Aerial Visibilities: Towards a Visual Sociology of the Sky
Introduction to the Special Issue

For many people, watching the sky, even if only momentarily, is an act of escapism, absorption and fantasy flow. We gaze at the stars or track a passing satellite; some of us even travel, recreationally or as hobbyists, to look at the dark skies in what is becoming known as astrotourism. The culture of skyward observations has long had an effect on individuals, communities and spaces. Whether it is tourists watching the atmospheric phenomenon of the aurora borealis in the Arctic – a flickering and unpredictable light show in the night sky – or tourists on the rooftops in Las Vegas watching mushroom clouds and orange glow at the Nevada test site (in the 1950s the Las Vegas chamber of commerce issued special tourist calendars with dates, times and the best "spots" to observe detonations).

Beyond atmospheric spectacularity, the sky is a compelling canvas of myriad shapes and objects – like the sea it has many layers of depth and is "semiotically fertile" (Peters, 2015). We stop to look at the fluid formation of clouds and wonder at their volume and colour. Depending on our location, we stop and look upwards for objects we might not otherwise see in our day-to-day routines. Technological advancements within, and towards, the sky shape what we see and experience. The sky above is ubiquitous but also unique depending on your location or status. Those who routinely see and live amongst skyscrapers are also less likely to routinely witness the sight and sound of a military drone above their head. For others, it is now increasingly common to see internet blimps – whose purpose is to produce greater global connectivity – in rural and remote landscapes. These internet blimps, which are autonomous, floating communication masts, can cover up to 10,000 sq.km, equating to the same range as 20-30 ground-based towers (Galeon 2018), providing an internet connection for those in isolated locations.

In the midst of the 2020 COVID 19 global pandemic, the world's skies emptied. Commercial flights were grounded, industry slowed, with vehicular traffic dramatically reduced. People across the world, but especially those in the most polluted cities, were presented with a different sky: cleaner, "bluer", brighter, with "smoother" and more transparent air. Atmospheric equity existed, if only momentarily. This simple example of the sensorial experience of height is useful when we try to better understand verticality and ascension vis-à-vis quality of life, and the horizontal political and economic geographies and ecologies that prevail in urban, sky-scraping environments around the world. Stephen Graham & Lucy Hewitt (2012), borrowing from Choy (2010), note that in Hong Kong, for example, "elite expatriates can seek refuge from the bad air, noise, heat and humidity by colonizing the city's 'airy refuges' in penthouses located in the topographic height of the Peak or Mid-Levels on Hong Kong Island" (2012:84). The sensorial experience of elite verticality is not only found in the urban density of prime real-estate, but also via the increasingly plausible prospect of space tourism.

While equity of the environment above our heads is stratified by institutional, national and economic hierarchies, volume is also assigned value, metaphorically. Upwards mobility, Graham notes (2016), is commonly associated with prestige, holiness and progression, either socially, culturally or religiously. As Graham states, vertical and spatial metaphors, including the notions of language, power, wealth, status and happiness, "literally work to constitute and reconstitute social power: they both derive directly from the physical and phenomenological experience of social life and actively influence how people perceive and shape the social and political world" (2016:15). For example, a position above the city, as noted earlier, is commonly represented as an "island of purity" (McFarlane 2008: 419) from below. These metaphorical "islands" with their

own select citizenry status, also provide access to privileged, private “keyhole views” of our society (Warner, 2013).

The Volumetric Turn

As Peter Adey noted, we are increasingly “airborne” (2014), and this airborne property affects the way we perceive, experience and configure ourselves in relation to our environment and surroundings. With this, our vision is increasingly airborne too. As scholars, this verticalization of experience and vision affects our approaches (see articles by O. Jensen, J. Brake and J. Aitken, this issue) as well as how we critique and theorise volume and vision (A.M. Brighenti and A. Pavoni, this issue). It shapes us as subjects, as well as offering us new perspectives as participants and researchers. The abstraction of flat maps, diagrams and “radically flat imaginations of urban life” (Graham 2016:4) also makes it difficult to fully make sense of the geographies and geopolitics of what lies above and below the earth’s surface, and how that is seen, represented and engaged with in terms of mediation, but also experientially and sensorially.

The aim of this special issue is to gather diverse perspectives that help us examine various facets of the dyad of verticality and visibility. Following Wrigley and Philippopoulos-Mihalopoulos (2016), we intend to bring sky and air into the view of visual sociology and argue that there is more to the sky than phenomenological and geopolitical dimensions (Wrigley, 2018). The essays within this issue emphasize the need to rethink the aerial in terms of complex relations between humans, technological artefacts, vertical superstructures, and non-human others to examine the ways they can unsettle notions of aerial biopolitics. In doing so, this collection foregrounds the visual to ask to what end the image of – or efforts to create images through – vertical registers shape our understanding of our increasingly vertical world and the communities and users it engages or impacts upon.

Our inquiry owes much to the work of those from other disciplines and practices outside the field of sociology. Across a host of disciplines and approaches, verticality, its politics and associated in/visibilities – including, but not limited to, work concerning the role of the gaze and targeting, vertical consumption and atmospheric analysis – have been examined by cultural and urban geographers, urbanists, urban sociologists and philosophers alike. Yet rarely has the image of, or from sites and spaces of verticality been used as a prism through which volumetric space can be explored, sociologically. In this editorial and the articles that follow, we discuss how visual sociology can contribute to the growing scholarship on verticality, and ask how visual sociology can get the following questions off the ground:

How can we explore aerial space visually and sociologically?
How can we examine the sky as a visual medium?
What constitutes a visual sociology of the sky?

