

# **Capture and share the city: Mapping Instagram's uneven geography in Amsterdam**

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## **Capture and share the city: Mapping Instagram's uneven geography in Amsterdam**

*Abstract* – How do city dwellers use social media to represent, perceive and navigate the urban landscape? How do they use these media to find out what is happening in their city and to communicate their sense of belonging? How does the city feed into digital networks, and how these networks feed on the city? This paper develops a relational approach to these questions that relies on an innovative combination of qualitative methods and network analysis. It demonstrates the utility of this approach by analyzing a dataset of over 400,000 geotagged Instagram posts from Amsterdam posted by more than 30,000 users over twelve weeks in 2015. The analysis illuminates three important aspects of the interface between social media and the city. First, Instagram functions as a *filtering device*. It is a membrane over the surface of the city as it selects out certain parts of the urban landscape – the glamorous, the hip, the refined – and passes them through to users. By producing and circulating appealing pictures of exclusive, exciting and avantgarde establishments and events, Instagram users serve as voluntary promoters of high-end consumption and accelerators of gentrification. Second, Instagram functions as a *stratification device*. The networks that form on the platform are highly uneven. Some users command the lion's share of the attention, while the overwhelming majority are relegated to the margins. Similarly, a relatively small set of places reaps most of the benefits from being pictured on the platform. The users and places that gain a high degree of visibility on Instagram already have considerable symbolic resources at their disposal in other domains. Third, Instagram is also a *segmentation device*. Users often cluster within subcultural groups that relate to the city in different ways. While Instagram users arguably enact neoliberal subjectivity, they are not mere cogs in the urban development machine. Their appreciation is reserved for distinctly local establishments, not for large chains. They also value cosmopolitan places where people from different backgrounds come together. The paper thus reflects on the refraction and restructuring of the city through social media. Its approach and findings inform both urban studies and media studies and speak to lacunae in both fields.

“Capture and share the world’s  
moments.”

—Instagram motto

The contemporary city is beset with inequalities, not just in terms of the material distribution of resources and amenities, but also in terms of recognition and visibility. Areas and groups considered undesirable – the *banlieue*, the disabled, the elderly, immigrants, the homeless – are frequently degraded or rendered invisible, while spaces of upscale consumption and sanitized tourist havens are elevated. This uneven distribution of visibility is a well-known aspect of urban visual culture (Mirzoeff 2015; Schroer 2014). Many studies have drawn attention to the ways in which technocrats and developers use their power to promote specific representations of the city and shape it according to their ideologies and interests (Lefebvre 1991; Scott 1998). In this context, the proliferation of distributed media technologies is often heralded as a seismic shift: the power to represent the city is no longer concentrated in the elites controlling the state and mass media, but is distributed as people use their smartphones to produce and circulate messages of their own making (Castells 2009). However, we do not yet know what kinds of networks social media users form and how representations of the city circulate through these networks. While recent scholarship has extensively investigated the interplay of online and offline spaces in social movement mobilizations (Borge-Holthoefer et al. 2011; Castells 2012; Gerbaudo 2012), we know relatively little about city dwellers’ use of social media outside of periods of political contestation and turmoil (for an exception, see, e.g., Stephens and Poorthuis 2013). How do people represent the city on social media? And how do these representations in turn shape people’s uses of the city? To answer these questions, we develop an approach that grasps the relations underlying representations. We put this relational approach to work in a study of the symbolic geography of the city of Amsterdam on the popular photo-sharing platform Instagram. While our findings confirm that social media empowers citizens to represent the city from their perspective (Foth et al. 2011; Silva et al. 2013a; Ciuccarelli et al. 2014), we also find that Instagram’s networks and representations are highly uneven and that they accentuate socio-spatial inequalities.

Our paper is organized as follows. First, we provide some background on Instagram, the social photo-sharing platform at the center of this study, and briefly introduce the context for our case study in Amsterdam. We then elaborate our conceptual framework for the following analyses, which centers on the notion of regimes of visibility. This study draws on an innovative combination of data sources and methods, and we describe these before presenting our results. The presentation of our results is organized in four sections. The first draws on content analysis and interviews to understand Instagram as a way of seeing the world. The second section looks at patterns of self-organization among Instagram users. Our analysis finds a high degree of stratification in the ways Instagram users interact with the images they look at and the users who post them. A relatively small number of accounts is able to command a large share of the attention. We introduce some of the figures that predominate in the production of Amsterdam's symbolic geography on Instagram. In the third section, we investigate relations not among users but among landmarks in the city that function as focal points for Instagram users in the city. Here, too, our analysis finds a high degree of stratification, with a few high-status places commanding the bulk of the attention. The fourth section utilizes community detection to identify different subcultural groups. We find that these groups are embedded in Amsterdam's geography to different degrees and in different ways: some groups claim places within the city much more assertively than other groups. We conclude by outlining various mechanisms through which Instagram users develop uneven networks, claim space, and imbue symbolic value in some rather than other places.

### **Uneven networks**

While people's experience of place has always been shaped by communication – whether informal conversation on the street corner or news accounts drawn from mass media – the proliferation of media technologies has provided users with the capacity to instantly share their impressions and images with distant audiences. “The key feature of wireless communication,” Castells notes, “is not mobility but perpetual connectivity” (Castells 2009: 69). City dwellers increasingly perceive and navigate the city through smartphone applications and wittingly and unwittingly leave traces of data that in turn serve as input to decisions of others. The proliferation

of media technologies wraps an amalgam of communication systems around the city, weakening and complicating reality through the multiplication of places in representations (Sontag 1999 [1978]). Any city user with a mobile phone can capture and share any thought or view, redefining reality “as an item for exhibition, as a record for scrutiny, as a target for surveillance” (ibid.: 82). While mobile technologies allow users to instantly and incessantly feed thoughts and images into their timelines, it is critical to acknowledge that this process is uneven and selective. The interface between the city and social media is like a membrane (de Waal 2014) that filters images and thoughts: only some are recorded and circulated, most are not. Users are, by necessity, highly selective in what they communicate, where they communicate, to whom they communicate, and in which channels they communicate. Mediatization does not usurp reality in its totality, subordinating it to a single “media logic,” but warps it through selective and strategic representation. Our aim is therefore to explore uneven patterns of strategic and selective representation as well as their underlying mechanisms. We are specifically interested in the interface between social media and the city, highlighting how places within the city are selectively represented on social media and how social media, in turn, reshape the experiences and uses of the city. For these purposes, we adopt a relational perspective that examines how users relate to each other and the city on both the microscopic and the macroscopic levels (Elias 1978; Emirbayer 1997; Collins 2004).

A microscopic perspective brings into view the experiences of social media users as they go through their timelines or post their messages. In our case, we are interested in how individual Instagram users communicate an image of the world and of their identities. Such practices are by necessity a selective undertaking. On Instagram, users select certain places and moments, choose an angle and a frame, invent witty hashtags, and use one of a selection of filters to produce an image for circulation to followers who have subscribed to their updates. Even if users post images without giving them much thought, they are nevertheless communicating – consciously or unconsciously – a sense of what is beautiful, enjoyable, humorous, or interesting to their followers. This process of communication continues as users see posts of users in their network. Social media, including Instagram, offer users the possibility to curate their feeds by following others which means they get to see the

world – and the city – from their perspective. One of the tasks is therefore to discover how Instagram users produce posts of their own and how do they perceive the posts of others. We are specifically interested in the interface between online and offline places: how do users register and perceive places within the city?

In addition to a microscopic perspective, we need a macroscopic perspective to bring the broader patterns of uneven relations on social media into view. These broader patterns emanate from individuals' interactions but they also have a dynamic of their own in the sense that stratification or group formation may result from only small differences in preferences and without users consciously contributing to these patterns (Elias 1978; Schelling 1978). A relational perspective is especially opportune because social media are inherently and overtly relational. In the case of Instagram, users establish relations by following updates, “liking” posts or leaving comments. These mundane practices weave patterns of uneven relations, investing recognition in some posts and people and not others.

