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Embodied Precariat and Digital Control in the "Gig Economy": The Mobile Labor of Food Delivery Workers

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ABSTRACT

The promises of flexible work and instant deliveries promoted through food delivery apps are one of the latest trends within the "gig economy" and lay at the forefront of smart city agendas. This article focuses on the work undertaken by Deliveroo couriers to investigate how they embody, negotiate, and contest the "smartness" of the platform. Drawing on ethnographic research in London and Manchester, analysis of internal online communication, and interviews with workers, the article examines how competing understandings of "smartness" emerge in response to algorithmic management in the workplace. This paper conceptualizes two distinctive yet overlapping attitudes among couriers—entrepreneurialism and solidarity—and discusses their implications for the future of platform work.

Introduction

The growth of smart cities is promoting a rapid rise in on-demand work done through digital platforms such as Uber and Deliveroo. This growth is the result of an increasingly services-oriented urban economy and the dissemination of information technology in cities. Such multiplying interconnections between physical and virtual urban mobilities provide fertile inquiry for urban sociology, sociology of work and employment, and digital sociology.

Companies such as Deliveroo, Uber Eats, and Glovo are currently valued at billions of dollars and subcontract tens of thousands of delivery riders in over 200 cities across all continents. Their operations have wider implications on other types of work as they function as laboratories where new techniques of management, control, exploitation, and extraction of profit are tested and refined (Cant, 2020). Launched in 2013, Deliveroo is a food delivery company that serves as an intermediary between customers and restaurants. Using the app, customers place (and pay for) an order, which is then conveyed to the participating restaurant. Customers order food from a restaurant of their choice through a website or an app, and riders deliver it as quickly as they can, notwithstanding time and weather conditions. Their forms of employment vary significantly across

countries and companies, and even inside the same country and the same company (Zamponi, 2018). In most cases, they are not considered employees, but freelance workers performing "gigs."

Sheller and Urry (2006) argue that software writes urban movement, with mobility systems increasingly dependent in the last decades on computers and software. The algorithmic management (Rosenblat, 2018) of mobilities is transforming roads into a "code/space" (Kitchin and Dodge, 2014) which warrants that movement occurs seamlessly across urban streetscapes. At the same time, such platforms are exerting high levels of spatial and temporal control (Woodcock and Graham, 2019), dictating to workers which houses to deliver to, which routes to take, when they are needed, and how fast should they deliver a parcel. Furthermore, despite increasing calls for transparency and accountability (Amoore, 2018), little research nevertheless has focused on what practices of resistance and alternatives have been emerging to the overwhelming power of algorithms. Even less research has focused on how new forms of digital activism among workers are enabled by cross-platform messaging services such as *WhatsApp*.

The algorithmically managed mobilities of gig workers heralds a new age of automatization, flexibility, and job opportunities. Conversely, critics decry the associated job insecurity, isolation, and lack of social safety net. This article unpacks the changing nature of work that smart cities enable, with a specific focus on the gig economy and the work of Deliveroo food couriers. It aims to contribute to knowledge towards the affective experiences and practices emerging from operating in "smart" work environments and from being subjected to an algorithmic management of work. Theoretically, the paper builds on Srnicek's (2016) concept of platform capitalism, by focusing on how the information asymmetries (Rosenblat, 2018) inherent in the operation of companies such as Deliveroo generate "qualculations" (Shapiro, 2018) among platform workers, which represent affective responses to the algorithmic management of work.

Empirically, this is done in two distinctive ways. First, the paper unveils the power of metrics and how the time-related activities of working for Deliveroo makes the cyclists *feel* (anxious, sad, etc.) and what *actions* follow subsequently (e.g., speeding, waiting around, etc.). Second, and resulting from this, it considers how these feelings generate two trends in cyclist behavior. The first is directed towards entrepreneurialism and is concerned with how metrics affectively lead to neoliberal rationalities. The second inspires social solidarity and focuses on how these metrics are resisted and rejected.

To develop this conceptualization and argument, this article is structured as follows. First, it will offer an overview of the emergence of the gig economy, which has been enabled by the last economic crisis and the ubiquity of mobile platforms. This will be followed by a brief introduction to one of the most notable gig economy platforms, Deliveroo. Second, it will provide a theoretical lens to understand gig economy and Deliveroo by contextualizing them within broader changes brought about by platform capitalism, while also highlighting the links between gig economy and the smart cities agenda. Third, it will briefly present some fieldwork and methodological considerations, highlighting the importance of Manchester as a case study and the use of a *WhatsApp* group as primary site of research to follow real time processes and also explore an archive of solidarity, resistance, and compliance actions of Deliveroo riders. Fourth, it will effectively explore the dynamics of the online group, focusing on emerging forms of solidarity and entrepreneurship. Finally, the article will reflect on the potential for

the gig workers to organize and strike and the affective role that *WhatsApp* groups have in challenging platform capitalism rationalities.

Gig Economy, Deliveroo, and Precarious Work

The prospects of flexible and autonomous work promoted through mobile apps are the latest trend within a "gig economy" relying on a workforce of independent contractors whose conditions of employment, representation, and social protection are often exploitative. This independent workforce accounts today for over 150 million people worldwide and represents a third of the working-age population in the United States and most of Europe (Manyika et al., 2016).

