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Journal Item

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The algorithmic panopticon at Deliveroo: Measurement, precarity, and the illusion of control

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abstract

Deliveroo is a food delivery platform that allows customers to order food from restaurants and have it delivered via a smartphone app. It uses a similar business model to Uber, effectively outsourcing the costs and risks of the operation onto workers. New platforms like these utilise digital surveillance to measure and control workers through their smartphones. Although algorithms have become a popular topic of research, less is known about how these are experienced by workers and how effective they are at overcoming the indeterminacy of the labour process at work. This article draws on a workers' inquiry methodology – including observation, interviewing, and co-research – to explore these questions from the perspective of the worker. It traces the development of supervision, from the panopticon in the factory, to the electronic panopticon in the call centre, and applies this as the algorithmic panopticon at Deliveroo. The analysis highlights how this managerial technique relies upon illusions of control and freedom, drawing attention to the double precarity present for both the workers and the platform.

Introduction

Deliveroo is a platform for food delivery, using the model of Uber, which has become the archetypal example of this kind of organisation. Platforms have grown rapidly in recent years, something captured in the refrain for new

companies that they will be the 'Uber for X' (Srnicek, 2017: 37). Like Uber, Deliveroo is pitched as a platform that connects customers with food and the riders to deliver it. Deliveroo can therefore be considered as the 'Uber for food delivery', despite the fact it also competes with Uber's own UberEats offering. It has become a major part of the so-called 'gig economy' in London, in which work is becoming increasingly fractured across different gigs – or precarious work arrangements. Deliveroo is 'disrupting' the food delivery sector, to use the parlance of these companies. In the words of Deliveroo (2017), it connects 'hundreds of restaurant chains and many top quality independents to deliver their food' with 'a fantastic team of drivers.' The platform aspect relates to the fact that Deliveroo classifies the drivers as 'self-employed independent contractors', claiming that they bring together the restaurants and drivers rather than directly employing anyone. This is similar to Uber's claim to be a taxi company that employs no drivers, nor owns any cars.

The aim of this article is to intervene in the debates around the use of algorithms in platform work. There is an increasing output of research on algorithms (Schneier, 2015; Cheney-Lippold, 2017; O'Neil, 2017; Turow, 2017; Eubanks, 2018), but less focus on how they are used in practice as forms of 'algorithmic management' (Lee et al., 2015; Rosenblatt and Stark, 2016). At Deliveroo, algorithms are used to measure and supervise work. However, as comparatively little is known about how these work in practice, there is risk of overstating the power and sophistication of these techniques. This paper will address the use of algorithms at Deliveroo through an updated version of the panopticon metaphor. In order to do this, the development of different forms of measurement and supervision are traced from the factory and call centre. These two examples highlight how the techniques have developed, both in terms of the new methods, but also exploring what the loss of a human supervisor – either walking the factory floors or listening in the call centre – means for management at Deliveroo.

The contribution of this article is an intervention into the debates on platform work and the role of measurement, surveillance, and control. The intention is to highlight how the algorithm operates at Deliveroo by starting from the perspective of the worker on the platform. To do this, the article

uses the workers' inquiry as a methodological approach, drawing on observation, interviews, and elements of co-research. The findings also reveal how algorithmic management is experienced by workers, along with a two-fold expression of precarity at Deliveroo – both for workers and the platform. This is discussed in terms of Deliveroo's need for an illusion of managerial control, albeit backed up detailed supervision and the occasional disciplinary act. The appearance of an omnipresent and automatic method of supervising and disciplining workers is a cost-effective method of control, but, as the participants show in this paper, this appearance was far from total.

Measurement at work

The factory

The measurement of work is a core concern for management, clearly identifiable in the factory regime. The management of work involves the buying of people's time and then its effective use. The capitalist work relation is premised on the existence of what Marx (1976: 272) joked were workers who are 'free in a double sense'. This meant workers that are free to choose who they sell their time to, but also freed from any other way to make a living. The problem here, and one which managers have long been concerned with (as well as labour process theorists from the other side), is the contradiction between the interests of the seller of labour power (the worker) and the buyer (the capitalist). In chapter ten of *Capital*, Marx (1976) explores this through the tensions over the length of the working day. In the context of the factory, the capitalist seeks to increase their profits through increasing the extraction of surplus value from workers. Marx explores how the lengthening of the working day achieves this, increasing the absolute surplus value produced. However, this method results in marginal returns, as it exhausts workers in the process of lengthening the shifts. Instead of making the absolute period of work longer, relative surplus value can be increased by making workers produce more during the same period of time. Both of these are attempts to solve the indeterminacy of labour power (how to get the most out of purchased labour power), but increasing relative

surplus value has been the most effective. However, achieving this is complicated in practice because it entails exerting control over workers. As Edwards (1979: 12) has argued, 'control is rendered problematic because unlike the other commodities involved in production, labor power is always embodied in people, who have their own interests and needs and who retain their power to resist being treated like a commodity'.

