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# Digital Mediation, Soft Cabs, and Spatial Labour

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## Abstract

*Critics of digitally mediated labour platforms (often called the “sharing” or “gig economy”) have focused on the character and extent of the control exerted by these platforms over both workers and customers, and in particular on the precarizing impact on the workers on whose labor the services depend. Less attention has been paid to the specifically spatial character of the forms of work targeted by mobile digital platforms. The production and maintenance of urban social space has always been dependent, to a large degree, on work that involves the crossing of spatial boundaries – particularly between public and private spaces, but also crossing spaces segregated by class, race, and gender. Delivery workers, cabdrivers, day labourers, home care providers, and similar boundary-crossers all perform spatial work: the work of moving between and connecting spaces physically, experientially, and through representation. Spatial work contributes to the production and reproduction of social space; it is also productive of three specific, though interrelated, products: physical movement from one place to another; the experience of this movement; and the articulation of these places, experiences, and movements with visions of society and of the social. Significantly, it is precisely such spatial work, and its products, which mobile digital platforms seek most urgently to transform. Drawing on several recent studies of “ridesharing” (or soft cab) labour platforms, I interrogate the impact of digital mediation on the actual practices involved in spatial work. I argue that the roll-out of digital labour platforms needs to be understood in terms of a struggle over the production of social space.*

## “Technology is Inevitable”

In November of 2012, representatives from a half-dozen young startups – Cabulous, Hailo, Get Taxi, Taxi Magic, and others – gathered in a Washington, DC hotel for a talk hosted by the International Association of Transport Regulators (IATR). All the startups in attendance were presenting their apps for “e-hailing” – using smartphones to request taxi service – and responding to the IATR’s proposed model regulations for governing the roll-out of this new dispatch

technology. The lanky young CEO of one e-hailing startup began his presentation by taking a deep breath, and giving the audience a serious look. “Technology,” he intoned, “is inevitable.” The audience members nodded knowingly at this sage wisdom; but it is worth pointing out that, while the statement is profoundly true in a certain sense, it is completely nonsensical in the way that it was meant. What the speaker meant was that technological change is inevitable, and more specifically, that the emerging technology of e-hailing was inevitable. This is simply not true. Technological change or progress in any direction is not inevitable, no more than any of the technologies and institutions which the speaker and his audience were taking for granted – smartphones, automobiles, concrete-lined city streets, bodies of regulators, startups, conferences, hotels, etc. Each and every one of these formations is historically contingent. Specific technologies, and technological change, are not inevitable, but are instead dependant on the variable outcomes of complicated webs of human practice.

In a deeper sense, of course, the speaker was quite correct. Technology is inevitable, if by “technology” we understand the interaction of humans with their environment through prostheses of one sort or another (Stiegler 2010). The smartphone apps being presented at the conference were only one of the most recent means by which tools were to be inserted into, and used to mediate and transform, the relationships between human and human, and between humans and their surroundings. Yet the ends to which such apps would soon be put, and the transformation they would bring about, exceeded the imaginations of those present.

Another taxi and limousine-hailing startup, Ubercab (which had only recently shortened its name to Uber), had declined an invitation to the conference, but instead took up residence in a nearby suite in the same hotel, offering an open bar to meet with regulators on its own terms. This end-run around the conventions of the conference presaged the end-run Uber and similar companies would make or attempt around taxi regulations in the US and elsewhere. Uber’s aggressive approach toward regulators went hand in hand with its more aggressive use of the potential applications of e-hailing software (Slee 2015): the Uber app would be used, not only to enable more efficient car dispatch, but to more effectively and intrusively govern the labour of drivers, and the interactions between drivers and passengers. While the traditional taxi-app startups envisioned their e-hailing apps as momentary interventions in the existing practice of cab-hailing (replacing arm waving or phone calls), Uber and a few other e-hailing startups (e.g., Lyft and SideCar) recognized the transformative power of their apps as persistent digital openings onto the space of the cab ride, of the work of the drivers, and even of the everyday life of its customers. Using Latourian terminology, we could say that the taxi startups imagined the e-hailing app as an *intermediary* serving the same function as older means of communication; whereas Uber recognized the app’s transformative potential as a *mediator* (Latour 2005).

