Arts	11	12.0
Visual Arts	2	2.2
Virtual Reality	1	1.1
Total	92	100.0

Fig. 1. Word cloud of the profile description of the creative migrants.

person lives in the Netherlands, the tweets are in more than one language other than English and Dutch and the person has a public account, that is, the account was not protected at the time of the data collection. It should be noted that the methodology developed can be easily adapted to other countries and other professional groups.

We collected 92 users, 50 males (54%) and 42 females (46%). The creative migrants that constitute our case study are young entrepreneurs that work as architects, urban designers, planners and geographers at the intersection with technology (i.e. app developers, programmers) and culture (i.e. artists), as can be seen in Table 1.

The final list was manually verified to satisfy the criteria mentioned above but we have also carried out a content analysis of the profile description of our users to further verify the correctness of the automatic selection. In their profile descriptions, users tend to portrait themselves with a few words. They state where they live, what they do and what they are interested in. A frequency analysis of the terms and hashtags employed by the selected creative migrants in their profile (cf. Fig. 1) reveals that most users have a connection with Amsterdam, which is the only Dutch city mentioned by users in their profile. It further confirms that they are predominantly active in the creative sector, as shown by the frequency of words such as 'creativity' and 'innovation', as well as terms such as 'writing', 'music', 'arts', 'editing', 'photography'. Their profile also reveals that they are freelance and entrepreneurs or founders, but also researchers, professors and designers while their being migrants is also highlighted by the words 'expat' and 'born'.

The content analysis of the profiles carried out shows the validity of the approach developed that allows for an automatic selection of creative migrants that constitute our case study. Furthermore, the presence of words such as 'urban' and 'city' reveals their interest in urban issues while words such as 'technology' and 'tech', that are often used in connection with the smart city discourse (cf. Morozov & Bria, 2018), indicate that creative skilled migrants might play an active role in shaping its storytelling.

It should be noted that the methodology developed can be easily adapted to deal with other languages and professional categories.

3.2. Data extraction and storage

In order to analyze the content of the communication of the creative migrants and their contribution to the smart city discourse, we collected more than 3 million tweets, mentions and replies, as well as the profile description and the profile location of their followers, in order to visualize the extension of their social network. The data was collected in 2017 and was stored in a MySQL database whose structure reflects the data extracted through the Twitter interface, making it easily accessible for the analysis.

3.3. Data analysis

In this paper, we focus on two of the main areas of analysis in Twitter research (Bruns & Liang, 2012), that is content analysis and network analysis. In the case of content analysis, we rely on computational methods to carry out a word frequency analysis of the hashtags employed, that allows for an investigation of the way creative migrants shape the smart city storytelling. The social network analysis is limited to investigate the communication patterns of the creative migrants (which we visualize through the Gephi software) and provides insights on the geographical distribution of their network.

4. Content analysis of creative migrants' data

The Twitter analysis of the creative migrants has focused on hashtags since they are a relevant source of information employed to index keywords or topics that are of interest to the user (Monachesi & de Leeuw, 2018; Pandya, Mourad, Monachesi, Kostakos, & Loven, 2018). (Hash-)tags are added by users to their tweets, they are a way to add metadata to shared content and highlight the debate that is being carried out in the platform: people are thus able to follow topics that interest them in an easy way (Bruns & Burgess, 2011; Golder & Huberman, 2006). Hashtags make tweets more visible through the search functionality and it becomes thus possible to communicate with a specific community around the hashtag topic (cf. Bruns & Burgess, 2012).

Therefore, hashtag analysis, in the context of our case study, is revealing of the topics the creative migrants want to highlight. It should be noted that the hashtags used for the analysis were extracted not only from the tweets written by the creative migrants but also from their retweets (RT), since the fact that a user decided to retweet the text reveals an interest on the topic.

The frequency analysis represented in the word cloud in Fig. 2, reveals the attention of the creative migrants for creative hubs such as Amsterdam and Eindhoven, the two most important sites for creativity in the Netherlands, but also Rotterdam and den Haag, are attested, as important cities within the Randstad. Other relevant creative hubs such as London, Paris, Berlin, Hong Kong and Singapore are also mentioned. In the tweets, we find terms such as: 'technology', 'tech', 'science', and 'business'. However, 'art' is definitely the most important topic (cf. also

Fig. 2. Word cloud of the hashtags used by the creative migrants.

'kunst', the Dutch equivalent), as well as other terms related to the art field such as 'concert', 'music', 'photography', 'painting', 'drawing' and 'design', which reflect the fact that more than half of the creative migrants selected are active in the artistic sector.

