

On-Demand Taxi Driving: Labour Conditions, Surveillance, and Exclusion

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INTRODUCTION

As the so-called on-demand economy gathers momentum, the new labour and technical relations it enables have attracted increased critical scrutiny. Protests in cities across Europe (Fleisher, 2014) have focused on Uber's on-demand mobility service which allows users to hail private cars for travel, as well as allowing drivers to earn money from picking up rides. In this paper, we address the changing work practices and labour conditions of Uber drivers, and their impact on traditional taxi services – a business which already featured low wages and contracted out relationships between companies and drivers.

To begin to understand the labour conditions of taxi driving, it is worth outlining some features of existing cab and taxi work, and the role of Uber in changing these relationships. Cab driving is a dangerous job which, while low-paid, does offer opportunities for those excluded from other labour markets (Cooper et al., 2010). One feature of the job is that there is almost no limit on the hours one can work. Indeed, some cars are shared between drivers so that the vehicle can be on the road continuously, but studies suggest that drivers average around 50 hours of work per week (Hodges, 2009). Regulation has a large impact on drivers' experiences. In de-regulated taxis markets (e.g. Stockholm, Dublin, San Diego), there are more drivers, pushing down the amount of passengers available per driver. In regulated US cities, drivers often must pay for rental and access to a 'medallion' that allows them to drive. The SF taxi organisation statistics suggest an income of around \$11 an hour for drivers and US Labour Statistics calculate an average salary of \$14.52 per hour (Hara, 2011). This large variation is in part because of the difference in ownership of the car and medallion, but there is also chronic underreporting of salaries for tax avoidance purposes. One Australian study claimed 75% of drivers underreported income (ibid). There are also considerable differences in drivers' ability to get fares, and in the hours they work, making the 'average' driver income elusive. Whatever the exact figure, it is clear that taxi driving is low paid – but above minimum wage – with opportunities to work long hours. From our interviews with incumbent taxi drivers we document a business where drivers were broadly unhappy with their workplace, their relationships with customers, but also their access to the licences required to take fares. As one driver put it: *"The drivers are scared of the customers but also the customers are scared of the driver."*

Next to ethnographic observation of over fifty rides in ridesharing and traditional taxis, we draw on findings from 32 interviews with Uber drivers and passengers, as well as traditional taxi drivers. Interviews were conducted in San Francisco and London—two cities with very different legislative and commercial history for taxi driving, and 'ridesharing' app use. While media reports have frequently taken either a strong pro or anti Uber stance, they provide little empirical perspective on the experiences of drivers or passengers: we argue that there are both positive and negative elements, and that it is important to consider both. Moreover, commentaries on Uber often fail to consider the conditions of the incumbent taxi business prior to the proliferation of on-demand services like Uber. We contribute to an emerging body of literature outlining the Uber driver's experience of algorithmic and data-driven management (Lee et al., 2015), information and power asymmetries (Rosenblat and Stark, 2016), and requirements of immaterial forms of labour (Raval and Dourish, 2016).

Our empirical findings focus on the everyday experiences of both traditional taxi driver and Uber driver. From our interviews, we document how the Uber app changes work practices and effectively produces a new form of taxi driving. For Uber drivers, the work has become more flexible but also more demanding: the functions of the Uber app replaces the traditional work of hunting for fares and navigation, while introducing increasing demands of emotional labour, body labour, and temporal labour (Raval and Dourish, 2016). Further, the new economic opportunities presented by lowering barriers to entry are nevertheless tempered by additional financial risks. In an effort to look beyond the changing everyday practices, we conclude the paper with a discussion of labour conditions, surveillance, and exclusion: On-demand services have implications beyond the experiences of those directly involved, and as such, they are not solely a matter of private consumption.

RELATED LITERATURE

We will now briefly review related literature on three issues that are central to the issue at hand: taxi driving, the on-demand economy, and digital labour.

Taxi driving

The anonymity of traditional taxi driving was described in an early ethnographic study (Davis, 1959). Davis observed that a cab driver in a large city will probably never meet a passenger more than once; thus, “to a striking degree he is a practitioner *without reputation* because those who ride in his cab do not comprise, except perhaps in the most abstract sense, anything approximating a social group” (ibid, p159). More recent work echoes this, discussing the low mutual dependence and high mobility of taxi drivers (Elaluf-Calderwood, 2010). Government regulation presents perhaps the largest issue addressed by the academic literature (Hara, 2011). Economists have argued for deregulating taxi markets (as operating in Sweden and Ireland), drawing attention to regulated markets like New York - where there are *fewer* taxis on the road now than in 1937 (Moore and Balaker, 2006). Regulatory regimes may become monopolised by incumbents who manipulate the market for their benefit, to the cost of passenger and drivers. Long-term affect of regulatory measures to control the supply of taxi licenses can be counter-productive: London’s tough route-finding test, “The Knowledge”, has been used since 1865 to limit the supply of taxis but has resulted in an ageing driver workforce and a shortage of cabs during anti-social hours at night and weekends.