These individual acts contribute to *stratification* as some users and posts achieve greater recognition than others. Self-organizing systems – i.e., systems that are not designed from the top-down by an architect but result from the bottom-up through individual strategies – are often described as “horizontal” (e.g. Castells 2009, 2012), but the literature suggests that they have highly unequal distributions, with a few users receiving the bulk of attention and a long tail of more peripheral users. This pattern has been found for intellectual debates (Collins 1998), hyperlinks on the world-wide web (Barabási and Albert 1999), and scientific debates (Newman 2001), so we might expect it on Instagram as well. By preferentially associating with some rather than others, users weave asymmetric figurations in which a few emerge as stars and most are relegated to the periphery. One of the tasks is therefore to discover how recognition is distributed among Instagram users. Which users and posts receive recognition and which do not? Again, we are specifically interested in the interface between online and offline places: how do users elevate some places by recognizing them more than others?

Users' interactions also create *segmentation* into different groups. There seems to be consensus in the literature that social media afford users opportunities to associate with like-minded people. In the urban context, this results in what Robson and Butler (2001) call “social tectonics” and what de Waal (2014) refers to as “living

apart together”: urbanites may live in very diverse cities but they selectively associate with others to create homogeneous networks and demarcate their domains. Users can employ their mobile phones as “territory devices” by selecting to retreat from interactions with proximate others (de Waal 2014) but they can also, as Instagram facilitates, capture and share their experiences by posting pictures of the places they attend and the encounters they have. These representations serve as a way to mark places in the city and to make them into a focal point for the formation of groups. While we know that Instagram users are disproportionately part of specific segments of the population, it is nevertheless likely that selective association among users results in the formation of subgroups. One of our tasks is therefore to discern specific subgroups within Instagram’s population. Which groups can we identify and how can we characterize those groups? Focusing on the online/offline interface, we are specifically interested in how these groups are spatially embedded and how they mark places within the city as their own.

### **Background on Instagram and Amsterdam**

Before going into the details of data collection, it is important to provide some background on Instagram and explain why it is a particularly suitable platform for investigating the interface between the city and social media. Initially used by digital photography enthusiasts to add filters and effects to their photos, Instagram has since its launch in 2010 evolved and ascended to join the ranks of the most popular social networking sites. In 2012, Pew researchers found that 13 percent of online adults in the United States used Instagram. That proportion climbed each year, reaching 26 percent in 2014 (Pew Internet & American Life Project 2012; Duggan et al. 2014). The researchers found the service to be dominated by young adults. In the age category between 18 and 29 years, over half of respondents reported using the service in 2014. Nearly half of Instagram users surveyed in 2014 reported using the service daily. Men and women were initially represented in roughly equal proportions, but adoption by women has sped up at a greater rate than for men (Duggan et al. 2014). Today, the service is used by over 200 million users around the world, and they share 70 million pictures each day (McCracken 2015). In the Netherlands, a February 2015 report stated that Instagram had 1.8 million users,

compared to 2.8 million Twitter users and 9.4 million Facebook users (out of a population of just under 17 million). Use of Instagram was up almost 30 percent compared to the previous year, and the number of users reporting to use the service on a daily basis was up 35 percent to 700,000. During the same time, the number of Twitter users reporting they used the service on a daily basis was one million (NU.nl 2015).

Instagram posts are public by default, though users can opt to make their accounts private so only followers that they approve can see their posts. Users upload photos (or videos) and optionally apply filters to them. They then share them, making them discoverable by adding hashtags. In the mobile application, hashtags are clickable, taking the user to a stream of all posts to which the hashtag has been applied. In the image caption, users can also “tag” other users by adding their handle. Tagged users are then notified. Users can also comment on posts, but it is notable that, unlike Facebook, Instagram is rarely used as a platform for discussion. The images speak for themselves.

Another option users have – crucial for our discussion here – is to associate a location with their posts. Unlike on Twitter, where location can be activated for all tweets by setting a one-time preference for an account, users opt whether to attach their location to posts on a post-by-post basis. When they do so, they can either select a location from a database of predefined places, or they can name their location. In either case, coordinates are included in the post along with the location name and identifier. In the Amsterdam city limits alone, we found about 30,000 such named locations. Posts can also be geotagged without tagging a specific location. Instagram recently added a feature to its app in some cities that shows “trending places” being tagged by users in the vicinity (McCracken 2015; Instagram Engineering 2015). This foregrounds the locative dimension of Instagram and suggests that the service is taking on some of the features of check-in services like Foursquare. Users of the mobile app are encouraged to move seamlessly from taking pictures to uploading them, so many images posted to Instagram tend to capture a specific moment or a specific place. Instagram is also a popular platform to circulate memes and other visual jokes, with some accounts gaining minor celebrity status. While there are other social media platforms that are image-centric – including Pinterest and Tumblr – Instagram is the most widely used platform. It is also the one

that stresses location most strongly, making it a good choice to study how spatial and visual media practices go hand in hand.

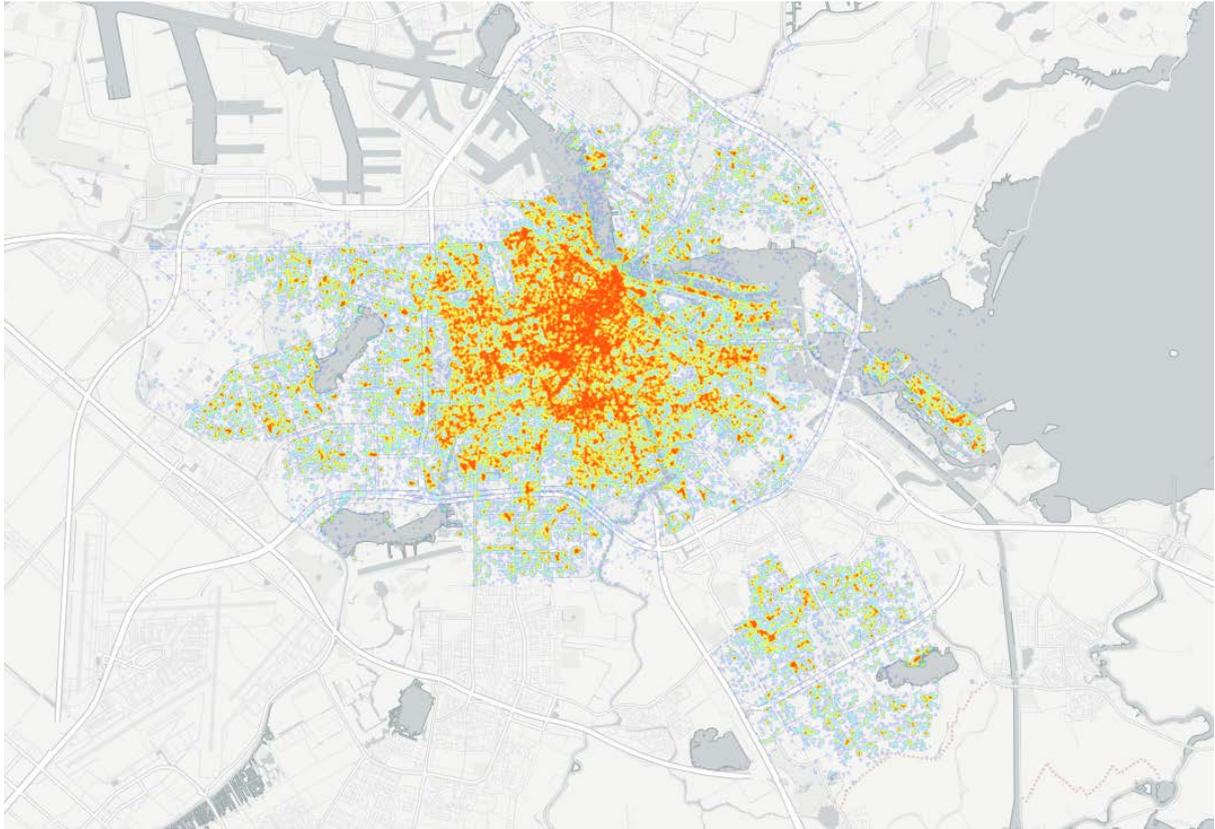
Since we are interested in how Instagram feeds off and feeds into the city, it is important to contextualize the following analysis by briefly considering the specific local context in which Instagram users are operating. Amsterdam is a major center of the Netherlands' cultural and economic life. With a population of only 800,000, it is much smaller than London, Berlin and other European metropolises, but its influence in the region far outweighs its size. It is a place to spot the emergence and spread of new cultural trends and social forms. In the wake of urban renewal policies and population shifts, several areas in Amsterdam are gentrifying or have been gentrified since the 1980s (Van Gent 2012; Uitermark and Bosker 2014). Amsterdam's population heavily skews towards younger people in service professions – the kinds of people that tend to use Instagram. Amsterdam also has a relatively high degree of racial and ethnic diversity, both as a result of longstanding Dutch colonial relations and more recent immigration to the country (Foner et al. 2014).