Drawing specifically on Davide Deriu’s work on emotions, vertigo and verticality (2016, 2018) and our previous work on the air as contested space (Zuev and Bratchford, 2020), we supplement these questions with more on the visuality of aerial experiences:

How can we visualize “states of suspension”?
How can we visualize the material and spatial properties of verticality?
What does the aerial view tell us about visibility as a sociological category?

What do vertical "superstructures" represent and how can these representations be compared across cultures?

The volumetric turn, specifically in relation to notions of vision, power and politics, came in 2002 when Eyal Weizman published his influential essays on the Politics of Verticality. Since then, his ideas have been used as a lens to critically examine volumetric thinking, precisely in terms of asymmetric power in urban and non-urban settings (Graham & Hewitt 2012; Harris 2015, Eldens 2015). Studies have sought to challenge the largely "flat discourse" of geopolitics and (Graham & Hewitt 2013: 35) and associated fields, such as urban studies, as well as aerial warfare, security and the politics of sight (Adey et al 2011; Gregory 2011, Roy & Bishop 2009, Lee-Morrison 2015). Elsewhere, scholars and artists have examined not only the physical structures that rise from the ground, or the logics and function of surveillance and communication technologies that orbit our atmospheres (Sandvik 2016, Paglen 2010), but atmosphere itself (Sloterdijk 2009), atmospheric state (Shaw, 2017), atmoculture (Brighenti and Pavoni, 2019), and its securitisation (Adey, 2014).

Air, specifically that of the megacity, Adey writes, "is more than just air but constitutive of the material affective relations that animate the experience of the city in a way which we might say is *atmospheric"* (2013:293). The air and atmospheres of the megacity are also a key medium for illustrating binary notions of crisis and promise as well as spaces for framing notions of (in)security, health and equality through which various forms of technocratic and ecological governance can be examined (Adey 2013, McCormack, 2008) alongside the politics of comfort and privilege, underpinned by economics and status. These latter observations of vertical life are associated with sensorial and experiential encounters that are both physical and mediated (Brake & Aitken 2020, Bratchford, 2020, Rose, 2016) and contribute to the way we as individuals or communities experience verticality either positively or negatively, specifically in terms of living conditions and one's own relationship to the urban streetscape below (see special issue by Momchedjikova and La Garre, 2019).

Similar elevation economies and verticalized enclaves of privilege linked to social and economic secession are increasingly common in rapidly developing economies with a visibly evident widening of wealth amongst their residents, as well as traditionally low-level, post-industrial cites with emergent skylines like Manchester and London in the United Kingdom. Such upward mobility is representative of the wealth and status of those who reside or socialise in these new spaces, but so too are such spaces associated with safety, sanctuary and mobility (see Cwerner 2006 & 2009 on urban flight and mobility, helicopters and heliports amongst São Paulo's urban elite). Similar to Cwerner's work in Brazil, studies focusing on Mumbai's vertical enclaves (Rao 2020, Wissink, 2013; Harris 2011) can be examined through an economic framework, but also through a security discourse. Verticality in these urban, global contexts is routinely framed as security from insecurities beneath (Adey, 2010: 58) because ascension for the select few also equals separation from the majority below.

This idea is visually articulated by Swiss photographer Roger Eberhard's photobook project, *Standard* (2015). Having visited 32 cities across 5 continents, Eberhard stayed in a 'standard' Hilton hotel double room, documenting the room and its view. Across a double spread, *Standard* presents the viewer with two sets of formalized photos. On the left, Eberhard takes a photo from the window of his standard room. One the right we see the interior; a photo of a "standard" Hilton Hotel room interiors in various locations around the globe. From Bangkok to Berlin, Tel-Aviv to São Paulo, we are taken on a homogeneous journey around the world where comfort is standardized. However, it is the view *from* rather than *of* the room that is of specific interest. As Hilton Hotels were amongst the first high-rise buildings in city centres, their vertical presence has many symbolic readings. For the usually wealthy guest, *Standard* also allows the "foreignness of the immediate surroundings [to] be observed… from a *safe-elevated perspective*" (Solte, quoted in Miller 2020:60; emphasis added).

Insert Figure 1 here.
Roger Eberhard, 'Cairo, Room 2605; from Standard 2015. © Roger Eberhard. Courtesy of the artist.

The spatial politics of vertical socio-economic mobility, specifically its marketisation, is a new and visually rich arena fit for "polyvocal" methodological exploration. Polyvocality, Harris writes, should be called upon to "investigate how vertical buildings and structures are actively produced, consumed and re-produced by a host of professional groups, such as planners and architects, but also, residents, amateur enthusiasts" (Harris, 2015: 609) as well as artists and visual researchers. Polyvocality has been a common strand of visually driven sociological work in other areas such as Knowles and Harper's work on Hong Kong (2009), Krase and Shortell's project on gentrification (2011), and the breadth of polyvocality found at the Goldsmiths University Methods Lab. Outside of sociology, at least in disciplinary terms, such polyvocality is richly dealt with by geographer Stephen Graham in his text, *Vertical* (2016), where he notes that the research perspective was "deliberately critical, highly international and *unusually interdisciplinary* in addition to being as visual as it can be" (Graham, 2016: 14; author's emphasis). Harris's call for polyvocality, and Graham's disciplinary range, are the driving logic of this special issue of Visual Studies, which includes contributions by photographers and artist-scholars, visual culture and mobility scholars, and sociological theorists.