However, deregulation can also bring issues: Maguire and Murphy (2014) describe the Irish experience of taxi industry deregulation, which began in 2000 with an overnight lifting of regulation that resulted in the taxi market being flooded with drivers, lowering the reliability of the taxi market and causing tensions between drivers. Hodges (2007) relates the history of New York where the tradable ‘medallions’ are issued by the municipality and gives the right to drive taxis. While the medallion system was originally implemented to constrain supply and maintain a decent living standard for taxi drivers, the current medallions owners seldom drive taxi themselves. Instead, self-employed drivers pay the owners for the right to drive, and these drivers enjoy no worker benefits and endure difficult conditions with low returns (ibid). Hodges notes that, by 2004 in New York, the number of medallion owning-drivers was only 29%. Sharma’s (2014) ethnographic work on taxi drivers illustrates both the financially tough situation of cab drivers, and the pressures of working long unsociable hours.

Uber and the ‘on-demand economy’

Uber is frequently included in discussions of the sharing economy (Anderson, 2014; Muniesa et al., 2007), although this designation is controversial. In contrast with traditional ‘ride-sharing’ and innovation around shared mobility (Chan and Shaheen, 2012), the Uber ride is not shared as such, since the driver has to invest his time and labour to make the requested journey (Cagle, 2014). While some argue that Uber, and similar apps such as Lyft and Sidecar, are part of an emergent ‘sharing economy’ where forms of consumption around shared goods and activities rival private, state and public consumption (Aigrain, 2012; Belk, 2014), more critical voices have outlined how platforms that provide on-demand services can bring about new low-benefit, insecure work (Irani, 2015; Rosenblat and Stark, 2016).

Early academic literature specifically on Uber includes ridership surveys by Rayle et al (2014) and ethnographic studies of Uber drivers (see, e.g. Anderson, 2014). A recent paper by Lee et al (2015) discusses the relationship of Uber drivers to the algorithms that Uber uses to allocate rides, arguing for greater transparency in how Uber’s algorithms work to support drivers. Others have documented further aspects of Uber drivers’ experiences and their work context, including information and power asymmetries (Rosenblat and Stark, 2016), and requirements of immaterial forms of labour (Raval and Dourish, 2016). Recent research (Ahmed et al., 2016) expands the exploration of on-demand mobility beyond North America and Europe with an ethnographic study of auto-rickshaw drivers in Bengaluru, India. The study highlights concerns regarding driver welfare, depicting the challenges these financially vulnerable workers face in the course of their daily work in the informal sector and illustrating how the Ola app has done little to change the uncertainty which characterizes a drivers’ day.

Digital labour

The relationship between labour and technology is a topic of increasing scholarly attention (see Scholz, 2012). Digital labour and crowdwork has been researched extensively, focusing on the experiences of crowdworkers and seeking to make their labour visible and better understood (Gupta et al., 2014; Irani, 2015; Martin et al., 2014). Exploratory research, sometimes in collaboration with crowdworkers themselves, has considered ways to improve the design of crowd work (Irani and Silberman, 2013; Kittur et al., 2012; Salehi et al., 2015), for instance, by addressing the lack of balance between task requesters and workers. In a similar vein, Kingsley et al. (2015) call for a new framework to understand the context in which people exchange labour online for pay. On-demand services, like Uber and TaskRabbit (Teodoro et al., 2014), generate a range of similar labour issues, as the services are involved in payment, income, pricing, productivity, and conditions of the work being completed through them.

Labour has also been a central concept in economics, of course, where the approach has been to focus on the labour market in

an effort to address issues such as wage levels and inequality (with various work discussing two tier labour market models (Pencavel, 1987)), discrimination, market rigidities, job-employer matching and mis-matching, and especially active government policies to support those who are absent from the labour market (Heckman et al., 1999). The mixed impact of flexibility on work is one relevant point to our present study. Research has suggested that flexibility can lead to intensification of work effort: While employees may themselves report a preference for more flexible work arrangements, this can still come at personal cost such as reduced leisure time (Pedersen and Lewis, 2012).

METHODS

The goal of our study was to understand the changing practices and labour conditions related to Uber driving, and how 'rideshare' driving contrasted with traditional cab driving. The co-existence of traditional cab driving and ridesharing also presented the opportunity to investigate how Uber taxi services are changing a longstanding form of employment and transport. Since taxi services vary considerably from city to city, the study contemplates a 'mature' ridesharing city alongside another city. Finally, taxi driving is a diverse occupation, and our sample aimed to reflect that diversity.