That transformative potential was just coming to light in 2012. That year, three companies – SideCar, Lyft, and Tickengo – started e-hailing services in San

Francisco under the legal cover of “ridesharing” (traditionally a non-profit activity, and thus exempt from taxi regulation in the State of California). Uber joined these companies in the “ridesharing” game early the next year. Instead of merely serving as a dispatch service, these companies used the digital mediation of the app to regulate the behavior of drivers and passengers and to pre-empt, at least in principle, the rationale for traditional regulation through the control of information and reputation systems. The outcome of this transformation was a controversial new assemblage which has gone by a variety of names, almost all of which are unsatisfactory:<sup>1</sup> here, I will refer to them as *soft cabs*, insofar as they rely on “soft regulation” by means of software, to supplant the traditional “hard” regulatory controls of the past; and because they make use of a *soft meter* (the term of art for an e-hailing app which also calculates the fare to be charged) in the place of that older mediating device, the taximeter, which had given its name to the “taxicab” a century earlier (Gilbert and Samuels 1982).

These soft cab services form the beginning of the roll-out of digital labour platforms (Fish and Srinivasan 2012) into the realm of mobile work. The term *digital work* has been used to describe the work of social reproduction in a digital context; Fuchs and Sevignani (2013) identify three kinds of digital work (cognitive, communicative, and cooperative).<sup>2</sup>

The earliest digital labour platforms – sites such as Elance, UpWork, and above all, Amazon Mechanical Turk – connected globally dispersed networks of on-demand workers and clients through the internet; though some observers have heralded the freedom and economic opportunity brought by these platforms, critics have focused on the extent of the protocological control exerted by these platforms over both workers and customers, as well as the precarizing impact on the workers on whose labour the services depend (the very low cost of “hits” on Amazon Mechanical Turk, for instance, is made possible by the developing-world location of much of its poorly paid workforce) (Fish and Srinivasan 2012; Fuchs and Sevignani 2013; van Doorn 2017). Such platforms, however, were largely limited by the nature of the work that could be conducted and distributed online.

The ubiquitous connectivity of smartphones has created the potential for a much broader range of services to be brought under the management of such digital platforms. The rise of the soft cab marked the advent of mobile digital labour platforms, tracking and managing a workforce doing non-online work.

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1 The name “ridesharing” properly refers to a distinct set of shared and/or not-for-profit services; see Anderson 2014. Other recent suggestions, such as “transportation network companies” (coined by California regulators) and “ridesourcing” (Rayle et al. 2016) fail to clarify the soft cab’s actual practical differences from other services and/or means of dispatch.

2 In this text I will be using the distinction made by Engels in a footnote to Capital between work as a qualitative creation of use value, and labour as a quantitative creation of value for exchange, i. e. paid work (Marx 1967: 47, 186).

So far, little attention has been paid to the specifically spatial character of the forms of work targeted by such platforms. “Social relations,” according to Henri Lefebvre, “have no real existence save in and through space” (Lefebvre 1991: 404); space, for Lefebvre, is thus inherently social space, and the production of space is inherently a focus of political struggle. The production and maintenance of urban social space has always been dependent, to a large degree, on work that involves the crossing of spatial boundaries – particularly between public and private spaces, but also crossing spaces segregated by class, race, and gender. Though this *spatial work* is diffuse, and intricately mixed with other forms of work and interaction, its fraught political character comes to the fore when such work is concentrated in particular paid activities; that is, when it takes the form of *spatial labour*. Delivery workers, cabdrivers, day labourers, home care providers, and similar boundary-crossers all perform spatial labour in moving between and connecting spaces physically, experientially, and through representation. Spatial work contributes to the production and reproduction of social space; as I will describe below, it is also productive of three specific, though interrelated, products: physical movement from one place to another; the experience of this movement; and the articulation of these places, experiences, and movements with visions of society and of the social.

Significantly, it is precisely such spatial work, and its products, which mobile digital platforms seek most urgently to transform, and as these platforms spread and are deployed in new kinds of spatial work, it is crucial to understand just how and why this is happening. The use of mobile digital labour platforms has spread far beyond car services, as “Uber for X” startups have sprouted offering a wide variety of on-demand spatial labour. Apps either already exist, or are in development, for home care workers, domestic workers, day labourers, home repair workers, and sex workers.<sup>3</sup> Below, I will define spatial work and outline the three fundamental products it creates, each of which is a target of particular attention for mobile digital labour platforms. Because the soft-cab platforms have, so far, had the most dramatic and controversial roll-out, and have attracted far more media and academic attention than other spatial labour platforms, I will draw primarily on ethnographic and sociological analyses of taxicab and soft-cab drivers, their occupational context, and the degree of control exerted over them by digital labour platforms. However, the focus on soft cabs should be read as the outline of a research agenda which will interrogate the impact of digital mediation on the actual practices involved in all forms of spatial work. In the conclusion, I will argue that the roll-out of digital labour platforms needs to be understood in terms of a struggle over the production of social space.