In the factory, the measurement of worker performance therefore became an important starting point for increasing profits. Systematic measurement of the labour process became an obsession for Taylor (1967: 36), who argued that 'managers assume' the 'burden of gathering together all of the traditional knowledge which in the past has been possessed by the workmen and then the classifying, tabulating, and reducing this knowledge to rules, laws, and formulae.' While studying work at the Midvale Steel company, Taylor developed a close knowledge of production, breaking down and measuring each aspect. Scientific management (or Taylorism as it became known) developed into a method with three principles. First, the 'gathering and development of knowledge of the labour process', which entails detailed measurement of the work. Second, 'the concentration of this knowledge as the exclusive province of management'. Third, the 'use of this monopoly over knowledge to control each step of the labor process and its mode of execution' (Braverman, 1999: 82). These three principles, along with the prevalence of time and motion studies, went beyond just measurement to become what Braverman (1999: 60) has argued is 'a theory which is nothing less than the explicit verbalization of the capitalist mode of production'.

Measurement is therefore a key part of managing the labour process. It provides the basis for managers to address the indeterminacy of labour power, ensuring that purchased labour power is being used effectively. In the factory, this required supervisors who would walk 'up and down the central isle of the workshop' carrying out 'a supervision that was both general and individual' (Foucault, 1991: 145). This process turned the factory into a workplace of surveillance, measuring the work through direct supervision to ensure workers were expending maximum effort. However, the general aspect of supervision is also one of threat – after all, the supervisor cannot watch every worker simultaneously. This aspect of supervision is often

discussed through the metaphor of the panopticon, which was an architectural model of a prison in which a single observer could simultaneously watch each prisoner from a central point. The panopticon was intended to internalise the supervisory function, as the individual prisoner cannot know when the observer is watching and so assumes it could happen at any point. While Bentham (1995: 80) discussed the utility of this in prisons, he also argued that 'whatever be the manufacture, the utility of the principle is obvious and incontestable, in all cases where the workmen are paid according to their time'. He foresaw how the panopticon could also be a tool to overcome the indeterminacy of labour power. However, Bentham also continued to argue that where workers are 'paid by the piece', the 'interest which the [worker] has in the value of [their] work supersedes the use of coercion, and of every expedient calculated to give force to it'. Therefore, the subordination of workers increasingly used piece-rates in production alongside supervision. Both involve attempts to make workers internalise management's aims.

Piece-rates provide a powerful tool for managers to encourage greater productivity. If management became obsessed with finding ways to increase productivity, Burawoy (1979) instead looked at why workers worked as hard as they did. In the study, he found workers used game-like practices to 'make out' and surpass expected work quotas. The piece-rate approach became successful and, as Cliff (1970) has argued, about two-fifths of the working class were covered by piece-work systems before 1970 in the UK. However, the piece-rate system – along with strong shop-steward networks – provided multiple avenues for workers to effectively resist management. In response to working class militancy, these were increasingly replaced by 'productivity deals', with workers agreeing to work for a higher wage and not restrict productivity measures. This meant again developing new ways to control workers, no longer relying on a straightforward financial incentive.

The call centre

The next key development of managerial control comes after the decline of manufacturing in the UK. Across the global north, this restructuring has meant that most people now work in services. What sets services apart from

factory work are four main characteristics: intangibility, variability, perishability of output, and simultaneity of consumption and production (Lovelock, 1983). This creates new challenges for management 'because services are more intangible than not, quality and productivity are difficult to measure', which means 'it is difficult to set specific goals for employees and evaluate their performance based on those goals' (Batt, 2008: 434). One way to overcome this has been to apply new kinds of technology to the labour process in service work. Despite the early claims to the contrary, this has led to a kind of post-industrial work that Brophy (2010: 474) has described as 'not Daniel Bell's dream, but Harry Braverman's nightmare'.

The call centre became symbolic of many of these changes, as well as becoming the focus of many debates on measurement, surveillance, and control. As Glucksmann (2004: 795) summarised, call centres are 'one of the most researched' forms of contemporary work, providing 'material for debates about "surveillance versus resistance", work degradation and the relevance of an electronic panopticon analogy'. This focused on how 'emotional labour' (Hochschild, 2012) was being organised in call centres (Mulholland, 2002; Houlihan, 2002; Kolinko, 2002, Taylor and Bain, 2003). This qualitative aspect of the labour process is difficult to quantify and measure, due to its subjective and ephemeral characteristics. Taylor and Bain (1999: 103) therefore conceptualised the demand for call centre workers to 'smile down the phone' within a workplace marked by 'extreme levels of surveillance, monitoring and speed-up' (Taylor and Bain 1999: 108).

Facilitated by digital technology, the call centre became a site in which the measurement of the labour process could be timed to the second (Woodcock, 2017). In this context, Foucault's (1991) use of the panopticon metaphor was developed by Fernie and Metcalf (1997: 3) to claim that call centres were organised like an 'electronic panopticon'. They argued and that the 'possibilities for monitoring behaviour and measuring output are amazing to behold' and that 'the "tyranny of the assembly line" is but a Sunday school picnic compared with the control that management can exercise in computer telephony'. The use of this metaphor has faced criticism, for example McKinlay and Taylor (1998: 175) argued that 'the factory and the office are neither prison nor asylum, their social architectures never those of the total

institution'. Similarly, Taylor and Bain (1999: 103) point out that this comparison can 'disavow the possibilities for collective organisation and resistance', and that in call centres, management 'rely on a combination of technologically driven measurements and human supervisors' (Taylor and Bain 1999: 108). After all, the workplace involves contradictions between quantity and quality of phone calls in the labour process (Bain et al., 2002: 3) and necessarily entails the 'dynamic process of capital accumulation' (Taylor and Bain 1999: 108). Yet it is possible to use the panopticon metaphor to illustrate the new dynamics of supervision while still drawing attention to the resistance that takes place on the call centre floor (Woodcock, 2017).