## **Data**

We study user experiences ethnographically and use network analysis to study the figurations that emanate from and structure interactions among users. We collected the data for the network analysis through Instagram's application programming interface (API). Most social media platforms provide APIs that make it possible for third-party developers to build clients or services on top of these platforms. Most importantly for our purposes, programmers using the API can access user-generated data in bulk. Instagram allows developers to query for posts published in a geographic area defined by a midpoint (specified by latitude and longitude coordinates) and a radius up to 5,000 meters. We found a series of circles that cover the entire area of the city of Amsterdam and queried them at regular intervals using a research tool we developed (Boy 2015).

Our initial corpus consists of nearly one million geotagged Instagram posts originating from the Amsterdam municipal area gathered over an twelve-week span between 19 April and 12 July 2015. Our corpus contains only posts that are geotagged, which comprises an estimated 20-25 percent of all Instagram posts. This

is likely a skewed sample of overall Instagram activity, but since we are particularly interested in Instagram as a *locative* visual medium, this selectivity is justified. Further, since our main interest is in how city dwellers use social media in their everyday lives, we considered only users who had at least two posts at least four weeks apart to eliminate likely tourists, bringing down the number of posts to 480,000. These posts were created by more than 30,000 users. Each post contains more than fifteen pieces of metadata, including a timestamp, user data, location data (coordinates and in some cases a named location), a caption (if provided by the user), and hashtags (e.g., #amsterdam or #cappuccino). About twenty-four hours after they were posted, we collected the responses (likes and comments) each post received.<sup>1</sup> The resulting dataset of responses has over 17.5 million entries, of which 1.1 million originated from local users.<sup>2</sup> While we have no guarantee that this method allowed us to store metadata from every geotagged post in Amsterdam, we are confident that we collected a meaningful share of posts and that there is no systematic bias as far as their spatial distribution in the city is concerned. Figure 1 provides a map of the geographical distribution of Instagram posts in our sample.<sup>3</sup>



**Figure 1. The distribution of geo-tagged Instagram posts from Amsterdam in the dataset. Hotter colors indicate more posts. Density of Instagram use roughly corresponds with socio-economic status and historicity. The historical center and the gentrifying nineteenth-century districts around it, such as Jordaan in the northwest of the center, are heavily covered. Roads from gentrifying districts to the canal district can also be discerned.**

## **Methods**

Our approach investigates practices and patterns of Instagram use microscopically and macroscopically. On a microscopic level, we researched how people see their worlds and especially the city through Instagram using qualitative methods such as content analysis, in-depth interview, and (auto-) ethnography. To get an understanding of what kind of images Instagram users produce, we selected a random sample of 140 posts to systematically analyze what is represented in the pictures and how it is represented. This is important because media and scholarly accounts have often assumed certain usages, for instance that Instagram is used especially for “selfies.” In the absence of information about users’ age, occupation, social class, we also use this sample to get a sense of the kind of individuals and

organizations that are using Instagram in Amsterdam. In addition to analyzing Instagram posts, we conducted in-depth interviews with seven active Instagram users, had informal conversations with Instagram users, and used the platform ourselves to become acquainted with its functionality and conventions. During the in-depth interviews, we asked a range of questions to get a sense of our respondents' backgrounds and subsequently discussed how they used Instagram. We also looked at their feeds and let them talk about images they posted.

On a macroscopic level, we examine the broader patterns that emerge from users' interactions. The basis of our network analysis are the "likes" and comments through which users engage with each other. These mundane practices weave webs of uneven relations, with some posts and users receiving a lot of recognition and acquiring central positions and other posts and users taking up more marginal positions. We consider users to have a tie if they either commented on or liked another user's posts during the twelve-week window we studied. The topology is constructed by considering these ties as directed edges between users, who are represented as nodes.<sup>4</sup> Ties are weighted according to the number of comments or "likes."<sup>5</sup> We look at these network topologies for the city as a whole as well as at the neighborhood level.

To study *stratification*, we look at the distribution of "likes" and "comments" among users. Rather than simply counting the number of likes and comments, we also want to take into account the prominence of the users doing those acts of recognition: if a very prominent user "likes" a post or writes a comment, this should count more than when a peripheral user does the same. For this reason, we use the Page Rank algorithm – first developed to rank search results for the Google search engine (Brin and Page 1998) – to map the distribution of recognition and identify central users. If there were no bias toward certain images, users and places, we would expect to find a more-or-less random pattern of ties. If, on the other hand, Instagram users expressed clear preferences for certain other users and places, we would find a skewed distribution.

To study *segmentation*, we identify different communities of users, i.e. users who have relatively strong direct and indirect ties. While there are many algorithms to detect such communities, we opt for the Infomap algorithm (Rosvall and Bergstrom 2008), which has performed well in comparative tests (Lancichinetti and

Santo Fortunato 2009) and is widely used among network analysts. To characterize the groups obtained from the community detection, we looked up the accounts of the most central users to see what their backgrounds are and what images they circulate. To investigate how these groups are situated in Amsterdam's geography, we calculated a general score for "spatial embeddedness": the proportion of posts that tag a location.<sup>6</sup> This tells us something about the extent to which the different groups mark places within the city. In addition, we wanted to know what places they marked. Note that this is not the same as simply measuring where these people are. While tagging places on Instagram is very common, it is still an act of distinction, so we can see a place tag as an expression of pride: users who tag places are not simply there, they also want others to know and see that they are there. We are not only interested in individual places but also in sets of places with distinctive profiles that are tagged by the same people. Silver et al. (2010: 2293) conceptualize these sets of places as scenes, i.e. clusters of urban amenities that provide the context for "consumption-based expressions of shared sensibilities as to what is right, beautiful and genuine".

### **Seeing the world through Instagram**

Let us start at the micro-level: what do Instagram users see when they scroll through their feeds and how do they choose to represent certain practices and places rather than others? What users see depends on a number of factors: who they follow, where they connect from, and how they use the app. It is easy for users to be caught in an "Instabubble," seeing only the kinds of images they have signaled a preference for<sup>7</sup>. Nonetheless, there is a discernable "signature" to Instagram posts; Instagram projects a certain kind of *Weltbild*. In this section we investigate this view of the world, first through a content analysis of randomly selected posts, then by detailing some of the experiences with the platform narrated by our interview respondents.

#### *Into the stream*

Although scholarly and popular accounts frequently regard Instagram mainly as an outlet for the narcissistic practice of posting selfies, our study of a random selection of posts from our dataset suggests that is not, in fact, what it is mainly used for.<sup>8</sup> Among geotagged posts, outside views of the city predominate. They account for

almost a quarter of the images in our random sample. These images mainly depict characteristic sights: Amsterdam's canals, tulips in bloom, distinctive architectural details of buildings in the city center, or large groups of cyclists waiting for the green light at an intersection. Pictures are often taken at sunset when the light is favorable. Usually the images are not spectacular; they don't portray a stunning panorama, but rather capture an individual's street-level view of daily urban life and the built environment. Thus, the "art" of these posts is to aestheticize the quotidian.