In collating this special issue the editors attempt to further contribute to the volumetric turn within the humanities, inviting a diverse range of scholarship to not only examine where and how we live from a grounded perspective, but to offer a more rigorous, visual, three-dimensional reading of our surroundings as spaces worthy of visual-vertical analysis. In what follows, we present a non-exhaustive array of themes under which airborne visual sociology can proliferate. The five themes – (1) the visual culture of contemporary aerial vision; (2) vertical biopolitics; (3) volumetric imagination; (4) the verticalization of protest space; (5) density, depth and visibility, and the intensification of vertical urbanity – are an attempt to map some of the key ideas and open up space for further visual-vertical exploration.

Visual Sociology of the Sky

The Visual Culture of Aerial Vision

As technologies and visual approaches shift, aerial visions of urban life are changing. David Gilbert suggests that cities are living through a distinctive third age of aerial vision (2010). The first age came as a result of the early balloon explorers, who developed aerial views that merged observations and imagination. The second phase of aerial vision was defined by the mechanical representation and reproduction of aerial photography. The third emergent phase is marked by the period of democratization of the aerial view – through and characterized by digitization and the kinetic perspective (Gilbert, 2010). The kinetic perspective is intensified by "zoomscape", where the aerial gaze becomes more active and exploratory. As life, as well as our ability to see and experience environments, becomes more verticalized, the notion of the ground and the concept of grounded-ness, is changing at pace with the technologies that further support this sense of "suspension". Geographers and urbanists have moved to consider this change, noting that in vertical cities, it is becoming less and less clear what ground level might mean (Graham, 2016:09) while philosopher-artists like Hito Steyerl have moved to suggest we are in a state of free-fall (2011). Visually and sociologically, our commitment to examining these paradigms – from suspension to groundlessness and free fall – in addition to critically examining that which is above us, or our own experiential or technologically-assisted engagement with the god's eye view, can

be explored though the analysis of how we live, move, socialise, and work across multiple planes. In an age of heightened verticalization, artists can provide frameworks for insightful commentaries, including the examination of volumetric vision and new types of visualities.

Since the first human flights in the late 18th century, the way we see the world, and how it is (re)presented to us, has undergone a profound transformation. From primary experiences, such as those of vantage points and viewing stations, to the rise of secondary representations in paint, print, in film and on screens via digital simulations, how we understand our environment has moved in tandem with modernity and our airborne ascension. Of the three visual registers noted by Gilbert concerning the city, it is the latter two which we will briefly address below.

With a focus on photography and urban space, one early, revolutionary perspective was offered by the constructivist Alexander Rodchenko. His photographs of Moscow from the mid-to-late-1920s show him experimenting with new, angular views of the city. Prime examples are Rodchenko's *Street from Above* (1925) and *Shadows on the Pavement* (1928), both of which harbour the grainy visual aesthetic commonly associated with drone-assisted images of possible targets and streetscapes produced in the battlefield (see Zuev & Bratchford, this issue). An aesthetic of suspicion and vertical suspense; the final frame before the screen goes blank. A visual pioneer of the extreme perspective, Rodchenko was one of the first to take photographs from an elevated, top-down perspective while at the same time employing the camera and his photographs as a tool for social commentary in 1920s Russia. His groundbreaking depiction of the vertical urban space and his hallmark "vertiginous plunge" views of Moscow have become a crucial reference for observing and documenting the verticality of the modern city (Deriu, 2019). This new approach to visualising the vertical city by Rodchenko and other European avant-garde artists became a blueprint for American photographers, including Berenice Abbott, who mastered the "roof's eye view" as a way to document the transformation of New York in the 1930s (ibid), and later in the '40s by Andreas Feininger.

The view from above started to change with the development of aerial photography during the First World War (WWI) and subsequent emphasis on the technological superiority of aviation in the 1920s. Photographically, Walter Mittelholzer embodied the spirit of the aerial photographer-aeronautic adventurer and entrepreneur. A professional photographer and voluntary "spotter" for the fledgling Swiss air force, Mittelholzer documented the landscape below for commercial gains, understanding that his privileged view could be monetised. Across the Alps, the appeal of aviation also influenced the Italian futurism movement (1929 – 1940). Using paint rather than film, *aeropittura* or aeropainting emerged in Italy as a way to visually articulate the celebration of flight, military machinery and the systematic destruction of cities from above, through romanticised notions of speed, technology and power.

The third, emergent phase is marked by the period of perceived democratisation and aerial accessibility via a host of participatory mediums, technologies and platforms. We now have access to an increasingly networked image both of and from the sky. In addition to being part of a visual culture saturated by military and entertainment views from above (Steyerl, 2011), the images we are now so accustomed to viewing (and engaging with) are often outsourced and mechanically produced, delivered to our screens via apps and intermediaries. While this is also true of photographic representations and paint – for which the photographer, newspaper or painters/gallery acted in the same capacity, as we will discuss – these views are now more immediate and, for the most part, more accessible and malleable, "characterized by digitization and kinetic perspectives" (Gilbert, 2010).

The exploratory nature of this third phase of aerial visibility is due to its accessibility. If you have a computer and an internet connection, you can explore the world from an aerial perspective via Google Maps, dropping into almost any street view on earth. Visual artists and photographers such as Mishka Henner (UK), Doug Rickards (USA) and Michael Wolf (Germany) have used Google Maps to offer alternative ways of seeing familiar spaces or events. While Wolf explored iconic, yet visually exhausted, cities like Paris (Paris Street View, 2010), Doug Rickards' *A New American Picture* (2010) painstakingly explored Google Street View for the decisive moment or snapshots of American life reminiscent of Frank's *Americans* (1955).