The platform

These previous debates about factory work and call centres provide an important route into understanding the role of measurement in platform work. The same concern over the indeterminacy of labour power in the factory and the call centre remains, although now platforms are purchasing slivers of worker's time, spread out over a geographic range that is potentially global. As Standing (2016) has predicted, one third of labour transaction will take place on digital platforms by 2025. The 'integration' of telephones and computers in the call centre that facilitated the intensification of measurement (Taylor and Bain, 1999: 102) is now reconfigured, with workers expected to pay for their own smartphones equipped with GPS for far more granular data collection.

The growth of platforms like Deliveroo and Uber has been analysed by Nick Srnicek (2017: 91). He identifies the 'lean platform economy' as emerging from a contect in which it 'ultimately appears as an outlet for surplus capital in an era of ultra-low interest rates and dire investment opportunities rather than the vanguard destined to revive capitalism'. Trebor Scholz (2017: 13) has also undertaken a sustained critique of platforms, arguing that they have been 'instrumental in the process of dissolving direct employment, thereby creating low-wage futures for millions of people'. Scholz (2017: 42) argues that platforms like Deliveroo are, in fact, 'a labor company, not simply a tech startup, which means it is reliant on the availability of an abundance of cheap labor and a permissive regulatory environment' (Scholz, 2017: 44).

While there are a range of different forms of platforms, delivery platforms are a kind of 'geographically-sticky' work (Graham and Woodcock, 2018: 245) that requires workers to be in a particular place to complete the work. This is distinguishable from forms of 'cloud work' that workers can complete from anywhere with a computer and internet connection, either short tasks like 'crowdwork' or larger 'freelance' activities. Deliveroo is therefore a kind of 'location-specific labour platform' (Graham and Woodcock, 2018: 245).

The key way that platforms like Deliveroo have sought to manage labour is through the use of algorithms. Algorithms involves 'sets of defined steps structured to process instructions/data to produce an output' (Kitchin, 2017: 14), often automating previous ways of doing things. The processes involved are often obscured as if they operate like a 'black box' (Pasquale, 2015), making research challenging. Kitchin (2017: 22-25) has suggested six different ways forward for researching algorithms. The first four involve directly engaging with the algorithm, either through the 'pseudo-code/source code', 'reflexively producing code', 'reverse engineering', or by 'interviewing designers or conducting an ethnography of a code teaming.' However, by positioning the algorithmic management as a development of previous management techniques in the factory and then the call centres, platforms can also be considered in two other ways: either by 'unpacking the full socio-technical assemblage of algorithms' – although this is clearly very difficult to undertake in a single short case study – or by 'examining how algorithms do work in the world' (Kitchin, 2017: 25). Thus, following the worker and the algorithm into what Marx (1976: 280) described as 'the hidden abode of production' provides a way to explore this in practice. This must start from an understanding of the workplace as a site of conflict in which algorithms are designed and implemented by management. The algorithm, and of course the measurement necessary for it to be effective, are therefore part of a longer history of management at work, a process that necessarily involves attempts to supervise, control, motivate, and discipline workers.

Research methods

There are significant challenges for researching work at Deliveroo as it is mediated via a digital platform. The organisation of work limits the opportunities for accessing workers, as there is nothing analogous to the factory gates. There is no physical point outside the workplace at the start or end of a shift to speak to workers. As with other kinds of precarious work, there are structural access problems, and the company itself is not open to research. To address this, the article draws on an ongoing research project that has experimented with different methods to overcome these barriers. It began in June 2016 in London, before the first strike at Deliveroo in August that year (see Woodcock, 2016). This project is an attempt to apply the method of workers' inquiry (Marx, 1938), which has been covered in previous issues of both *ephemera* (Woodcock, 2014) and *Viewpoint* (Woodcock, 2013). It began through serendipitous contact with a Deliveroo driver, along with noticing a rapidly growing number of workers appearing on the roads of London. In Workerist terms, despite the initial contact with a Deliveroo driver, the project began as an 'inquiry from above' (Rieser 2001: 4), seeking to gain access to the workplace. This involved 'participatory' methods, ethnographic observations, and conversations with workers (Alberti, 2014) which were documented with 'full field-notes' throughout the project (Lofland and Lofland, 1995). These were supplemented with ten semi-structured interviews, which were recorded and transcribed. The researcher's identity and the aims of the project were disclosed to both the interview participants, as well as the workers who were engaged in informal conversations. All of the interviews have been anonymised using pseudonyms to protect the identity of the participants. This is particularly important as Deliveroo have previously victimised workers for speaking publicly about the company (Geraghty, 2016).