In terms of images of people, it is the group shot that predominates, not the selfie. Counting images of couples, there are about twice as many depictions of groups as there are selfies of individuals, though of course some group pictures are taken arm outstretched, selfie-style. Groups are usually pictured in moments of conviviality. The overwhelmingly young women and men that appear in these shots are often dressed for a special occasion, smiling, and enjoying drinks or a meal together. Unsurprisingly, portraits of individuals tend to show well-dressed people posing in interesting places.

Users also portray objects, often artfully arranged like still lifes (Instagram users refer to these compositions as "flat lays"). In one images we see a Jeff Buckley record sleeve propped up atop a record player. We find Easter decorations, book covers, new shoes neatly placed by the wall, and designer furniture arranged on hardwood floors. A related genre of picture is the food shot showing a plate of mouth-watering appetizers or a particularly well executed example of latte art. Unlike the still life compositions, the food shot tends to be taken outside the house, in cafés or restaurants. A small but noticeable number of posts are by store accounts showing their products, usually clothes or shoes.

Pictures taken at events, such as concerts, account for a little over five percent of images in our sample. Users also frequently share images that originated elsewhere, such as memes, pictures with quotes, or photographs of celebrities. These account for one in nine posts. Some of these images are cute (cats) or funny (memes), while others are advertising for events. Except in the case of advertisements, there is rarely a relationship to the location these images were posted from. Finally, and perhaps surprisingly, we found only a relatively small proportion of photographs of pets, and almost no baby pictures.

Instagram posts capture moments – moments set apart by refined beauty, elevated positive emotion, and heightened enjoyment. As Henri Lefebvre noted, moments can be distinguished from mere instants: “When we say ‘It was an enjoyable moment...,’ for example, it implies a certain length of time, a value, a nostalgia and the hope of reliving that moment or preserving it as a privileged lapse of time, embalmed in memory. It is not just any old instant, nor a simple ephemeral and transitory one” (Lefebvre 2002: 343). Instagram users train their eye to spot slices of the world around them that stand out. The criterion for whether to capture and share a specific view is its “momentousness.” Does it condense some quality, such as beauty, wit, or glamor? Looking through a stream of Instagram posts, one sees a seemingly interminable series of peak moments. These moments emerge from everyday life and engulf it.

### *Instagram’s gaze*

As users browse through their feeds, they get a sense of Instagram’s aesthetic norms and internalize them to some degree. In this context, the exception proves the rule. One of our respondents has a highly developed critical reflexivity about Instagram. Worried about the intrusion into her privacy, she disabled the link between her Instagram and Facebook accounts, switched her Instagram account to private, and disallowed Instagram from using her iPhone’s location services. She pokes fun at Instagram users who show off their preference for exquisite food or healthy lifestyles, for instance, by posting a picture captioned “I hate refined deserts” in which she poses next to a well-composed *haute cuisine* desert and sticks out her middle finger to the camera. When asked directly in the interview, she explicitly states she never tags places. However, as the interviewer goes through her Instagram feed, it appears that she does, in fact, geotag many of her holiday photos. One recent post in Amsterdam also has a place tag. It’s a post that pictures her at Walter’s, a bar on Javastraat that is among the most prominent Instagram places in the gentrifying neighborhood Indische Buurt. The respondent is perplexed that she did that.

Respondent: I don’t think I have... well, maybe here. Oh! It says...

Interviewer: You tagged the location, Walter’s. This is on Javastraat.

Respondent: Yeah, I did. Interesting. Yeah, I did it here. Yeah. That was nice. [...] Yeah, it was new then, and it was very nice, it was very... dinner was very good, and a friend of mine

worked there, she was our waitress. Maybe, I don't know why... maybe also to show, "I went to the new cool place!" I don't know what was going through my mind.

We think that this illustrates that Instagram's functionalities entice even reflexive and critical users to engage in strategies of distinction and the digital marking of space.

Another user, a 26-year-old woman whom we identified through her central position in her neighborhood network, was more explicit about this:

Interviewer: How do you find that a new restaurant has opened that you want to go to and those kinds of things?

Respondent: Yeah, mostly Instagram, actually. I follow a lot of people from around here. There's always someone who hears about it, and then it just spreads so quickly. You just see people going there, and... yeah. Sometimes I'm the first, sometimes someone else is the first, but I always like to be one of the first to go. It's like a little – it's not really a competition, but in a way it also is, a little bit. [laughs]

She attributes her success in this competition to her acute awareness of her surroundings.

Respondent: I always look around. If I see new places and it's something that really interests me – it's like a gift. I see everything. I actually see, if you have a big street with shops and it's completely chaotic, I still see if there's a new place opening there, because it's just something I notice. I see everything. My doctor says that it has something to do with my ADHD [laughs], that I look at everything. [...] I'm kind of obsessed with my surroundings, so that's where my focus goes. My focus is completely on my surroundings, so then I forget that I have an appointment or I don't hear what someone says to me, but I do see all the things that I'm focused on. I see them all.

Interviewer: That's why you're often the first to be at a new place?

Respondent: Yeah, that's actually it.

Interviewer: You pick it out.

Respondent: Yeah.

More generally, Instagram users seem acutely aware that the pictures in their feeds are taken and curated to convey that their posters are happy, healthy and hip. While the beauty and grandeur in their feeds may cheer Instagram users up, they also express their awareness and frustration that these pictures present a sanitized ideal that has been purged of negativity and blemishes. The same pictures that cheer them up confront them with the imperfections of their own lives. While they acknowledge

this, they also cannot escape it, as the above-cited example of the critical Instagram user shows. She explains:

When you really think about it and analyze it, it's very stupid. It sounds so stupid. But we're doing it all. It's nice to show. I mean, when you are happy, when you are proud, or content, you just want to share it with the world, show people. You know?

Another respondent says that she often feels social pressure when reading her social media feeds because everyone always seems to be doing impressive things. But mostly she appreciates how Instagram users curate their images: "You can just scroll, and you're looking at it, like, 'pretty!' And the pictures are always very happy, and everybody is so healthy!" This exclamation came over as at once delighted and exacerbated.

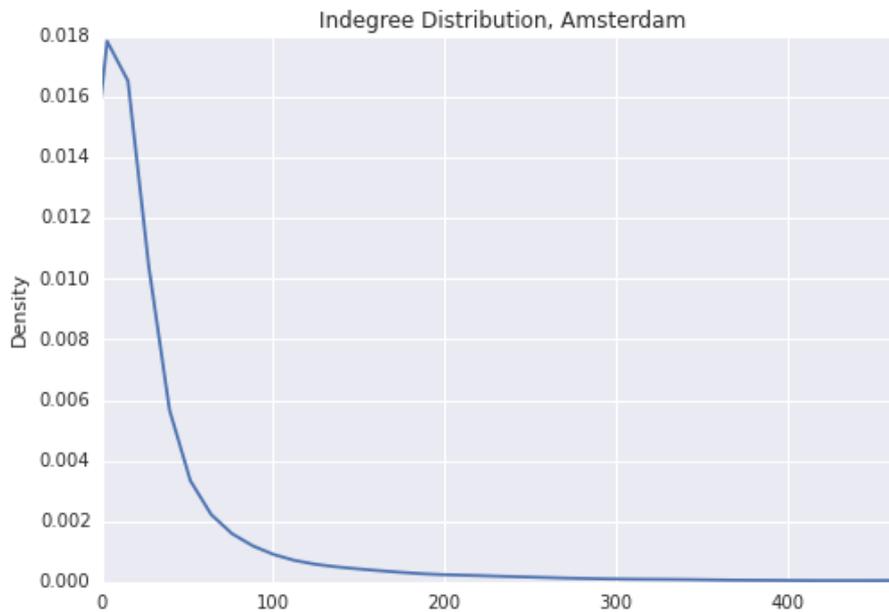
Instagram promotes particular types of viewing and valuing people as well as places. Instagram is a navigation tool that helps users explore unknown territories by marking noteworthy places and making them visible through the eyes of selected users. Just like some people used to put flags on a map of the world to mark where they have been, our respondents switch on geolocation for the pictures they take on their travels. When we looked at the maps with their geotagged pictures, the first thing that comes out is that they are often abroad, both because they take many pictures when they travel and because they want to have their pictures' geographical coordinates. Such geotagged histories in turn serve as maps that help others navigate. Our respondents typically look up Instagram pictures when they travel somewhere to get a preview of the scenery and the places and their patrons. One respondent was planning a trip to Morocco and had used Instagram to decide which places to visit; another respondent was at the time of the interview selecting a number of Parisian Instagram users to see what places she could visit during her study-abroad semester. "It's a search engine," one of our respondents observed – a search engine for places. The same logic applies when respondents use Instagram to navigate in their own city. When they see the appealing pictures their contacts post, they may get the idea to join the user or to visit the place at a later point in time. One respondent explains: "Sometimes you see a post, and there isn't a name of the coffee shop, and it has a nice picture, and I always want to know, like, 'Oooh, where is this?' And then you can see the location, so then you do know where it was. That's very convenient."