We conducted 32 interviews with a mix of taxi drivers, Uber drivers and passengers, and two additional interviews with a taxi union and Uber representative. Drivers were recruited by requesting a ride via the Uber app, phoning to book a minicab, as well as traditional hailing on the street. The interviews started during the ride and were then continued at the end of the journey. Our status as passengers obviously impacted the interviews, although this did not appear to prevent drivers from being critical of their employers or the job. For passengers, we recruited using social media, and an email list sent around a US-based company.

The interviews ranged from 20 to 70 mins in length. We interviewed 8 traditional taxi drivers (2 SF taxis, 2 London mini cab, 4 London black cab), 17 Uber drivers (10 in London, 7 in SF), 7 Uber users (6 SF Users and 1 London user), a taxi drivers' union official and the general manager of Uber London. One of our London black cab drivers also picked up for Uber, and one of our Uber drivers was also a Lyft driver. While our passengers were balanced in terms of gender, the drivers recruited were all male. (According to Hara (2011), only 2% of taxi drivers in the US are female.) For diversity and in part due to media reports questioning the safety of Uber for female passengers, we recruited one female Uber driver via social media, and interviewed over Skype. For the drivers, we took a two stage approach with verbal consent, followed by a short discussion about each driver's position to ensure they were comfortable with taking part, followed by the formal signed consent document and the interview itself (two drivers gave verbal but not written consent and were not included in the study). As a semi structured interview, we drew on an interview protocol covering the following topics – learning to become a driver, navigation, previous driving experience, comparing Uber, describe last fare and interactions with customers, these were combined with questions responding to topics that drivers introduced. Passenger interviews followed a similar pattern. Additional observations and analysis of driver forums, and discussions with Uber and Drivers Union personnel were formative in nature, and conducted at the beginning of the study.

All interviews were fully transcribed, and qualitative textual analysis deployed, giving close attention to the different perspectives represented within the interviews. Our approach draws upon an interpretivist stance, with the development of an understanding of the problems and practices of those being studied. The analysis involved coding the transcribed interviews to develop themes through an iterative process. Aspects of our empirical findings have been reported in prior publications (Glöss et al., 2016; McGregor et al., 2015). This paper makes a further contribution by discussing questions regarding labour conditions, surveillance, and exclusion.

THE TAXI TRADE: LONDON AND SAN FRANCISCO

To understand some of the labour conditions of taxi driving it is worth outlining some features of existing cab and taxi work, and the role of Uber in changing these relationships. Cab driving is known to be a dangerous job which, while low-paid, does offer opportunities for those excluded from other labour markets (Cooper et al., 2012).

In London, the incumbent taxi business is segmented into black cabs, which can pick up passengers on the street, and mini-cabs, which cannot pickup and can only be allocated jobs by despatch companies. Black cabs charge higher fares, are regulated by city authorities, and the drivers need to pass a difficult route-finding exam ('the knowledge'), which typically takes three or four years to complete. In contrast, the San Francisco cab business is less segmented, although cab driving there has an equally complex history and cab drivers must pass an exam and work with a city license, 'a medallion'. Historically medallions have changed hands for hundreds of thousands of dollars. In both cities there exist 'bandit' cabs (drivers working illegally) and luxury limousine business. While entry to these regulated markets is not easy for new drivers, taxi driving has long been one job available to those with limited formal education.

It was to these markets that Uber entered, first with its launch in San Francisco in 2009, and subsequently into over 400 cities worldwide, entering the London market in 2012. With Uber, a potential driver with a suitable vehicle can sign up online and submit details for a background check. If they are approved they are sent a phone, and are ready to work when logged into the

app. For passengers, downloading the app allows them (after entering credit card details) to hail cab to the location they select. The app manages all communication between customer and driver before they meet, handles payment, and then asks both passenger and driver to rate each other.

FINDINGS

We organize our empirical findings here in terms of traditional taxi drivers and Uber drivers. While our main focus is on the work practices of taxi and Uber drivers, we will touch upon the passengers' experiences of changes in on-demand mobility in our discussion, since their choices have an important role in how the market develops and with what implications.

TRADITIONAL TAXI DRIVERS

An impact of city regulation is that taxis are significantly more expensive to own and operate than regular cars. Combined with the need to have a city licence to drive, drivers start the day owing money. One SF driver picked up his car at 5am and complained that he didn't earn anything for the first three hours of his nine-hour shift.

