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The appropriation of public places
through locative media:
A pilot study on Foursquare City Guide/Swarm

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Summary:

This paper is about the possible social consequences attributable to a new form of media-facilitated space constitution, arising out of an increasing fusion of physical with virtual spaces. This transformation is caused by a new generation of smartphone apps, which foster the cyber-physical merging of the perception and appropriation of public space in day-to-day life. These apps are termed locative media. Locative media are characterized in particular by the fact that they combine location-based information from the Internet with the physical places of face-to-face communication. A much-debated implication of using locative media is that places in the public space no longer appear the same to all people present, because users' perceptions and appropriations of these places are now based on additional information, which is represented only digitally. Depending on which apps are used and which personalized settings are selected, users may receive quite different information on the same physical location. The paper discusses whether the increasing use of locative media leads to the creation of new inclusive meeting places or – on the contrary – increases the tendency towards urban segregation by creating exclusive places of retreat. The discussion is based on the empirical results of a pilot study on locative media users in Berlin. The pilot study's focus was on apps that are used to annotate public places with digital information such as texts, photos, or ratings. We compared the effects of two apps that emphasize different aspects of the appropriation of public places: the location-based recommendation service Foursquare City Guide and the location-based social network Foursquare Swarm. Both apps can be used either independently or in combination. Thus, these apps offer its users very different options for the appropriation of public places.

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1. Introduction

This paper is about the possible social consequences attributable to a new form of media-facilitated space constitution, arising out of an increasing fusion of physical with virtual spaces. This transformation is caused by a new generation of smartphone apps, which foster the cyber-physical merging of the perception and appropriation of public space in day-to-day life. These apps are termed locative media. Locative media are characterized in particular by the fact that they combine location-based information from the Internet with the physical places of face-to-face communication. For example, game apps augment the space with characters and objects from the game universe that virtually occupy specific locations in physical space and only appear on the smartphone screen of a present user. Or, a mobile recommendation app displays a map of restaurants located in the vicinity, including their menus as well as experience-reports and ratings from previous customers. A much-debated implication of using locative media is that places in the public space no longer appear the same to all people present, because users' perceptions and appropriations of these places are now based on additional information, which is represented only digitally. Depending on which apps are used and which personalized settings are selected, users may receive quite different information on the same physical location.

Below, we will discuss whether the increasing use of locative media leads to the creation of new inclusive meeting places or – on the contrary – increases the tendency towards urban segregation by creating exclusive places of retreat. The discussion is based on the empirical results of a pilot study on locative media users in Berlin. In the next section, the paper provides a brief outline of how digitalization and mobile media are altering the public space in urban societies (section 2). Based on this overview we propose a differentiated analysis of the effects of locative media on the constitution of space, distinguishing between three different types of usage – annotation, navigation and chance management. We then present the design of our study (section 3) and the exemplary application of it on two apps of the mobile annotation type (section 4). Finally, we discuss the results regarding the question of whether the observed effects on the cyber-physical constitution of space tend to be primarily inclusive or exclusive. Further, we want to indicate how pending studies on the other usage types of locative media might be integrated here (section 5).

2. Public space: physical, virtual and hybrid

Although the term public space is often applied in urban and spatial research, as a concept it nevertheless remains under-defined for the most part. Regarding this conceptualization of public space

we are drawing upon the work of the Chicago School of Sociology and follow the Chicago School's principal idea that public places are structured according to the meanings attributed to them by the citizens. These meanings were and are always co-constructed with the aid of media. In the following we wish to investigate how a new generation of mobile media either enhances or alters the semantic structure of urban public space and which effects on urban coexistence are generated by this. Starting point for our considerations is a definition from Lyn Lofland, which delineates the scope of public space based on the criterion of legal accessibility (cf. Lofland 1973: 19). In contrast to private households, public space is freely accessible to all city dwellers.² In addition to the feature of free accessibility, public places are characterized by the fact that most encounters here occur between strangers. In most cases, city dwellers deal with this life among strangers by adopting a reserved social demeanor. In fleeting encounters with strangers this is realized through "interactions of avoidance" (Hüttermann 2017): "as the other passes, the eyes are lowered, fading the other out as it were." (Goffman 1963: 85). As Erving Goffman has already stressed, in public space – in contrast to encounters which take place in a private setting – special circumstances must prevail for the barriers of "civil inattention" (Goffman 1963: 83-88) to be breached. Only in central places of encounter such as the marketplace or city hall do large public gatherings regularly occur.

The public space in modern cities is a network of freely accessible places in which large numbers of mutual strangers pursue their activities – sometimes together, often in parallel. These activities are expressions of different social worlds populating the city. According to Anselm Strauss (1978), social worlds organize around core activities, concerned, for example, with the production of certain goods or collective identities, as is clearly expressed by the public display of lifestyles. Social worlds are typical part-time ways of life in urban societies, differentiated by work and culture, in which people act in heterogeneous roles. (cf. Unruh 1980). Within the urban context, social worlds are represented by such groups as youth scenes, occupational groups, or ideological milieus. Large cities, in particular, are a mosaic of the most diverse cultural, ideological, work- or leisure-time-oriented social worlds.

One of the reasons why the diverse social worlds within a city coexist mostly without conflict is that just a few places in the public space are frequented equally by all social worlds. Only in

² This definition raises the question whether for example train stations or local city trains form part of public space. The free accessibility of these places is not limited by legal barriers, but certainly by financial ones. In German-speaking countries, means of public transport clearly form part of public space because the state makes contributions to allow all citizens to take part in public life, and this specifically includes the use of local public transportation. However, the question of whether what are termed means of public transport are part of public space in other parts of the world must be answered negatively in some cases.

subway stations, on city plazas, in shopping malls and other such areas of dedicated purpose to the city infrastructure – Marc Augé’s (1995) “non-places” – does the entire spectrum of city dwellers, and with them their variety of social worlds, meet and mingle. In contrast, most places in the public space are used de facto only by small portions of the city population. This is the case even though in principle they are open to all and access to them is not limited by exclusive membership rules, prohibitions or the threat of sanctions. Examples of such places of retreat are churches, cafés, sports venues, parks or similar sites, which only serve as places of encounter for one or very few social worlds. Although access is not blocked by direct barriers or restricted legally, there is little probability that outsiders would seek out the dedicated meeting places of other social worlds. This becomes particularly evident considering the places of retreat for marginalized social worlds such as those of drug abusers or the homeless. According to Anselm Strauss, this is due to the fact that urban places are endowed with different symbolic meanings attracting some social worlds while repelling others (cf. Strauss 1976: 58pp.). These symbolic meanings establish a spatial order that determines which locations act as places of encounter or retreat for which segments of an urban society.