## **The stratified world of Instagram**

Mundane acts of recognition in the form of “likes,” comments or place tagging result in stratification, making some posts, users and places stand out while others remain an undifferentiated part of the stream. Who and what comes out on top in these processes? Which places rise to prominence? This section first demonstrates that Instagram’s figurations are very uneven and introduces the figures that sit at the zenith of the symbolic universe, enjoying the lion’s share of the attention and recognition given to Instagram users in the city. These hubs in the network are the successful symbolic entrepreneurs who are in a distinguished position to shape how other users perceive the city. Then we introduce the places come out on top.

### *The stars*

A first thing to note is, that Instagram’s symbolic universe is highly stratified. The graph in Figure 2 shows that, for the city as a whole, the likes and comments are very unevenly distributed. We made similar graphs for each of the 22 areas within the city and they looked virtually identical: they are heavily skewed and resemble an exponential decay curve.<sup>9</sup> Most users attain only a meager level of attention; they account for the peak at the left end of the x-axis. As we go further along the x-axis, we see that the proportion of accounts attaining higher levels of attention drops off rapidly. Only a very small number of users in the “long tail” of the distribution command very high levels of attention.



**Figure 2. Weighted indegree distributions for Instagram users in Amsterdam. Edge weights are proportional to the logarithm of the total number of likes and comments between users.**

Looking at the most central accounts on the neighborhood level using Page Rank centrality, some similarities emerge. For one, the central accounts are run by young people. According to our estimation, the women and men running these accounts are on average around 24 years of age. Only a third are aged thirty and above, while others are as young as 18 years of age. The clear majority of the central accounts are run by women. In the 22 areas of the city we studied, fourteen had accounts run by women in the most central location of the local network. It is also worth noting the gender presentation of these women, which calls to mind the ideal of perfection bred by the “competitive femininity” noted by Angela McRobbie (2015).<sup>10</sup> A third characteristic most account owners share in common is that they work in the creative professions, broadly conceived. Seven work in fashion as stylists, designers, models or boutique store owners; six work in entertainment as DJs, party organizer, actresses or singers; while the remaining in marketing or public relations, as writers, editors, or artists. The star account at the city level is run by a woman in her thirties who works as a model, DJ, travel and fashion writer, and more. It is hard to determine how, exactly, she makes a living. On her website she calls herself “a professional socialite.”

While these occupations, particularly in fashion, marketing and entertainment, are strongly represented in Amsterdam, the cultural capital of the Netherlands, it is nonetheless striking that they are so strongly represented among the star accounts. These professions prepare people to be successful symbolic entrepreneurs. The skills learned in these fields can be applied to craft a successful image and identity online. Also, it is not clear whether these users' Instagram activity is even distinct from their professional life. Their "social life" on Instagram may just be an extension or outgrowth of their professional life and vice versa, to the extent that the lines are completely blurred. A pair of city marketers who run a highly visible Instagram account confirmed this in the course of our interview:

Respondent 1: Last night it was so warm and I couldn't sleep at all, so I just put a chair in front of the window, opened the window and thought I'd read a book. So I was reading the book, and every two pages I was like – I wanted to grab my phone. This is not normal! I just put my phone away in another room. Okay, I don't want – I just want to read right now. But the constant – it's just in your head all the time. You just want to grab it. It's ridiculous. Because we do it all day long, and you share all day long.

Interviewer: It's hard to confine that to your work hours.

Respondent 2: But that's something – you know, work hours, for us...

Respondent 1: We don't really have work hours.

Respondent 2: We don't work, and we don't have a private life.

If we look not only at the number one users in each neighborhood but at some of the lower-ranked top users, we mostly find accounts run by individuals that share many of the same characteristics: young, female, with a connection to marketing, public relations, fashion, entertainment, and lifestyle. These users may not work directly in fashion, for instance, but they are fashion enthusiasts that maintain blogs on the subject. Similarly, we find food bloggers who are hobbyist restaurant reviewers. In these cases as well the distinction between work life and social life is blurred. Lastly, we find full-time city marketers who hype local scenes and explicitly turn to Instagram to promote what the city has to offer. For these individuals, too, the personal and the professional overlap: their feeds combine pictures of their clients' places, mainly stores and restaurants, with personal impressions of waterfronts, parks, or time spent with friends.

### *The hot spots*

When Instagrammers in Amsterdam tag locations in their posts to advertise their presence there, as they do in about one fifth of their geotagged posts, they favor certain kinds of locations. In fact, less than two dozen locations account for one fifth of all location-tagged posts. Topping the list, the Vondelpark, the city's second-largest park to the south-west of the city center, is tagged more than twice as often as the second most popular location, a former gasworks that now houses cultural events, startups, and bars. Several other parks and public landmarks are among the most commonly tagged locations, including the Central Station train hub. Perhaps surprisingly, considering that we eliminated most out-of-town visitors from our dataset, users also tagged the city's well-known art museums, including the Rijksmuseum and the Stedelijk Museum. An observation by one of our respondents may help explain the high level of visibility of these landmarks:

Someone who lives here is so much more popular than someone who lives in Almere [a small town located just east of Amsterdam]. People think you're cooler already, just because you live here. It's weird but it's true. If you make sure to show that every once in a while. Of course it's also a beautiful city. That also helps. But if you show that every once in a while, it just makes that more interesting. If I see photo of a girl who posts very beautiful photos of coffee and food, I even like her more if I know she lives in New York and you see posts of Brooklyn in between, you know?

Whether or not such strategic considerations are in play, users' inclinations to picture public places and lavish them with attention and appreciation is striking.

Toward the top of the list we also find several concert venues and event spaces. It is noteworthy that Paradiso, a venue with a seating capacity of around 1,500, appears far more frequently than arenas that host concerts by superstars that can seat tens of thousands. Apparently the patrons of indie shows are more likely to posts to Instagram than the audience at a Taylor Swift concert. Other commonly tagged places include nightlife locations in the city center, such as lounges and clubs. These frequently host glamorous parties that are promoted on Instagram and then have an afterglow there when attendees share their pictures from the night. Users also signal their presence at other temporary events, especially music festivals, fashion shows, but also a weekend-long food truck festival. Further down the list we find restaurants, bars, coffee houses, and retail stores. While there are several

hundred posts tagged at Starbucks and Coffee Company franchises, they are far outweighed by posts tagged at independent establishments owned and operated by local entrepreneurs. The same is true for stores. Quirky concept stores that sell vintage clothing alongside premium coffee roasted in small batches frequently appear toward the top of the list, while H&M stores are tagged only sparsely. Much like they are more inclined to post from the small concert venue than a big arena, Instagram users are more likely to promote independent boutique establishments than major outlets.