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3 Examples include TaskRabbit, Cleanify, ClearCare, and Rendevu.

## Mobility and Spatial Work

Within the broad literature that has emerged in the wake of the “new mobilities paradigm” (Sheller and Urry 2006), the most relevant for present purposes is that addressing the “politics of mobility” (Cresswell 2006, 2010). Defining spatial work necessitates a focus on the mobility of people (or “corporeal mobility” [Urry 1999: 56]) without losing sight of other kinds of mobility (e.g., of objects, images, communications, etc.; cf. Larsen et al. 2006: 47–61). In this context, *mobility* depends on the relative capacity to move, in other words, power; it is necessary that agents have and exercise this ability to connect the dots; to move, for instance, from place of rest to place of work to place of play and back again, for territorializing projects to function; and for large scale, enduring territorializations such as cities it is necessary that as a population they do this as repeated and shared practices of mobility. As a productive practice, mobility is constrained, conducted, and channeled through various means, but nevertheless agentive and subjectifying, and hence potentially unstable (Foucault 1983). To theorize mobility politically, it must be understood in its productive context and so cannot be treated as pre-existent or outside of power. However, to treat mobility solely as produced is to deny it causality; it must be considered as both produced by, and outside of limiting, constraining structures.

Thinking of mobility in terms of this two-way production and responsiveness, we come to the apparent paradox that mobility is *outside* power because mobility *is* power; or, more accurately, employing the Foucauldian understanding of power as diffuse in all social relations, mobility is an aspect of the excess of power – its extension, intrication, backgroundedness, unassimilable complexity – in which any given practice of power is inserted. Any program of fixedness, planning, or legibility is born in the midst of a multitude of ongoing processes and relations, and from this standpoint that which threatens to disable or limit these is mobility, to the extent that mobility is the excess of presence of objects, the excess spatial agency of subjects. Mobility is then, a species of power taken as an object of power, an object upon which power (as constraint, production, compulsion to circulation) is to be exercised.

Since domination must always be practiced within the networks and context of power more generally, projects of “power over” must make use of and draw on (and thus contribute to) the rhizomatic threads of “power to.” The excessive power of mobility is in this sense, not merely a threat, but also a vast resource to projects of territorialization and social control. As an excess of power, mobility reacts excessively to its constraints, in part like a river which moves faster when it is channeled; but it is also excessive in that, without producing them per se, it imparts force to the very constraints that operate on it. Mobility thus has a transferable or commutative power which is what makes it an object of productive constraint.

Much of the productive capacity of mobile practices takes the form of *spatial work*, the work of moving between and connecting spaces – connecting, that is,

physically, experientially, and through representation. Spatial work contributes to the production and reproduction of social space; it is also productive of three specific, though interrelated, products: physical movement from one place to another; the experience of this movement; and the articulation of these places, experiences, and movements with visions of society and of the social.

This triad is influenced by, and formulated in response to, two other triads outlined by scholars of space. The first is Lefebvre's tripartite discussion of the production of social space:

1. *spatial practice* (all the practices involved in the relations of social production and reproduction, the ways that people move and act in space; the way in which a sense of reality is produced through daily routine);
2. *representations of space* (which, as explicit representations, order space, in alignment with the existing relations of production and their ideological justification; the privileged product of scientists, planners, urbanists, and social engineers); and
3. *representational spaces* (a complex set of often implicit spaces of experience and familiarity, influenced by representations but not reducible to them; the lived space of inhabitants) (Lefebvre 1991: 33, 39).