Most cab drivers are only paid if they get rides, so one of the first demands of the job is to find passengers. Both London Black Cab drivers and SF Yellow Cab drivers relied largely on watching for passengers hailing them on the street. Some London drivers talked about how they did not take just any ride, but 'interviewed' passengers to gauge if the ride was worthwhile or 'troublesome':

Yeah, you have an interview at the door, you don't just get in. I always speak to ya before you get in. (L2, London Black Cab Driver)

With a job as dangerous as taxi driving some caution about passengers may be reasonable. Yet the 'interview' cause issues for passengers—study suggests that taxis are around 11% less likely to stop for an African American passenger (Cooper et al., 2012).

Once a passenger is in the cab, the driver needs to navigate to the requested destination. The London Black Cab drivers made the least use of technology, relying primarily upon their expert knowledge of the city obtained as part of their qualification process. Yet, even they did make some use of GPS and mapping systems:

Yeah. That thing now, it makes me lazy...I've got to be honest. Within that machine, you've probably got most of "The Knowledge" in it. (L1, London Black Cab Driver)

Overall, however black cab drivers were quick to defend their hard earned knowledge of the city. For London mini-cab and SF drivers there was a mix of their own route knowledge and use of GPS if it was an unfamiliar destination. Clearly the GPS has become an established part of taxi driving.

The interaction with the customer requires constant assessment and flexibility. One SF driver talked about how in cases where a passenger seemed in some difficulty, they would give the passenger a free fare:

I had a man get in the car. He's in a suit and he's got a bouquet. He says, "I'm in a hurry. I'm getting married." I said, "Dude, I'm giving you this ride free." He's like, "Oh, you're awesome." I said, "Listen, you buy one more bottle of champagne and you toast that bride and here's to the cabbie." (SF1, SF Yellow Cab Driver)

There was also a darker side of the relationship with passengers, with passengers behaving inappropriately in the car and incurring time and cost for the driver and adding potential risk. Working the night shift causes particular problems in that passengers are frequently inebriated, with resulting problems of behaviour, violence causing considerable financial hardship for the driver. Other threats include passengers running from a cab without paying or even attempting to rob the driver. Indeed, cab driving is more dangerous than firefighting or law enforcement (Gambetta and Hamill, 2005).

Amongst traditional taxi drivers there was considerable competition over passengers and turning fares quickly enough. One driver spoke about how his skills let him grab good fares over other drivers:

It makes me more money than the other cab drivers. They're not smart enough or they're stubborn... why give away the secrets? Let them learn them themselves. (SF1, SF Yellow Cab driver)

Davis' (1959) classic paper, "The cab driver and their fare", talks at length about the importance of tipping, and the lengths to which drivers go to maximise their tips, including classifying passengers by their propensity to tip and at times even passing over passengers who seemed unlikely to tip the driver. For payment, the traditional taxi drivers talked about the popularity of cash over cards. Two drivers put this down to tax avoidance:

We're talking about tax evasion. That's what you're talking about. Even if you only even declare that which you take there [via credit cards] and then you take a syphon of a certain amount of cash. You've got to declare something. (L1, London Black Cab Driver)

UBER DRIVERS

Uber driving has significant differences compared to traditional driving. Additionally, each city context has unique features. For example, in London, a prospective Uber driver must acquire a Private Hire Vehicle regulatory license (PHV) to confirm their vehicle's complies with European standards emissions, determining the vehicle is less than five years old. Uber requires no proof of knowledge in navigating the city. Rather, the entry requirements focus on the driver's background, such as scanning for criminal records. In San Francisco, a normal driving licence is sufficient, and gaining access to the app is remarkably streamlined and requires little contact between driver and company. Subsequently, the relationship between Uber and the drivers is managed almost entirely through the app:

Basically I started with them, and that was it. I don't think I've ever spoken to anyone from Uber after that. (SF4, SF Uber driver)

For Uber drivers, the app supports much greater flexibility in when they work. Many of our drivers studied or worked other jobs (e.g. paramedic, video editor). Working with Uber could be switched on and off with no requirement to fit into predefined a schedule:

I'm a paramedic, so we have weird schedules. When I was looking for a part time job, it was difficult finding something that would fit with my schedule. This was very flexible and can work whenever I want on the days off. If I don't want to work, I don't have to, so it's great. (SF4, SF Uber driver)

The working routine of the Uber driver is similar in some regards to that of the traditional driver. The Uber app is central to the key tasks of acquiring customers, navigating to their destination and getting paid, amalgamating the ride despatch function of a traditional cab firm, along with 'innovations' such as review ratings, navigation, and payment. To obtain fares, a driver logs into the app and indicates they are ready to drive. After dropping a passenger off, drivers waited to pick up another fare, sometimes 'dead-heading' (driving back empty to busy spots for next ride):