### **The segmented worlds of Instagram: clusters and scenes**

The community detection finds eight large clusters of more than one hundred users that each have a more or less pronounced profile and that are embedded in the city to different degrees and in different places. Table 1 reports key statistics for the clusters and documents their embeddedness within the city. Before discussing the clusters and their locations within the cities, it is perhaps important to point out that divisions between these clusters are not very sharp. We see interactions between the various clusters, as shown in Figure 2. Cluster I, for instance, has strong ties with clusters II, IV and VIII. Additionally, there are places that are tagged by users from different clusters. For instance, the Amsterdam Open Air festival attracts a remarkably diverse Instagram constituency, as does the Vondelpark. The existence of these spaces of mutual identification suggests that group boundaries are ambiguous and permeable.

However, we also see that the clusters are distinctive in some important ways. While there are no strict boundaries between clusters and all clusters are internally heterogeneous, we nevertheless provide rough descriptions of the different clusters to give an impression of processes of group formation on Instagram. Our analysis is based on an examination of the time lines of the most central figures, the relations among clusters (Figure 3), and the locations of posts (Figure 4).

Table 1. Overview of clusters obtained from community detection on relations among 30,000 Instagram users in Amsterdam

	<i>Characterization</i>	<i>Spatial embeddedness</i>	<i>Main places</i>	<i>Users</i>	<i>% Overall PageRank</i>	<i>Posts</i>
I	Vanguard of partying cultural producers	19,1%	Jimmy Woo, 53, Paradiso Amsterdam, 49, Schiffmacher & Veldhoen Tattooing, 43, Hannekes Boom, 34, PITCH Festival, 29, Vondelpark, 28, Westergasfabriek Amsterdam, 28, Amsterdam Open Air, 25, Rollende Keukens, 24, Tolhuistuin, 23	344	3,59	8.645
II	Vanguard of lifestyle promoters	20,1%	Westergasfabriek Amsterdam, 47, M&M Stand Up Paddling, 38, Vondelpark, 28, Sofitel Legend The Grand Amsterdam, 27, FUSE Communication, 24, The Harbour Club Kitchen, 22, MaisonPR, 22, Mercedes Benz Fashion Week Amsterdam, 21, Hotel Droog, 17, Jimmy Woo, 17	166	1,77	6.428
III	City image makers	32,7%	Station Amsterdam Centraal, 105, Rijksmuseum, 94, Vondelpark, 88, A'dam Toren, 66, Jordaan District, 42, Westerpark, 35, LAB111 Amsterdam, 31, Westergasfabriek Amsterdam, 31, Amstel River, 28, Singel, 25	231	1,59	8.362
IV	The Amstelstraat club scene	19,2%	ABE club & lounge, 253, Hotel Arena Amsterdam, 52, Jimmy Woo, 36, John Doe Amsterdam, 33, Amsterdam Open Air, 30, Vondelpark, 10, Amsterdam Oud-Zuid, 10, Escape Caffé & Lounge, 9, Het Amsterdams Verbond, 8, The Harbour Club, 7	174	1,42	3.838
V	Locally oriented gentrifiers	36,9%	PRESSROOM Amsterdam, 126, Cafe Scrapyard, 120, INK Hotel Amsterdam, 63, BAUT ZUID, 55, Restaurant Girassol, 36, Izakaya Asian Kitchen & Bar, 34, Buffet van Odette, 27, Rollende Keukens, 27, Amstelpark, 25, Vondelpark, 23	166	1,25	5.563
VI	Unpretentious partygoers	23,3%	Amsterdam Open Air, 25, Amsterdam Open Air Festival 2015, 16, ABE club & lounge, 14, Jantjes Verjaardag, 12, PALLADIUM AMSTERDAM, 11, Pacha Festival, 11, Gaasperpark, 10, Jimmy Woo, 9, Kingsland Festival, 9, SkyLounge Amsterdam, 8	129	0,90	1.224
VII	Urban	6,4%	Global Dance Centre, 19, Vondelpark, 4, Station Amsterdam Centraal, 4, Amsterdam Open Air, 4, Louvre Paris, 3, Club NYX Amsterdam, 3, Open Air, 3, NoLIMIT, 3, Kingsland Festival, 3	135	0,81	1.899
VIII	Neo-bohemians	17,2%	Paradiso Amsterdam, 27, InterContinental Amstel Amsterdam, 10, Mercedes Benz Fashion Week Amsterdam, 8, Stedelijk, 7, Heineken Music Hall, 7, De Balie Amsterdam, 7, Tolhuistuin, 6, De Toppers Amsterdam Arena, 6, Zeeburg, 6, Vondelpark, 5	111	0,78	2.013

