RESEARCH ARTICLE

Disconnecting labour: The impact of intraplatform algorithmic changes on the labour process and workers' capacity to organise collectively

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Abstract

This article examines how gig economy platform companies, via algorithmic management, shape working conditions and collective organisation of food delivery couriers. Using qualitative data from one case study operating in a city in the United Kingdom, the study captures real-time intraplatform unilateral changes in algorithmic management to provide increased flexibility for couriers. Findings show algorithmic changes generating a reconfigured, fragmented and compliant workforce. As a result, couriers demonstrate different interests and motivations to work for the company, where disparities in the demands for improved working conditions hindered efforts for collective organising. This article argues that intraplatform algorithmic changes create affordances that companies can exploit to concentrate power over labour even when conceding some control over the labour process.

KEYWORDS
algorithmic management, collective organising, gig economy, labour process, platform work

INTRODUCTION

The gig economy has become increasingly prevalent in contemporary societies and has generated considerable scholarly and policy debate (De Stefano, 2016; Griesbach et al., 2019; Taylor et al., 2017; Woodcock, 2016). The gig economy is broadly defined as people using digital platforms to sell their labour (Taylor et al., 2017). A platform and algorithm mediate the capital–labour relationship by controlling worker supply and consumer demand to complete a small task or 'gig' (Gandini, 2019). Research has categorised the different types of gig work (see De Stefano, 2016). This article is particularly concerned with local gig work used to deliver food that is mediated via platforms and algorithms. Food-delivery gig work has been characterised as the 'last mile of delivery'. Its coordination and cost-effectiveness, attained via platforms and algorithms, is key to gaining a competitive advantage (Heiland, 2021).

Recent theoretical accounts have argued that gig economy platform companies constitute a new governance mechanism for conducting economic transactions (Vallas & Schor, 2020). Platforms, seen as permissive potentates, rely on technological infrastructure, information asymmetries and flexible employment to concede some control, but retain most power over the labour process (Gandini, 2019; Vallas & Schor, 2020). Notably, studies have explored the use of algorithmic management to examine its impact on reducing indeterminacy of work (Cant, 2019), workers' experiences (Griesbach et al., 2019), autonomy (Shapiro, 2018, 2020) and collective and individual agency (Kougiannou & Mendonça, 2021; Tassinari & Maccarrone, 2020; Veen et al., 2020; Wood & Lehdonvirta, 2021; Wood et al., 2018). Studies have also examined how the compounded effect between technological control and flexible forms of employment impact workers' experiences and working conditions (Gregory, 2020; Ivanova et al., 2018). Finally, some authors explored these dynamics across different gig economy platform companies and their different impacts on working conditions and workers' capacity to collectively organise (Griesbach et al., 2019; Ivanova et al., 2018; Tassinari & Maccarrone, 2020; Veen et al., 2020).

However, less attention has been paid to how intraplatform changes in algorithmic control (i.e., algorithmic changes that occur within the same digital platform, in opposition to those observed across digital platforms) influence workers' experiences of the labour process and impact the collective organisation. By addressing this gap and complementing the growing research in this area, this article contributes to new knowledge empirically and theoretically. Empirically, by examining the processes of intraplatform algorithmic management changes and how these shape labour and the labour process in real-time. Theoretically, first by furthering our understanding of gig economy platform companies as permissive potentates where some control over the labour process is conceded while power remains centralised. Second, by examining how gig economy platform companies exploit affordances of unilateral algorithmic changes and their implications for labour and the labour process. Third, by exploring the significance it has for workers' collective organisation. In so doing, this article asks: how intraplatform changes in algorithmic management impact couriers' experiences of the labour process; and how these technological-workplace dynamics shape couriers' capacity to organise collectively.

To address these questions, this study investigates two processes through which the gig economy structures capital–labour relations. First, it intersects labour process theory (LPT) with the conceptualisation of platforms as permissive potentates to explore the interplay between algorithmic management strategies, labour process control and its impacts on working conditions and workers' experiences (Gandini, 2019; Vallas & Schor, 2020; Veen et al., 2020).

Second, this article resorts to mobilisation theory (Kelly, 1998) to understand how gig economy platform organisations shape workers' capacity to collectively organise and mobilise.

This article is organised as follows. First, it discusses the links between algorithmic management as a control mechanism, the labour process and the outcomes regarding workers' capacity to organise collectively. The following section describes the methods and presents the case selection. Then, the findings section highlights the importance of algorithmic management in the control of labour and the labour process, namely, how strategies of labour oversupply and high levels of competition between workers constrain couriers' capacity to organise. The final section reviews the article's main findings and outlines its contribution to the literature.