It's good for drivers too. Anywhere I drop... there's a job. Anywhere in London. Even the other day I went to eh, where's the tennis, Wimbledon. I drove somebody there. I was thinking of, oh my god, now have to drive all the way back into town. As soon as I cleared the job there was a job. And I go there [Wimbledon] for maybe one hour, you know, up and down there and in there. (L12, London Uber driver)

According to Uber, jobs are allocated to cars that are closest to the fare, although some drivers questioned this since at times they would be allocated jobs that appeared far away. While drivers can decide whether to accept a ride, they are only given a name, distance, address, and passenger rating, and they are penalised by Uber if they reject too many rides. Once allocated a ride, the driver needs to drive to where the passenger is and find them. This can involve some searching or calling the potential passenger. The information provided via the app to both driver and passenger can be ambiguous:

Sometimes there's five or six cars and you see them asking are you for so-and-so? But you can look for the registration number and to match the driver's face. Then they get into the car and go. (L18, London Uber driver)

Another aspect of taxi driving which has radically changed is the importance of navigation knowledge. Although some of the Uber drivers took pride in knowing 'their' city, most of them had not undergone any formal training in terms of routes or maps and relied heavily on the use of GPS systems. While the Uber application provides an in-built map, this was often considered unreliable and navigation was conducted instead using Google maps and Waze because of their ability to provide real-time traffic information.

Compared to traditional taxis, social interaction plays a more central role. Some Uber drivers saw the interaction with their customers as a positive job experience: *So the interaction is fabulous... I really enjoy it a lot. Not being from the city I get a lot of great information about things, about the city, places to eat, places to go, different things of that nature. (SF14, SF Uber driver, female)*

Indeed, some of our interviewees claimed driving only occasionally and being motivated by the social experience as much as the income. This touches on the self-image (some) Uber drivers—quite distinct from that of incumbent taxi drivers. As we have described earlier, the importance of navigation, finding customers, as well as payment processing, have been deprioritised by the Uber app, whereas skills of engaging with passengers gain importance. Several drivers, in particular in San Francisco, underlined that they would not want to be associated with taxi drivers:

I actually... took the classes of being a taxi driver. I passed, I got my license, but I never started ... it didn't seem like something I wanted to do for work. With Uber, you work on your time... It's very flexible, so when you're free, when you have free time, you actually are not tired. To start up in a taxi, they've been driving since 3:00 in the morning. They may feel all tired. Just like when we're tired, we don't try to talk to nobody or social. So it's understandable in a way. (SF6, SF Uber Driver)

Another aspect of Uber that differs from traditional cab driving is the use of ratings. Drivers are rated by passengers, between 1 and 5, and drivers receiving reliably low scores are suspended from the Uber service. Acting as a form of surveillance and performance review on drivers, this forces them to focus on passengers. The rating system adds an element of 'emotional labour' (Hochschild, 2012) to the job: alongside the responsibility of driving safely and efficiently, the driver is now required to attend the social and emotional needs of customers. Further, minority drivers may be additionally burdened to overcome discriminatory preconceptions involving 'identity work' in order to conform with passenger expectations (Rogers, 2015). In the absence of any transparent measurement or defined set of rules, drivers may feel over-reliant upon arbitrary ratings:

Sometimes I just think the people, they either don't pay attention to the ratings are, some people are on it, some people definitely recognise that it holds stature – but some people I think are just kind of willy nilly with it. (SF7, SF Uber driver)

At the same time, our interviewees felt the rating system provides drivers a greater sense of control and security when it comes to picking up passengers. Since customers are registered and rated, Uber creates a stronger perceived connectedness between driver and customer:

It's a huge, huge difference in the technology that's applied to Uber versus taxis... all of the things that are involved with the car and Uber to really make it solidly safe. What I mean by that is that we know who's getting into the car when they are getting in, everything's connected to their credit card, we don't carry cash, If anything were to happen to us the vehicle has a tracker... I wouldn't recommend being a woman taxi driver because anything could happen (SF14, SF Uber driver, female)

The customer preregistration payment system has made Uber taxi payment easier, and drivers no longer are required to process transactions in the car, or to carry cash. Uber collects payment through the app directly at the time of the journey completion, and pays the driver on a weekly basis (after taking its commission). Although we recruited drivers by taking rides, we were surprised about how critical drivers were of Uber regarding their controlling policy. Even though the company defines the relationship with its drivers as a 'partnership', drivers suspect they carry the risks alone:

Of course they make a lot of money with me, and they don't spend nothing... They don't spend the gas, they don't spend the maintenance for the car, they don't do nothing. How do you think they're worth \$15 billion? Do you think they make it from the customer? No... They make it from the drivers. (SF7, SF Uber driver)