The extended contact with Deliveroo workers allowed the utilisation of snowball sampling for the semi-structured interviews, which Hagan et al. (2011: 157) have noted is 'a commonly used strategy for locating hard-to-find or sensitive population'. This was a deliberative approach to sampling, seeking out further contacts from those encountered during the observation. The interviews themselves were difficult to organise, despite initial interest

from potential interviewees. Due to the shift patterns of the work, it proved difficult to reliably schedule interviews. When the interviews were scheduled, they took place across London. Each was recorded, and informed consent was achieved with each participant. In total there were ten formal interviews which were transcribed, along with field notes for the other conversations and participatory activities. Eight of the interviews were with bicycle riders, while the other two were with moped/motorcycle drivers. Half of the interviews were with migrant workers, mainly from EU countries. The age range was relatively narrow, with participants in their 20s, and all of the participants were men.

To supplement these methods, the project also attempted a collaborative form of 'co-research' (Rieser, 2001: 1). This involved two main activities. First, co-writing an article with a Deliveroo rider, who used the pseudonym Facility Waters (Waters and Woodcock, 2017). This process was carried out over six months. It involved Waters self-tracking their routes across London, taking detailed information and pictures about each step of the labour process, and analysing their own experiences in depth. It began as a form of co-writing termed 'the full fountain pen method' (Worcester 1995: 125) that the Johnson-Forest Tendency developed, but the final paper was mostly written by Waters, with myself becoming more of an editor. The results of this paper are drawn upon here both directly (with some quotation from Waters in the article) and indirectly. The second part was a collaboration with the IWGB (the Independent Workers' Union of Great Britain). The workers involved in the strike approached the IWGB and began organising with them afterwards. I observed these early meetings and provided volunteer support in various ways to facilitate access.

Informal conversations were conducted with workers during the later organising campaign in London. Many of these conversations were conducted during the organising drive in a north London zone, which involved speaking to people based in that zone, but also activists who had travelled over from other areas to leaflet for the union campaign. Due to the nature of the activities, there were burst of activity as drivers arrived at peak times, followed by relative lulls that provided ample time to talk. Given the conditions in which these conversations were had – on the side of the road,

often interrupted, and partly in the rain – it was not possible to record these, although for fourteen, field notes were taken as soon as possible afterwards. However, despite these constraints, it was possible to discuss the issues of algorithmic management and resistance with workers, adding additional data to the formal interviews.

This collaboration was overt from the very beginning, with the position of the researcher made explicit throughout. It mainly involved observation and informal interviews, but I also volunteered to help union activists with the creation, dissemination, and analysis of an online survey of work conditions in the gig economy. This involved a combination of closed questions about features of the work, along with open questions to solicit testimonials from workers. The survey was conducted online and distributed via existing WhatsApp networks of riders and through the organising campaign in London, resulting in 158 responses. Further details can be found in parliamentary select committee submission (IWGB Couriers & Logistics Branch, 2017). In return for assisting with the research, it was agreed that the statistics could be used for this article, and the initial findings of the data is drawn upon here to add an overview of the conditions in this kind of work. The connection between knowledge production and organising has always been a critical component of workers' inquiry as a method, setting it apart from more traditional methods. As Burawoy (1988) has argued, engagement and intervention can indeed be a valid part of the research process. The project therefore aimed to create a 'participative communit[y] of inquiry', collaborating with Deliveroo workers in a form of 'co-research' (Reason and Bradbury, 2008: 1) in order to move from an inquiry 'from above' towards and inquiry 'from below' (Rieser, 2001: 4).

Working for Deliveroo

How Deliveroo works

Working for Deliveroo starts with a short 'onboarding' process. For example, as one driver, Alejandro explained, 'I apply on the internet and that's it, they send me a text "can you come tomorrow to have a quick interview", ask me a few questions, a trial with the bicycle, twenty minutes of cycling around and

that's it'. The speed of the process was much quicker than applying for other kinds of service work, although it was comparable, as Fred noted, to getting work in a call centre – another industry marked by high demand for workers. The 'onboarding' process took place at physical location shared with the company's call centre. Once the initial assessment was complete, a representative from the company would take the prospective worker's phone and download the app, then the worker queues for the Deliveroo branded clothes and backpack. This contact with Deliveroo is the first and only physical interaction, and the company representatives (like the call centre workers that they meet at this point) are also on precarious contracts.

The delivery workforce at Deliveroo is divided into two parts. The first are the moped or motorbike drivers, who work throughout the day and evening. As Mostafa explained, drivers tended to work 'six days or more, around eleven hours a day is common'. This meant that Deliveroo would be the main source of income. These workers were primarily migrants, with large numbers of workers from Brazil, the Indian subcontinent, and eastern Europe. The second are the cyclists, who work a shorter shift pattern over lunch and the evening, helping to meet peak demand over mealtimes. For many of the cyclists, this was often fitted around other kinds of work, like Tim who worked 'in the evenings after my other job', and Fred who also worked in a book shop. There are similarities here with other kinds of platform work, with the income being used to supplement other forms of low paid work, particularly given the high cost of living in London.