Woodcock and Graham (2019) advance, in what represents the first comprehensive attempt to theorize this phenomenon, a set of contributing factors to the emergence of platform work. Among them there are the digital legibility and measurability of work, the ubiquity of mass connectivity and cheap technology, and the desire for flexibility for and from workers. These are intensified by the similarly changing socioeconomic landscape of the last forty years which has led to the state deregulation of work and the weakening of employment protection, started with the neoliberal policies from 1970 and amplified by the 2007–2008 economic crisis.

Driven by the "lean platform economy," developed after the financial crisis of 2007–2008, and which "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" (Srnicek, 2016: 91), "gig work" has received several criticisms in recent years. They range from its contribution to the dissolution of jobs into atomized tasks that could undermine the role of jobs as anchors of the social structure (Pesole et al., 2018), the algorithmic management of work which enhances digital control and discipline (Rosenblat, 2018), and the challenges they pose to workplace organization and unionization (Woodcock, 2017).

Deliveroo is valued at almost £7.6 billion, has over 2,000 employees (office workers, often invisible) in 11 markets, sub-contracts 110,000 delivery riders (the ubiquitous box-carrying bike workers), and partners with over 140,000 restaurants (Corporate Watch 2021). Most of UK Deliveroo couriers are male (93 percent) and 73 percent are between 18 and 34. Moreover, 84 percent of them said they were happy working for Deliveroo, with Deliveroo claiming that average earnings for couriers are around £12/hour (Iqbal, 2021), despite various reports showing that they earn as little as £2/hour (Field and Forsey, 2018; Mellino et al., 2021).

On the other hand, the revenues of Deliveroo have increased exponentially since its launch. Between 2016 and 2019 the company's revenues grew sixfold, reaching £772 million at the end of 2019. The pandemic further boosted its revenues, and the company was listed in early 2021 at the London Stock Exchange. It is estimated that the majority of meals now cooked at home could be replaced with takeout meals by 2030 and delivery platforms like Deliveroo and Uber Eats will play a major role in this shift. Thus, online food delivery might control up to 10 percent of the total food services market, accounting for more than $350 billion (Moore, 2018).

Many of the Deliveroo workers in the United Kingdom are migrants or asylum-seekers without the right to work in the country, who rent or borrow an account from

another worker (see also Cant, 2020). Commenting on the social composition of the Deliveroo workforce in Brighton (which is likely to be replicated elsewhere in the country), Cant notes that this is oftentimes reflected in the type of vehicle used. Cyclists, who represent the majority of the workforce, tend to be young UK citizens working part-time. Moped riders, on the other hand, are usually older migrant workers supporting themselves and their families and who do the bulk of the orders.

The high volume of migrant couriers working for Deliveroo deserves a little more attention since, as Van Doorn et al. (2020: 2) acknowledge, gig workers, more generally, provide an "infrastructural role" for these platforms, "one that is as vitally important to their business model's viability as the steady influx of investment capital." With the deregulation of labor markets and the aftermath of the 2008 recession there has been an increase in the number of documented and undocumented migrants doing lowly paid work through non-standard contracts (D'Angelo et al., 2020). The phenomenon has been amplified by the gig economy, as relatively cheap smartphones and bicycles facilitate access to work, as does the fact that workers do not have to speak the local language fluently.

One's migrant status can nevertheless significantly affect how easily the work is secured. Algorithmic bias is one common experience among ethnic minority populations (Benjamin, 2019) and food couriers in the United Kingdom have already been subjected to discrimination by Uber Eats, whose facial identification software was accused of being racist after it proved incapable of recognizing faces and firing ethnic minority workers as a consequence (Kersley, 2021). App renting is also a prevalent phenomenon among undocumented migrant workers, with numerous riders paying up to £50 per week to rent an account, a practice that is common across borders (Alderman, 2019; Griffin, 2020). Within this context, it is often assumed that app-based food-delivery workers are less inclined to express collective agency (Tassinari and Maccarrone, 2020). Yet, the two strikes in Manchester, which will be discussed later, were organized by migrant workers. Migrant moped riders have also been at the forefront of the largest strikes in London, Bristol, and Brighton (Cant, 2018). Woodcock (2021) observes that patterns of migration bring with them distinctive patterns of work struggle, based on community and traditions of self-organizing.

The prosperous sector has nevertheless generated heated debates regarding issues such as the ambiguous employment status of workers; its potential for accelerating "fragmentation," i.e., the breaking down of jobs into discrete tasks auctioned to the lowest bidder; and gig workers' struggles to earn a living, stay healthy and safe, and resist intrusive surveillance of work performance. In this context, "unemployment is not considered as the lack of wage labor, but as the permanent activation of the subject in search of a formally defined occupation in the context of structural precarity" (Ciccarelli, 2018, quoted in Zamponi, 2018: 11). Where others might see a much-welcomed work flexibility, I draw instead attention to the flexible exploitation, or "flexploitation," which adds an additional layer of precarity for migrant workers and women. The precarious are "one day overworked, the following day out of work; one week zero hours, the next thirty on late-night shifts. Not only are their incomes unpredictable, but also their work schedules … A precarious is a worker and a non-worker, a citizen and a non-citizen." (Foti 2017: 11) What we are left with is more flexibility for some than for others within an otherwise generalized state of flexploitation. Some of these couriers are doing deliveries

as a side job and are able to maintain relative control over how much they work, when, and even where. Others, relying on platforms for a living, are deprived of any control they have over when and for how long they need to be out on the road with their apps turned on (Popan and Anaya-Boig, 2022]).