At the same time, Henner's work with the Google platform takes a decidedly top-down perspective that also moves out of the urban context. For Henner, Google Maps is a tool that enables us to "join the dots in the sea of data and imagery that exists online" and by doing so, "begin to see and understand how the world looks from that point of view" (Wired, 2013). Henner's approach is to find structural, geographical, economic or social patterns and produce typologies of what he finds, using the god's eye perspective afforded by Google Maps. This is best demonstrated in his work *Dutch Landscapes* (2011) and *Eighteen Pumpjacks* (2012). Each project allows the viewer to hover over specifically selected sites and spaces from a birds-eye-view/top down perpsrcitve. Henner's numerically titled projects like *Fifty-One US Military Outposts (2015)*, and *2012s Eighteen Pumpjacks*, Henner's are nods to Ed Ruscha's now classic works *Twentysix Gasoline Stations* (1963) or his *Thirty-Four Parking Lots* (1967) – (New York Times, 2015). While those noted above seem to work *with* Google's visual offering, even if its images are presented as a blur on the landscape, other visual artists including collaborative paring, Shabtai Pinchevsky (US) and Miki Kratsman (Israel) have used domestic drones to produce high resolution drone photography as a way to reinstate contested Palestinian geographies back into the public realm. Entitled *Anti-Mapping,* the project offers a counter-visual ethnography that lets us see "that which is not there but which structures the contemporary empirical realities we observe" (Schept, 2014). As the artists state, "aerial photography is available to the public at a resolution of 0.5m^2/pixel, but in the area around Israel the resolution is restricted to 2.5m^2/pixel" (Pinchevsky, 2020).

Insert Figure 2 here.
Mishka Henner, Staphorst Ammunition Depot, Overijssel. From the series Dutch Landscapes (2011) & Mishka Henner, API 4303716180 Ismay, UT. From the series Eighteen Pumpjacks (2012). © Mishka Henner. Courtesy of the artist.

Vertical biopolitics

> We all-too-often think of the spaces of geography as areas, not volumes. Territories are bordered, divided and demarcated, but not understood in terms of height and depth. (Elden, 2013: 1)

For a visual sociology of the sky, it is important to understand the constitutive elements that will help us analyse the aerial relations between humans, objects and environment. These relations are still grounded in a fundamental question: what are the upper bounds of sovereignty? How high is the ceiling of aerial trespassing? The issue of the ownership of the sky, and thus decisions about how to use the space above, date back at least to the mid-19th century (Banner, 2008). Who owns the sky is a crucial question as technologies of surveillance in the sky proliferate? This surveillance is justified by security discourses or conservation, research and smart governance. As the sky and the atmospheres beyond become more accessible and contested, the appearance of the sky and what we see is also altering.

The launch of the Sputnik satellite in 1957 was the paradigmatic shift in aerial and space exploration; now even small, albeit affluent, nations such as Qatar can launch their own satellites. There are already over 4,800 satellites in the sky, with private companies such as SpaceX launching thousands of internet satellites and telescopes that are changing the view of the night sky[1]. Is the sky at risk of colonisation, and should we begin to think about the atmosphere above us as a volumetric resource that requires safeguarding from extensive militarisation and privatisation in the same way nation-states protect Antarctica? Thus, the constantly evolving question of who owns the sky relates to the limits of visibility as a relational quality (Brighenti, 2007) and the politics of oversight and everyday vigilantism (Amoore, 2007) as well as increasingly of vertical biopolitics related to contestation in conservation areas, specifically with the use of drones (Millner, 2020). The increased use of drones in conservation projects implies a shift towards the vertically-assisted ordering of people and natural resources.

The emergence of drone-aided video production is one of the significant ongoing shifts in the perceptual system and practices of visibility, surveillance and video-imaging – as much as the creation of photography and, later, its digitisation. While it is recognised that digital photography and mobile devices have made photography accessible to the mass population, drones are now making aerial photography and video imaging mainstream. Thus, we must begin to recognise how drone photography is being integrated into visual practices that perform and construct ways of seeing (Berger, 1982). Part of the visual ordering underpinned by this burden is due to what Stephen Graham (2016) termed "vertical orientalism", which plays out over zones and territories linked to the global war on terror. This predisposition to look and assume is further complicated by the burden of data-overload that comes from "persistent surveillance". Citing Gaston Gordillo, Graham outlines how the "sheer mass of imagery and data often means that drone controllers are completely overloaded with too much data to process or interpret while they are making decisions to fire" (2016: 78).

Under the rubric of surveillance, image-producing technologies – from early studio practices through to drones – constitute a social body rather than straightforwardly reflecting one (Miller, 2020: 34). Their effects are compounded by various forms of visual fatigue and drone operator stress akin to post-traumatic stress disorder (PTSD). The biopolitics of visual-vertical control can be mapped against subtle shifts in how militarised drones are deployed. From far-away lands fighting the War on Terror to the borders of one's own sovereign territory, the use and presence of military drones – to take one example – begin to both blur and normalise the use of drones in domestic, national and international contexts, as well as clouding the distinctions between policing, intelligence and military deployment. Thus, networked surveillance and targeting within domestic spheres (Graham, 2016: 85) and the use of drones for "military operations other than war" (MOOTW) become increasingly enmeshed in the culture of surveillance. The proliferation of drone-afforded surveillance is exemplified by a recent project by the Defense Advanced Research Projects Agency, called *Aerial Dragnet*, to track slower, low-flying unmanned aerial systems, particularly in urban environments (Axe, 2018).[2]

[1] New Fleets of private satellites are clogging up the night sky. https://www.sciencenews.org/article/starlink-spacex-satellites-amazon-oneweb-global-internet-astronomy. Accessed August 15th, 2020.