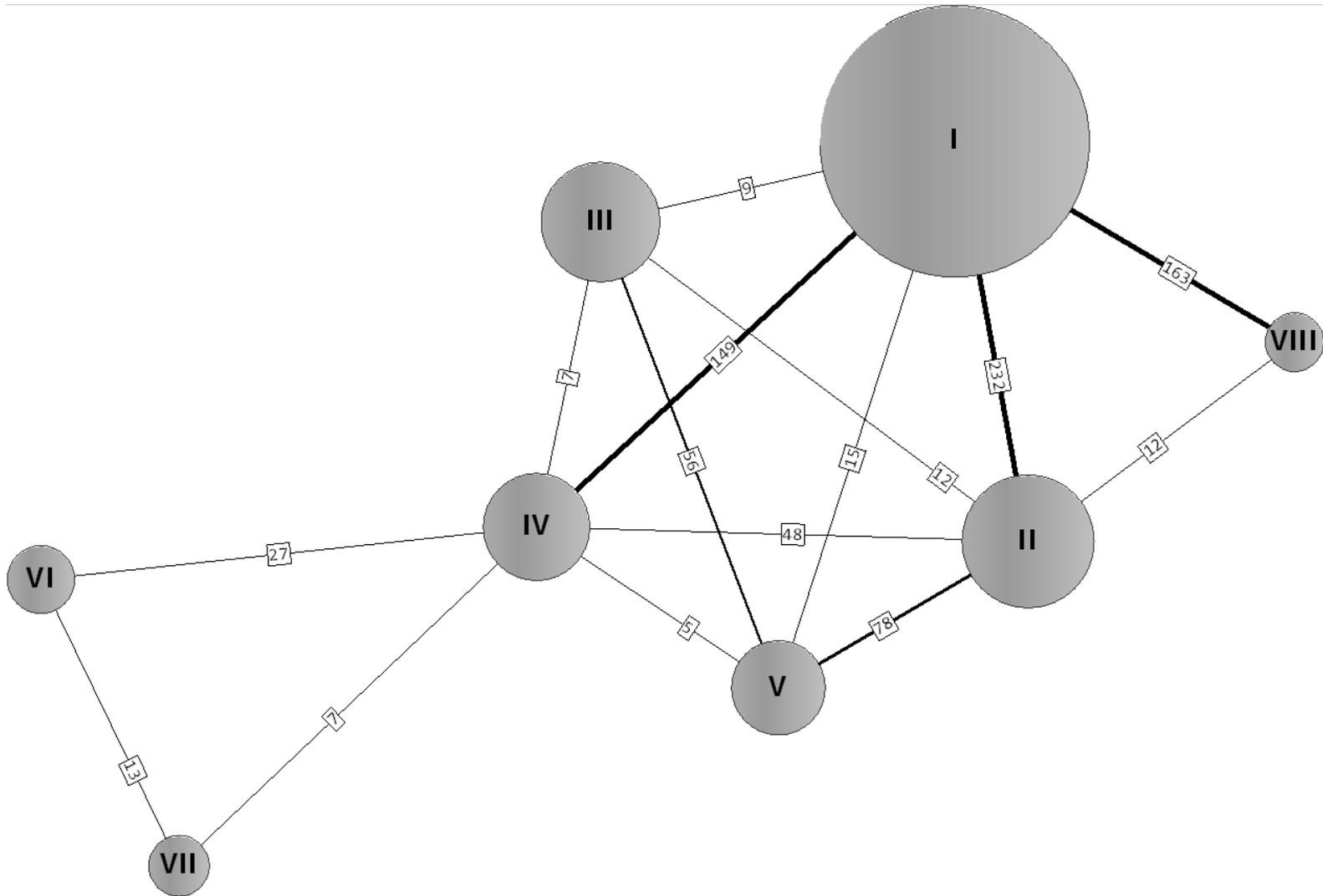
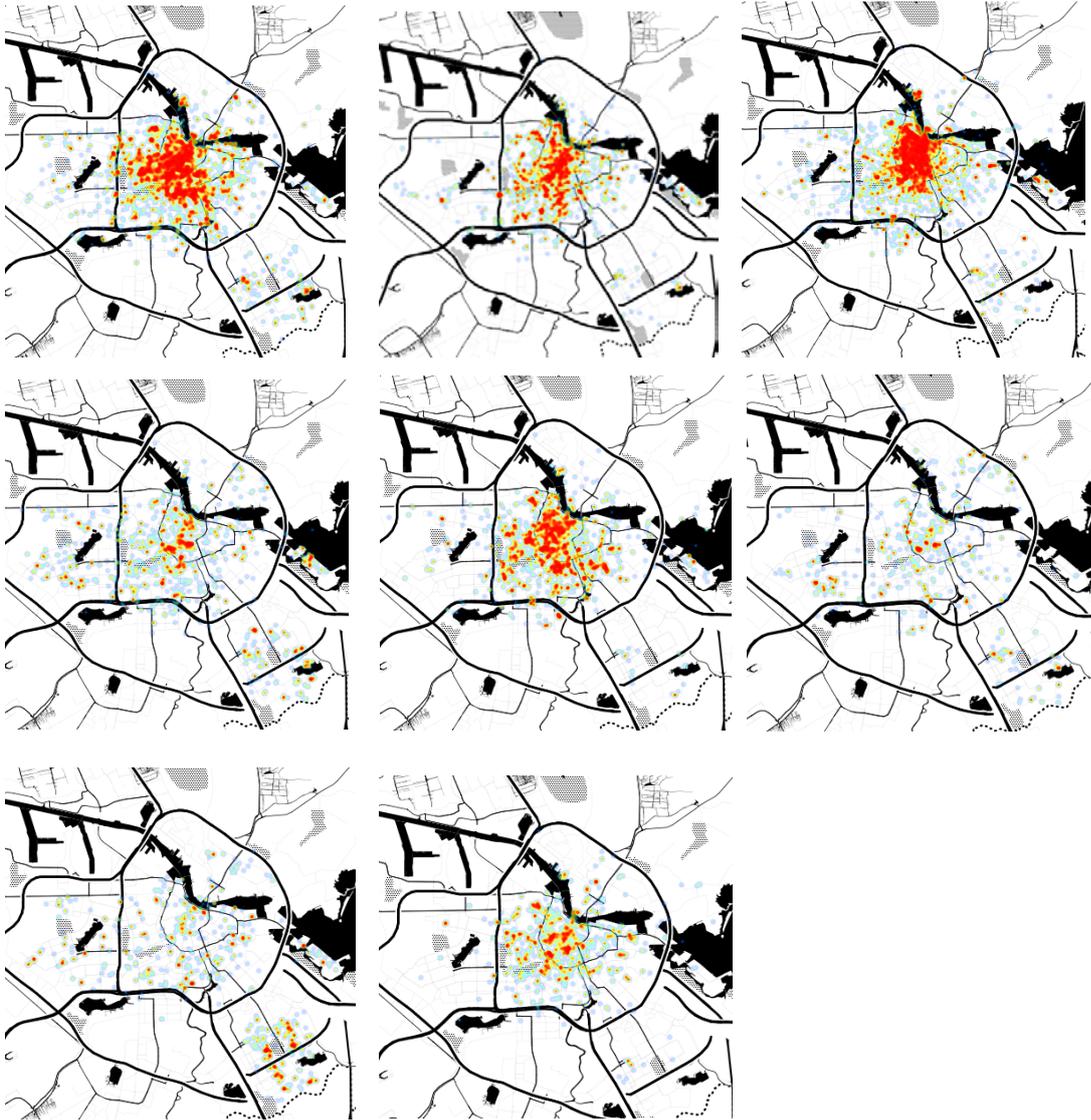


Figure 3. Graph of ties between clusters. Edge labels specify the number of interactions between users in clusters.



**Figure 4.** The distribution of geo-tagged Instagram posts from Amsterdam for different clusters of users (hotter colors indicate more posts).

I. “The vanguard of partying producers” is consists cultural producers like photographers, party organizers, and communication specialists. They are in some ways similar to the users in the cluster of “the vanguard of lifestyle promoters” and have many links with that cluster but they are slightly less committed to ascetic lifestyles and slightly more to partying hard; their pictures more often display people in the thrall of a party and have more explicitly sexual references.

II. “The vanguard of lifestyle promoters” consists overwhelmingly of women in their 20s and 30s who write about fashion, food or sports. They relay and repackage new trends they

observe in their habitats, which consist of places for the exhibition of new fashion (Westergasfabriek or Mercedes Benz Fashion Week). The users in this cluster go to parties and places of leisure but are generally committed to ascetic lifestyles as they try to stay healthy, keep in shape and look good.

Clusters I and II are most central in the overall network (Table 1, Figure 2). These clusters are overwhelmingly made up of people involved in creative professions who cultivate hedonistic and spectacular lifestyles (cluster I) or aesthetic and ascetic lifestyles (cluster II). The figures introduced above as the “stars” of Amsterdam’s Instagram landscape can overwhelmingly be found in these clusters. When we look at the locations of posts, both these central clusters cover large parts of Amsterdam (Figure 4). The geographies of both clusters are rather similar but cluster I features more posts from the “trendy” and recently gentrified neighborhoods of De Pijp and Oud-West whereas cluster II features more posts from the established and chic Zuid neighborhood.

III. The cluster of “city image makers” has many users specializing in film or photography and love to take the city as their object. They are expert image makers and picture the city from original angles, but they focus their lenses on the same landmarks and landscapes as tourists, including the canals, the museums, and the historical districts. Their streams are full of pictures of characteristic streets or buildings. This appears to be the type of aesthetic that Instagram is interested in fostering; the cluster interestingly includes an account of “Amsterdam instagrammers” that features landscapes with the Instagram logo. This cluster also contains a number of expats who are registering what they find beautiful as they explore the city. This cluster has a greater-than-average score for spatial embeddedness, meaning they are more likely to tag places than most users.

IV. The Amstelstraat party cluster is very much organized around ABE club and lounge. While many users tag ABE as they visit the exclusive club, the most central users in this cluster actually work at ABE or right next door, at club AIR, as DJs or party organizers. They members of this cluster are very much specialized in parties: all the places they tag are large festivals or well-known clubs in Amsterdam’s city center. Cluster IV brokers between groups that are on the periphery of the network (the unpretentious party goers of cluster and the urban cluster) and the central clusters I and II. This seems due to the efforts of party organizer

and DJs in Cluster IV who bring together different subcultures in clubs on Amstelstraat and elsewhere.

V. The cluster of “locally oriented gentrifiers” stands out for its comparatively high score on spatial embeddedness: users of this cluster tag places frequently. The cluster is formed around specific places that are mostly outside of Amsterdam’s city center. The density of posts is comparatively high in the rapidly gentrifying nineteenth-century districts (the ring around the canal district). Amsterdam East is generally not very dense with posts but that’s different for this cluster as its members post from gentrifying squares and streets in this part of the city. Several of the most central accounts in this cluster are run by marketing entrepreneurs who assist gentrifiers in navigating the city: they picture places (sometimes for a fee) that appeal to gentrifiers’ taste for branded authenticity. This cluster is very much locally oriented: users organize around places with a neighborhood vive. Through their pictures and discourse, they promote new establishments that they consider real assets to the neighborhood because of their authentic and local feel, as expressed for instance in locally produced beers.