Environmental related hashtags are present such as 'nature' while an interest in relating innovation to common good is revealed by the hashtag 'socialeinovatie' (social innovation). It is further revealed by hashtags referring to social events such 'aesop2017', which aims at creating a platform for urban futures based on participation, inclusiveness and multiculturalism, while the hashtag '6emesconf' indicates a conference on social enterprise. An interest in a responsible use of data in artificial intelligence is indicated by the hashtags 'weareresponsible' and 'aiethics' (i.e. AI ethics).

The analysis reveals a predominant professional use of Twitter, but (international) politics plays an important role, as shown by terms such as 'Trump', 'Brexit', 'Jews/holocaust' and 'LGBT', however, the only term related to Dutch politics is represented by the politician 'Wilders'. Furthermore, terms indicating nations (i.e. 'France', 'Portugal') are attested but context is necessary to reveal whether they are used in a political of geographical sense.

In order to investigate whether there are differences in the interests of the various categories of creative skilled migrants and the way they participate in the smart city discourse, we have carried out a more in-depth investigation of the use of hashtags among the groups represented in our sample.

More specifically, the most frequent hashtags of the group of *writers* can be seen in Fig. 3. It shows the relevance of the city 'Amsterdam' since it is the most frequent term revealing that migrants have a strong connection with it but we don't notice hashtags related to technology that might reveal an interest in the smart city discourse except for the rather neutral 'data' and 'database'.

Environmental themes are highlighted by hashtags such as: 'earthday', and 'climate' while 'climateMarch(NL)' indicates a protest against current environmental policies and 'science march' is used to advocate for equitable policies for the common good. The hashtag 'mkbkids' stands for multicultural kids' blogs and refers to a group of bloggers that aim to raise kids with curiosity about the world through different cultures (cf. also the hashtag 'diversity'). The terms 'CMAMS', 'CMlove', 'CMSummit', 'CMweird' refer to 'Creative Mornings' which are gatherings for the creative community on socially oriented themes. The importance of space at the basis of innovative processes is indicated

by the hashtag 'spacesforinnovation', that refers originally to a book on this topic.

Tags with a specific focus on the writing activity are attested as well as tags indicating creative events or initiatives.

The *New Media Arts* group of creatives shows, unlike the previous group of *writers*, an interest for technology, as illustrated, in Fig. 4. Digital data, that constitute the basis for artificial intelligence, are related in their communication to ethical issues and common good, as shown by hashtags such as: 'aiforgood', 'design4values', 're-inventingsociety', 'weareresponsible'. While 'sustainableTech' refers to exploiting technology for efficient use of resources, environmental care as well as to developing new products from trash or organic material (cf. also 'EcoFashion').

A similar behavior to that of the *writers* is exhibited by the group of *fine arts* creatives, as can be seen in Fig. 5. We notice an abundance of terms related to the creative sphere (i.e. 'photography'/'fotografie', 'sculpture(s)', 'drawing(s)'/'dessin'/'tekening', 'paintings'/'schilderij', 'illustrations'/'beeld', 'streetart'), with 'art' being the most frequent one.

Brands/tools such as 'nikonpro', 'nikonnps', 'nikonnl' are also mentioned as well as art musea such as 'Rijksmuseum', Stedelijkmuseum or 'Van Gogh (museum)'. Art events are mentioned such as 'Museumweek' or 'amsterdamlightfestival', which is an exhibition of light installations, at the intersection between art, technology and innovation. An interest in nature is revealed by the hashtag 'nature' and 'amsterdamsebos' (a park in Amsterdam). We notice less concern for social issues or initiatives except for the hashtag 'alzheimer' that a closer analysis reveals to be connected to 'marathon', indicating a running event for Alzheimer's disease. The most frequent urban location is 'Amsterdam' also in this case, but other cities are mentioned such as 'Rotterdam', 'London', 'Liverpool', 'Taipei' and 'Paris'.

A group that plays an important role in the smart city discourse is that of *architects and designers* probably due to the fact that its members are involved in shaping the physical urban space, as professionals. A frequency analysis of hashtags employed by this group in Fig. 6 reveals that they are very active at professional level and concerned about social issues as indicated also by their discussion of political topics (i.e. 'LGBT', 'Trump', 'Brexit'). They share with the IT companies an interest in technology in relation to the city, as can be seen in the use of hashtags such as 'smart city', 'future', 'tech', 'gamesforcities', 'appsterdam' and 'globaldesignathon', as well as a concern for data, which is attested by hashtags such as 'data', 'big data', 'opendata', 'database'.

Fig. 3. Word cloud of the hashtags used by the group 'writers'.

However, they are also interested in innovation and social entrepreneurship, as highlighted by their use of hashtags such as: 'fabcity', 'livinglabs', 'hackablecity'. Cities are developing programs to bring manufacturing back to the urban space and one interesting initiative in this respect is the 'fabcity' that involves 12 cities among which Amsterdam (Morozov & Bria, 2018). Similarly, 'living labs' are platforms to test innovative concepts and assess their potential value for society (Angelidou, 2015).