Uber sets the rates and has driven rates down in many markets. This means drivers can experience a falling income they cannot negotiate over. There have also been recent legal actions concerning whether Uber drivers should be classified as employees and not as independent contractors. Still the drivers we interviewed had mixed feelings about unionisation, and rates of unionisation in the taxi business overall have always been low (Hodges, 2007b):

So as far as joining a union they don't have any, nor would I probably even join it. As far as being self-employed I've done other stints as working as a freelancer so I kind of equate in some aspects to being self-employed. (SF6, SF Uber driver)

DISCUSSION

The livelihood of drivers all over the world from London to Lagos, and Shanghai to New York, is impacted by the decisions made by those designing and implementing on-demand service apps, such as Uber. In this paper, we have focused on the experiences of taxi and Uber drivers. We will now turn our attention from the changing everyday practice of drivers to a broader discussion of the role of Uber (and other services like it) in managing labour. Moreover, in addressing concerns over surveillance and exclusion, we will also touch upon the impact Uber has on passengers looking for a ride as well as others who may be affected by the emergence of new on-demand mobility services.

Labour issues

First, thinking about the economic impact of on-demand services raises questions about how the labour itself is transformed. A critical perspective might identify processes of increased surveillance, deskilling, casualisation and intensification with the advent of on-demand labour. Again, our examination of Uber reveals how the service also depends upon creating new skills, such as using the GPS, operating the app, and meeting the increased expectations of customer service. While on-demand services can dramatically lower barriers to entering a labour pool they may, at the same time, close the market for those who don't meet the changing skills requirements.

A prospective Uber driver need only be appropriately licensed to drive, and have access to a vehicle, which Uber considers suitable. This contrasts with incumbent taxi drivers who are required to comply with local regulatory systems devised to

control the overall supply of taxis—for example, the medallion system in the US, or ‘The Knowledge’ examination in London, UK. Both of these regulatory schemes were originally introduced to moderate the overall number of taxis operating, in order to help ensure a decent income for drivers. However, both have had the effect of making it difficult to become a taxi driver, requiring significant financial and time commitment, as well as limiting the supply of cabs in periods of high customer demand. Further, since Uber drivers are currently classified as independent contractors, each individual driver can log into the app to access work tasks only at times that suit them. Many of the drivers we interviewed were using the Uber app to supplement their income; unlike the traditional drivers we interviewed who drove as a full time job. Yet, being classified as an independent contractor while still essentially relying on Uber is a contested arrangement that is especially problematic for those drivers who do rely on Uber driving as their main source of income.

In discussion, the drivers we interviewed expressed a lack of clarity about the role of the company and some drivers were frustrated with the lack of human contact after initial registration with the app. The more experienced Uber drivers who had joined the platform during its launch in 2009 described their recent diminished earnings. They blamed this decrease in income not on the algorithm that allocates rides, but on the company itself – Uber was seen to push running costs down to the drivers. Moreover, interviewed drivers brought up Uber’s policy of aggressive rate cutting to fend off rideshare competitors like Lyft and Sidecar. Even though the company defines the relationship with its drivers as a ‘partnership’, drivers suspect that they, as a matter of fact, are obliged to absorb the risk. Rosenblat and Stark (2016) have found similar complaints in their examination of discussions of online driver forums and in interviewing drivers in person.

We might ask how driver economic power is reduced. So, for example, Uber drivers have no control over prices, and while in most regulated markets they would not have control either, there exists some sort of political representation and the ability to influence (and sometimes capture) regulations. A reflective perspective on the economic effect of Uber has to be critical but at the same time not to ignore the benefits for drivers and passengers that an app like Uber can provide: the app circumvents the complex system of middle-men and brings customers and drivers together more efficiently, lowering barriers to entry for the drivers and making it easier for those equipped with smartphones to get a ride.

As can be seen the algorithms that underlie Uber present a number of challenges and changes to established business practices. Critique of on-demand services has often focused on the impact of algorithms and data-driven management upon working conditions. Some have mapped features of the Uber ridesharing app’s algorithms directly to human managerial activities: Uber’s automated ride allocation, surge price alerts, driver evaluation using ride acceptance rates and passenger star-rating reviews are equated with human management decision making, information and evaluation, (Lee et al. 2015). While there have been calls to consider this in terms of ethical algorithms (Greenfield 2015), to us it seems that this is perhaps better framed as a set of questions regarding business ethics and decisions that companies and their management make about how they pursue profits and how they treat those working with (or for) them. Indeed, as Anderson and Sharrock argue, a focus on the autonomy of the algorithm might actually distract us from the proper analysis of a workplace situation that perhaps is not as new as it might seem at a glance (Anderson and Shamrock 2013).