VI. A cluster of “unpretentious party goers”. The most central users in this cluster are young women in their early 20s. Their time lines are full of pictures at parties where they pose with young men displaying their toned bodies. Some of the places they go to are exclusive but not vanguard; they are places where for instance football players are known to hang out. Other places (especially Jantjes Verjaardag) are unpretentious party places known to attract a clientele from outside Amsterdam that is sometimes pejoratively referred to as “provincials”. Places like Jantjes Verjaardag are unpretentious party places known to attract a clientele from outside Amsterdam that is sometimes pejoratively referred to as “provincials.” While it is likely that a number of people in this cluster live outside Amsterdam, the geography of their posts suggest that quite a few live in Amsterdam West and Amsterdam Noord. Whereas the other clusters post from the hotspots in these districts (like Pilek, NDSM, Eye, Bret), the people in this cluster post from these districts’ residential areas. The posts in this cluster are only unpretentious by comparison. Many of the pictures outside of party situations are suggestive of aspirations to high-class metropolitan living as the users pose with glasses of wine or cups of coffee in urban landscapes.

VII. An “urban” cluster. This cluster overwhelmingly consists of men and women of color in their early 20s. Many users within this cluster showcase their affection for locally inflected expressions of hiphop culture. This cluster has a lower spatial embeddedness than any of the other clusters: no more than 6 percent of posts have place tags. In the rare cases that places are tagged, these are in the Bijlmer, a predominantly black neighborhood on Amsterdam’s periphery. However, this does not mean that the life-worlds of users in this group are confined to this neighborhood – while Bijlmer is this cluster’s center of gravity, their posts come from all over Amsterdam. Members of this cluster also strongly identify with the city, as expressed in displays of local designer brands Patta and Filling Pieces. While they are proud of their city, members in this cluster lack places that they identify with and mark as their own.

VIII. A “neo-bohemian” cluster. The cluster of “neo-bohemians” includes many creative professionals and artists. This cluster has comparatively more men who are somewhat older than the members of other clusters. While many users in this cluster look well-kempt, this cluster is the only one where at least some (male) users seem to consciously and ironically reject an overly slick appearance. They sport untrimmed hair and they picture bizarre situations (like a man posing with an huge inflatable banana while he is – ironically – making overtures to a woman) – some might identify them as “hipsters.” The range of places they tag is really remarkable: we find chic establishments (Amstel Hotel) and places for the cultural elite (De Balie) alongside the decidedly low-brow performers of the Toppers.

## **Conclusion**

While much of the literature emphasizes that the wide distribution of social media results in horizontal networks with considerable critical potential, our case study of Instagram paints a more complex picture. We find that Instagram users act out aesthetic and lifestyle ideals as they strategically zoom in on aspects of their life-worlds and bodies. Instagram constitutes a distinctive way of seeing that composes an image of the city that is sanitized and nearly devoid of negativity. The everyday is relentlessly aestheticized to the point that it never appears as the merely ordinary or mundane. Instagram feeds are full of desirable items, attractive bodies, beautiful faces, healthy foods, witty remarks, and impressive sceneries. The image of the city that the Instagram interface conveys to users is not a neutral reflection.

Instead, the city appears through a selective filter. Instagram users are acutely aware of this selectivity; it is what excites them about the platform and it is also what, occasionally, causes them stress as they feel they have to follow suit and produce images that their followers will appreciate.

As Instagram users “like” pictures and comment on pictures, they construct asymmetric relationships within Instagram’s symbolic universe. Our results indicate that these networks are far from horizontal: there are a few “stars” who receive the bulk of attention and many more peripheral users who receive comparatively little. The figures with the greatest capacity to shape the image of the city on Instagram are emblematic of the post-Fordist urban economy.

The ideals that are cultivated and visualized on Instagram and the uneven relationships that are constructed also implicate the city: some places are elevated and feature center stage, while others remain peripheral or are altogether ignored. We find that the places that are elevated above all others are part of local scenes centered around high-end consumption, glamor, and refined lifestyles. Instagram thus serves to showcase patronage of exclusive and expensive places. However, we also found that users often tag public places, like parks.

Our analyses show how social media help to reconfigure the urban landscape. In particular, our results point towards a process of recursive elevation: as Instagram users boost their status by picturing themselves in certain places, they also boost the status of those places. By producing and circulating appealing pictures of these places, Instagram users serve as voluntary promoters of trendy bars, restaurants, coffee houses and stores. Through their posts, they assist other users in navigating the city and seeking out exclusive, exciting and *avant garde* establishments and events. While it is therefore plausible that Instagram users help to accelerate and sugarcoat commercial gentrification, they do so in particular ways. They do not bring attention to large chains or big brands but picture distinctly local and often small places. The proprietors of these places lack the scale to set up massive marketing campaigns, but their patrons advertise their products through social media, thus giving a boost to their businesses.

These mechanisms produce inequalities both among places and users. Our analyses show some types of users are way more likely to tag places than others. We conceptualized these differences in terms of differential spatial embeddedness: some groups are more inclined and have more resources to claim urban spaces than others. While the results reveal

subtle variations, there are also some striking differences that signal pronounced inequalities that emerge on the online/offline interface. For instance, we found that users in a cluster of gentrifiers are six times more likely to tag places than users in a cluster of young women and men of color. This suggests that some groups have way more symbolic and spending power to remake the city in their image and use Instagram as a tool to do this. While some details of our discussion are unique to Instagram, our findings also have broader implications. Social media platforms come and go, but even if Instagram were to shut down tomorrow, the culture of connectivity (van Dijck 2013) of which it forms a part is here to stay. The city will continue to be perceived and processed through digital networks, and this will continue to shape how people conceive of and navigate urban spaces.

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<sup>1</sup> While there is an occasional “long tail” of activity, most activity on a post happens in the first few hours. When fetching likes, we are limited to the 140 most recent likes, so for some very popular posts, we are unable to retrieve all activity.

<sup>2</sup> We stored metadata in a database, but in an effort to honor users’ privacy, we did not save the media file attached to posts. When needed for our content analysis, we retrieved these media files later. We could only do so if the user had not deleted the post in the interim or set the account to private, which means that we could not see posts the users did want to publically display. Even though the users we discuss in this paper often have many followers and share images very freely, we do not report in detail on the users or posts on the assumption that they may not have realized that their posts are publicly available.

<sup>3</sup> Previous work using Instagram data with location data either relied on using Instagram posts shared via Twitter, making the Twitter stream, not the Instagram API, the data collection channel (Silva et al. 2013b); or sourced data from Gnip, a for-profit data broker owned by Twitter Inc., to retrospectively gather posts (Manovich et al. 2014a). Our method should provide at least as much coverage as these other data collection methods. Highfield and Leaver (2015) suggest a methodology for collecting Instagram posts with certain hashtags, but they leave the aspect of location unaddressed.

<sup>4</sup> We used the igraph software package (Csardi and Nepusz 2006).

<sup>5</sup> Because we were unable to retrieve the full number of likes for very popular posts, we used a logarithmic scale for the edge weights.

<sup>6</sup> We disregard location tags that are obvious spam.

<sup>7</sup> For instance, if a user only follows accounts that post pictures of anime, then she will only like and comment on anime pictures, and she will overwhelmingly have more anime recommended to her by Instagram’s recommendation algorithms.

<sup>8</sup> This is also noted by Manovich et al.’s (2014b) Selfiecity project: “People take less selfies than often assumed. Depending on the city, *only 3-5% of images* we analyzed are actually selfies.” Other studies of the aesthetics of Instagram posts, such as Marwick (2015), focus not on a random sample of posts, but on posts by celebrity users.

<sup>9</sup> The shape of the Page Rank distribution, not shown here, closely follows the shape of the indegree distribution.

<sup>10</sup> We know from surveys that Instagram users, at least in the United States where these surveys were conducted, are overwhelmingly young adults, and we know that a greater share of women using Instagram is greater than the share of men. In this regard, the central nodes are quite typical. It is also noteworthy that, although these users are overwhelmingly white and Dutch, there are a few exceptions. For instance, in several of the neighborhoods that make up the South-East area of Amsterdam, the central accounts are run by black Instagram users.