The interest of these creatives for participation, 'makerspace' (Niaros et al., 2017) and social themes is further identified in hashtags, that are numerous in this group, such as 'co-creatie' (co-creation), 'circulareconomy/circulaireEconomie', 'duurzaam' (sustainable),

'blockchain', 'discriminatie (discrimination)', 'socialmarketing', 'socialeinnovatieindestad' (social innovation in the city), 'newcollectives'. Social initiatives are mentioned such as 'UrgentCity', which is a hashtag that identifies a multidisciplinary network of professionals to support understanding of urban changes. The interest of these creatives for environmental issues is revealed by hashtags such as 'climatechange', 'energy', 'bike' and 'cycling'.

Finally, they mention cities such as: 'amsterdam', 'rotterdam', 'hong kong', 'berlin', 'london', 'beijing' which are examples of creative hubs.

Fig. 4. Word cloud of the hashtags used by the group 'New Media Arts'.
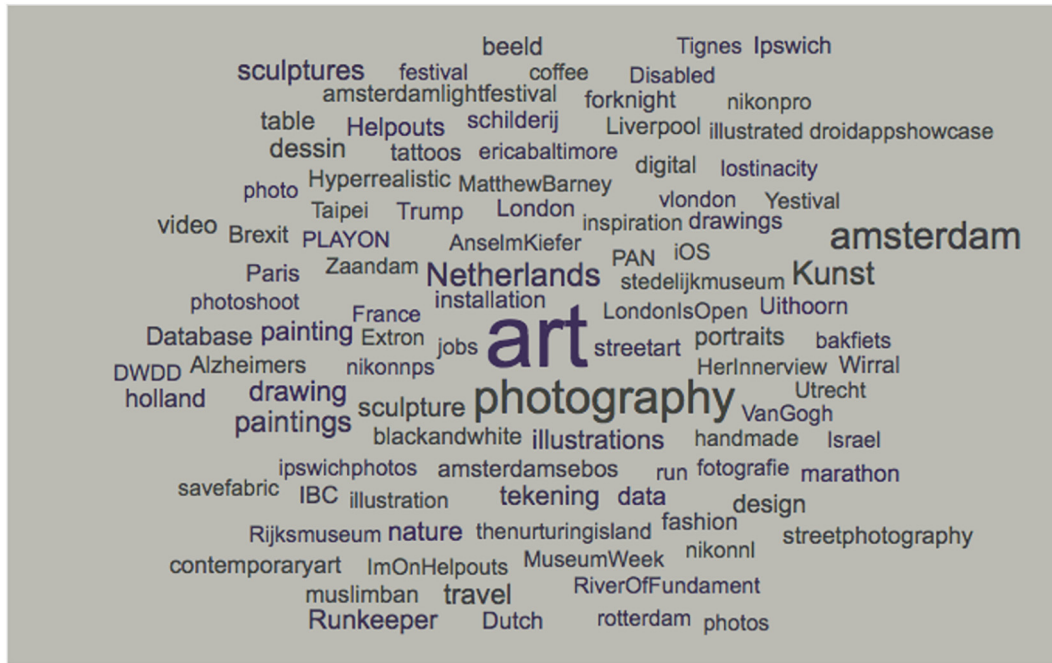
Fig. 5. Word cloud of the hashtags used by the group 'Fine arts'.

5. Discussion hashtags analysis

The hashtag analysis, that we have presented in the previous section, aims at investigating the participation of skilled creative migrants in the smart city storytelling. Our sample reveals an interest in technology as exemplified by the various hashtags related to this domain, with the exception of the two groups of *writers* and *fine arts*. However, creative migrants show social engagement and innovation and they broadcast, through the hashtags they use, a social vision of the smart city (McFarlane & Söderström, 2017) driven by citizens and social entrepreneurs (Castelnovo et al., 2015; Dameri, 2013; Joss et al., 2017; de Waal & Dignum, 2017). Creative migrants act as voices in the smart city storytelling that combines technology with a participatory and socially driven discourse based on events, initiatives and projects showing

social and environmental engagement.

This is especially evident in the case of the group of *architects and designers*. They are interested not only in technology and data, two of the features of the smart city discourse (Kitchin, 2014; Morozov & Bria, 2018) but they relate them to the common good as shown by hashtags linking technology to ethics, environmental issues and innovation, triggered by participation through 'makerspaces' and city labs, (e.g., Baccarne, Mechant, Schuurman, Colpaert, & De Marez, 2014; Evans, Karvonen, & Raven, 2016; Niaros et al., 2017; Scholl & Kemp, 2016). Due to their professional activity, that involves shaping (urban) space, they can play an active role (perhaps more than other creative migrants) in promoting social issues and participation within the smart city context, a shift advocated by Hajer (2016).