[2] https://www.thedailybeast.com/pentagon-plans-citywide-drone-catching-dragnets?utm_content=buffer22d06&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer Accessed January 25th 2019.

Despite their use by the military and their potential in ubiquitous surveillance, drones have considerably helped to increase our interest in everyday aerial exploration and broaden our imagination of the sky as a reachable space.

Volumetric Imagination.

How we imagine the sky is in part informed by our cultural, and increasingly political, association with it. As Alexandrine Boudreault-Fournier (2020) suggests, different cultures engage with the sky as a medium of circulation in different ways. While the sky and the upper atmosphere above is a contested site of scientific and militarised efforts to claim vision and power, closer to the surface, cities and their skies across the world have different infrastructural layers; these are the vertical objects related to our urban experience – the wires, lamps, balconies, signs, flags flapping in the wind or the freshly-washed laundry emitting the smell of detergent.

Insert Figure 3 here.

A side street in Macau and vertical clutter above. Copyright: Authors, 2020.

In some instances, these appendages and the web of residential and technological paraphernalia that crisscross above our heads add to the vertical clutter above us, but simultaneously add to the charm and intensity of the place (Figure 3). Some cities, however – such as St. Petersburg, the Russian cultural capital – have launched programs to hide and remove these "infrastructural distractions" and appendages in order to purify their aerial appearance for tourists and residents[3].

Aerial infrastructures such as satellite dishes and air conditioners dripping on the passers-by below are typical features of cities. Laundry and clotheslines remain a quintessential part of everyday life and a common aerial object that has diverse compositional ordering across cultures and urbanscapes such as those of China, Portugal, Brazil and Italy (Saito, 2017). They also remind us about human dependence on the elemental – the air and the sun required to dry them a remaining point of contact with nature in the city[4]. Tourists see the flapping laundry a signifier of authenticity, "homeliness" and a "traditional practice" of the place.

However, we tend to be too grounded to see these aerial objects and the practices related to them, often excluding their aesthetic value – thus the need not only to discipline our aerial imaginations, but also to deconstruct the meanings of these aerial infrastructures as "theoretical objects" (Damisch, 1994) that can be instructive in producing the sociological theory of the sky. Tim Ingold, in his study of lines and the "inverted world" (2015, 41), notes that when "we fall asleep in beds placed on a floor" we must remember that this may also "be someone else's ceiling" (2015). The ground itself is the infrastructure, and the structures growing upwards, such as skyscrapers, are the "superstructures". The key analytical point that we can draw from this is that there is a multiplicity of interstitial layers and lines, vertically arrayed, that escape our imagination and our sight, partly because we are not trained or disciplined in distinguishing these vertical layers. The layers contain numbers of *a(i)rtefacts*, objects that are related to the air and our aerial imagination of divinity and spirits, communication and connectivity (Boudreult-Fournier, 2020). The *airtifacts* combined or in their singularity generate new intersections and ruptures, as well as mark social boundaries (see Freire-Medeiros et al. in this issue on the funicular in Rio De Janeiro's

[3] Чистое небо над Невским стало реальностью. Смольный уберет провода с улиц/Clear Sky above Nevsky has become reality. Smolny will remove cables from the streets. https://www.fontanka.ru/2020/07/28/69390184/

[4] Clotheslines have been prohibited in the US as an "eyesore" and "flags of poverty" (see more in Saito, 2017).

favelas) or social progress and become the symbol of urban rejuvenation (the funiculars in Bogota or Medellin in Colombia[5]). While air is a boundless space, the *airtifacts* give it materiality and draw the lines that visual sociologists may attempt to track, decipher and interpret.

Insert Figure 4 here.
FLAK anti-aircraft Tower turned into Climbing Wall, Vienna. Copyright: Authors, 2019

Airtifacts can also be choreographed and performed; athletes climb routes marked out on rising climbing slopes and canvasses with a maze of jibs, blobs and compound geometric volumes. These are often attached to now-defunct vertical structures, as in the case of the WWII anti-aircraft FLAK tower turned into a climbing centre and vertical aquarium in Vienna. The ugly, indestructible grey concrete structure is given a new lease of life as it gets detached from its historical context. At the same time, it reminds us how the air and the vertical become a heated space of contestation.

Verticalization of Protest Spaces

The air as contested space has long been the object of research and legal battles, but only with the relative democratization of drones has this contestation become more acute. Drones as aerial trespassers have been used not only to stage protests, as at Heathrow (in 2018), but also to collect data via aerial surveillance or sousveillance (see Zuev and Bratchford, this issue) or through practices of collaborative aerial vision (see Keysar, this issue).

The aerial view is the view of superiority. Or at least a view that is presumed to have more control by being above the ground. The case of the so-called “cliffhangers” - precariously-employed Chinese construction workers suggest a different perspective, that of precarious groundlessness embodied through a novel protest ritual and contentious performance (Hillenbrand 2020). In the ultimate vertical performance to negotiate their wages, “cliffhangers” scale high-rise buildings to gain visibility in order to draw attention to their demands, only to plunge down into the void.