In the current phase of the digitalization of society the operating principle of public places as places for encounter and exchange for members of specific social worlds is matched by the operating principle of social media as “virtual” meeting places and as areas where “virtual” communities are created. From the perspective of a sociology of space, the digital revolution has, in a sense, doubled the public space. In parallel with the “real” places of face-to-face interaction, the Internet and social media have created a “virtual” space of digital communication. Like the public space in cities, this virtual space is freely accessible and offers a platform for the activities of a large number of social worlds. Initially, however, the virtual space was largely separated from the physically experienced everyday reality and was accessible only intermittently and temporarily – via the computer workstation. In social media a virtual parallel space for everyday communication arose (cf. Schmidt 2013). In other words, during the early days of the digital revolution people experienced virtual space as a space with a reality of its own, as a separate universe of discourse and experimentation site for new (digital) lifestyles. This separation has undergone a drastic change within the past decade. With the emergence of Internet-capable mobile devices, particularly smartphones, the virtual space is now accessible at any time and in any place.

This mobilization of the Internet is a core element in the current phase of the digitalization of society, which is increasingly permeating our everyday environment. The continuously accessible digital information and communication infrastructures result in an increasing superimposition and

merging of virtual and physical realities to what are termed “cyber-physical systems” (Rajkumar et al. 2010). One of the observable consequences resulting from the proliferation of cyber-physical systems is that the strict distinction between online and offline communication loses its practical relevance in the everyday life of many smartphone users. Entirely in this spirit, the Japanese media sociologist Hidenori Tomita diagnoses that people in contemporary communication societies are living a life in the “second offline” (Tomita 2016: 1pp.). These people quite naturally integrate social media communication as part of their daily routine into a number of physical activities. In this way new forms of cyber-physical reality arise which are currently spreading, predominantly through the altered daily practices of youths and young adults. These groups act as social pioneers (“early adopters”, cf. Rogers 1983: 248-249) with regard to the adoption of smartphone apps. Lorenza Parisi has described these pioneers as “hyperconnected digital media users” (Parisi 2015: 6) and has investigated their practices in the appropriation of space. According to her results, the smartphone is increasingly playing an active role for this age group in appropriating and perceiving space. For example, many younger users employ the smartphone in everyday life as a form of social radar to locate friends in the area or to look out for possible flirt partners. Also, the smartphone is frequently used for the purpose of navigation. It unerringly guides its user along unknown streets, as well as visualizes virtual messages left by previous visitors, pointing out a good restaurant, for instance, or the beauty of nearby lookout points.

Within social science research the respective smartphone apps, which are based on the merging of physical space with location-based information from the Internet, are collectively termed locative media. This is a special form of utilization of cyber-physical systems.³ Locative media result from the combination of social media with mobile telephony, position location methods (e.g. GPS and wireless triangulation), geo-referencing and digital cartography to form a new context of infrastructure (cf. Buschauer/Willis, 2013). The term locative media arose in the 2000s within the context of location-based computer games (cf. de Souza e Silva/Frith 2012: 89pp.; de Souza e Silva/Sheller 2015: 3-4; Wilken/Goggin 2015: 4-5). The original aim of merging virtual and physical reality was to turn public urban spaces (back) into playgrounds (cf. de Souza e Silva/Sutko 2009; Gebelein 2013). This genre of locative media is presently enjoying great popularity, as in the commercial variant Pokémon Go. In the meantime, the same basic process of the location-based merging of virtual and physical reality is taking place in many other smartphone services as well, which are also referred to collectively as location-based services (LBS).

³ Other forms of social and economic utilization of cyber-physical systems go under the headings of “Industry 4.0” and the “Internet of Things” (IoT).

The functional principle of location-based services is not exclusively bound to the smartphone but has technical forerunners, as a prominent definition of locative media from Jordan Frith (2015: 2) makes clear: “Locative media refers to any form of media – ranging from in-car GPS displays to RFID tags – that feature location awareness, which is a device’s ability to be located in physical space and provide users with information about their surroundings.” However, it is primarily thanks to the smartphone that locative media have advanced within a few years to become a technology suitable for use in everyday life. When the first smartphones conquered the market around a decade ago, they suddenly solved one problem, which many older approaches towards digitally augmenting physical reality had to face. All of these so-called augmented reality approaches failed in their attempt to follow eye movement with the adequate precision in order to allow the digitally provided content to adapt to the users direction of sight in real time. The use of a smartphone eliminates this problem since a person, rather than using their eyes, simply aims the camera of their mobile device at the section of space which is of interest; and in place of cumbersome projections, the digital content is displayed on the smartphone screen. This new approach fueled the development of what is today a nearly incalculable number of apps, which provide the user with location-based information from the Internet in real time.

The potential of locative media for the constitution of new spaces becomes strikingly evident in ethnographic studies, which focus on the micro-level of social interaction. These illustrate how the smartphone screen becomes a sensory extension: On the screen, the melding of virtual and physical spaces takes place; here, cyber-physical reality becomes visually accessible and – by means of touchscreen functions – haptically manipulable as well (cf. Farman 2013). As conveyed on the screen, a “hybrid space” (de Souza e Silva 2006: 261pp.) arises, whose constitution is equally physical and virtual, and which links the social media communication in the Internet back to a current physical location. This cyber-physical merging has consequences both for meeting and for interaction in public places as well as in the virtual public space of social media. In this hybrid space the boundaries between physical and virtual reality as well as between face-to-face interaction and media-based interaction become blurred.