The first key difference with other service industry work is that there is no formal employment contract for drivers. Deliveroo, like Uber, uses the controversial 'self-employed independent contractor' (rather than employee or worker status), which is in the process of being challenged (Rogers, 2016; Aloisi, 2016). The survey conducted with Deliveroo drivers and the IWGB illustrates some of the problems with this independent contractor status. Notably, 87.1 percent of the respondents did not think that the status accurately reflects the nature of their work, with 47.6 percent believing they should be categorised as 'employee' and 43.5 percent as 'worker'. In addition to this disagreement with employment status, an overwhelming 97.8 percent wanted an increase in employment rights – including 'access to pensions,

parental leave, holiday pay, and sick pay'. In particular, 95.7 percent of respondents thought that the company should be responsible for providing specific measures for safety at work, including paying for insurance and providing adequate training. These figures demonstrate serious issues at Deliveroo. The clearest examples of this is that 92 percent felt the classification as 'self-employed' resulted in them 'being treated unfairly compared to an employee' and that 'employers deliberately misuse the "self-employed" category to take advantage of their workers'. The results of the survey highlighted that these workers were not content with the current contract status.

The 'self-employed independent contractor' status affected the experience of working at Deliveroo. As Conor noted, this meant that 'technically I can get anyone else to fill in for my shift', but that would mean 'I'd have to give them my phone to get the orders, and I'm not going to do that, who would give their phone over to someone else!'. Rather than taking advantage of this option – which was arguably only included to support the self-employed status – the lack of employment security was keenly felt by all the participants. As Steve explained, 'it's not even like you'll get sacked working here, you just get "deactivated", that's it just a message, a notification'. In light of this, Kendrick explained he would 'rather have something with more security' and was 'actively looking for something else'.

This experience is a form of precarity at work – both in terms of the conditions of the work and the subjective experience of the insecurity. Precarity, 'as a concept', is 'both more unwieldy and indeterminate than most'. As Mitropoulos (2005: 12) argues, if anything can be said 'for certain about precariousness, it is that it teeters', which points towards 'some of the tensions that shadow much of the discussion about precarious labour'. Bourdieu (1998: 95-9) has provided a useful definition of 'précarité' as a 'new mode of domination in public life... based on the creation of generalized and permanent state of insecurity aimed at forcing workers into submission, into the acceptance of exploitation'. This experience of precarity is present at Deliveroo, compounded by the lack of physical contact with other workers and management. For example, Fred talked about the difference with working in a 'call centre' as 'its a workplace you can see like

the amount of people within like a week that would be gone but with Deliveroo it's much harder to tell...you don't have any physical contact with Deliveroo'. This is again like Uber, as after the 'onboarding' there is no reason why there would be physical contact with supervisors or representatives of the company. However, unlike Uber, Deliveroo workers meet at 'zone centres' and can form offline connections with other workers (Waters and Woodcock, 2017). As Leonardo explained, 'Deliveroo tell us where to wait between orders, so you know, we meet each other, that's how I got on the WhatsApp group too'. For Steve, the meeting points played an important role, as 'you get to chat away, talk about what's happening and meet other people doing the same thing'. Despite these collective moments between deliveries, Alejandro remarked that 'I feel alone with the company, you feel like you are a self-employed because you don't have bosses but at the same time Deliveroo is your boss, you can't see anybody but you work for a company'.

The precarity and risk led Alejandro to highlight that he 'feels scared sometimes... If I have an accident it's my problem, the company only care about you if you deliver the order and that's it. I feel less secure absolutely'. The risk of accidents while making deliveries was a strikingly common theme. There were numerous stories of drivers or riders who had accidents while on a shift, receiving no assistance from Deliveroo, other than suspending their account while they could not work. Mumit had a crash while on his motorbike and received no help. Similarly, after this, he left his motorbike for 'three minutes... standard delivery, came back down, bike was gone'. Following the theft, he also received no support:

> Deliveroo don't care, it's got nothing to do with them, because you're an independent contractor so you have to deal with your own things, they don't care, they'll sign you off for the shift until you can get back, they'll say get back in touch with us and that's all through the call centre as well, not through a person who's...even pretending to give a fuck [laughter].

In Mumit's estimation, 'across the whole of London every day, at least one Deliveroo motorcycle gets stolen, if not two or three, and I imagine the bicycle rate is a lot higher'. This represents a significant extra cost for drivers, whether the cost of a new bicycle or 'thousands of pounds to get a

[motor]bike'. The process of contractual outsourcing (through the self-employed independent contractor status) frees Deliveroo from the risks of much of the work, meaning they do not even need to measure the extent of these losses. For workers, this compounds the sense of precarity, not only through the unstable relationship with Deliveroo, but the additional risks from cycling or driving around the city.

Measurement at Deliveroo

The measurement of work at Deliveroo begins when the driver enters their 'zone'. London is divided into multiple zones that carve up the city. Once entering the zone – after the unpaid drive from home to there – the worker can activate the smartphone app and log in. Within this is a 'zone centre'. This is an algorithmically determined meeting point, designed as a waiting area with the shortest possible routes for deliveries. This is a key difference to Uber, with drivers not being given directions between taxi journeys, other than the nudge of surge pricing. Example screenshots of each step of the labour process can be found in the co-written article (Waters and Woodcock, 2017).