We can conclude that in the communication of creative migrants we

Fig. 6. Word cloud of the hashtags used by the group 'Architects & Designers'.

notice signs of an alternative smart city storytelling that focuses, not only on data and technology, but also on social needs, citizens' participation, social entrepreneurship and makers culture. Technological solutions to be effective should be shaped by knowledge that is relevant in the local context (McFarlane & Söderström, 2017) and we believe that the creative migrants are well equipped to create synergies in this direction through their interest in local initiatives. They mention several small-scale initiatives, that act as pilot projects, trigger participation and raise acceptance in the smart city vision. However, these projects should be part of a strategic plan and foresee synergies, as claimed in Angelidou (2014).

Creative migrants might help in creating these synergies since they are also interested in the global context: they mention several smart cities and creative hubs, revealing a connection with them in accordance with the view that innovation is triggered by cities, as previously discussed (cf. Angelidou, 2015; Florida, 2002; Hu, 2014; Yigitcanlar & Lönnqvist, 2013). Through their digital communication, they relate Amsterdam to the global networks of power represented by these smart cities (Castells, 1996, 2012). Their use of hashtags in social media broadcasts local initiatives at a global level, being thus 'transversal enablers' (Wise, 2009; Wise & Velayutham, 2014) that have the potential to connect transnational and local communities (Nadler, 2013).

It seems thus important to investigate in more detail the geographical context of the various forms of communications adopted through a social network analysis. We aim to provide a holistic vision of the way the smart city discourse emerges through digitized social relations, mediated through language in the digital spaces.

6. Social network analysis of creative migrants' data

The social network analysis we have carried out is limited to an investigation to identify the geographical distribution of the various patterns of communication possible in Twitter by analyzing the followers, reply and mention networks of our users.

On average, a user in our sample has 739 followers, has followed 691 other users and has tweeted 1593 times. The standard deviations show that the number of followers and tweeting behavior of users is asymmetric and there are differences in this respect in our sample, as can be seen in Table 2 that shows the number of followers and tweeting behavior:

In order to investigate the communication of the creative migrants, we have examined the nature of the relationships between users (ties/connections) and then we quantified and categorized the users' connections in four dimensions: creative vs. non-creative (by relying on the same profile matching methodology employed to select our users) and local (if location is in the Netherlands) vs. global users (if location is outside of the Netherlands), calculated on the basis of the geo-location provided. If this information was absent, the user was categorized as 'NA' (i.e. not available). In this way, it is possible to investigate with whom creative skilled migrants interact and where these users are located.

As for the visual representation of the network, for each user, we have extracted its network and aggregated them: users are represented as nodes and ties are represented as links. The results are visualized by means of three maps representing the locations of the users which were created by gathering the latitude and longitude of the users' locations

and mapping them onto a world map using Gephi.

The *followers* network merges two kinds of information, that is who the creative migrants follow and who follows them. It is thus important to identify the direction of the relationship (follows versus followed_by). We can conclude from Table 3 that the migrants in our sample follow slightly more users than they are themselves followed by. This suggests that there is some sort of reciprocity in the relations: it is known that Twitter users tend to follow back those who follow them (Java, Song, Finin, & Tseng, 2007), which might explain these very small differences.

The creative migrants in our sample follow mainly non-creative users outside of the Netherlands, they are also followed by more non-creatives outside of the Netherlands. A visualization of the network can be seen in Fig. 7 where the network map can be interpreted according to the proportions in Table 3.

In the network, a link between users is drawn whenever a user follows or is followed by a creative migrant. The map shows green nodes that represent creative users, the pink nodes represent non-creative users and the orange nodes are users for which we do not have any information. Since the creative users in our sample are migrants it is to be expected that there are more connections with people outside of the Netherlands.

The *mention* network represents a similar pattern as the follower's network, highlighting the fact that our users mention and are being mentioned by more non-creative users that are outside of the Netherlands, as can be seen in Table 4. If we consider the total number of users, we notice that the users that mention the migrants are much less than those the creative migrants mention. A visualization can be found in Fig. 8.

In the case of the *reply* network, the creative migrants replied and were replied by more non-creatives outside of the Netherlands, as can be seen in Table 5. Furthermore, the number of users that replied to the migrants is almost four times less than that the migrants replied to. A visualization is provided in Fig. 9.