As by far the market leader, Uber now essentially sets the rates and working conditions for a considerable slice of the taxi driving market worldwide, undercutting years of government regulation. Since the role of government regulation in the past has been to attempt to raise income for drivers, a central concern then is what this move in control means for the wages of drivers which can now be cut (or raised) at will by the rideshare provider. The decisions regarding Uber surge pricing are, at their root, based on business choices, although their manifestation to drivers and passengers seems algorithmic. Surge pricing is used by Uber to both encourage drivers to attend to areas with high demand—and importantly the surge also helps to moderate the demand for rides as passengers choose not to accept the additional cost. Indeed, research suggests surge pricing has more impact on suppressing demand (Chen, Mislove, and Wilson 2015). Surge pricing often passes very quickly, and passengers can log in again within minutes to find the surge price no longer in effect. However, the workings of the surge charge are opaque and neither consistent or predictable. This is problematic for both drivers and passengers, although arguably more consequential to the drivers who rely on Uber for earnings, and who are unable to forecast their income accurately.

Tracking, data, and surveillance

There are issues related to tracking, data, and surveillance that are remarkably different in the context of on-demand service apps than what has traditionally been the case with taxis.

First, Uber drivers’ activities are constantly monitored while they are logged into the system. For example, every Uber driver’s acceptance rate is monitored and drivers get penalized if they refuse too many rides. In this way, much of the Uber driver’s choice and control about which passengers they pick up is dissipated. (Lee et al. 2015) argue that drivers develop workarounds to try ‘play’ the Uber app to manage when and what rides get allocated to their car within the system – and these are discussed anecdotally and shared online via driver forums because the company does not provide details about how their algorithmic allocation system works. From our interviews, we are skeptical that there is much ‘play’ that drivers could

exploit. Due to the increased automation, the deployment of location information, and the automated payment technology, the app provides a service more optimized to passengers. While, for the drivers the opportunity for ‘workarounds’ through human interactions is removed.

Second, when an Uber has been ordered the application shows a countdown until the driver arrives, alongside a picture of the driver and details of the vehicle. When actually in the car and on route, concern for not being ‘ripped off’ by the driver was identified as a challenge of taking a traditional taxi. In contrast, the ability with Uber to see the ride on the receipt afterwards, as well as the rating system, all contributed to a perception of Uber’s reliability. Here, security can also take on a stronger meaning, in the sense of the driver not harming the passenger. One of the Uber passengers we interviewed in San Francisco described experiencing an extra sense of comfort and safety from knowing that the car’s location is tracked throughout a ride. Digital traces can improve accountability, too, and serve as evidence in settling disputes. In contrast, the relationship between a traditional taxi driver and a fleet cab is much looser, more anonymous, and less accountable.

Third, at the end of the journey drivers are rated by passengers, and vice versa. Many of our passengers did not know that they were rated by drivers, and could be refused rides if they had low ratings. As for rating drivers, most passengers would give stars. This acts as a form of surveillance and performance rating on drivers, forcing them to attend to passengers, and causing considerable anguish when their rating falls.

Fourth, from our study, it was apparent that the automatic nature of payments through the Uber app, and the emailed receipts, can have unexpected ramifications. One was the possibility of someone else paying for an account – a practice that while convenient, can open up novel opportunities for intimate surveillance and control. In particular, we encountered the case of parents paying for their children’s Uber rides, and then tracking their location and movements via the e-mail receipts.

Finally, there remain important questions regarding the data produced in the course of Uber rides. These issues are a rich topic for future study. At this point, we want to simply note that these data may, evidently, be valuable for a variety of purposes for the company, the drivers and passengers, as well as regulators alike. As such, we expect that questions of who owns, controls, and has access to data about Uber rides will become an increasingly important topic in the debate regarding on-demand services.

Discrimination and exclusion

Hailing a taxi is one area where it has been claimed that Uber can help combat discrimination. The traditional taxi drivers we interviewed talked about how they ‘interview’ passengers to see if the ride was worthwhile (or safe). Traditional cabs potentially carry considerable sums of money making them a potential target for robbery – indeed Gambetta and Hamill talk at length about the ‘pre-ride’ interview (Gambetta and Hamill, 2005), drawing on data from Northern Ireland where many taxi drivers lost their lives due to sectarian killings. In turn, there have long been questions over race and taxi provision, with investigations suggesting that taxis are 25% less likely to stop for black passengers. Alongside explicit discrimination, there are also the spatial aspects of discrimination in that drivers can refuse telephone bookings from particular areas, or simply avoid taking rides going to particular areas.