In order to investigate the operating principles of the cyber-physical constitution of space, it is helpful to analytically distinguish between different types of locative media usage. Based on ethnographic case studies regarding locative media the following three general usage types could be derived, each of which encapsulates numerous concrete manners of use:

(1) Within the context of locative media, *annotation* denotes the linking of geographic coordinates with virtual information in the form of comments, photos or brief reports (microblogs).

These annotations endow an area with particular meanings by acting as the functional equivalents of physical display boards, posters or graffiti (cf. de Souza e Silva and Frith 2012: 94pp.; Frith 2015: 81pp.; Lemos 2010: 406). They make use of a broad spectrum of media-based forms of expression. Usually, users annotate personal experiences, photos and opinions of an area. Their contributions often follow the everyday communication formats of “authentic self-portrayal”, which are known from the social contact between friends and acquaintances and which also predominate in social media. (cf. Schmidt 2013: 23pp.). The extension of these communication formats to potential strangers has led to the emergence of a new form of “personal public sphere” (ibid.) within the virtual space. With the proliferation of annotation services this form of public sphere is currently becoming established in the physical urban space.

(2) Many locative media apps support their users in the *navigation* through unknown or unfamiliar spaces. Apps such as Waze aid their users through a space by guiding their movement based on certain criteria, for example in the interest of avoiding areas plagued by crime or traffic (cf. Frith 2015: 45pp.; Quercia et al. 2015). Business travelers or tourists visualize various route options and annotated information on a digital map and use this information to choose their travel routes, often while they are underway. GoogleMaps and OpenStreetMaps are further well-known examples of this usage type, and are some of the most frequently used locative navigation services worldwide. When queried as to their motivations for use, aside from the saving of time, users also note the possibility of benefiting from the annotated “insider knowledge” of local residents. This allows them as well to avoid situations in which they would have to reveal themselves as outsiders, for example by asking for directions or for the location of a good restaurant (cf. Sutko/de Souza e Silva 2010: 813-814).

(3) When apps point out a specific shop to their users that is right along their route and adequate to a pending purchase, they provide a form of *chance orchestration*. Another example for this usage type is the signaling of nearby friends or potential flirt partners by locative media apps. In place of coincidence-based social forms of “sociability” which Georg Simmel (1911) considered to be a characteristic of urban meeting places, new forms of spatial encounter are arising. Robin van den Akker (2015: 39pp.) describes those as “chance orchestration” (similarly: Lemos 2010: 412). Such apps visualize social-spatial chance structures on a local map and help their users take advantage of opportunities to meet like-minded people (cf. Frith 2015: 68pp., 74pp.; Sutko/de Souza e Silva 2010: 809, 815). From an information technology perspective, the basis of chance management is formed by matching algorithms, which align annotated information with personal profiles. Analogous to visiting a club, bar or other urban meeting place, the use of such algorithms

signalizes the willingness to communicate between users whose interests and preferences indicate a match. In contrast to a bar, the socially approved physical meeting place loses importance in this type of public sphere because the simple crossing of paths in the physical space – e.g. in the subway – is sufficient to initiate contact (cf. Blackwell et al., 2014: 9pp.).

From a global scale perspective, the diffusion of advanced locative media is still in its early stages. All three categories of locative media use require not only mobile access to broadband digital infrastructures but also a high density of potential partners for interaction. These two prerequisites are less well fulfilled in rural areas (cf. Spellerberg 2008). For this reason, the pioneers in locative media use are found primarily in late modernist urban spaces. To date the urban centers of Europe, North America and Eastern Asia have been the main arenas for the emergence, establishment and diffusion of new forms of space constitution in connection with locative media. Most recently, however, the focus has turned to the megacities in the so-called emerging nations such as Brazil, whose urban middle classes are increasingly developing their own modes of handling locative media (cf. de Souza e Silva et al. 2017).

Presently, discussion is underway in the literature on urban sociology and the sociology of space as to which extent the advancing diffusion of locative media in urban everyday life is altering the interaction between strangers in public places. Two predominant strains of discussion can be identified here, which we term *inclusion hypothesis* and *exclusion hypothesis*. The typical proponents of the inclusion hypothesis assume that the use of locative media increases the de facto accessibility of public places, and leads to more encounters as well as to more participation in public life. Locative media are considered to encourage the playful and participative reshaping of public space because they circumvent urban rules of civil inattention and facilitate communicative exchange between strangers (e.g. Keijl et al. 2013: 10-11). According to the inclusion hypothesis, locative media increase sensitivity for the urban environment and stimulate communication within neighborhoods as the users carry the “participative culture” of the Internet into the public urban space (Hamilton 2009: 393). In short: Locative media are considered to promote the emergence of integrative places of encounter because they would make the multitude of concurrently existing meanings and modes of using the public space both visible and accessible as courses of action to all participants.

In contrast, the exclusion hypothesis maintains the position that the de facto accessibility of public places is decreased and the decline of urban public life is accelerated. Mechanisms of the communicative closure of social worlds (key term: filter bubble; Pariser 2012), already familiar

from social media, are considered to now be moving into the urban space, fragmenting everyday reality into personalized filter bubbles:

“What, in fact, could happen is a splintering of how people experience space; two people who use the same application in the same location may each access a totally different set of spatial information. [...] They stand in the same location using the same application, but their experience of place is customized for them. They use locative media to bring their ‘filter bubbles’ out into physical space.” (Frith 2015: 140-141)

The filtered, selective perception and appropriation of places could result in a further intensification of urban tendencies towards contact avoidance and social segregation. Instead of promoting chance-based sociability and the emergence of new forms of public life, locative media are considered to simply foster dialog between those city dwellers who already share common interpretive patterns and lifestyles: “[locative media] takes the chance out of chance encounters” (Crawford 2008: 91). Particularly the personalized filter of mobile social networks and dating apps could contribute to the emergence of subcultural counterpart places and private places of retreat within the public urban space invisible to outsiders (cf. Lemos 2010: 411).