The actual presence of a human being above ground can symbolise either triumphant individual achievement or individual despair, and in any case an individual reclaiming and humanizing of vertical space. In her analysis of Phillippe Petit’s high-wire walk in New York, Gwyneth Shanks wrote that there exists the potential for authorial disruption contained within groundlessness – indeed for challenging authority and humanizing edifices (Shanks, 2016). Similarly, rooftopping, the practice of extreme, often illegal, urban vertical exploration presents viewers – sometimes live-streamed via social media platforms or retrospectively uploaded to video sharing platforms – with a tangible, embodied, first-person perspective of the skyline above us.

Co-constituted by technological enhancement using visual recording technologies and visual social media platforms, rooftoppers engage in extreme acts of visual documentation of the aspiration to move skywards as a meaning-making spatial practice that normalizes dizzying height. In rooftopping, selfies are considered legitimate trophies gained in an extreme and transgressive feat of scaling the heights without safety equipment. Sheer vertical drops are given indexicality through the inclusion of the climber’s sneakered feet, which present a trivialized image of being a hair's breadth away from death. In this regard, aerial photography of the rooftoppers

[5] Urban Transformations: In Medellín, Metrocable Connects People in More Ways Than One. https://www.wri.org/blog/2019/03/urban-transformations-medellin-metrocable-connects-people-more-ways-one

too has its own visual syntax (Zuev and Bratchford, 2020).

In a different realm – that of energy politics – the air and the skyline are equally contested and a cause of anxiety among Europe's rural population. White wind turbines have become a signifier of sustainable energy politics, but on the local level they have been fiercely opposed. As unavoidably visible objects, wind farms have already become part of the "politics of things", as mainly agricultural landscapes transform into wind energy landscapes (Krauss, 2010; Pasqualetti et al. 2002). The major concern about these vertical white structures and their rotating propellers is over the changes in the landscape's aesthetics, and the resulting inequity between communities that benefit from clean energy, on the one hand, and communities that do not benefit but are left to contemplate the transformed technogenic landscape; views of white protrusions over the treetops or shadows cast on their gardens. In similar vein, cellular antennas have become everyday landmarks and emblems of networked urbanism (Wiig, 2013), disrupting the aesthetics of many heritage sites (e.g. the protests against telecommunication antennas in a protected site in Monsanto village, Portugal). As Wiig (2013) remarked, aerial infrastructures are often made invisible through the process of veiling, masking and disguise. Wind farms and cellular antennas are a powerful reminder of the growing human desire to tap into the air and the heights for resources without consideration of the impact of technology on the aerial views that we have become accustomed to. The visual impact of energy and telecommunications infrastructures that rise up into the air should be considered an important phenomenon for visual sociologists if they do not want to miss essential aspects of social change, vertical infrastructure justice and aesthetics.

In our next and final section, we will demonstrate that the intensification of *urban* vertical growth has much to do with a long-standing celebration of vertical architecture in global cities.

Rising Up: Skyscrapers and the Intensification of Vertical Urbanity

Symbolically, towers have been the key mediators between heaven and earth, and provided optical and acoustic leverage (Peters, 2015) – they have been symbols of futility (The Tower of Babel), symbols of nation (The World Trade Center), and often symbolic of the city (The Eiffel Tower). The modern "*skynomics",* or skyscraper economics (Barr, 2016), marks the global race among cities for vertical superiority – and, in practical terms, demonstrate the use of the most dizzying and vertiginous height, but also stability, to seduce future investors. These skyscrapers' height reflects the desire for visibility, and although the towers are often the best vantage point for a 360-degree view and provide "iconicity" for city branding, they are often secluded and disembodied from cultural practices and public rituals. The growth of vertical tourism, however, meant a new lease of life for these towers – concrete and glass needles that provide a literal jumping-off point for thrill-seeking urbanites. The void below the glass floor of a skywalk has become the key attraction, while the skywalk outside the tower, or even the climb up the mast, is the ultimate feat of vertical exploration.

As shown in **figure 5**, the Macau Tower skywalk allows visitors to take a circular walk outside and feel the void, dangling their feet 230 meters above the ground, or leaning out to the side, feeling the emptiness of the air. This thrilling performance, along with the other three available – the highest bungee jump in the city, the climb to the top of the mast, and the walk on the transparent glass floor – change the perspective of the city, which is now seen in its surrounding environment: the Pearl River delta, the sea and the islands. Here tourists meet the open air, with wind currents

coming from all sides. This multisensorial experience is visualized by a tour photographer, as the only equipment the tourists are allowed is their smartphone, which is placed in a sealed plastic envelope and tied to them so they cannot drop it. Vertigo is the key emotional aspect of this exploration of the vertical landscape, triggering anxiety and dizziness through the heightened consciousness of gravity (Deriu, 2018).

Insert Photo 5 here.
The Macau Tower skywalk: a vertigo-inducing experience and an example of vertical tourism. Copyright: Authors, 2020.

While for tourists this is a memorable experience of spatial depth, high-rise living has domesticated the vertical experience. With the growth of the vertical city, the meaning of living in a high-rise has changed as well. Social housing towers and the associated complexity of living together (captured in *Highrise* by J.G. Ballard) have given way to elite, premium sky lofts and penthouses. The air has become the safest home for the ultra-rich Brazilians residing in Edifício 360, towering over the congested traffic and boarding the helicopters of São Paulo (Leahy, 2017). While already safe in their villa communities, by living high above, *paulistas* remove themselves from both the problems and the view of the poor below – the traffic congestion, the noise, the waste.