Each of these three plays a role in the production of space, though Lefebvre argues that *representation of space* is typically dominant, particularly in modern capitalism, insofar as privileged representations crucially order, and give sense to, spatial practices and the more experiential "representational" spaces. This is related to the hierarchy Lefebvre finds in forms of knowledge, with *savoir*, the field of explicit propositions and laws which forms the basis of (for example) scientific knowledge, playing a dominant role over *connaissance*, the less explicit realm of familiarity and experience. Representations of space – as representations – are more closely embedded with *savoir*, while spatial practices and representational spaces are primarily associated with *connaissance*. Lefebvre's triad is useful for emphasizing the fact that the experience of space is not independent of the practices and representation that produce it, as well as for his insistence on the political implications of different forms of representation and of knowledge. Nevertheless, Lefebvre overemphasizes the dominance of *savoir* and the representation of space, painting *connaissance* and representational space as relatively passive. I argue that the concept of spatial work helps to correct this imbalance. Spatial work is not passive, but active, it is interactive and productive. Within Lefebvre's triad, spatial work is primarily a spatial practice, shaped by, and operating in context with, other spatial practices; it draws on the ability for, and takes place within the experience of representational space; and it is regimented by, and can reinforce or undermine, representations of space.

Tim Cresswell (2010: 22) also outlined three aspects of the politics of mobility:

1. *movement*, “the fact of physical movement;” the “motive force” and expenditure of energy involved in getting from one place to another;
2. *representation*, “the representations of movement that give it shared meaning;” and
3. *practice*, “the experienced and embodied practice of movement.”

Cresswell’s triad, not surprisingly, is clearly based on Lefebvre’s, though simplified (while Lefebvre’s triad are imagined as interacting dialectically, Cresswell’s are simply three different “aspects” of mobility; Lefebvre is concerned more generally with space and its production while Cresswell is considering mobility in particular). Also, while Lefebvre’s triad, which insists on the dominant influence of representations of space, is largely meant to explain how enduring power structures are reproduced at the level of social space, Cresswell’s is meant to problematize the immediate politics of the production of space at the moment of movement itself (and of outcomes such as why a person or thing moves, how fast, in what rhythm, by what route, with what feeling, and how it stops) (Cresswell 2010).

Drawing from these triads, spatial work can be defined as contributing to the production and reproduction of social space; and as furthermore productive of three specific, though interrelated, products: A. The *physical movement* of people, of things, etc. from place to place; the physical connection this establishes between “point A” and “point B;” B. The *experience of movement*, or of the connection of those places; in the case of the taxicab this relates to the affective experience of the ride, though in general this should refer to any affective impact of spatial work (the exhaustion of the commute or of driving in traffic, the pleasant surprise of receiving a package mailed by a distant friend); and C. The *articulation* of these places, movements, and experiences *with visions of society and the social*. This linkage is created in many ways, before, during and after travel; it is the field explored through concepts such as psychogeography, rhythmanalysis, and cognitive mapping; it is the sense in which the “mattering maps” by which we make sense of society are more than metaphorical (Grossberg 1992). Every journey is a “spatial story” (de Certeau 1984), telling the expected or unexpected connections between place and place, and between the people who live in and pass through them.

The politics of spatial work revolves around the control of these products. Spatial workers have always been the subjects of a range of disciplinary controls targeting their movements, affective interactions, and knowledge. The transportability and multifunctionality of smartphones and other mobile communicative devices – along with the tracking and computational power of the networks they are linked to – have brought an unprecedented opportunity for the rollout of projects to control spatial workers and their products. The transformation of analog space and practice through the ubiquity of digital interfaces is arguably one of the most important developments of our time; and it is not surprising that a profusion of metaphorical terms and theoretical approaches have arisen in

response. Thus, digital connectivity is described as “ubiquitous” and “persistent;” “augmented” social space is *transduced* by the logic of software (Kitchin and Dodge 2011); or becomes a *hybrid*, simultaneously analog and digital (de Souza e Silva 2006). As Aurigi and de Cindio put it,

In the augmented city, ‘virtual’ and ‘physical’ spaces are no longer two separate dimensions, but just parts of a continuum, of a whole. The physical and the digital environment have come to define each other and concepts such as public space and ‘third place’, identity and knowledge, citizenship and public participation are all inevitably affected by the shaping of the reconfigured, augmented urban space. (Aurigi and de Cindio 2008: 1)