The information asymmetry between the platform and the worker is particularly notable at Deliveroo. The platform has a real-time knowledge of each worker, measuring GPS positioning and timing, whereas the worker is only given enough information to complete the next part of the task. Once an order has been made, it is then pushed out via the app to a worker, a process determined algorithmically. The individual worker chosen by the algorithm is only given the option to accept the delivery – although they can be skipped by ignoring the notification. This is believed to negatively affect the workers rating, but as Facility explained 'we rarely receive any official clarification, and largely rely on sharing information and experiences between workers' (Waters and Woodcock, 2017). Despite the claim that these workers are self-employed, they are only given just enough information at each step. The first instruction is which restaurant the food needs to be picked up from, with no information about the following journey. This means workers cannot skip a delivery with a long or complicated route, in favour of making shorter journeys to maximise their

pay. The app screen displays the restaurant location and then moves into a GPS guide route. On arrival at the restaurant, the worker confirms this through the app and is given instructions, which can involve entering the restaurant via a back door to collect food. The worker is then expected to check what they are picking up, but the focus here is the order number to be exchanged. In some cases, the worker can be informed that they are doing a 'stacked order', picking up more than one order from a restaurant, again not given a choice through the app to refuse this.

Once the order has been received from the restaurant, a new swipe on the app provides the worker with the address of the customer. The app then switches to the GPS route. After the journey – which can differ greatly in length across the zone – the worker arrives at the customer's address, hands over the food, and confirms the delivery on the app. The customer interaction is limited to the handing over of the food, perhaps with some brief pleasantries. Unlike Uber, the customer does not rate the quality of the interaction. There is the option for the customer to add a tip through the app, although this can only be added at the point the customer orders the food. Therefore, the customer does not have an opportunity to measure the workers performance – either in terms of speed of the delivery or quality of the doorstep interaction – before making a choice about whether or how much to tip. As Conor explained, 'you find out about the tips after you do the deliveries, I save them up until the end of the shift to open them like scratch cards'. Following a delivery, workers are ordered back to the 'zone centre' to wait for the next delivery. Through the app, workers are given each task step-by-step. Echoing Taylor (1967: 3), the app 'specifies not only what is to be done, but how it is to be done and the exact time allowed for doing it'.

Workers, at least at the point I conducted interviews, were assigned shifts to log in. However, despite the ability for Deliveroo to know exactly when a worker starts or ends a shift, the interviewees noted that often they would start earlier and finish later. For example, Facility (Waters and Woodcock, 2017) would often start before their assigned shift because:

> I have logged on early and been paid my hourly rate regardless of when I was officially down to do so. Sometimes this works, sometimes it does not. While I am certain there are specific criterion that Deliveroo payroll are using, I have no certainty of what these actually are. The other riders and I have our superstitions, but very little concrete knowledge.

Similarly, shifts would often be extended if the worker took a delivery that could not be completed in the remaining time. Although technically workers could call 'Rider Support' to be unassigned, 'the line gets jammed at 9:30pm as so many people are doing this, so being on hold takes just as long as delivering the food. And if you deliver the food you get the pay, so it is just not worth the hassle' (Waters and Woodcock, 2017). However, this dynamic later began to disappear, as Deliveroo moved from a pay arrangement with an hourly component and a small amount per delivery, to only paying per delivery.

The movement from hourly rates to piece rate – or rather to an entirely piece rate arrangement – is a further method through which Deliveroo is shifting the risk of the business model onto workers. In the absence of physical supervision, Deliveroo has developed methods to encourage workers to make timely deliveries. The piece rate means that workers can measure the relationship between their own performance and pay: the more they deliver over a shift, the more money they make. However, this also relies on enough demand from customers – something which mainly comes over mealtimes, rather than evenly spread over the day. In addition to the numbers of deliveries made, workers also receive an email (at the point of the interviews it was every two weeks) with work performance statistics. As Kendall explained, 'so I get this email that tells me… time to the restaurant, to the customer, at the customer'. However, he continued:

> I don't even get the actual numbers, I get my distance from the mean and whether or not I met their criteria. So I get this email that is like: good job you met all the criteria and you were five minutes faster than average. The first month I like missed the criteria of time at the customer, which I thought was weird, but nothing happened. If you had no penalties yeah, you don't have to show up, there's no penalty. Like they send you the email for self-motivation, I don't know, SDSA they call it, so here's a bunch of information, changes of my Service Delivery Standards Assessment, so that they did give me my average, time to the restaurant. So average difference was 2.8, but they didn't

actually give me my real time. Travel to customer, -3.4, time at customer, they don't tell me, they just tell me they matched it.

The new possibilities offered by this level of surveillance is impressive. It is comparable to methods developed in call centres, in which (as noted earlier) it became 'feasible to attain total knowledge, in "real time", of how every employee's time was being deployed, through the application of electronic monitoring equipment' (Bain et al. 2002: 3). This possibility is now extended at Deliveroo through the smartphone, GPS technology, and greatly increased bandwidth. It is also, like in the factory and the call centre, combined with a piece-rate system.