The growth of the precariat has been accelerated in recent years by the use of mobile ICTs to organize and discipline labor practices, particularly in the field of logistics (Briziarelli, 2018; Lemozy, 2019). The embeddedness and "pervasiveness" (Dodge et al., 2009) of ICTs in our daily lives is having profound consequences by allowing our movement to be directed and animated by black-boxed algorithmic processes (Williamson, 2016:135). This embeddedness leads Dodge et al. (2009, 1284) to ask to what extent pervasive forms of computing challenge agency and democracy and produce/exacerbate inequalities.

The hype that disruptive start-ups such as Uber and Deliveroo have generated in both tech and business spheres and the associated social concerns that critiques have raised against their abusive and exploitative practices have dominated the debates surrounding the gig economy. Yet, this new economy must be understood within the broader framework of smart cities and platform capitalism, which represent the focus of the next section.

Platform Capitalism and Smart Cities

The use of digital data and big data has progressively had greater impact upon practices of urban and transport planning and governance, generating lively debates over the power/importance of smart technologies in terms of knowing and managing the city. Heralded by the advocates of smart cities as providing unparalleled opportunities to design and enact more efficient, sustainable, competitive, and open cities, big data have also come under intense scrutiny in relation to their negative implications on a range of issues. Concerns have been raised with respect to the politics of such data, technocratic governance and neoliberalization of city development, technological lock-ins, system vulnerabilities, and surveillance (Kitchin and Dodge, 2014; Gabrys, 2014; Luque-Ayala and Marvin, 2016).

As do smart cities, the gig economy uses information technology for data management to improve work efficiency. The gig economy and smart cities are thus related since the former is linked with various aspects of urban life such as individual transport, short-term housing, domestic services (cleaning, child-, elderly- or pet-care), mobile meals and delivery services (Schiek and Gideon, 2018). There are several factors converging to make cities the topmost location for the emergence of gig work: population density, the expansion of the service sector in urban economy, the salaried employment crisis, and the emergence of new work aspirations such as freedom and flexibility (Menascé et al., 2017).

The "gig economy," whose definition, terminologies, and contested claims about the transformation of work are often confusing (Howcroft and Bergvall-Kåreborn, 2019; Cant, 2020; Woodcock and Graham, 2019), is better understood with reference to what Nick Srnicek (2016) has termed "platform capitalism." Rather than thinking about enterprises such as Uber or Deliveroo as tech start-ups, they should be understood as capitalist companies. The platforms are digital infrastructures enabling two or more

groups to interact and extract data from that interaction: "Today the capitalism of the high- and middle-income economies is increasingly dominated by these firms" (Srnicek, 2016: 6). While the benefits of platform capitalism are clear for consumers, owners, and stockholders, "the actual value added for vulnerable workers and the long-term value for consumers are unclear at best" (Scholz, 2016: 5).

Recent years have seen an upsurge in writing on algorithms, most of the literature being concerned with the apparent power of algorithms, expressed in increasingly mundane everyday activities (Neyland, 2019). Despite calls for transparency, accountability and for unpacking the power dynamics of algorithms (Amoore, 2018; Crawford and Schultz, 2014), little research has focused on what are the practices of resistance and the alternatives to the overwhelming power of algorithms (although see Schor et al., 2019; Shapiro, 2017). In exploring alternative modes of digital development in urban life, Lynch proposes the notion of "technological sovereignty" in order to claim "radical democratic control over processes of technological development" (Lynch, 2020: 2).

It is clear from current scholarship on gig economy workers that while their work may be precarious and low paying, through the very mobile ICTs and platforms that seek to control them, workers are also developing a shared sense of skills and solidarity through the work that they do (Kidder, 2005; Spinney and Popan, 2021). While the absence of physical workplaces for riders may be seen to hinder solidarity and organization, the mobile hybrid produced through the intersection of physical and virtual mobilities has nevertheless created fertile grounds for social movement—whether effective or not—to emerge.

Can we think differently about smartness and smart cities? How can this shared sense of skills and solidarity among couriers be theorized otherwise than through the narrow "smart lens," which they seem to reject? In the next pages, this article will turn to the work of Deliveroo riders in Manchester, unveiling the manifold ways in which they embody, negotiate, and contest the smartness of the platform.

"Onboarding" the Fieldwork

Joining the ranks of Deliveroo riders was the first and logical step to undertake in order to explore the lived experience of doing this gig work. Following a half an hour "onboarding" session at one of their offices, which involved watching some video tutorials on road safety, food hygiene, and how to check for IDs when delivering alcohol to those under 18, I was officially riding "with" (not "for"!) Deliveroo. Once on the road, on my own bike and sporting the official Deliveroo equipment (which I had to pay for, as well, in instalments out of my salary), I became "my own boss." I am a confident cyclist in my late 30s, yet the area in London I was supposed to cover was new to me and cycling on a "push" (electric) bike in the cold and dark winter evenings proved to be challenging at times, even if only for two–three hours. Stratford is a relatively flat area in London, yet the roads are badly maintained and often chocked with car traffic, making cycling not very pleasant. Many of the orders came from restaurants located in the very crowded Westfield shopping mall, whose outdoor promenade lacks cycle parking racks and is guarded by security personnel who required me to dismount and walk my bike. All of these conditions "cost" me a lot of time (see a summary of daily earnings in Table 1).