Nevertheless, it is important to keep in mind the differences between the digital and analog spaces in which mobility is practiced, as well as what these differences are *not*. One is not more “real” than the other; one is not “physical” and the other ethereal; the augmentation of analog with digital space is made possible by a very physical global apparatus of servers, satellites, mobile devices, etc. (Bratton 2015). These spaces are, however, founded on different kinds of relationships, which can be illustrated through the differing ways in which space is measured by taximeters and by soft meters. Relationships in analog space are founded in adjacency and connectivity; relationships in digital space are founded in calculability. This is not to say that analog spaces can never be calculated or calculatable. Insofar as to be “analog” is to be comparable or in proportion with some standard of comparison, analog space is a space already in a relationship of measurement or representation: the analog is not the immanent. Digital practices can exist in analog space; for instance, counting the sheep that pass through a gate begins with direct indexical relationships which, once established, may be transformed into abstract symbols for calculation (Anderson 2011). The analog taximeter, invented in 1891, measures the distance of the trip by counting the rotations of the vehicle’s wheels or axle (Gilbert and Samuels 1982: 34). Modern taximeters may use digital displays and integrate with digital payment systems, GPS, etc., but these remain founded on the initial analog measurement of space.

Digital space, in contrast, begins with symbolic relationships and calculability, and is only afterwards applied to indexical or analogous relationships. The digital space of the soft meter is composed of global positioning coordinates which exist independently of the cab trip, and indeed, of the geographic points to which they are plotted. The soft meter calculates the vehicle’s successive positions in terms of these coordinates, then uses them to calculate the distance traveled. A foundationally digital space is created, even as drivers and passengers interpret these coordinates in terms of the analog space of the built environment and of human interaction.

Differing sets of practices are enabled and constrained by the differing logics and material affordances of digital and analog spaces (Galloway 2012). In analog space, mobility is a never-fully contained or calculated excess, which produces

spatial relationships (for example, the path worn across a field would not exist without the mobile practices of animals, human walkers, etc.). But in digital space, the relationships between places are already determined – programed, or “emplaced” in De Certeau’s terms – and mobility is simply the acting out of moves on the already inscribed “gamespace” of the map (Wark 2007). Anything that does not conform to the existing protocols simply is not registered and/or fails to take effect (Galloway 2004). This means that, whereas mobility in analog space is always to some degree *polytropic* – indeterminate, untrackable, and potentially deceiving – mobility in *protocological* digital space is inherently trackable, known, and circumscribed. The capacity for deception afforded by this polytropic mobility has long been a problem for analog projects of measurement or control; one of the appeals of digital space is that such *polytropoi* are eliminated in advance (cf. Nietzsche 1974: 344).

Of course, the actual digitally-enabled movements of humans and non-humans in cities take place in both analog and digital spaces, simultaneously. As Brian Massumi has argued, it is within the analog that power exists; to have any impact, the digital must operate through, and by means of, the analog (Massumi 2002). Next, I will describe in turn each of the three products of spatial work, and the means by which the mediation of such work through digital media is used to control and transform it in the case of the soft cab.

The studies from which the following descriptions are derived were almost completely conducted in the United States, where the soft cab originated. Donald Anderson conducted participant observation and ethnographic interviews with soft cab, taxi, and limousine drivers in San Francisco and in Tucson, Arizona (Anderson 2014, 2015), and analyzed the writings and video blogs of soft cab drivers in several US cities (Anderson 2016). Barry Brown, Marieke Glöss, and Moira McGregor interviewed taxi drivers, soft cab drivers, and passengers in San Francisco and London (Glöss et al. 2016). Min Kyung Lee, Daniel Kusbit, Evan Metsky, and Laura Dabbish analyzed soft-cab driver discourse in online forums, and interviewed soft cab drivers and passengers in Pittsburgh, Pennsylvania (Lee et al. 2015); Brenton J. Malin and Curry Chandler, also in Pittsburgh, followed a similar methodology (Malin and Chandler 2017). Alex Rosenblat and Luke Stark analyzed discourse on soft-cab driver forums, followed by ethnographic interviews with drivers (Rosenblat and Stark, 2015, 2016). Benjamin V. Hanrahan, Ning F. Ma, and Chien Wen Yuan analyzed driver discourse on the online forum *uberpeople.com* (Hanrahan et al. 2017).