This aspect of Deliveroo is particularly important for understanding how the work is managed. Unlike many other kinds of service work in London, there is almost no contact with the company or managers. Conor explained the difference as this: 'there's no supervisor standing over your shoulder, no one checking up on you and coming over to talk, it's really different'. In order to understand how a workplace – in this case dispersed over numerous zones across London – can be successfully organised and managed, it is necessary to consider how technology and techniques are experienced by workers at Deliveroo. The app-based organisation of the labour process allows Deliveroo to collect fine-grain data on the performance of workers. While workers are signed in to the app they are tracked by GPS and each stage of the order is timed and logged. The technology provides 'a real-time "God's eye-view" of workers currently logged in', as Facility argued, involved a perspective of 'watching the city from directly above, viewing the abstracted "units" as they move around the terrain, and displaying live data flows of various kinds' (Waters and Woodcock, 2017). The information created by the technology is not shared with the workers, leading to an information asymmetry which is becoming a common feature of platform work (Heeks, 2017: 17). It was this that led Facility to self-track and attempt to overcome this asymmetry (Waters and Woodcock, 2017).

The illusion of control at Deliveroo

The labour process at Deliveroo is clearly precisely timed and measured. While these kinds of methods were developed extensively in call centres, at Deliveroo this is now happening outside of a physical workplace. Each action that the worker takes is meticulous logged and compared through the software platform, another example of what Cederström and Fleming (2012: 38) have called 'exposure capitalism', where 'everything about us is suddenly on display – to be seen, to be judged'. In other contexts, algorithms have been used to 'seduce, coerce, discipline, regulate and control: to guide and reshape how people, animals and objects interact with and pass through various systems' (Kitchin, 2017: 19). This is also the case at Deliveroo. As Mumit explains, at Deliveroo 'it's the algorithm that's the boss', automatically collecting and comparing data across the entire company. Mumit continues: 'the algorithm has rules and we're the ones who, knowing that, the guys in the office are data driven, and we're the ones who make the data'.

For the worker, the information is only relayed in the form of 'a progress report and it gives you a list and it breaks down how long it taking you to do each of your things', which Fred explains includes time to get to accept the order, travel to the restaurant, collect the food, deliver to the customer, time taken at customer, and so on. Fred further notes:

> the thing that's really interesting, is they don't tell you what the average that they're looking for is, they just say 'you're achieving' or 'you're not achieving it' but they don't tell you, they don't say 'you're under thirteen minutes', they say 'your time is twelve and a half minutes, which is you know, achieving better than the target' but they won't say what the target is, it's just you're doing it quick enough, but you're not, but its definitely like obscurity is part of the motivating thing, like if you don't really know then you just have to keep going faster.

This is an important feature of the Deliveroo platform. However, as Sam explains, 'when you fail it just says like, 'you haven't met the expectations', there is no consequence, there is no anything'. Each of the interviewees noted that there were very few, if any, direct disciplinary results for performance. At one stage Ben had been told there was 'a three strike rule',

although in their case this had never been acted upon. There was a general confusion amongst participants about how the process worked, and Sam also explained 'things like this keep changing, like the payment structure too, and it'll change again soon I'm sure'. However, later Deliveroo would introduce waves of 'deactivations', firing people for what workers presumed was falling into the lowest performing categories.

To make sense of this it is useful to return to Fernie and Metcalf's (1997: 3) metaphor of the 'electronic panopticon'. The key difference at Deliveroo is that there is no physical presence of supervisors or managers to enact decisions based on the data. Instead, Deliveroo automates much of the management of the labour process, sending emails to drivers rather than calling them into meetings. This creates what can be conceptualised as an *algorithmic panopticon* (Pasquinelli, 2015) at Deliveroo (Waters and Woodcock, 2017). The algorithmic panopticon is, like the architectural model, 'sustained by another appearance, one that is not the effect of reality, but that is itself a fiction' (Božovič, 1995: 8). Not only has Deliveroo attempted to contractually outsource workers, but the actual supervision and management of the labour process is automated. This is not outsourced in the same way as it is within the platform, but involves supervisors no longer being employed in the same way. The efficacy of this approach relies upon the social power of algorithms: there is evidence of detailed supervision in the emails to workers, and discipline is enforced with occasional 'deactivations'.

The process of measurement is combined with the piece-rate system to provide the illusion of control at Deliveroo. This illusion is an attempt to inculcate workers with the imperatives of management. Unlike the factory or the call centre, the supervisor is no longer present, removing the physical aspect. Control goes beyond just the supervision of workers to ensure that they are working effectively. Control is also about overcoming worker resistance. Yet, the strikes at Deliveroo have shown that the algorithmic panopticon is not effective at all for dealing with wildcat strike action. The idea of an algorithmic panopticon does not 'disavow the possibilities for collective organisation and resistance' (Taylor and Bain, 1999: 103), which was a concern during the call centre debates. This can be seen clearly with

the instances of strike action from 2016 at Deliveroo. In response to a change in payment terms, a demonstration was organised outside of the Deliveroo headquarters in central London. Drivers were able to take strike action over the course of the next few days by logging out of the Deliveroo app. The precarity of their own employment conditions allowed the wildcat strike action to spread incredibly quickly, with no need to adhere to the regulations restricting trade union action in the UK. In a sign of their own precarity, Deliveroo backed down from their original plans that sparked the action, opting instead to trial the new rate in a particular zone. In the factory or the call centre, supervisors would be on hand to deal with strike action. Without any effective disciplinary apparatus, Deliveroo had almost no tools at its disposal to manage the strike action. This also hints at the possibility that there is more resistance happening below the surface of both the researcher and managerial gaze.