LABOUR PROCESS IN THE GIG ECONOMY

Recent research in the gig economy has analysed how working conditions are shaped by digital organisations using platforms to intermediate the supply and demand of products and/or services (Gandini, 2019). On the one hand, platform gig work can play a crucial role in boosting the flexible dynamism that is exemplary of the UK economy, in an area of the labour market that has the potential to 'address the needs of people actively choosing to work outside of the traditional employment model' (Taylor et al., 2017, p. 28). On the other hand, research studies have highlighted the overreliance of gig economy platform companies on atypical employment and technology as a calculative managerial technique for optimising cost and operational efficiency and maximising surplus value (Gandini, 2019; Ivanova et al., 2018).

Platform companies have been argued to constitute new governance structures, termed permissive potentates, where value extraction lies on platforms concentrating power even as they cede control over aspects of the labour process. In essence, platforms are seen as retaining control over relevant functions, such as the allocation of tasks, collection of data, pricing of services and collection of revenues, but handing over control of other dimensions, such as work schedules and performance evaluation. Therefore, the labour process acquires a new geometry in which some control is distributed while power remains centralised (Vallas & Schor, 2020). Gig economy platform companies are said to achieve this through an intersection between flexible forms of employment with workers and self-learning algorithms. The interplay between flexible employment and technology has been identified by LPT studies as key for gig economy platform companies to better control the indeterminacy of labour (Gandini, 2019; Wood & Lehdonvirta, 2021). An emphasis on the indeterminacy of labour recognises that the purchase of labour power alone does not secure a predefined quantity and quality of labour. Instead, the employer needs to extract the latter through control mechanisms (Smith, 2015).

In the United Kingdom, food delivery couriers are regarded as independent contractors by most gig economy platform companies in the sector. The use of self-employment status enables gig economy platform companies to swiftly and efficiently recruit workers and reduce costs by eliminating many of the labour and time costs involved (Ivanova et al., 2018). This practice is critical as it permits companies to coordinate better the labour supply–demand required to complete the orders made by customers to restaurants. At the same time, it has been argued that self-employment fosters a level of dependency on workers and furthers the company's power and capacity to reshape its control over the labour process (Gandini, 2019). Therefore, this employment status has been widely discussed as being more conducive to companies' particular business needs (De Stefano, 2016; Huws & Joyce, 2016; Woodcock, 2016). Although self-employment implies individuals having the autonomy to control when to work and how

much money they want to make, researchers have emphasised that this relationship enables gig economy platform companies to save on direct and indirect overhead costs (Ivanova et al., 2018), access a wider pool of potential recruits (Campbell, 2018; Meijerink & Keegan, 2019) and gain prerogative over when and why an individual can be fired (Prassl, 2018; van Doorn, 2017).

Another key dimension that helps gig economy platform companies close the indeterminacy of labour is the use of algorithms. Algorithms can be understood as artefacts that shape (and are also shaped) by the practices individuals use in interaction with, around and through them. Therefore, algorithms can be seen as affording companies or individuals an action (Hutchby, 2001; Wajcman, 2006). In the case of platform food delivery, algorithms have been conceptualised as a form of control mechanism enabling companies to remotely monitor workers' activity and performance to increase operational efficiency (Gandini, 2019). This mechanism is arguably crucial for controlling a dispersed, fragmented workforce. Algorithms can also manage and monitor work processes (Rosenblat & Stark, 2016), calculate the value of specific tasks (Shapiro, 2020) and provide optimised routes for workers to take (Graham et al., 2017; Griesbach et al., 2019).

Recently, studies have started to examine the varying impact of algorithmic changes on work experiences across platforms. For instance, Heiland (2021) demonstrates individuals have less control and knowledge over the labour process because platforms regularly redraw the boundaries of the delivery zones to tap into a potentially wider customer population. Shapiro (2020) also shows that the adoption of dynamic wages (such as 'surge pricing' or changes in price setting) by gig economy platform companies solves potential labour supply–demand coordination issues and generates longer waiting times, longer working hours and reduced earnings. Therefore, research has shown that digital organisations use algorithms with the dual purpose of coordination in a 'logic of efficiency' (Shapiro, 2020) and a 'logic of control' (Heiland, 2021). Put differently, the algorithm is used to decentralise the point of production (Thompson & Van den Broek, 2010), whereby technology enables the reconfigurations of the labour process and the managerial role to be enacted upon workers.

However, echoing Griesbach et al. (2019), there are still significant gaps in our understanding of how the changes in algorithmic control impact workers' experiences and collective organisation. Specifically, our data allowed us to examine, in real-time, how changes in algorithmic management reshape workforce configuration into the desired characteristics that are conducive to the company's interests but are detrimental to workers' willingness and capacity to collectively organise. The following section develops on this aspect.

WORKERS' CAPACITY TO COLLECTIVELY ORGANISE IN THE GIG ECONOMY

This section builds on mobilisation theory (Kelly, 1998) to theorise workers' collective organisation in the gig economy. Specifically, we emphasise the tension between the nature of employment and technological control of platform-based gig work and its impact on workers' willingness and capacity to organise collectively.