In the next couple of days, I determined the work process to be simple and repetitive: cycle to the zone center, an area with busy restaurants where the app sends couriers

Table 1: According to Deliveroo, on average across the UK, fee per delivery riders earn £12 per hour. My own statistics show that this pay is much lower.

Day	Distance (km)	Time at work (hours)	Earnings (£)
22 January 2018	34.9	2.6	7.5
24 January 2018	17.0	2.0	15
27 January 2018	15.5	2.4	18.75
12 February 2018	34.8	3	18.75
14 February 2018	19.8	3.1	18.75
16 February 2018	41	2.3	15
18 February 2018	19.34	2.5	15
19 February 2018	16	2.4	15
25 February 2018	17	2.7	22.5

waiting; open the app; log in; and select "available for orders." The algorithm then took into account my location and availability to distribute orders. On busy days I would wait a few seconds, otherwise the wait could last for hours. This waiting led in numerous cases to informal conversations with work colleagues, the vast majority of whom had a similar profile to mine: male migrants in their 20s and 30s, riding push (or electric) bikes.

The instructions given by the app are impossible to contest other than through rejecting orders, which I did frequently when I was required to go to restaurants in Westfield shopping mall. Moreover, neither myself or other riders seemed to know how or why the algorithm distributed orders in the way it did, and several theories combining guesswork and rumor were circulated. This ignorance was compounded by a total dependence on the app, rude kitchen managers fed up with couriers piling up in restaurants, and aggressive road users. Once the order was picked up, sometimes after a considerable wait, I would rush as fast as possible and take risks just to try to maximize my earnings. Also, there was no sick pay to protect me in case of an accident or help to replace a broken phone or bike, since I was "self-employed." Facing such hard-working conditions, it is not difficult to understand why my colleagues went on strike.

In the last five years, protests over working conditions by couriers in the United Kingdom and elsewhere in the world generated considerable publicity and outrage. Such strikes against Deliveroo and other similar platforms attracted media attention and, in a few cases, led to some improvements in working conditions. The range of protest tactics used was broad: from striking, to circling company buildings, distributing leaflets in restaurants, occupying company offices, refusing work in bad weather. Although these struggles have mainly taken place at the local level, embryonic forms of transnational organization have become visible, "with regards to the discursive, communicative, and narrative level, creating the shared feeling of being part of a transnational struggle" (Zamponi, 2018: 10; see also Shenker, 2019).

While protests against Deliveroo in London date back to 2016 and rapidly spread across Europe, targeting other platforms as well (for a user generated map see Transnational Food Platform Strike Map, 2020), they took almost three years to materialize in Manchester. During this time, I followed their spread and dynamics, reflected on mainstream media (P. Jones, 2020; King, 2016; Varghese, 2018) and on Twitter, where handles of grassroot and independent trade unions such as United Voices of the World and the Independent Workers' Union of Great Britain have been reporting on and promoting strikes. It was through activist networks that news about the upcoming Manchester strikes started to emerge.

Deliveroo partners with over 900 restaurants in Manchester and there were 500 self-employed riders working for the platform before the beginning of the pandemic (Brown, 2019), when their number increased exponentially. It is estimated that there are now 5,000 riders in Manchester. They organized two protests in total, both at the beginning of 2019. The first one took place on February 14 and was attended by 40 cyclists and motorists. The second one, on February 26, which I attended, gathered a similar participation. The strike demands were mainly in relation to payment conditions, travel distances, long waiting times to collect orders, and work hazards such as accidents or inclement weather. Many of them are further developed and exemplified in the *WhatsApp* group. Despite the media coverage, the strikes in Manchester, as elsewhere in the United Kingdom, did not improve the working conditions. On the contrary, in informal discussions with strike organizers, I was told that their accounts have been monitored ever since and they fear they can be "deactivated" at any time. Another round of strikes was eventually planned in December 2020, during the Covid lockdown, but failed to materialize as not enough riders were convinced to log off their accounts. While in themselves, the strikes did not immediately improve the working conditions of riders, the public reaction to Deliveroo's treatment of its workforce has affected the company's valuation: in the wake of its stock market listing, Deliveroo's shares dropped by £1 billion after some institutional investors balked at the company's treatment of riders (Gopinath, 2021).

Backstage Activism on WhatsApp

I joined the *WhatsApp* group on February 26, 2019, on the day of the second Deliveroo strike organized in Manchester (See Figure 1 for a timeline of this research). I was not yet part of the Deliveroo Manchester community, but upon informing organizers that I previously worked for Deliveroo in London and planned to do this in Manchester too while also conducting research, I was invited to join the *WhatsApp* group. I was thus added to a "thread" of 130 couriers across the city, whose description read "United we stand, Divided we fall." The research in Manchester exclusively focused on analyzing the *WhatsApp* group communication, which was supplemented by two interviews with Deliveroo riders.