Outside of strike action, the illusion holds Deliveroo together as an effective organisation. It works just well enough to keep the platform operating. However, the points of rupture highlight that Deliveroo, like other platforms, is involved in a twofold precarity: forcing workers into precarity, while operating precariously as a lean platform itself. This illusion of control can be partly explained by the emphasis of data collection by platforms, but also due to the lean model with pressure on costs (Srnicek, 2017). The data collected at Deliveroo is not just used to send out automated performance emails. As Agre (1994: 107) pointed out, privacy can be considered in terms of surveillance (as it often has) or as capture. This capture model 'has deep roots in the practical application of computer systems' and goes further than observation to acquire and dissect data on individuals. It can also be found in more forms of work, as data collection and metrics become increasingly widely used (Woodcock, 2018). At Deliveroo, this extends to the installation of proprietary software on rider's smartphones, allowing the vast capture of data. Deliveroo's algorithmic panopticon can also be conceived as operating within a broader 'surveillance assemblage' (Haggerty and Ericson, 2000: 611) of both worker and customer. This data is intended to develop the future business models of Deliveroo, stretching from the dark kitchens (where food is prepared only for deliveries, see Facility and Woodcock, 2017), automated

food delivery, and the prediction and shaping of food consumption patterns (Panja, 2018).

The algorithmic panopticon has not solved the problem of the indeterminacy of labour power for Deliveroo. The longer term aims of Deliveroo, like Uber, lies in the collection of data. For now, the model at Deliveroo requires two interrelated illusions. The first is the illusion of control discussed here. The second is an illusion of freedom. As Fred explained, working at Deliveroo is 'actually like a reasonable shit job because that illusion of freedom is really strong like you do kind of feel like your own boss because we can all stand around and talk shit about Deliveroo as much as we like' because 'you don't have that sort of spectacle of authority'. The difference with Deliveroo's algorithmic panopticon is this lack of direct disciplinary action. In the factory, supervision was direct and carried risk of disciplinary action, while in the call centre workers had regular meetings with supervisors to discuss their performance – and could be fired on the spot (Woodcock, 2017: 43). The panopticon requires 'punishment' as a 'spectacle' to support the supposed omnipresence of the inspector (Božovic, 1995: 4). Instead, Deliveroo entrusts the automated performance emails to convince workers. In the process, workers find a form of freedom within this. However, it is an 'illusion of freedom', as Fred notes, because in the end, workers do not have control. For example, there is no way to dispute a 'deactivation' or challenge the data that has been collected.

Conclusion

This article aimed to understand Deliveroo from the perspective of workers. The use of workers' inquiry methods allowed an experimental look at how management through algorithms, conceptualised here as an algorithmic panopticon, is carried out in practice. Rather than focusing attention on the algorithm itself, the article places this within the development of different forms of measurement and control at work. This historical trend is an important corrective to the risk that complex algorithms are overestimated, either in practice or theoretically, and then appear as a perfect supervisory

tool, becoming like the observer in the panopticon. The correction to this is a return to the workers' perspective.

Throughout the article, the role of measurement has been considered. First, through an examination of the factory and the classical panopticon, the call centre and the electronic panopticon, and then at Deliveroo with the algorithmic panopticon. Each of these instances had different ways of enacting surveillance and measuring work – with piece rates, disciplining, and other methods to try and overcome the indeterminacy of the labour process. However, measurement alone is never enough within the contradictory context of the workplace. At Deliveroo, the algorithmic panopticon goes beyond measurement, but without physical supervision, it relies upon the illusions of control and freedom. However, like in the factory and call centre before, the practice of this management approach is not without problems. Workers discover these through their engagement with the labour process. The precarious employment conditions also represent a potential lowering of the barriers to resistance and struggle, seen with the wildcat strikes at Deliveroo in 2016. Precarity is therefore twofold at Deliveroo: both precarious working conditions for workers, as well as a precarious operation for the platform.

The appearance of an omnipresent and automatic method of supervising and disciplining workers is a cost-effective method of control, but as the participants indicated, this appearance was far from total. It is also important to note that the participants expressed a positive experience of the illusion of freedom created by the algorithmic panopticon, along with the ability to work outside of a formal workplace, whether on a bicycle or moped/motorbike. The illusion of freedom provided an important mobilising factor for the organising campaign that followed. The business model of Deliveroo, like that of Uber, has so far proven effective and is being applied – either in part or completely – to an increasingly greater range of sectors. The early success of Deliveroo workers to organise, along with the support of the IWGB, provides an important example of how workers can resist in these new contexts. Further research is needed to understand the factors that led to the strike action and trace the lines of struggle that are emerging in the gig economy. The strikes show that the power of the algorithmic panopticon

is not totalising. Instead, it is one part of what Foucault (2012) would have called an 'archipelago of different powers.' Thus, the streets of London, like the factory floor and the call centres before that, remain a 'contested terrain' (Edwards 1979: 15), in which workers continue to come into conflict with their employers – whether via an algorithm or not.

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