## Moving and connecting places

Spatial workers are boundary crossers; a practice which entangles their image and identity with fears and concerns about the other and the alien, or even with the impure and the profane. This is particularly true for those workers who cross the

boundaries between public and private space. Most obviously, domestic workers intrude upon the intimate space of middle and upper-class homes, as do, to a more limited extent, repair personnel and on-call health workers (cf. Gutierrez-Rodriguez 2014; Stacey 2005). The intimate nature of on-call sex work is self-evident. Cab and “ridesharing” drivers share the intimate interior of the car with their passengers for the duration of the ride, a fact which has spurred a long history of micropolitical contestation over the boundaries and meaning of in-cab interaction (Anderson 2004). Even delivery workers, when food is involved, impose upon the domestic sphere due to the affectively-imbued practice of serving food. The boundary crossing of these workers is rendered all the more volatile in that much of this work is performed by workers of a different class and ethnicity than their customers. (Boris and Nadasen 2008; Schaller 2004).

Liminal and precarious status incites further surveillance, and this is rolled out through the digital mediation of spatial work. By means of this digital mediation, spatial workers become constantly trackable, with an analyzable data trail. In the case of soft-cab services such as Uber and Lyft, the insertion of mobile labour platforms into the relationship between drivers and passengers has made possible a new form of “algorithmic management” (Lee et al. 2015), and transformed the car into a “digitally mediated workplace” (Hanrahan et al. 2017). A growing set of surveillance mechanisms are deployed to track, evaluate, and police the movement of drivers, in order to increase company control and assuage the concerns and fears of passengers (Lee et al. 2015; Glöss et al. 2016). The acceptability of drivers in the view of passengers is managed through driver profiles, which use a five-star rating system (discussed in more detail below), and, depending on the platform, additional details such as driver name, photo, car make and model, and even information on what kinds of music interests are shared by both driver and passenger. The larger soft-cab companies have developed means for tracking and evaluating the driving style of drivers based on smartphone sensor data, using algorithms to tag excessive braking, speeding, etc. Though not all of the potential applications of this information have yet been deployed, the intent is clearly to make use of the ubiquitous digital tracking of the smartphone app to render knowable the movements and behavior of drivers, for the purpose of more effective control.

The extent to which cabdrivers manage their own movements in urban space has long inspired projects of surveillance and control, from vehicle licensing and numbering, through police monitoring of cabstands, mandatory waybills and trip reporting, to (of course) the taximeter (Anderson 2012). Soft cab platforms make use of digital tracking and asymmetrical access to information to further influence and control the movements of drivers (Rosenblat and Stark 2015). While the author’s early research on soft cab drivers documented them recreating many of the spatio-temporal strategies long employed by cabdrivers (such as “deadheading” to busy areas, or “sandbagging” the locations of likely trips) (Anderson 2014), subsequent studies have detailed the increasing effort by soft cab companies to develop greater control over drivers, including in particular their movements in space (Lee

et al. 2015; Rosenblat and Stark 2015; Malin and Chandler 2017). Dynamic pricing is used to lure drivers onto (and off of) the platform, and to attract them to specific areas where demand is expected to be high; hourly promotions and income guarantees based on number of trips completed, along with targeted “nudges” by text and email, bring drivers out on the road during specific hours, and keep them on the road, accepting calls (Malin and Chandler 2017; Rosenblatt and Stark 2015).

Soft-cab companies emphasize the role of their platforms in “connecting people” (i. e., drivers and passengers), and many drivers describe this as a primary benefit of the apps (Anderson 2015). The soft cab is established as a space purified of the taxicab’s old, pre-digital means of connection, signification, and control, through an appeal to the technological prestige of algorithms (or what Rosenblat and Stark [2015: 8] call the “appeal to the concept of algorithms”). In this discourse the responsibility, and the agency, for the production of social space through connections is assigned to these mobile digital platforms, without which such connections come to be imagined as impossible.

## Spatial Work as Affective Interaction

The intimacy of much spatial work is linked to the affective or emotion work involved. Hochschild used the concept of “emotion work” to describe the work done by workers whose jobs include the need to strictly manage one’s own emotions, or at least the display thereof, in the work environment and during interactions, especially with customers; as well as the associated work of maintaining a (usually) positive relationship and atmosphere in the workplace. Such work involves guiding interaction towards certain feelings and/or meanings, which are then associated with the workplace or the service performed (Hochschild 1983). All forms of spatial work which entail interaction with clients involve some form of emotion work. Because all interactants are invested in the meaning and outcome of the interaction, the micropolitics are all the more fraught.