Kelly (1998, pp. 24–38) argues that collective organising is part of a sequence of interrelated processes involving interests, mobilisation, organisation, opportunity and action. The definition of common interests and collective organisation is grounded on management's actions that may

generate a sense of injustice amongst workers. Moving the articulation of collective interests involves framing the common and shared dissatisfactions as unfair, attributed to another group (usually, the employer or management). Factors internal to the group, such as its configuration, will influence how workers' interests are homogeneously defined and the success in organising collectively (Kelly, 1998). In particular to platform work, Lei (2021) suggests that external factors also play an influencing role in the process of collective organisation and mobilisation, whereby the platform architecture (i.e., the legal structure, technological apparatus and organisational design) deployed by the platform company may create opportunities or barriers for workers' mobilisation.

Fundamental to the analysis of workers' collective organisation in the context of the platform-based gig work is the definition of interests within a fragmented and dispersed workforce and the degree to which workers see themselves as similar, different from, or opposed to other workers (Wood et al., 2018). Recent research in food delivery gig work suggests that gig workers may be segmented in terms of dependence and attachment to the job (Joyce et al., 2019; Veen et al., 2020). For instance, Joyce et al. (2019) differentiate between those who only work on platforms and are dependent on this job for their income and those who do such work and another job. Fragmented and dispersed workforces have been identified as a significant obstacle to the collective organisation as they often see themselves as separated from other workers in the workplace and ultimately engage in individual competition with one another (Gumbrell-McCormick & Hyman, 2013; Heery, 2009). This fragmentation of the workforce is particularly relevant in platform-enabled gig work. As Franke and Pulignano (2021) demonstrate, platform companies can empower and disempower different groups of users by, for instance, granting access to transactions and fuelling competition. Wood et al. (2021) add to this argument by showing collective organisation is influenced by variation of dependency towards the platform work.

Moreover, workers' status in food delivery platforms works as independent contractors, that is, they are not covered by collective bargaining (Tassinari & Maccarrone, 2020) and are less protected in terms of employment and health and safety (Cant, 2019), which can also create an imbalanced bargaining relationship and accentuate divisions. Therefore, workers find themselves less powerful and increasingly pressured to manage the risks inherent to the job on their own (Dubal, 2017). However, such barriers to worker organising can be mitigated when a 'reserve army of labour' is small, and companies cannot easily cover their labour needs through external recruitment (Flecker et al., 2013).

Finally, the nature of work based on the almost exclusive interaction with the platform and algorithm may create further obstacles. Gandini (2019) argues that the absence of a human managerial structure is purposively designed as an organisational model that 'invisibilises' the organisation and the manager. However, according to Tassinari and Maccarrone (2020), the platform opaqueness also provides the opportunity for workers to socialise and organise in spaces free from the managerial gaze.

While the impact of employment status and the algorithmic control on gig workers' collective action and individual agency has been analysed (Tassinari & Maccarrone, 2020; Veen et al., 2020; Woodcock, 2016), there is yet limited understanding of how intraplatform algorithmic changes impact not only workers' experience of working lives but also their capacity and willingness to organise collectively. The following sections examine these issues through a detailed analysis of the power relations and outcomes in a food delivery digital organisation operating in the United Kingdom.

METHODOLOGY AND CASE CONTEXTUALISATION

The article is based on fieldwork focused on a Food Courier Network (FCN), created and used by couriers to collectively organise, and food couriers' experiences of a specific platform-enabled food delivery company in a UK city between February 2019 and December 2019. The case selection is empirically relevant as this food delivery company was the prevalent service provider in the city, and the fieldwork followed two major intraplatform algorithmic changes undertaken by the food delivery company. It was then possible to observe how these algorithmic changes shaped the labour process and impacted couriers' working experiences and organising efforts.

This article draws on qualitative data from 31 semistructured interviews with 29 food couriers (FCN leaders, members and nonmembers) and two food delivery company managers; nonparticipatory observation of four FCN meetings and five FCN leadership meetings; analysis of FCN meetings' minutes, and email communication between FCN and the gig economy organisation; and analysis of FCN's private Facebook group page and messenger chat. Trustworthiness and rigour of data were increased through prolonged engagement with the participants in the case study, prolonged and varied observation of events, and data triangulation protocols with the four main sources of data (Creswell & Miller, 2000; Lincoln & Guba, 1985).