7. Discussion social network analysis

The social network analysis carried out reveals that the creative migrants are connected to more non-creative users than creative ones, this fact might reflect the hybrid nature of the platform that is used both for professional and private use. A positive side effect is that their messages can spread beyond their professional network and involve common citizens into their inclusive smart city discourse. Furthermore, they are connected to more people outside of the Netherlands than local users which implies that they can brand the city, including the local projects and innovative initiatives, at a global level (Zhou & Wang, 2014). At the same time, the presence of both local and global users in their networks is in line with previous studies that have shown that creative migrants combine transnational and local communities (Nadler, 2013).

The communication networks analyzed reveal a certain degree of reciprocity in the case of the followers' network, while there are some differences in the case of the replies and mentions networks. The creative migrants mention and reply to more people than they are mentioned and replied by, which might indicate that they are more engaged in the communication than the people in their network. An investigation of the people they mention and reply to, might shed further insight on the source of information. However, an analysis of these differences as well as the impact that these communication networks have in the diffusion of information is beyond the scope of the paper and left for future research.

8. Conclusions

The paper has examined the engagement of creative skilled migrants in the smart city discourse by means of a social media analysis of

Table 2
Statistics of creative migrants' followers, following and tweeting behavior.

	N	Std. dev.	Median	Min	Max	Skew
Followers	92	1497.217	739	8	12,200	2.851326
Following	92	1517.283	691	25	12,960	2.833768
Tweets	92	6144.489	1593.5	45	68,118	3.258667

Table 3
Proportions table of followers' network.

Followers' Networks

Average tie proportions (%) with actual denominator (d).

Relationship Type	Creative users	Non Creative users	NA's Description	Local users	Global users	NA's Location	Total users (d)
Users the migrants Follow	29%	65%	6%	25%	58%	17%	39264
Users the migrants are Followed_by	24%	61%	15%	21%	55%	24%	37306

Fig. 7. The Follows/Followed-by network.

Table 4
Proportions Table of mentions' network

Mention network

Average tie proportions (%) with actual denominator (d).

Relationship Type	Creative users	Non Creative users	NA's Description	Local users	Global users	NA's Location	Total users (d)
Users the migrants Mention	24%	72%	4%	26%	58%	16%	13453
Users the migrants are Mentioned_by	25%	64%	11%	18%	57%	25%	764

their communication patterns. We show that they contribute to the current smart city storytelling by relating technology to common good, broadcasting social and environmental issues as well as social projects, this is especially the case for the group of *architects and designers*. Creative migrants promote a makers' culture based on innovation and entrepreneurship, contributing to a more inclusive and participatory vision of the smart city (Niaros et al., 2017). Their use of Twitter broadcasts these social local initiatives at global level, even beyond their professional circle, linking Amsterdam to the global networks of power represented by global cities (Castells, 1996; Hillier & Hanson, 1984).

The paper contributes, with an analysis based on novel data, to the human-centered, smart city literature by providing new insights on the way creative migrants affect the smart city discourse. It highlights the importance of the city as a place where progressive claims and opportunities can emerge (cf. also Bastia, 2017). Creative migrants contribute to shaping an inclusive vision of the smart city, as well as the idea of the

city-state as trigger of innovation and creativity, in line with Hu (2014), that views cities as crucial nodes in the knowledge economy. Social media play an important function in this context since they give rise to new spaces (Monachesi, 2018; Monachesi & Turco, 2017). They contribute to the creation of a digital urban imaginary (that complements the physical one) by broadcasting information about local projects and social initiatives at a global level, contributing to the development of networks of innovation (Castells, 1996) that rely on cities as relevant hubs instead of the nation-state. The importance of cities is envisaged also by Morozov (2018) that claims that cities can trigger a new democracy deploying technology in the interests of the citizens while Joss et al. (2017) question the notion of citizenship all together.

An innovative aspect of our work consists in the methodology developed that can have broad applications in urban studies: the results of the data analysis allow for an understanding of the storytelling behind the smart city discourse which constitutes important knowledge for urban planning and policy makers (van Hulst, 2012). The hashtags

Fig. 8. The Mentions/Mentioned-by Network.

Table 5
Proportions table of replies' network.

Reply Network

Average tie proportions (%) with actual denominator (d).

Relationship Type	Creative users	Non Creative users	NA's Description	Local users	Global users	NA's Location	Total users (d)
Users the migrant Replies to	28%	65%	7%	23%	62%	16%	2976
Users the migrants are Replied_by	20%	65%	15%	15%	58%	27%	781

Fig. 9. The Replies/Replied_by Network.

employed by the creative migrants highlight social projects, issues related to environment, sustainability, circular economy as well as a strong interest for technology and data in relation to common goods, being in line with the claims of grassroots movements. Urban policies should acknowledge that technology and innovation should be employed to tackle social challenges and should not support a privatized smart city driven by corporations that often neglect social issues. Cities should choose few domains that need improvement in the smart city context, in the case of Amsterdam those are open data and energy (Angelidou, 2014), as also evident in the data analyzed. Amsterdam is at the forefront in exploring alternative smart urbanism, promoting grassroots innovation and empowering local communities, while at the same time winning awards and recognitions for its successful smart city initiatives (Angelidou, 2014; Calzada, 2018). These practices could inspire alliances among cities interested in experimenting new forms of cooperativism and social innovation to rethink future sustainable economic models for smart cities that can create an alternative response to the dominant corporations (cf. also Morozov & Bria, 2018).