The proponents of both these hypotheses ascribe the assumed effects of locative media to the superimposition of digital content onto the physical space, by which the areas within the physical space are imbued with additional semantic content. They focus, however, on opposite consequences on the social-spatial relation structures of urban life. While, in the case of inclusive usage types the public space is constituted as a heterogeneous togetherness in the sense of a multi-voice cyber-physical Agora, exclusive use of locative media leads to the purely physical juxtaposition of predominantly homogeneous and separate social worlds whose differing location-based semantic constructions remain closed to other social worlds.

From an empirical standpoint, the question currently remains open in which direction – inclusion or exclusion – the use of locative media will transform urban life as a whole. The answer depends on which forms of cyber-physical perception and appropriation of space specifically emerge in connection with the respective apps. To date, no systematic investigations have been conducted to more accurately determine the implications of the two hypotheses and to describe the mechanisms of inclusion and exclusion.

It is apparent that the seemingly opposing results conducted by particular studies, which verify both inclusive and exclusive effects, is due to the broadness of the collective term locative media. As stated earlier, this term includes all apps, which identify their own location and provide online

information on this location. Although this collective term is suitable as an aid in sensitizing researchers to the multitude of usage forms of this new type of medium, at the same time it obscures the differences between the various applications and the ways they are used. It is this ambivalent situation to which the contrary results found in the literature can most probably be ascribed. The question of inclusive or exclusive effects must therefore be investigated by differentiating between various usage types and how they are applied in the apps. Whether new chances for inclusion or exclusion are created seems to strongly depend on the inherent functional abilities of the apps and the use practices which evolve from them (for the interrelationship between technical structures and social use practices cf. Schulz-Schaeffer 1999; 2000). We fulfill the requirements for a differentiated analysis of locative media by, on the one hand, analytically distinguishing between three overarching types of usage: annotation, navigation and chance management as stated above. On the other hand, we simultaneously apply an empirical investigative design which queries the various functionalities and use practices within each usage type for inclusive or exclusive effects. In the following we present the design of our study which guided us in this search for inclusive and exclusive effects.

3. Study design: webnographic investigations of space

Naturally, the results unveiled by our research are influenced by how broadly or narrowly we define the terms inclusion and exclusion. No empirical research is necessary to demonstrate that locative media do not perform inclusion in the sense of integrating society as a whole. Just like social media, locative media do not overcome the digital divide between the predominantly younger users and the predominantly older non-users of new media. When the term inclusion is perceived in a broad sense then, the result is obviously preprogrammed. In view of the future of urban life, it appears more interesting to us to pose the question to which extent the digital native generation itself is impacted by the inclusive or exclusive effects of locative media. Although the members of this generation are bonded by their affinity for locative media, they nevertheless inhabit different, sometimes quite heterogeneous social worlds, each with its own lifestyle. In reference to Hitzler et al. (2001) these various social worlds can also be termed as “scenes.” Our primary focus of interest is on how the users of locative media, as inhabitants of their specific scenes, appropriate public places and how they perceive the spatial structure of cities from their own particular perspective, combining physical and digital information to a specific hybrid space. However, not a great deal is to be gained just by limiting the focus of research to the generation of digital natives alone. It remains a methodological challenge to gauge the consequences of locative media use on the perception and

appropriation of public places. Although locative media constitute a relatively young phenomenon, the number of corresponding apps available is already too large to investigate and examine the field as a whole. For this reason, we have applied a qualitative research design, which studies typical forms and consequences of locative media usage based on exemplary cases. In the present article, we focus primarily on the usage type of annotation.

In our selection of research units, we follow the logic of grounded theory (cf. Strauss 1987; Strübing 2014). Guided by the principle of maximum contrast, we look at apps characterized by different specifications of use. The two respective apps in focus are both developed by the Four-square Company, which is considered a pioneer in the field of annotation services (see below). Since the main impact of locative media is in urban areas, we have concentrated our data collection as yet on a single large city: Berlin. Measured in terms of the number of annotations, the Berlin metropolitan area constitutes the main area of use for Foursquare in German-speaking countries.⁴

Our descriptions of annotation practices and their spatial effects are based on a mix of artefact analyses, guided interviews and ethnographic observations. This method is in line with Strübing (2006) who, under the term “webnography,” early on suggested a method for researching distributed contexts of interaction that take place concurrently in virtual and in physical space. We have adapted his suggestion to meet the requirements of locative media. At this point, we present a brief summary of the most important elements of our data acquisition and analysis:

(1) *Artefact analyses*: In researching the constitution of space with and by means of locative media it is of interest to take a closer look at the objectivized action scripts and presets of use embedded in the functions of the apps. This purpose is served by means of artefact analyses (cf. Lueger/Froschauer 2018; Strübing 2006: 267-268; Boellstorff et al. 2012: 121pp.). In the course of this study, artefact analyses are applied in order to determine the scopes of action provided by the various apps with regard to their importance for the constitution of space. In our research, we concentrated on a new variant of artefact analysis, the “walkthrough method” (Light et al. 2018), which was specially developed for the analysis of smartphone apps. The basic idea is to carry out auto-ethnographic studies, allowing to get a first impression on how the technical structures of the apps allow users to receive, create and share spatial annotations in general. Based on this self-observations, affordances and restrictions of the apps can be identified.

(2) *Expert interviews with superusers*: In general, the participation patterns of social media applications that provide user generated and controlled content indicate that most of the users who

⁴ The spatial and quantitative distribution of annotation services can be found, for example, at Foursquare Infographics: <https://de.foursquare.com/infographics/500million?> [Last access: April 26, 2019]

contribute content do so only occasionally, but that there is a small number of very active users. Often those users are granted privileged access rights from the operator of such apps. Typically, they also take on general tasks such as the editing of outdated information. The two Foursquare apps we investigated are precisely social media applications of this type. The particularly active users of these are referred to as *superusers*. In the course of our ethnographic study we were able to participate in two annual meetings of German-speaking Foursquare superusers. The organizers of these meetings became aware of our research project website and were kind enough to invite us to attend. At these superuser meetings we were able to make important contacts in the field, the result of which were expert interviews (cf. Bogner et al. 2009) with four superusers who were able to contribute additional information on the intended interdependencies between technical functional features and social use practices.