Some evidence suggest that Uber can reduce such discrimination by drivers (Uber Newsroom, 2014c), due to the requirement of drivers that they accept 80% of rides. From their own data, Uber themselves claim that income has a marginal effect on taxi provision, citing evidence from Chicago and Boston (Uber Newsroom, 2014a). What is not mentioned in the Uber presentation, however, is that to hail a taxi in the first place, a passenger must have an active credit card, which can be problematic for the 10% or so of Americans without a bank account (and although technical solutions such as VCPay are available, they are less convenient than cash) as well as other ‘unbanked’ passengers around the world.

Taxis fill important gaps in public transporting, supporting transport for those with disabilities, alongside participants and workers in the night-time economy (Uber Newsroom, 2014b). The passengers we interviewed had integrated the use of Uber into their transportation routines, with convenience and price as two major benefits cited. Our passengers spoke extensively about the social aspects of the journey experience. In this, the perceived unsociability of the taxi driver was to be taken for granted, and there were much higher expectations with Uber drivers. Where the passenger desires it, small talk seems to be an expected part of the Uber journey. While the passenger could decide whether to engage with the social interaction, they assumed extra rights to be critical of drivers’ conversations. Alongside the aforementioned concerns over emotional labour, this raises the issue of potential discrimination. Earlier work brings up the issue of homophily—the tendency of people to prefer associating with others similar to them—in Airbnb and Couchsurfing (Ikkala and Lampinen, 2015; Lampinen, 2016): often similar ‘types’ of people (in terms of class, age, ethnicity, or lifestyle) pair up in using these services. Our Uber passengers presented this issue as, *“Uber drivers are like me”*. Moreover, the centralized control Uber maintains in matching drivers and passengers alleviates some of the potential for discrimination, since unlike for example in the case of the hospitality exchange platform Airbnb, users of Uber (drivers and passengers) do not get to choose who they would like to be

matched with. Yet, passenger expectations of similarity may still play into who can succeed as an Uber driver, and how easily, thus contributing indirectly to the displacement of workers who historically were able to enter the workplace via low paid, low skilled labour (Schor, 2014). Minority drivers may be additionally burdened to overcome discriminatory preconceptions.

In considering the impacts of Uber, it is of course not sufficient to focus on the experiences of Uber drivers and their passengers. Existing cab companies, owners of medallions, and city authorities no longer have as much control over taxi driving as they used to. It is important to acknowledge that while some benefit from the emergence of on-demand services, others are worse off in the changed situation. Among those excluded are existing cab drivers who do not fit (and are incapable or unwilling to adapt) into Uber's desired driver profile. This may create something of a two tier cab market with divisions in terms of both drivers and passengers. While the app opens new customer segments by offering convenience and efficiency, it excludes others, such as those without bank accounts and smartphones. Indeed, problems with users 'borrowing' other Uber accounts were brought up in our interviews.

Lastly, as a Norwegian study of "crowd-taxis", such as Uber, depicts, not only do traditional taxi owners worry about decreasing revenues and taxi drivers about poor working conditions, but the emergence of on-demand service platforms brings about further concerns related to poor transport preparedness, accessibility issues, quality assurance and tax evasion (Dotterud Leiren and Aarhaug, 2016). The authors argue that these services will likely to produce a range of unanticipated effects necessitating regulation. In the Norwegian case, current regulations of the taxi market provide existing taxi owners and dispatchers some protection from competition, but also require them to guarantee transport preparedness as well as the availability of regulated number of vehicles that are accessible to people with special needs. The authors argue that the probability that crowd-taxis offer such services is currently low, and point out that this is a case where the protections for the incumbents can be justified by social solidarity—a solution that gets undermined in the face of competition from rivals who "can choose to enter only those markets that are profitable, thereby depriving the established taxi owners of the revenue to fund universal services". There are, therefore, concerns that this endangers the quality of transport services as well as the transport preparedness in rural areas or consistently during different times of the day and different days of the year. If society wants to ensure that these services are performed, while allowing for the development of a competitive regime and reaping the benefits of new technologies, it will be necessary to create regulations which facilitate provision of safe and available transport services to the public, both in rural and urban areas (Dotterud Leiren and Aarhaug, 2016).

CONCLUSION

In this paper, we have sought to document the new work life of a set of Uber drivers, contrasting this with the existing world of cab driving. Our goal has been to examine the changing life world of a very old profession—that of the taxi driver. Clearly, there is much controversy ahead concerning broader regulatory policy around on-demand mobility. Balancing the needs of different groups of consumers as well as both new and established workers will present considerable challenges to regulators in the future. In an effort to look beyond the changing everyday practices, we concluded the paper with a discussion of issues regarding labour conditions, surveillance, and exclusion. On-demand services have implications beyond the experiences of those directly involved, and as such, they are not solely a matter of private consumption.

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