I was informed that the group was used both as a communication and strike organization tool, the latter being a functionality that other authors have also observed
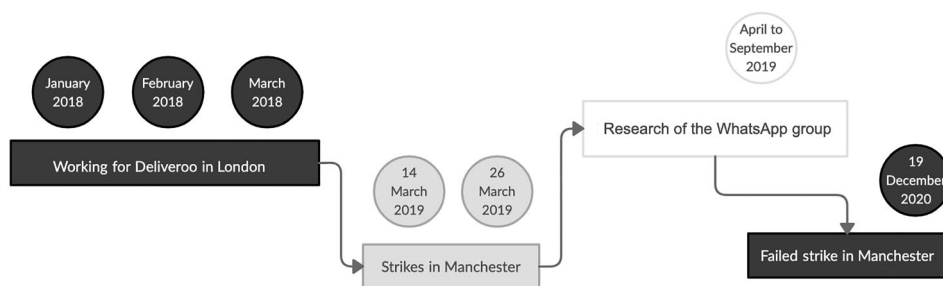

Figure 1. Research timeline

(Cant, 2018; Shenker, 2019). Because it can be an intimate and controlled environment in which users can almost simultaneously gather and share news, discuss politics, and mobilize others, *WhatsApp* has had a positive influence on activism more generally (Zúñiga et al., 2019; Treré, 2015). In relation to the couriers' specific use of *WhatsApp*, the practice can be described as "backstage activism" (Treré, 2015; 2020), whereby the group is used to organize clandestinely, operates horizontally, and effectively works in parallel with the "frontstage" platforms developed by Deliveroo. (The official "*Rider*" app is automated in forms of tasks and mostly occurs vertically. A second, the so-called "Roo Community," functions merely as a one-way communication tool between the company and its workers.)

Following informed consent obtained from the group members, I closely followed the conversations for six months, mapping the multiple ways in which the algorithmic management of work affects the wellbeing of couriers and the actions they consequently undertake. During this time, I made sure no sensitive data were collected, particularly riders' phone numbers and names, which are readily available on the app, but also details about protest organization and other contested actions that Deliveroo could, in turn, use to target riders and "deactivate" their accounts (for details on this practice done by another platform, Foodora, in Italy, see Cavallini and Avogaro, 2019). My role in the group was mostly that of a "fly on the wall," unobtrusively gathering information by looking and listening without direct participation or interference, with a few exceptions when I shared news of courier strikes happening elsewhere or approached particular riders for individual discussions. The two short interviews conducted in Manchester involved one of the strike organizers, a North African migrant riding a motorcycle, who also facilitated my access to the *WhatsApp* group, while for the second I approached one of the group members, also a migrant, for an online conversation.

Through this online research of the *WhatsApp* group, I gained exceptional access to a platform that sheds light into the daily routines of Deliveroo riders. This allowed the researcher to be co-present with riders in digitally-mediated settings in two ways: the *WhatsApp* group has functioned both as a *digital as archive* mode, gathering a record of digital interactions among spatially dispersed workers and as a *digital as process* mode, allowing the researcher to observe how participants actually interact in real time (Akemu and Abdelnour, 2020).

Against the grassroot nature of the *WhatsApp* group stands Deliveroo's algorithm, for which the company has chosen a friendly, anthropomorphized name: *Frank*. On its website, we are introduced in a very casual and opaque manner to what *Frank* actually does:

> The timing for every single order is different, depending on factors such as: the specific dish that is being prepared; the location of the restaurant; the time of day and the day of the week; the number of riders on the road; how many live customer orders there are; the distance from the restaurant to the customer. (Deliveroo website)

Thus, *Frank* has the resemblance of a black box:

> You know roughly what inputs go into the app (customer orders, worker location and status, restaurant preparation) and understand the outputs in the form of instructions, but you have no idea about the exact calculations and processes that turn one into the other. (Cant, 2020: 39)

In this way, algorithmic management disempowers riders not only through the imposition of constant surveillance, but also through an imbalance in access to the data that the algorithm generates.

On the other hand, the purpose of the *WhatsApp* chat group, according to its users, is to provide the very opposite of this: a platform where common issues that riders are facing are addressed and which range from restaurants with long waiting times, to dangerous zones to avoid or payment issues. Sometimes these group chats function as a self-defense mechanism for workers against theft or mugging (see also Cant, 2020). There are other online platforms riders use on a regular basis, such as Reddit forums or YouTube tutorials, where they express grievance, share detailed accounts of work experience, or offer tips on how to be a more effective courier. On other occasions they simply post humorous content, mostly to mock their employer, in a ludic activism used to express a "communicative resistance grammar" (Treré, 2015). The *WhatsApp* group remains nevertheless particularly versatile for instant communication across a network of like-minded individuals:

> This group was made to take practical actions against deliveroo to improve riders pay … they will keep playing with you all and we will have to dance according to the deliveroo beats. (*WhatsApp* group, March 2019)

Despite its extraordinary capacity to facilitate communication, to create solidarity, and to enable the organization of strikes, the *WhatsApp* group has its limitations. Only one in five riders in Manchester were enrolled in the group at the time of this research. Since the beginning of the pandemic, when Deliveroo hired 15,000 more riders across the United Kingdom, this ratio became even smaller. The newcomers, often riding cars away from the city center and not wearing the visible Deliveroo turquoise bags and kit, were more difficult to approach and be added to the group by existing couriers on their cycles or motorcycles. Additionally, the language barrier can prevent newly arrived migrants from joining an English-based messaging group. Some of these migrant workers, as well as the few female riders doing the job, told me they use instead one-to-one messaging to communicate with work colleagues.

Next, I will detail how some of the riders' demands and struggles were expressed and addressed in daily conversations using the *WhatsApp* group. The data collected for this research comes from three main sources. First, it is based on participant observation carried out as a Deliveroo rider for two months in the Stratford area of London. During this time, I kept a field diary and initiated informal discussions with fellow riders. Second, I conducted semi-structured interviews with three Deliveroo riders, one in London and two in Manchester. Third, I gained access to and conducted online research in the group chat used by Deliveroo couriers in Manchester. The empirical material is organized around the data accessed through the chat, with the other three resources used to contextualize and further develop the short messages exchanged on the chat group.