(3) *Participatory observation*: Participatory observations made in several Berlin neighborhoods served to document various forms and circumstances of the constitution of space by means of locative-media. These were conducted in the manner of a mobile, or multi-sited, ethnographic study (cf. O'Reilly, 2009: 144pp.). In order to do this, we first explored the public space without the additional aid of digital annotation, then we observed the same areas again through the lens of the Foursquare apps. A comparison of the observation protocols generated before and after the usage of the apps provided us with information as to which additional layers of meaning the annotations contributed to these areas and how they modified the purely physical perception of the space.

(4) *Cultural probes*: Additionally, we collected data in a manner based on the cultural probe design development method (cf. Gaver et al. 1999). From a group of around one hundred people who responded to our request for participants for this study we selected the most heterogeneous sample possible. The derived test group of ten participants intentionally included some to whom the Foursquare apps had been hitherto unknown.⁵ Over a period of four weeks and on a weekly basis the test subjects received specific tasks which they were to perform using the Foursquare apps. For example, they were to search for locations using the apps and visit them, or to write ratings and upload them to the app. At regular intervals, the users submitted their experiences in using the apps in the form of short journal entries and screenshots, which provided information on their user behavior (cf. Boellstorff et al. 2012: 113pp.). Furthermore, we conducted interviews with

⁵ Including the superusers interviewed, the sample consisted of fourteen users, six of whom were female and eight males. Six users had years of experience with Foursquare apps, while the others had little or no experience. The users ranged in age from 21 to 43; the average age was 29 years.

the participants both at the beginning and the end of the four-week period of use. This was intended to note changes and developments in connection with use of the apps. Our guided interviews in this matter were constructed around the themes of the perception and appropriation of space by our subjects. We thereby focused on how they structured their work and free time, their residential area, mobility behavior and their use of media. On average the interviews lasted sixty minutes; they were recorded, transcribed and coded in their entirety. We conducted them as problem-centered interviews (cf. Witzel/Reiter 2012) with the aim of reconstructing the location-based interpretation patterns and activity orientations in which the everyday use of locative media is embedded.

The interview transcripts, field notes and other documentation generated in the course of collecting the data were coded and evaluated with the aid of a text analysis program (MAXQDA). Using theory-constructing coding, the evaluation aimed to obtain the most complete collection possible, in the sense of a theoretical saturation, regarding the use types of interest and their location-based effects (cf. Strauss 1987; Strübing 2005: 222pp.). The result is a typology of annotation practices and their effects concerning the accessibility of public spaces.

4. Case study: annotation apps

The digital annotation of places is one locative media use type which encompasses different types of annotation. From a technical standpoint, the term annotation refers to the linking of GPS coordinates with digital information such as ratings, photos or comments. From a sociological point of view, annotations add new layers of meaning to public places. The Foursquare apps are good examples in studying the phenomenon of digital annotations. The original version of the Foursquare app was released in 2009. It combines a recommendation service for urban areas with a social network. At its core, it is a search and recommender engine for restaurants, shops and other locations. These recommendations are not generated by an organized team of editors; instead, the users themselves create locations and annotate them with content. The app merely provides a platform to the community of users who fill it with annotations as the years pass. In many ways its functional principle was similar to competitive apps such as Yelp or TripAdvisor. However, in contrast to most competitors, Foursquare early on possessed the function of “checking in” at GPS coordinates and sharing this information with other users. By means of such “check-ins” users can track down friends currently in the vicinity and take part in playful competition with other users, as repeated “check-ins” at the same locations are rewarded with digital badges and similar incentives.

The Internet entrepreneurs Dennis Crowley and Naveen Selvadurai had public life in Manhattan in mind when they founded the Foursquare mobile annotation service. From the company headquarters in Manhattan the app spread rapidly among digital natives worldwide. In 2014 the app exceeded a total of over 50 million registered users. Foursquare is thus a pioneer in the field of annotation services. Nowadays, platforms such as Google and Facebook increasingly integrate similar annotation functions into their offerings. In doing so, these platforms consciously imitate the design of successful role models such as Foursquare. Therefore, an analysis of Foursquare promises more readily generalizable insights into the annotation use type, independent of whether this specific annotation service survives in the long run or is squeezed out by larger platforms.

Since its inception, Foursquare has experimented with different business models, including the sale of user-generated data to business partners and the provision of location-specific advertising.⁶ Up to the present, use of the app has been free of charge. The popular app stores offer versions in various European and Asian languages, which can be installed on any smartphone within a few seconds. In August of 2014 the company decided to split Foursquare into two apps:

(1) The Foursquare City Guide contains mainly the search and recommendation functions. The app collects location-based information, which is annotated in the form of comments, ratings and images. This information is freely accessible to all registered users.

(2) The social network functions are now externalized in a separate app, Foursquare Swarm. The app offers the option of connecting and competing with friends for in-game rewards. The users of Foursquare Swarm also annotate information such as their current location (check-ins) or location-based comments, but these are shared only within private contact networks.

Both apps can be used either independently or in combination. Thus, Foursquare now offers its users very different options for the appropriation of space. From a technical standpoint, Foursquare supports both the inclusive use types, which are geared towards the public communication of location-based information, as well as the exclusive forms of communication, which limit location-based information sharing to personal contacts. This broadness in technical presets of use provides an excellent opportunity to observe which typical usage types actually evolve and become entrenched in the practice of urban life. We begin our assessment with City Guide and continue with Swarm.

⁶ For Foursquare's business model, cf. Frith 2015: 96pp. and Wilken/Bayliss 2015.