Declaration of competing interest

Acknowledgements

References

AEB (2014). Naar een Europese toppositie door demonstreerbaar leidend te zijn in innovatief en creatief vermogen. *Clusterstrategie Creatieve Industrie 2014–2020*. Amsterdam Economic Board.

Allen, A., Lampis, A., & Swilling, M. (2016). Untamed urbanism. *Routledge advances in regional economics, science and policy*. New York: Routledge.

Andrienko, G., Andrienko, N., Bosch, H., Ertl, T., Fuchs, G., Jankowski, P., & Thom, D. (2013). Thematic patterns in georeferenced tweets through space-time visual analytics. *Computing in Science & Engineering, 15*(3), 72–82.

Angelidou, M. (2014). Smart city policies: A spatial approach. *Cities, 41*, S3–S11.

Angelidou, M. (2015). Smart cities, a conjuncture of four forces. *Cities, 47*, 95–106.

ASC (2014). http://amsterdamsmartcity.com.

ASEF (2014). Enabling crossovers: Good practices in the creative industries. *6th Asia-Europe Culture Ministers Meeting*. Asia-Europe Foundation (ASEF).

Baccarne, B., Mechant, P., Schuurman, D., Colpaert, P., & De Marez, L. (2014). Urban sociotechnical innovations with and by citizens. *Interdisciplinary Studies Journal, 3*(4), 143–156.

Bastia, T. (2017). Transnational migration and the gendered right to the city in Buenos Aires. *Cities, 76*, 18–22.

Bontje, M., & Lawton, P. (2013). Mobile policies and shifting contexts: City regional competitiveness strategies in Amsterdam and Dublin. *Tijdschrift voor Economische en Sociale Geografie (TESG), 104*(4), 397–409.

Bontje, M., Pethe, H., Petrasch, F., & Tuppinger, K. (2009). *Amsterdam: An attractive creative knowledge region? The view of transnational migrants. ACRE report 7.1*. AMIDSt. University of Amsterdam.

boyd, D., & Crawford, K. (2012). Critical questions for big data. *Information, Communication and Society, 15*(5), 662–679.

Bruns, A., & Burgess, J. E. (2011). The use of Twitter hashtags in the formation of ad hoc publics. *Proceedings of the 6th European Consortium for Political Research (ECPR) General Conference 2011* (pp. 1–9). .

Bruns, A., & Burgess, J. E. (2012). Researching news discussions on Twitter. New methodologies. *Journalism Studies, 13*(5–6), 801–814.

Bruns, A., & Liang, Y. E. (2012). Tools and methods for capturing Twitter data during natural disasters. *First Monday, 17*(4), 5.

Calzada, I. (2018). (Smart) citizens from data providers to decision-makers? The case study of Barcelona. *Sustainability, 10*(9), 1–25.

Caragliu, Andrea, & Del Bo, Chiara F. (2019). *"Smart innovative cities: The impact of Smart City policies on urban innovation," Technological Forecasting and Social Change. 142*, Elsevier373–383.

Castells, M. (1996). *The rise of the network society*. Oxford, UK: Blackwell Publishers.

Castells, M. (2012). *Networks of outrage and hope: Social movements in the Internet age*.

Cambridge, MA: Polity Press.

Castelnovo, W., Misuraca, G., & Savoldelli, A. (2015). Smart cities governance: The need for a holistic approach to assessing urban participatory policy making. *Social Science Computer Review, 34*(6), 724–739.

Dameri, R. P. (2013, October 22). Searching for Smart City definition: A comprehensive proposal. *International Journal of computers & technology, 11*(5), 2544–2551.

de Jong, M., Joss, S., Schraven, D., Zhan, C., & Weijnen, M. (2015). Sustainable–smart–resilient–low carbon–eco–knowledge cities; making sense of a multitude of concepts promoting sustainable urbanization. *Journal of Cleaner Production, 109*, 25–38.

de Souza e Silva, A., & Firth, J. (2010). Locative mobile social networks: Mapping communication and location in urban space. *Mobilities, 5*(4), 485–506.

de Waal, M. (2013). *The city as interface: How new media change the city*. Rotterdam, The Netherlands: Nai010.