As Saulo Cwerner (2009) suggested, São Paulo, the largest Brazilian city, has a unique urban mosaic in which many wealthy residential districts lie adjacent to working-class neighborhoods, including some of the largest favelas in the city. Essentially, São Paulo is the best example of the utopian metropolis, where the underclass lives on the ground, and the upper-class lives with panoramic views above. It is also one of those cities where a distinct breed of helicopter-friendly architecture with rooftop helipads has flourished, with professionals viewing the circular toppings of helipads as sculptures rather than functional elements of buildings (Cwerner, 2009).

While in São Paulo living above the traffic means serenity and greater safety than living in an isolated villa, in some of the densest urban settings in Asia, life on the 40th floor is the norm (see Figure 6). The density and verticality of the urban fabric is conditioned by the lack of habitable space and extreme land prices.

Insert Figure 6 here.

Macau is the most densely populated region in the world. Some residential blocks in old Macau resemble deep wells across which people can see and communicate with each other. This creates an ambience of total presence and visibility – a residential panopticon. Copyright: Authors, 2020.

The skyscraper has been an icon of modernity and neoliberal urban politics – the more expensive the land, the more rational it is to build upwards. The city needs to have a skyscraper or a business district with sky-rises to demonstrate its modernity and thus to attract investment. However, not all high-density cities are growing upwards – high-rise cities like Tokyo, Hong Kong and Seoul are less densely populated than Dhaka. High-rise buildings not only create skylines, they also create shadows, changing the light on the street and within buildings. They turn into large night decorations, too, with advertising or different colours lighting up the clouds and the sky. In the city of Macau, the gambling center of the world, the lights and light projectors from multiple casino developments never go off, changing the colours of the sky and nocturnal landscape of the city.

Since the volumetric turn, there has been an increasing shift away from the previously dominant flat discourse within the social sciences (Graham & Hewitt 2013). To echo Hito Steyerl (2011), our sense of spatial and temporal orientation has changed dramatically in recent years. This has been prompted by new technologies of surveillance, tracking, and targeting as well as new forms of protesting and imagining. The emphasis on horizontalism, particularly (though not exclusively) in urban scholarship, which emphasized planar or flat imaginaries of urban space over volumetric or vertical ones (Hewitt & Graham 2015), has increasingly made way for a more holistic and cross-disciplinary consideration of verticality in relation to the production, consumption, experience and representation of urban space and also, as we suggest, non-urban environments. With the rise of technologically-assisted aerial vision and the normalisation of vertical life, the previously dominant linear perspective is decreasing in importance. This introduction and the articles that follow build on these developments, continuing to initiate a more expansive, visually-focused approach to examining volume and atmospheres across a range of arenas, environments, practices and forms that reveal something about how society works with – or in relation to – an increasingly vertical world.

Summary

In this special issue, we bring together the analyses of authors for whom verticality, volume and visuality are at the centre of societal enquiry – analyses that strengthen visual sociology's status as a para-field (Pauwels 2010) of sociology at large. In doing so, we have outlined five different themes that are related to the various articles and methodologies used by authors in this special issue. These five themes are: (1) the visual culture of contemporary aerial vision; (2) vertical biopolitics; (3) volumetric imagination; (4) the verticalization of protest space; (5) density, depth and visibility, and the intensification of vertical urbanity. Our aim, in identifying these preliminary themes and collating these multi-disciplinary articles, is to encourage cross-disciplinary dialogue through a polyvocality (Harris 2015) that points to the discipline's potential post-disciplinary formation (Cambre, forthcoming). In doing so, we follow anthropologist Tom Hall's suggestion that we engage in purposeful looking and watchfulness (2017), where cities and non-urban spaces alike are given as much attention vertically as they are horizontally. From this stance we propose the importance of cultivating an aerial visual sensibility, to sharpen our attention towards the "everyday" of aerial life – organizationally, experientially, meditatively and representationally – as well as to look beyond the extraordinary or overtly visible and to focus on the experiences and choreography of socio-material politics in and of vertical space. In the quest to defamiliarize aerial objects, we echo Yuriko Saito's (2017) suggestion that we look at the sky as a blank canvas against which *airtifacts* and aerial events create a new visual landscape.

As we move to accept new vertical forms and social practices – living in high-rises, the sound and sight of drones above our heads, accessing aerial cableways above the city, and contemplating the wind farm on the hilltop horizon with its "functional beauty" and thin, sensuous qualities (Saito, 2017) – we must also remember that these practices are relatively new and disruptive. We must continue to work to understand how these vertical forms and social practices change the dynamics of the gaze, and, as Hagit Keysar notes (this issue) "what new hierarchies of race, social belonging and gender emerge as a result" (see Haraway, 1988, Parks, 2015). We must also continue to examine the global change in the colour of the sky. The sky is no longer "just blue". The "traditional" blue is giving way to the orange sky glow of the forest fires across the globe and the "black skies" of the industrial nations and polluted cities in China, India and Russia. This changing colour of the sky is an important canvas for further sociological reflection about the air, the aerial gaze, and our shifting visions from the ground up and from the sky down.

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References.

Amoore, L. (2007). Vigilant Visualities: The Watchful Politics of the War on Terror. *Security Dialogue*, *38*(2), 215–232.

Banner, S. (2008) Who owns the sky? The struggle to control airspace from the Wright brothers on. Harvard University Press: Cambridge, MA.

Boudreault-Fournier, A. (2020) Aerial Imaginations in Cuba. Stories from Above the rooftops. Routledge: London

Brighenti, A. (2007). Visibility: A Category for the Social Sciences. *Current Sociology*, *55*(3), 323–342.