4.1 Foursquare City Guide: lurking and editing

The artefact analysis of City Guide indicates that the presets written into the app enable two complementary forms of use. When you open the app, the City Guide screen initially offers various search-and-discovery options. For example, users can search maps, categories or lists to obtain information on their GPS location. In contrast to similar services there is also the option of making full text searches within the archived annotations. After a brief period of familiarization, City Guide is a suitable tool for what is termed “lurking”. Within the social media context lurkers are typically considered to be the users of an Internet platform who call up content but do not actively participate in generating it.

An eye-catching interface feature and a technical preset that supports this practice of lurking called the Foursquare score. Every location which is created in Foursquare is rated by the app with a score from 1 to 10. This Foursquare score is derived from various information, such as user ratings or the total number of check-ins. The score helps the mobile user to quickly assess the popularity of a location at a glance. In our interviews, experienced Foursquare users considered a score above 8.0 to be a sure indication that a location is worth visiting. Lurkers, who spend more time searching for interesting locations, can read the comments left by other users. These comments, which City Guide calls tips, typically consist of one or a few sentences. They are often complemented by photos, intended to convey an impression of the location’s atmosphere. The content of tips ranges from warnings to all types of recommendations or helpful tips (e.g. abbreviations, wireless LAN passwords). In short, the users of City Guide share everyday and scene knowledge the same way as is commonly practiced in the personal public spaces of social media. In contrast to purely digital communication spaces, however, the constitutive point of reference for annotations is the physical location. Therefore, the credibility of tips increases in the perception of many users when the app shows that the writers have already checked in to the location several times.

Although the City Guide uses pop-up windows to repeatedly prompt the user to rate the locations visited and to leave comments, the majority of users belong to the lurker category. Lurking behavior is already widely known from social media.⁷ To the smaller group, which is willing to share their experiences with a public audience of users, the City Guide offers various options of generating content. Aside from rating locations with emoticons and uploading photos and short texts, users can create lists of similar locations or add new locations to a GPS position. In the

⁷ Jakob Nielsen 2006 sums up this circumstance in his 90-9-1 rule as follows: “In most online communities, 90% of users are lurkers who never contribute, 9% of users contribute a little, and 1% of users account for almost all the action.”

language of experienced users, like the superusers, these activities are characteristic of a usage type called “editing”. Earlier versions of the app employed game-based incentives to reinforce this behavior. Today, City Guide seems to rely more on intrinsically motivated users who wish to make their location-based expert knowledge publicly accessible.

The most important contribution of the so-called editors to the success of the app is the continuous writing of tips. One of the few remaining game-based incentives for editing is to allow the active users of Foursquare to apply for the position of a superuser and to rise through various ranks. In contrast to normal users, superusers have more opportunities to edit location-based annotations. For example, they can delete locations or make changes to telephone numbers, street addresses and other similar location-based information. Key topics at the superuser meetings we attended involved which editing rights are granted to which rank and how much editing work is required to move up the ranks. From these conversations we also gathered that superusers consider the work of editing to be an authentic form of reporting. Although theoretically imaginable, it seems like the majority of users is not interested in endowing locations with new meanings or making the public space more exotic. In fact, the objective even of superusers is to share practical everyday knowledge and positive experiences. This behavior is motivated by the expectation of being able to profit from the tips of other users when the superuser is present in an unfamiliar area.

The analysis of our interviews and observations indicates that lurking and editing slightly increase the accessibility of public places. However, the spatial order often remains unchanged, since the users we interviewed rarely used the app to exceed the limits of their own social worlds. Although it is technically possible to explore any location in the environment and to create new places for encounter, in practice this is hardly the case. The predominant motivation for using City Guide seems to be the desire to find more places that reflect a user’s personal preferences. Instead of looking for unfamiliar or different types of places, users set the various search filters in a way that most of the locations in their environment are made invisible and only those fitting to their specific preferences remain displayed on the screen. In truth, many interviewees confirm that they only search for places that resemble those they already know and that match their lifestyle. For example, one young business consultant, who has no office of his own and thus does most of his work in cafés, reported that he rarely visits locations which do not match his search criteria – which are the same relevant to him in times when he isn’t using the app. He considers cafés without free wireless Internet or an adequate number of electrical sockets to be useless to him:

“I just have my own criteria for a location where I’d like to work, so I don’t change them all the time, and then I actually tend to always end up in relatively similar places”. (Inexperienced user, age 26)

In a similar vein, users report that they always search for vegan products or special brands of coffee. Even though the majority of test subjects insisted that they were definitely interested in discovering new locations, their use of the app was mainly motivated by the desire to find more of the places they already favored than by the desire to encounter completely different places. The sheer curiosity to obtain access to unknown locations is not a very common motivation for using City Guide – at least not in our sample. This tendency to behave according to already existing practices and preferences is additionally reinforced by algorithmically generated suggestions. The users receive those, for example, when the app recognizes them moving within a new area. Thereby, the algorithms themselves also use places already visited and personal preferences as orientation. In this regard, one superuser we interviewed compares the location suggestions provided by City Guide with the purchase suggestions of the recommendation algorithms on mail-order platforms:

“If you then have a location that interests you, there are suggestions of other locations that are similar to it. Or: People who go here also like to go here and here. It’s this Amazon effect”. (Superuser, age 43)

Nevertheless, there is also an obvious selectivity in the views and viewpoints on the urban space that are reflected in City Guide by the different locations presented and the annotations to them. By far not all the societal groups and social worlds in urban life are represented here equally (if at all) with their perspectives on urban spaces. After one of our test subjects, a chemistry student, had used City Guide to help her explore her neighborhood in one of Berlin’s districts that is strongly influenced by migrants, she told us:

“Interviewee: ‘There are a ton of kebab shops here and you just notice that about 50 percent at least, or no, 30 percent of the people here have something or other to do with Turkey. When I look at reality and look at Foursquare [City Guide], Foursquare seems a little European to me.’ Interviewer: ‘Okay. Then how would you describe the image that Foursquare presents - European and maybe some other attributes you can think of?’ Interviewee: ‘European, progressive, creative and little bit green oriented, I guess.’” (Inexperienced user, age 21)

The same selectivity is found in the makeup of the user group at the superuser meetings we attended. At the same time, however, many of the superusers we spoke with do not consider the

comparatively homogeneous spectrum of social worlds represented in the City Guide a disadvantage. On the contrary: The fact that the majority of users share similar lifestyles is considered to be quite functional in the sense that it makes it easier to trust the recommendations and taste judgements of other users. In other words, in the majority of cases the objective is to expand your radius of movement within public space without leaving your own social worlds.