Platform apps work to control the affect of these interactions through ratings systems and controls over the performances of workers and to a lesser degree, of customers. The use of ratings systems to recruit customers into policing workers has begun to spread in many retail sectors, but is most marked, and most controversial, in the soft cab (Anderson 2016; Rosenblat and Stark 2016; Malin and Chandler 2017). With such a system, both drivers and passengers rate each other, on a scale of one to five, at the end of each ride. Drivers and passengers, thus, each accrue a personal rating, averaged from all those they have received, which forms part of their profile. The rating serves two purposes; first, both drivers and passengers are able to see each other’s ratings as part of their profiles, and may choose not to request or accept rides with those who are low-rated. Second, both drivers and passengers who fall below a set rating run the risk of being removed from the system.

Although the ratings system ostensibly helps drivers identify and avoid potentially troublesome customers, the ratings system actually has little effect on customers, and other controls exerted on drivers limit their opportunities to exclude passengers based on ratings. The primary function of the ratings system is to induce a sense of anxiety in drivers, and to mediate the policing of drivers by passengers. The anxiety experienced by drivers, and the effect of this in making them a compliant workforce, is often emphasized in studies of soft-cab platforms (Anderson 2016; Rosenblat and Stark 2016). Drivers are encouraged to maintain as high a rating as possible (close to a 5.0), and are threatened with deactivation when their rating falls below 4.6 (depending on the app and the city). When their ratings go down, drivers do not receive a clear indication of what passenger rated them poorly, or why. The result is that drivers inculcate a generalized fear of upsetting customers, which governs their behavior during each ride.

Similar ratings systems have been used by other spatial labour platforms, such as those for home care workers and day labourers. Ratings systems seem especially suited for assuaging the fears of clients over sharing intimate or personal space with the potentially dangerous others involved in spatial labour. By disciplining the performance of workers, and labelling these performances with an ostensibly objective numerical value, the polytropic quality of the worker is resolved through digital mediation into a trackable, objectified quantity – a “data double,” which is used against the drivers as a tool of control (Haggerty and Ericson 2000). Hanrahan et al. (2017: 1) argue that “the replacement of the relationships between the stakeholders by the platform [...] is a contributing factor to the decrease in contractual responsibilities each stakeholder has to one another,” resulting in the enabling of bias and discrimination between passengers and drivers, as an effect of platform mediation.

## **Spatial Work as Articulation of the Social**

Through their boundary crossings and affective interactions, spatial workers help create and disseminate visions of the city and of the social. Spatial labour relates different spaces of the city, tying them together – or separating them – in meaningful ways. As a result of their movement across the spatial boundaries of social stratification, and their affective labour in intimate circumstances with diverse clients, each kind of spatial worker must develop some particular form of occupational knowledge which doubles as a cognitive mapping, or an auto-ethnographic image of the social space of the city. Examples of such practical ethnographic knowledge will be found among occupations in which one deals regularly with individuals from a broad spectrum of society (electricians and plumbers, for instance, spend their days travelling through town seeing how other people live and work, in their homes and offices; even more intimate is the view of domestic workers working for on-demand house-cleaning services); or among any of those

who, moving through different communities or social strata, must keep relearning “what people do” and how to interact (Heider 1975). At the same time, in practice spatial workers, for their clients and employers, often obscure this “hidden transcript” of subaltern knowledge and the “hidden injuries of class” behind a performance which reinforces an apologetic image of the social order (Sennet and Cobb 1972); this too is a product of spatial work.

The production of this social image, and whether it will challenge or reinforce social order, has long been at the heart of the ambivalent cultural image of cabdrivers; whether envisioned as city “ambassadors” in Toronto (Berry 2006), spreading rumors and news across Bangkok (Sopranzetti 2013), or telling spatial stories about driving to their passengers in San Francisco (Anderson 2004). While London cabdrivers famously train to learn “the Knowledge,” an officially recognized understanding of the spatiotemporal ground for navigating their city, the same name and concept is applied unofficially by cabdrivers in cities around the world.