Brighenti, A.M. and A. Karrholm (2018). Atmospheres of retail and the asceticism of civilized consumption. *Geographica Helvetica*. 73, 203–213.

Cosgrove, Denis E. Apollo's Eye: A Cartographic Genealogy of the Earth in the Western Imagination. Johns Hopkins University Press, 2003.

Cwerner, S. 2009 Helipads, heliports and urban air space Governing the contested infrastructure of helicopter travel, In (eds.) S. Cwerner, S. Kesselring and J. Urry. *Aeromobilities.* Routledge: London

Damisch, H. (1994). The origin of perspective. Cambridge, MA: MIT Press.

Deriu, D. 2018. Skywalking in the city: glass platforms and the architecture of vertigo. *Emotion, Space and Society*. 28: 94-113.

Deriu, D. 2016. "Don't look down!' A short history of rooftopping photography. *The Journal of Architecture..* 21(7): 1033-1061

Deriu, D. 2019. 'A dynamic attitude of the gaze': Gabriele Basilico's sense of vertical space. *The Journal of Architecture*. 24(8): 1096-1117

Druick, Z. 2018. A wide-angle view of fragile Earth: Capitalist Aesthetics in the work of Yann Arthus-Bertrand *Open Cultural Studies.* 2: 396-405.

Dorrian, M (2011) On Google Earth. *New Geographies* 4: 164–170

Elden, S (2013) Secure the volume: Vertical geopolitics and the depth of power. Political Geography 34: 35–51.

Garfinkel, S (2003) Elevator stories: Vertical imagination and the spaces of possibility. In: Goetz, A (ed.) Up Down, Across: Elevators, Escalators and Moving Sidewalks. London: Merrell, 173–196.

Gilbert, D. (2010) The three ages of Aerial Vision: London's Aerial iconography from Wenceslaus Hollar to Google Earth. *The London Journal*. 35(3): 289-299

Graham, S, Hewitt, L (2012) Getting off the ground: On the politics of urban verticality. Progress in Human Geography 37: 72–92.
Graham, S. 2016. Vertical. London, Verso
Goldsmiths Methods Lab: https://www.gold.ac.uk/methods-lab/
Haffner, Jeanne. 2013. The View from Above: The Science of Social Space. MIT Press,
Harris, A (2011) Vertical urbanism: flyovers and skywalks in Mumbai. In: Gandy, M (ed.) Urban Constellations. Berlin: Jovis, 118–123.
Harris, A. (2015). Vertical urbanisms: Opening up geographies of the three-dimensional city. *Progress in Human Geography*, *39*(5), 601–620.
Hillenbrand, M. 2020. The Cliffhangers: Suicide shows and the aesthetics of protest in China. *Cultural Politics* 16(2): 147–170.
Knowles, C. & Harper, D. (2009). Hong Kong: Migrant Lives, Landscapes, and Journeys. Chicago University Press
Krase, J., & Shortell, T. (2011). On the Spatial Semiotics of Vernacular Landscapes in Global Cities. *Visual Communication*, *10*(3), 367–400.
Krauss, Werner (2010) The '*Dingpolitik*' of Wind Energy in Northern German Landscapes: An Ethnographic Case Study, *Landscape Research*, 35:2, 195-208,
Leahy, J. (2017) Penthouses in São Paulo: a world away from the city's intensity. *Financial Times.* https://www.ft.com/content/c6e95ad6-a1f7-11e7-9e4f-7f5e6a7c98a2
Lindner, C. (2013) After-images of the highrise city: Visualizing Urban Change in Modern New York. The Journal of American Culture. 36(2): 75-87
Lugon, Olivier. 2013 "The Aviator and the Photographer: The Case of Walter Mittelholzer." Seeing from Above: The Aerial View in Visual Culture, edited by Mark Dorrian and Frédéric Pousin, IB Tauris, , pp. 147-162.
Millner, N. (2020). As the drone flies: Configuring a vertical politics of contestation within forest conservation. *Political Geography*, 80*,* [102163]
Momchedjikova, B., & La Barre, J. D. (2019). Introduction: From Above: The Practice of Verticality. *Streetnotes,* 26. Retrieved from https://escholarship.org/uc/item/6877p6fs
Pasqualetti, Martin J. Paul Gipe, Robert W. Righter.2002. Wind Power in View, Energy Landscapes in Crowded World. Academic Press,
Peters, Durham J. 2015. The marvellous clouds. Toward a philosophy of Elemental Media. The university of Chicago Press: Chicago
Saito, Y. (2017). Aesthetics of the familiar. Everyday life and world-making. Oxford University Press: Oxford
Shanks, Gwyneth. 2016. The politico-Aesthetics of groundlessness and Philippe Petit's High-Wire Walk. *Performance Matters*. 2.2: 43-62
Shaw, I.G.R. 2017. The great war of enclosure: Securing the skies. *Antipode.* 49(4): 883-906
Steyerl, H. – free fall - https://www.e-flux.com/journal/24/67860/in-free-fall-a-thought-experiment-on-vertical-perspective/
Wiig, A. (2013) Everyday Landmarks of Networked Urbanism: Cellular Antenna Sites and the Infrastructure of Mobile Communication in Philadelphia, Journal of Urban Technology,
20:3, 21-37,
Wrigley, C. (2018). It's a bird! It's a plane! An aerial biopolitics for a multispecies sky. *Environment and Planning E: Nature and Space, 1(4), 712–734.*