De Waal, M., & Dignum, M. (2017). The citizen in the smart city. How the smart city could transform citizenship. *Information Technology, 59*, 263–273.

Engbersen, G. (2012). Migration transitions in an era of liquid migration. In M. Okolski (Ed.). *European immigrations. Trends, structures and policy implications* (pp. 91–106). Amsterdam: Amsterdam University Press.

Evans, J., Karvonen, A., & Raven, R. (2016). *The experimental city*. Abingdon: Routledge.

Fainstein, S. (2005). Cities and diversity. Should we want it? Can we plan for it? *Urban Affairs Review, 41*(1), 3–19.

Farman, J. (2012). *Mobile interface theory: Embodied space and locative media*. New York, NY: Routledge.

Fernandez-Anez, V., Fernández-Güell, J. M., & Giffinger, R. (2018). Smart City implementation and discourses: An integrated conceptual model. The case of Vienna. *Cities, 78*, 4–16.

Florida, R. (2002). *The rise of the creative class*. New York: Basic Books.

Flyvbjerg, B. (2011). Case study. In N. K. Denzin & Y. S. Lincoln (Eds.). *The SAGE handbook of qualitative research* (pp. 301–316). Thousand Oaks, CA: Sage.

García-Palomares, J. C., Salas-Olmedo, M. H., Moya-Gómez, B., Condeço-Melhorado, A., & Gutiérrez, J. (2018). City dynamics through Twitter: Relationships between land use and spatiotemporal demographics. *Cities, 72*, 310–319.

Gargiulo Morelli, V., Weijnen, M., Van Bueren, E., Wenzler, I., Salvati, L., & De Reuver, M. (2013). Towards intelligently-sustainable cities? *Journal of Land Use, Mobility and Environment, 1*, 73–86.

Georgiou, M. (2012). *Media and the city*. London: Polity.

Gitelman, L. (2013). *Raw data is an oxymoron*. Cambridge: The MIT Press.

Golder, S. A., & Huberman, B. A. (2006). Usage patterns of collaborative tagging systems. *Journal of Information Science, 32*(2), 198–208.

Hajer, M. (2016). On being smart about cities. Seven considerations for a new urban planning and design. In A. A, Allen, A. Lampis, & M. Swilling (Eds.). *Routledge advances in regional economics, science and policy*. (pp. 50–63). New York: Routledge.

Hancke, G. P., de Carvalho e Silva, B., & Hancke, G. P., Jr. (2013). The role of advanced sensing in smart cities. *Sensors, 13*(1), 393–425.

Harvey, D. (2008). The right to the city. *New Left Review, 53*, 18.

Hillier, B. (1996). *Space is the machine: A configurational theory of architecture*. Cambridge, UK: Cambridge University Press.

Hillier, B., & Hanson, J. (1984). *The social logic of space*. Cambridge: Cambridge University Press.

Hollands, R. (2015). Critical interventions into the corporate smart city. *Cambridge Journal of Regions, Economy and Society, 8*(1), 61–77.

Hu, R. (2014). Migrant knowledge workers: An empirical study of global Sydney as a knowledge city. *Expert Systems with Applications, 41*, 5605–5613.

Java, A., Song, X., Finin, T., & Tseng, B. (2007). Why we Twitter: Understanding microblogging usage and communities. *Proceedings of the 9th WebKDD and 1st SNA-KDD 2007 workshop on Web mining and social network analysis*. ACM.

Joss, S., Cook, M., & Dayot, Y. (2017). Smart cities: Towards a new citizenship regime? A discourse analysis of the British Smart City standard. *Journal of Urban Technology, 24*(4), 29–49.

Kaplan, S., Grünwald, L., & Hirte, G. (2016). The effect of social networks and norms on the inter-regional migration intentions of knowledge workers. *Cities, 55*, 61–69.

Kitchin, R. (2014). The real time city. Big data and smart urbanism. *GeoJournal, 79*, 1–14.

Kitchin, R. (2015). Making sense of smart cities: Addressing present shortcomings. *Cambridge Journal of Regions, Economy and Society, 8*(1), 131–136.

Lansley, G., & Longley, P. A. (2016). The geography of Twitter topics in London. *Computers, Environment and Urban Systems, 58*, 85–96.

Lefebvre, H. (1996). The right to the City. In E. Kofman, & E. Lebas (Eds.). *Writings on cities*. Oxford: Blackwell.

Lewis, S. C., Zamith, R., & Hermida, A. (2013). Content analysis in an era of Big Data: A hybrid approach to computational and manual methods. *Journal of Broadcasting & Electronic Media, 57*(1), 34–52.

Leydesdorff, L., & Deakin, M. (2010). The triple helix model and the meta-stabilization of urban technologies in smart cities. *Physics and society; adaptation and self-organizing systems*. Retrieved from http://arxiv.org/abs/1003.3344.