The digital labour platforms governing soft cab work seek to harness and control this same productive power. Through the app interface, soft-cab drivers are fed carefully measured portions of relevant information – locations of fares, routes to follow – that replace and pre-empt the traditional taxi drivers’ need to develop a “knowledge” of the city. In place of the complex and polytropic performance of the cabdriver (Berry 2006), soft-cab drivers are given work doled out into a series of guided tasks – tap to accept hail, follow map navigation to location and destination – and are provided a narrative to follow which positions the soft cab and its driver as friendly, “sharing” alternatives to taxicabs and taxi drivers. As described in Anderson (2016) this narrative becomes an *allegorithm* when drivers use it as an (analog) “allegory” to interpret the algorithms governing their performance through the app’s digital mediation. Recalling de Certeau’s distinction between the perspectives of urban “walkers” and “voyeurs”: it is as if the (analog) walkers came to understand their own actions through the mediation of the (digital) voyeurs’ perspective (de Certeau 1984).

Malin and Chandler note, with irony, that many drivers internalize the “celebratory rhetoric of the digital workforce” which soft-cab companies promote (Malin and Chandler 2017: 384). This rhetoric emphasizes the freedom of choice and flexibility offered to drivers by the soft-cab platforms. Several authors have pointed out the contradiction between such claims to freedom, and the influential controls exerted over drivers through the “algorithmic management” of the app (Lee et al. 2015; Rosenblat and Stark 2015; Malin and Chandler 2017). Drivers resolve this contradiction by assuming the responsibility for their own submission to these controls, as a result of their free choice to enter into the job; this means, however, that drivers feel they should cede the right to complain about or contest the controls exerted by the companies; that drivers should “get over yourself” (Anderson 2015: 419) and “just deal with it as a driver” (Malin and Chandler 2017: 386).

Such submission is not only likely to “discourage the political activism that might help challenge the systemic problems facing these workers as a whole” (Malin and Chandler 2017: 397); it surrenders the very ground on which such problems could be contested. To the mediating platform is attributed the power to connect people and places, to manage the affective performances of drivers and passengers, and, in the end, to produce social space. The “right to the city” (Lefebvre 1996) becomes a privilege for properly behaved users of mobile platforms.

## Mobile Digital Mediation and the Production of Social Space

Mobile labour platforms have made it possible for workplace control to extend beyond the mere interaction between customers and workers, and beyond the control of the immediate products of labour, to attempt new forms of control over the production of social space itself, as this is achieved through spatial labour. The struggle over the production of social space centers on the three parts of Lefebvre’s “conceptual triad:” spatial practices, representational space, and representations of space. I have argued above and elsewhere (Anderson 2015) that Lefebvre’s classic account overemphasizes the power and importance of the representation of space vis-a-vis representational spaces and spatial practices; this leads his theory into a somewhat static condition, which has, arguably, resulted in a greater contemporary interest in Lefebvre’s more fluid account of rhythmanalysis (Lefebvre 2004) than in his theory of the production of space. The concept of spatial work as the mobile work involved in producing social space is intended to open up the politics of the production of social space to a more fluid analysis of the interaction of practices and affects.

Technology may be inevitable, but particular forms and effects of technology are not. The uses and outcomes of new technologies depend on the practices adopted by developers, producers, and users. The new forms of control exerted over spatial labourers through the digital mediation of mobile labour platforms, which I have detailed above, are projects in the making, not inevitable outcomes; and they have already sparked controversy and resistance. Although many drivers submit to the control of information through the company apps, others seek alternative channels of information, via other media such as online driver chat rooms, websites, and Facebook pages – there are even smartphone apps providing soft-cab drivers with the functionality of old-fashioned walky-talkies. Although many soft cab drivers embrace the affective framing of the algorithm and the image of the “ridesharing” driver promoted by companies (Malin and Chandler 2017), others develop a critical stance and identity as working drivers; some even organize politically to challenge the companies’ control over their work (Anderson 2015, 2016).

The politics of spatial labour in the soft cab illustrate the new sites of struggle over control and the production of social space which will take place as mobile digital labour platforms continue to develop. And although these platforms primarily focus on spatial *labourers*, the ubiquitous character of connected, hybrid space means that all kinds of spatial work can be transformed through similar projects of digital mediation – and beyond this, all of the work of social reproduction (Urry 2007: 41). As mobile digital platforms are used to mediate, track, and analyze more and more of our interactions and social lives, value extraction and means of control become ubiquitous as well; we are all mobile digital workers, now. But just what this will come to mean, and how it will transform the production of social space, depends on our response.

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