However, we also find some indications in our empirical material of an increased accessibility of public places. Repeatedly, our interviewees referred to City Guide as a “window” that allows them to look behind the walls of unfamiliar places. This does not necessarily result in users actually visiting a place, but it does seem that social barriers are broken down. For example, a young historian reported that she often feels uncomfortable entering new locations. Normally she enters unfamiliar places only in the company of friends. But reading the annotations of other users helps her to overcome social barriers, as well:

“Places you don’t otherwise go into, it’s a kind of barrier, I don’t really know what makes me go in there, especially not alone, and I think the app does give you a different feeling about what you can expect there. And so it can kind of take away the barrier a little, or you just see, yes, no, it confirms my impression, but in a certain way, sure, it also takes over the position of people who might say to you in such a case, hey, but it’s worth going in there, but they aren’t always around and not all your friends have been everywhere. [...] So I do believe that it [the app] is a door opener.” (Inexperienced user, age 25)

In other words, Foursquare makes it easier for strangers to slip into the role of tourists who explore unknown worlds from time to time. City Guide adopts the function of a tour guide through their own city and invites its users to make brief visits to locations in alien urban scenes.

In the same sense, the aggregated score with which each location is rated in City Guide seems also to function as a door opener that helps crossing the threshold into places harboring unknown social worlds. A few of our interviewees based their searches for locations more on the aggregate score than on the annotated personal comments or photos from other users. First and foremost, it is the superusers who trust in this algorithmically calculated number of points. The score is based on both user ratings and other indicators such as the total number of check-ins. In a way, however, the Foursquare score is blind to the symbolic meanings of locations, which are primarily expressed in annotated photos and tips. But, according to some interview partners, their trust in the score sometimes led them to places they would never have chosen based on their visible external appearance. For instance, a superuser reports that while searching for pancakes he ended up in a restaurant with an unusually high score that he had hitherto avoided:

“A restaurant, from the outside it looks like a rocker bar. So I probably wouldn’t have gone in there. But on the inside, it looked like my grandma’s living room and they had delicious pancakes! [Laughter] Well, I really would never have gone in there. This was also one of the times I had based my search on the score.” (Superuser, age 37)

4.2 Foursquare Swarm: lifelogging and following

Turning to Swarm we notice that the user interface of the app has little similarity to the design used for City Guide. The app works independently of City Guide, but many users link the functions of the two apps. In Swarm everything revolves around the check-in function. As soon as a user clicks on the check-in button in the bottom center of the user interface, Swarm displays a list of possible locations which share the current GPS coordinates. Every time a check-in is performed the user is prompted by the app to enter a brief comment or upload a photo. However, users can easily bypass this prompt. For each check-in users receive points, referred to in the app as coins, as well as stickers. First-time and periodic check-ins are rewarded with additional coins. The stickers relate to the function of a location. For example, users receive a gas tank sticker for their first check-in at a gas station, a shopping bag sticker for a shopping mall, a cocktail sticker for a bar, etc. Users can collect up to 100 stickers which reflect the variety of the locations they have visited. When Swarm is linked to Foursquare City Guide, users receive additional push messages containing location-based tips from other users as soon as they check in.

Swarm offers two options for using check-ins. Firstly, Swarm offers a new location-based form of lifelogging. A digital lifelog is a detailed chronicle of a person’s everyday activities which typically encompasses large volumes of technically protocolled data. Originally, lifelogging apps recorded fitness- and health-related data. In the case of locative media, lifelogging involves protocoling the locations visited. For instance, Swarm can show its users a list of their check-ins in chronological order or make them visible on a map. In this way users can follow how often and on which days they checked in to a health club or a supermarket, for example. In tandem with the comment function, this list becomes a digital journal and photo album. The purpose of this function is not to exchange information with other users or to increase the accessibility of a location. Rather, our interviewees were motivated primarily by their personal desire to preserve fleeting recollections of locations visited and to retain such memories:

“For me it’s [Swarm] more like a kind of memory function. A type of localization that tells me: You’ve already been here. And I’ve checked in to locations where I could swear I’d never been to before, but then it seems I actually had been there before! And checked in there.” (Superuser, age 36)

The list of personal check-ins leads, if at all, only indirectly to a search for access to new locations. This is the case, for example, when user's lifelogs cause them to conclude that they don't yet have adequate knowledge of their surroundings. In her subsequent interview, one of our participants, who had tested Swarm for the first time, is astonished to discover that her life is limited just to a few areas of Berlin, despite the city's size and the opportunities this offers:

“What I found interesting was that my daily life is actually a kind of triangle. In Wedding, where I live, then in Charlottenburg, where my university is and where I sometimes go to nearby restaurants, and then in downtown, too. That everything is in this area. Okay, the church is a little bit farther south in Wilmersdorf. [...] To see that I [...] move within such a tiny area, it actually was impressive to know that.” (Inexperienced user, age 21)

Aside from lifelogging, Swarm offers a second function typical of social networks: to follow the activities of other users and to make friends as a follower. As in social network websites of the Facebook and Instagram type, users can send messages to befriended members. Far more important, however, is that the users of Swarm can follow check-ins in order to keep track of their friends' current locations or to set up meetings. As in conventional social networks, the number of Swarm friends normally extends beyond the close circle of personal acquaintances to include other users whom they rarely if ever meet face-to-face. The inclusive potential remains low, however, as users generally follow people who share the same lifestyle and taste. In her interview, a superuser reports how she chooses friends and how her community of Swarm friends is constituted:

“Interviewer: ‘Do many of your friends use Foursquare too?’ Interviewee: ‘Nah, not many. I have my friends and my Foursquare friends. I mean, my friends from the office or my boyfriend's friends and people I know. And then I have Foursquare friends, and they think like me. They have similar tastes. And I trust their taste. So I wouldn't consider them to be friends, but rather acquaintances. But I trust their opinions. And that's why I follow what they say and I believe their ratings. But the communities are separate. Not all of them. My boyfriend is a Foursquare fan too. And other friends, who I would consider friends. But not all of them. Some are very ‘random’. And I know them through Foursquare and not through anything else.’” (Superuser, age 34)

Additionally, users compete within their contact networks as to who collects the most coins per week. Swarm regularly reminds its users of their current rank in the competition for coins. Although there are no advantages to the winners, the playful competition increases the incentives to make frequent check-ins. This integration of virtual game elements into everyday life seems to entangle even users like the superuser just quoted who do not feel at home in the anonymous gaming worlds of the purely virtual space:

“When I was a child EVERYONE was into video games. Everyone was into them. And I was always outside. I never understood it. But what convinced me was: I can play with real life. I can (...) I can compete with my friends. Everyone is on a map and I see them like in a video game. At least in the MPO (...) at least in the multi-player games. Everyone loves it. Everyone plays with unknown people in unrealistic worlds. For me it was exactly those experiences, but with my own world! And that’s what gave me a kick.” (Superuser, age 34)

In short, the emphasis of the functions in Swarm is on personal life and the contact network which encompasses either personal friends or acquaintances with similar preferences. Thus the app has more of a potential for intensifying exclusive social interaction constellations because it emphasizes and strengthens existing social bonds and lifestyles. It offers only few opportunities for interaction with unknown users in the immediate vicinity. One exception is the competition for what are called mayorships; these are symbolized by crowns and are pinned to the profiles of those users who have checked in to a location most often over the previous 30 days. Such mayorships are competed for by all persons who check in at a location, regardless of whether or not they follow each other in the Swarm network. As a rule, however, this playful competition does not seem to result in strangers overcoming the rules for social distance in public space nor to increasing communication with each other. Only when participants were already acquainted with one another, as in the case of a programmer we interviewed, who competed with his colleagues for the most frequent check-ins at work and to a nearby health club, did the competition increase communication between those physically present.

5. Discussion of results

In order to capture the influence of locative media on the perception and appropriation of public places, differentiated analysis of various applications and modes of use must be performed. For this reason, based on the research literature we have differentiated between three types of locative media use and formulated two opposing hypotheses supported by various authors – more or less explicit – with regard to the effects of cyber-physical constitution of space. On the basis of this theoretical sensitization we have employed qualitative methods to provide a more precise description of one particular type of locative media use – digital annotation – and have analyzed our empirical material concerning the question as to which inclusive or exclusive forms of use can be found. From the viewpoint of mobile annotation services, the results are ambivalent. Using two apps which pre-structure the use of annotations in different manners we have identified four annotation use

types which are probably found in this or similar form in connection with other annotation services, as well.

In the first step of our analysis we successfully demonstrated that the City Guide app supports the location-based use forms of lurking and editing. Although these forms of usage have the potential for increasing the accessibility of public spaces because they make it easier for users to obtain information on their physical surroundings first hand, many users filter the annotated information according to lifestyle-related criteria, with the result that they rarely cross the boundaries of their own social worlds. Empirical reality (presently) seems far removed from the expectation of earlier studies that digital annotation might contribute to the transformation of non-locations where little communication takes place into new locations for public communication and encounter (cf. Buschauer/Willis 2013: 17; de Souza e Silva/Frith 2012: 164pp.; Frith 2015: 72pp.; Parisi 2015: 7pp.; Schwartz 2015). With this the expectation arouse that locative media centered around annotation might contribute to social inclusion by creating cyber-physical arenas that make the diverse voices of urban life heard. These studies took the fact that more and more public places are being annotated to come to the hasty conclusion that users would receive this information unfiltered. But just as little as formal and legal access to public places is sufficient to make them into urban meeting places, general accessibility of annotated information alone is equally insufficient to counteract the territorial segregation of social worlds. On the contrary, practices in the use of annotation service are emerging which are more suitable for increasing the segregation of social worlds, such as when users apply the annotated information in a way that enables them to more unerringly maneuver within their own urban scenes.

The results of our second analytical step, which we focused on the social network functions of annotation services taking Foursquare Swarm as our example, also seem to indicate that it would be wise to exercise caution with respect to the expectations reported in the literature regarding the inclusive potential of locative media. The primary purposes of use forms such as location-based lifelogging and following are private recollection and the communicative exchange between like-minded people. However, we do not view Foursquare Swarm or other similar services as the significant motor of social inclusion and exclusion processes accompanying the practices of their use. In fact, lifelogging and following reflect the already existing lifestyle of users who create social-spatial distance and distinctions independent of their media use as well. Swarm and other similar services offer tools to more strongly emphasize the location-based aspects of its users' lifestyle. In this way the physical contours of social word lifestyles can be stabilized and may become more obvious, but it seems that the social order of the public space remains more or less unchanged.

From these statements it becomes clear that the inclusion and exclusion hypotheses denote extreme poles of social development trends that outline a space of possibility within which the actual development takes place. Both the fears of the exclusion hypothesis and the euphoria of the inclusion hypothesis seem to be exaggerated.

But possibly, the image drawn here of the space-related effects of locative media may change if we include further types of usage such as navigation or chance management. In the view of subsequent project work we therefore plan to compare the use of annotation services with other location-based apps, particularly those from the gaming sector. In contrast to annotations, location-based games are not designed to reflect existing knowledge of urban areas, rather they transform such areas into playgrounds and probably have a greater potential to alter the symbolic order of public space. We also suspect that the community of users of popular games like Pokémon Go or Ingress is distributed across a broader spectrum of social worlds than it is the case with annotation services. When players from heterogeneous social worlds are involved, more significant inclusive effects might be observed. It remains an important task in the social science research of space and technology to further examine and explore the potential of locative media to alter the accessibility of urban space – thus also providing an empirical basis for grounding the expectations of the technological pioneers and the fears of the critics.

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