Lim, S. S., Bork-Hüffer, T., & Yeoh, B. (2016). Mobility, migration and new media: Manoeuvring through physical, digital and liminal spaces. *New Media and Society, 18*(10), 2147–2154.

Massey, D. (2005). *For space*. Thousand Oaks, CA: Sage.

McFarlane, C., & Söderström, O. (2017). On alternative smart cities. *City, 21*(3–4), 312–328.

Mocanu, D., Baronchelli, A., Perra, N., Gonçalves, B., Zhang, Q., & Vespignani, A. (2013). The Twitter of Babel: Mapping world languages through microblogging platforms. *PLoS One, 8*(4), e61981.

Monachesi, P. (2018). Overcoming space inequalities in city building games through negotiations. In C. Stephanidis (Ed.). *HCI international 2018 - 20th international*

conference, proceedings, part III (pp. 487–493). Springer.

Monachesi, P. (2019). Sustainable development and ICT use among elderly: A comparison between the Netherlands and Italy. *Human aspects of IT for the aged population, design for the elderly and technology acceptance.* Springer.

Monachesi, P., & de Leeuw, T. (2018). Analyzing elderly behavior in social media through language use. In C. Stephanidis (Ed.). *HCI international 2018 – 20th international conference, proceedings, part II* (pp. 188–195). Springer.

Monachesi, P., & Turco, M. (2017). New urban players: Stratagematic use of media by Banksy and the Hong Kong Umbrella Movement. *International Journal of Communication, 11*, 1–18.

Morozov, E. (2018). *There is a leftwing way to challenge big tech for our data. Here it is.* The Guardian.

Morozov, E., & Bria, F. (2018). *Rethinking the smart city: Democratizing urban technology.* New York: Rosa Luxemburg Stiftung.

Nadler, R. (2013). *Plug & Play places: Lifeworlds of multilocal creative knowledge workers.* (Ph.D thesis).

Niaros, V., Kostakis, V., & Drechsler, W. (2017). Making (in) the smart city: The emergence of makerspaces. *Telematics and Informatics, 34*(4), 1143–1152.

Pandya, A., Mourad, O., Monachesi, P., Kostakos, P., & Loven, L. (2018). On the use of URLs and hashtags in age prediction of Twitter users. *2018 IEEE International Conference on Information Reuse and Integration (IRI).*

Polson, E. (2015). A gateway to the global city: Mobile place-making practices by expats. *New Media & Society, 17*(4), 629–645.

Sandercock, L. (2003). Out of the closet: The importance of stories and storytelling in planning practice. *Planning Theory & Practice, 4*(1), 11–28.

Sassen, S. (1991). *The global city.* New York, London, Tokyo. Princeton, NJ: Princeton University Press.

Scholl, C., & Kemp, M. (2016). City labs as vehicles for innovation in urban planning

processes. *UrbanPlanning, 1*(4), 89–102.

Söderström, O., Paasche, T., & Klauser, F. (2014). Smart cities as corporate storytelling. *City, 18*(3), 307–320.

Soja, D. (2010). *Seeking spatial justice.* Minneapolis, MN: University of Minnesota Press.

Swilling, M. (2016). Towards sustainable urban infrastructures for the urban Anthropocene. In A. Allen, A. Lampis, & M. Swilling (Eds.). *Untamed urbanism. Routledge advances in regional economics, science and policy.* New York: Routledge.

Uitermark, J. (2009). An in memoriam for the just city of Amsterdam. *City, 13*(2–3), 347–361.

van Hulst, M. (2012). Storytelling, a model of and a model for planning. *Planning Theory, 11*(3), 299–318.

Vanolo, A. (2014). Smartmentality: The smart city as a disciplinary strategy. *Urban Studies, 51*(5), 881–896.

Viitanen, J., & Kingston, R. (2014). Smart cities and green growth: Outsourcing democratic and environmental resilience to the global technology sector. *Environment and Planning A, 46*(4), 803–819.

Wise, A. (2009). Everyday multiculturalism: Transversal crossings and working class cosmopolitans. In A. Wise, & S. Velayutham S (Eds.). *Everyday multiculturalism* (pp. 21–45). London: Palgrave.

Wise, A., & Velayutham, S. (2014). Conviviality in everyday multiculturalism: Some brief comparisons between Singapore and Sydney. *European Journal of Cultural Studies, 17*(4), 406–430 2014.

Yigitcanlar, T., & Lönnqvist, A. (2013). Benchmarking knowledge-based urban development performance: Results from the international comparison of Helsinki. *Cities, 31*, 357–369.

Zhou, L., & Wang, T. (2014). Social media: A new vehicle for city marketing in China. *Cities, 37*, 27–32.