Contesting and Following the Algorithm

Two main types of actions have been noticed among Deliveroo workers using the *WhatsApp* group. The first are directed towards entrepreneurialism and are concerned with

how metrics effectively lead to neoliberal rationalities. The second set of actions, in contrast, inspire solidarity and focus on how these metrics are resisted and rejected. Despite their stark contrast, these actions are not mutually exclusive: oftentimes they overlap, illustrating the complex and contradictory values and actions that these workers have and undertake. This empirical section focuses on three main aspects highlighted during the strike and how they are further developed during *WhatsApp* conversations: (a) disputing payment conditions; (b) avoiding waiting times and dangerous areas; and (c) working long hours for several companies.

The intersecting instances of solidarity and entrepreneurialism among couriers, whereby affect, emotions, and feelings are constantly kept in balance by more pragmatic decisions designed to reduce wasted time and maximize productivity, are both challenging and follow the algorithmic management imposed by *Frank*. In doing so, they often upset the company's script of action, which relies on rationality and calculability. Instead, they propose a different type of reasoning, called "qualculation" (Callon and Law, 2016; Thrift, 2007; Shapiro, 2018), which emphasizes the affective sense-making that platform work both demands and negates from workers.

Solidarity: Disputing Payment Conditions

One of the strike's claims was for distance-based fees to be "calculated correctly, not as the bird flies." According to Deliveroo: "Distance-based fees takes into account how far each order will take you, offering a different fee for every order and a fairer system, paying more for orders that take you further." This is contradicted by the everyday experience of riders, who often feel they ride long distances for little pay. The most common reaction is to reject such orders and let the others know about Deliveroo's practice. Below is such a reaction:

> Basically, we can clearly see now that the acceptance rate is elephant in the room, they want us to accept every single order, so they can satisfy their costumers and the food arrives on time without delay. (*WhatsApp* group, April 2019)

These frustrations reveal on the one hand the lack of transparency and ensuing comprehensibility of algorithms (Amoore, 2018) and, on the other hand, the incapacity of individual riders to hold the company accountable for what they see as unjust practices. Thus, a considerable number of discussions on *WhatsApp* are trying to develop plausible explanations or, on the contrary, mock the logic behind an algorithm and its lack of understanding of the riders' everyday experiences. In other circumstances, harsher words and even profanity is used to describe overall dissatisfaction with the algorithms, which in the long run, can lead, as Duggan et al. (2020) have observed, to workers losing trust and confidence, resulting in a reduced sense of wellbeing.

Another demand made during the strike was for a minimum of £5 per delivery. According to Deliveroo, on average across the United Kingdom, fee per delivery riders earn £12 per hour. This is contradicted by my own experience in East London (See also Table 1):

> We (me and another rider I've just met) kept on chatting via text messages throughout the evening. By 10:30 PM he had three deliveries done, with £2 in tips. That's four and a half hours of work for a bit over £10. I did two deliveries, with £1.5 in tips. That's about two hours work for £8.5. (Fieldnotes, January 2019)

Another rider with more experience succinctly described on *WhatsApp* how the payment per delivery has gone down since Deliveroo began its operations. This is something that most other riders are not aware of because of high turnover rates. In 2016, Deliveroo changed the payment system, replacing the standard hourly rate (£7), including a bonus per completed delivery (£1), with a fee-per-delivery piece-wage (£3.75), with no hourly rate.

> I remember we used to get paid £3,75 per drop plus petrol in London. Many other places were £4,25 fixed to £4,50. Later on they changed the option to fixed £4 but no petrol. In Fri, Sat, Sun Night from 11:00 PM till 11:30 was £6 per drop and other locations £6,50. Sat and Sunday Mornings from 9AM till 11:30 AM £6 Pounds per drop. Double orders were fully paid to £8 /£9 for 2 and £12, £13at morning weekends. Just last year at the beginning of march was still very profitable as there were not enough riders in the zone that I was doing making constantly 4 drops per hour to 3 when it was slow to 5 at busiest times. (*WhatsApp* group, February 2019)

Insights such as the one above are thus essential for keeping a record of deteriorating working conditions. Most importantly, they have proven instrumental in mobilizing workers to strike. It must be said that the payment rates have not eventually improved, and neither has the fee-per-delivery system, despite the strikes and a parliamentary inquiry and report on the pay and working conditions of Deliveroo riders (Field and Forsey, 2018).

Solidarity: Avoiding Waiting Times and Dangerous Areas

During the strikes, complaints were also made in relation to long waiting times at restaurants, and the protesters asked for £0.20/minute after five minutes waiting time. Deliveroo, in their defense, claimed to be able to predict waiting times and reduce them. Nevertheless, the situation was contradicted by my own experience as a rider:

> Having to wait 10 minutes for one order. Asked to have a seat, as if I were a customer, then eventually told to move away or at another table. Marko (a fellow rider) tells me he had to wait once for an hour, at a steak house. He spent the waiting time reading, but he no longer takes orders from that place (Fieldnotes, January 24, 2018)

In other situations, the waiting takes place outside, as riders hang out in front of popular restaurants where most orders are likely to be placed. While in some cases the waiting is productive, forging connections and solidarity among otherwise geographically dispersed co-workers, in most situations the dead time means reduced wages and involves enduring cold and rainy weather. The most common strategy adopted by riders is to reject orders coming from afar, from restaurants known for long waiting times, but also when delivering in dangerous areas. A form of solidarity can be distinguished, as such decisions are also communicated to others so as to avoid the "slow" restaurants.

> The rude manager in KFC Oxford rd asked me if we are satisfied with delivery waiting time, I said mostly we cancel your order because you got less staff and we wait 15–20 mins to pick up one order. Is Deliveroo putting pressure on them to improve their services? (*WhatsApp* group, February 2019)

While excessive waiting times are a common source of complaint among riders and increase particularly outside peak hours (19:00 to 21:00, especially on Fridays, Saturdays, and Sunday), they are not an anomaly from the company's standpoint. Instead, the waiting times are embedded in its very business model. By switching from the hourly pay to the pay-per-drop system, Deliveroo has ensured that it has enough workers to meet the rush in busy periods, but the company is not left paying their wages during quiet periods with no work to do. The new contract effectively takes the risk off Deliveroo, which instead of having to anticipate demand, simply places it firmly on riders. This allows the company to flood the streets with riders, helping them meet demand and keep customer waiting times low during busy times, yet suffer no consequences or penalty when riders are left idle. For the fast mobility of ordered food and the extensive mobility of capital owned by these platforms to materialize, the more vulnerable have to go through painstaking immobilities (Urry, 2007).

The precarious nature of work comes not solely from the psychological demands placed on Deliveroo riders, but also from the physical ones. Platform work is not mitigating these risks and the algorithmic management systems are designed to be inflexible and oblivious to the changing psychological and physical limits of workers. Information about the delivery process is assigned step-by-step, with workers often having no control over what or where their next delivery will be. This means that the more vulnerable riders are unlikely to refuse jobs that are challenging, long, or have them going through dangerous city areas. One means used by riders to address these hazards is to notify their colleagues of potential risks and dangers:

Rider 1: Guys Pickford street near Oldham road

Rider 1: Avoid I been there deliver 2 guys try to snatch my moped

Rider 1: Thank God I am ok

Rider 2: Glad you are ok did you report it?

Rider 1: Bro ben report to who … Police … Useless. Better to report u guys (*WhatsApp* group, April 2019)

These messages exchanged above show how the *WhatsApp* group effectively challenges the abstruse nature of the platform and becomes a "solidarity radio" similar to the two-way car radios used by truck drivers to counter police surveillance and speed traps in efforts to maintain profitable speeds on their trucking routes (Hay and Packer, 2004). Despite this notification system, stories of fatal stabbings and crashes and other violent incidents directed against couriers have become common in cities across the United Kingdom (P. Jones, 2020).

A more subtle form of solidarity among couriers could be observed in the form of emojis added to text exchanges. While the latter tend to be filled with frustration and anger, various other expressions were conveyed through a range of emojis. Solidarity and cohesion are expressed through illustrations representing thumbs up, raised fists or flexed biceps, while laughing emojis involving faces with tears of joy or with stuck-out tongues and winking eyes are frequently used to mock the algorithm or appease more tense road situations. These are complemented by graphic art and graffiti produced and circulated on Reddit forums depicting Deliveroo riders as exploited subjects. The

widely circulated hashtag #slaveroo, a wordplay on "Deliveroo" and "slavery," illustrated with a kangaroo (the animal Deliveroo uses for its logo) with its foot chained to a metal ball, is perhaps the best illustration of how riders are mixing anger with humor. The importance of humor, irony, and parody has been recognized as important for the development of a new type of "ludic activism" (Benski et al., 2013; Romanos, 2018) within contemporary social movements, whereby various forms of humor are adopted to temper moments of stress and fatigue.

Entrepreneurialism: Working Long Hours and for Several Companies

Other strategies, on the contrary, emphasize more individualistic approaches. One is to work for several companies at the same time: while riders switch from Uber Eats to Deliveroo and vice-versa for various reasons (better pay, contract termination, etc.), some decide to deliver for both companies and juggle on a regular basis with orders coming from both Deliveroo and Uber Eats. This entrepreneurial approach has the potential to lead to solidarity among workers from the two platforms, who not only end up sharing the same workforce, but see their respective workers join the same *WhatsApp* group (see also Cant, 2020).

> I came last July, it was summer so it's quiet period everywhere but at that time I was doing Uber Eats morning time from 8 and took me a month to get my booking with deliveroo from 5 to 11AM where they give you 55 hours a week so if you mix up with Uber Eats and deliveroo you can make 120 or 140 if it's busy in 10 or 11 hours plus the 120 here is like you making 150 in London because your cost of living is very low you can find good room for 250 to 300 pounds. (*WhatsApp* group, April 2019)

This masterful handling of digital technologies has thus two complementary roles, as the quote above suggests: both to garner respect and "street capital" among messengers and also to organize resistance to oppressive and algorithmic working practices (Spinney and Popan, 2021). On the other hand, the fact that many riders use two, even three, different apps at a time is indicative of how insecure the pay is. The platforms consequently exempt themselves from the obligation to assure a minimum number of orders per hour or decent wages, claiming instead that their workforce choses to work part-time and be flexible.

Another tactic observed during my own shifts and predicated on self-help tutorials on YouTube involve working seven days a week, avoiding busy areas, being assertive when going to restaurants, or disobeying traffic rules. These entrepreneurial actions are described by Moore and Robinson (2016: 2774) as an internalization of the imperative to perform, a "subjectification process as we become observing entrepreneurial subjects and observed, objectified laboring bodies."

> The only problem I see with Deliveroo is that the fees keep going down but even at the lowest fee £3.60 you'd get about £11 per hour. No delivery guy in the face of this earth earns that. 55 hours of £11 will give you £2k a month. My friend, you know full well £24k a year is more than enough to provide for a family. And even put some savings aside. (Online interview, May 2019)

This cold entrepreneurial logic we see in the quote above might yield results in some cases, where young and fit couriers are capable of working eight hours per day, seven

days per week, but the reality is much more complicated. According to the parliamentary review on their pay and working conditions (2018), 72 percent of Deliveroo riders have worked fewer than 15 hours per week while only 4 percent have worked more than 40 hours per week. This indicates that for many riders this work resembles more like a "forced entrepreneurship" resulting from limited alternatives (MacDonald and Giazitzoglu, 2019) or even an entrepreneurial performance, in a Goffmanesque sense (Giazitzoglu and Down, 2017).

The self-employed type of contract that riders have with Deliveroo means that they do not receive holiday pay. Despite claiming these benefits on several occasions, in 2017, Deliveroo has won the right not to give its riders minimum wage or holiday pay (Butler, 2017). Moreover, riders' statistics are also affected upon their return to work. Some riders chose to borrow or rent their Deliveroo accounts on occasions when they cannot work the shifts they committed to, in order to keep their good statistics intact.

> Anyone want my 1130–1300 and or 1300–1400 shift in Salford on my account? Need to keep my stats up but can't attend it. (February 2019)

Conclusions: A Platform for Feelings and Emotions

The beginning of 2020 highlighted more than before the vulnerabilities of British courier workers in the gig economy. A Deliveroo driver was stabbed to death in London during working hours in the first month of the year. The storms Ciara and Dennis made working conditions almost impossible for many, with comments posted on the *WhatsApp* group I followed showing the serious safety hazards some faced: "Guys, be really careful when the powerful gusts come through" (February 2020). The coronavirus pandemic added additional strain on gig workers who could not afford to get sick since their pay was under threat should such a misfortune occur to them (Wall, 2020).

Platform workers, whose capacity to self-organize has been constantly dismissed, are at the vanguard of strikes and protests across the United Kingdom and elsewhere. In the context of the ongoing coronavirus crisis, which has, nevertheless, intensified protests of essential and vulnerable workers across the world, the lessons from the self-organization of couriers working for Deliveroo and other platforms are extremely valuable. This article has brought some of these lessons forward by specifically focusing on their main catalyst: the *WhatsApp* group set up by Deliveroo couriers in Manchester to initially organize and coordinate strike actions and later assist them in resisting the algorithmic management of work. It thus contributes to the increasing attention in the academic literature to forms of coping with and challenging work arrangements within the gig economy (Cant, 2018; Rosenblat, 2018; Woodcock and Graham, 2019; Zamponi, 2018; Briziarelli, 2018). It also supplements the existing literature on digital activism in the gig economy (Joyce, 2010; Bonilla and Rosa, 2015; Graham et al., 2017; Chesta et al., 2019; Chen, 2018; Wood et al., 2018) by specifically highlighting the "backstage activism" (Treré, 2015; 2020) enabled by this *WhatsApp* group.

The significant power and information asymmetries (Rosenblat, 2018) produced by *Frank*, the algorithm behind Deliveroo, are inherent to the company's ability to exert control over its couriers. Yet, as this paper has indicated, we can say that riders are often capable of "overriding" these asymmetries. Their personal and collective intuitions and experiences generate an affective style of reasoning that couriers employ to address

algorithmic workforce management, which becomes visible through the broad range of emotions and feelings regularly expressed through the *WhatsApp* group under investigation. They take to the private messaging group to express their frustrations and anxieties while at the same time highlighting strategies of action vis-à-vis payment conditions, waiting times, or dangerous areas.Shapiro (2018: 2965) terms this form of reasoning *qualculation* (as opposed to calculability), emphasizing "the more-than-calculative nature of worker intuitions, the on-the-job bodily and affective sense-making that on-demand companies both demand and negate from workers." One poignant aspect of riders' "qualculation" highlighted in this article is their subjective appreciation of time. The minutes spent waiting to be allocated an order, the waiting times in restaurants before collecting the food, or in front of a client's house who is only slowly emerging to pick up the parcel are all contrasting the emphasis that the company places on speed, efficiency, and expediency. This dichotomy between slowness, waiting, frustration, and exhaustion on the riders' side, and speed, efficiency, immediacy, and instant gratification for the rest serves to highlight the interplaying politics of mobility (Cresswell, 2010) in the smart city where "the speed and physical exertion of some are the pre-condition for others' idleness" (Nikolaeva and Nello-Deakin, 2020: 316).

The control exerted by Deliveroo and similar platforms on their riders proves to rely greatly on the workers' willingness, as well as constraint, to follow the calculative rationalities projected onto them. While many of the riders exhibit entrepreneurial strategies which sometimes align with the calculability put in place by *Frank*, a significant number of workers reflect on the conditions of their work. They comply to corporate strategies only when they align with their own interests and, as with the successful case of strikes, they subvert altogether these rationalities.

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