Semistructured interviews were used as this enabled us to explore the meaning and experiences of participants captured in their own words whilst keeping question consistency across the interviews (Marshall & Rossman, 2011). The themes of the interviews included experiences of work and working conditions, the labour process with particular emphasis on the role of technology, and the motivations and aims of collective organisation. Observation enabled a greater understanding of the case (Stake, 1995, p. 60) by covering real-time events, their context and the consistency of people's statements (Yin, 2009). Furthermore, observation bias was mitigated by adopting a 'complete observer' approach (Burgess, 1984), in the sense that we chose not to take centre stage (for instance, we were not sitting with the leaders during meetings, but chose to sit at the back so that our presence could go unnoticed). With social media and chat groups, rigour and bias of data collection were addressed by taking into consideration key criteria such as (1) selecting social media pages and chat groups related to the city where the study was being conducted; (2) by only 'observing' interactions, without posting questions or our views; and (3) by selecting interactions that related to the themes the study was focusing on (Kozinets, 2020). However, there may be a risk of nonresponse bias within this data collection method, as the people who post on social media can be more opinionated and self-promotional than those who do not. The potential nonresponse bias was mitigated by always considering that we were not dealing with generalised views but only individual opinions (Kozinets, 2020). Moreover, conducting data triangulation, as explained previously and illustrated in Table 2, also compensated for potential social media nonresponse bias.

Purposive sampling was used to select information-rich participants to accommodate an in-depth study (Patton, 2014). Overall, interview participants included the FCN's leaders ($n = 3$) who later were elected as the FCN's Chair, Secretary and Social Media Officer; couriers that were FCN members ($n = 8$) and non-FCN members ($n = 18$); and two gig economy company managers. Specifically to couriers, the sample was purposively selected to broadly mirror the multilayered reality (Smith & Elger, 2014) typically observed in the gig food-delivery sector in the United Kingdom (Cant, 2019; Joyce et al., 2019). However, the sample is numerically limited and not a representative population of food delivery workers. As Table 1 shows, we

TABLE 1 Sample details

| | Total | Mode of transport | | Dependence and attachment to the job[a] | | |
		Bicycle	Moped	Only work on platform	Dependent on top-up income	Occasional or transient job
Couriers FCN leaders (FCNL)	3	3	0	3	0	0
Couriers FCN member (FCNM)	8	7	1	4	4	0
Couriers non-FCN members (C)	18	12	6	6	4	8

Abbreviation: FCN, Food Courier Network.

[a]Status at the time of the interview.

sought to recruit participants from different nationalities, modes of transportation, dependence on gig work (adapted from Joyce et al., 2019) and their level of engagement with FCN. This structure also became crucial to ensure comparisons between different and often contrasting accounts and minimise respondents' biases (Yin, 2009). Including non-FCN members was a particular concern for the authors. It helped mitigate potential bias of sample and data (for instance, having a skewed sample with FCN members could result in biased data with pro-collectivisation/mobilisation positions). Data saturation was reached around the 20th interview; however, the authors continued to conduct interviews as these had been previously scheduled and ensured that saturation had been reached (Yin, 2009).

Table 2 presents details about the data sources and how they were used in our data analysis. Before commencing, all data collection received ethical approval from the authors' academic institution.

The analysis process was the same for all types of qualitative data gathered. NVivo (Version 12) was used as a tool to code the qualitative data. Open coding was initially used to identify concepts, moving from in vivo, i.e. coding verbatim statements by respondents, to second-order codes based on thematic analysis (Maanen, 1979; Strauss & Corbin, 1990). Thematic analysis is a method used to systematically identify, synthesise and organise data offering insight into patterns of themes or meanings across a given data set (Braun & Clarke, 2006). The method helps to reveal and decipher meanings and experiences, thereby helping recognise the similarities within the data set. An abductive approach was followed to develop the themes for this study (Awuzie & McDermott, 2017). This method allows the researcher to move between theory and participants' accounts, each informing the other to answer the project's research questions and add new knowledge (Cunliffe, 2011). While all narratives from interviews were treated equally, we gave more weight to ideas and experiences corroborated by the interview sample (Patton, 2014). Observation notes, interview recordings, minutes of meetings and online chats were vital for informing interviewees' recollections of events. Interviews and chats complemented observations of meetings and events by giving a rich insight into how workers experienced the labour process, the network and its meetings and what issues were discussed.

FINDINGS

The findings presented in this section are divided into two subsections. The first shows how the studied platform engages in algorithmic changes, such as the sign-in system and delivery priority given to different groups of couriers, and their impact on the labour process and

TABLE 2 Data sources and use

Source	Type of data	Use in the analysis
Social media	1. FCN Facebook group. 2. FCN's Facebook Messenger chat. 3. FCN's leadership Facebook. Messenger chat 4. Public [city] couriers Facebook page.	Gather information regarding changes in the algorithm and their impact on the labour process. Understand the history of the creation of the FCN—how it has been formed and how it has evolved. The specific impacts of algorithmic changes on the evolution of the network. Cross-check the truthfulness of interview statements and observation notes.
Interviews	31 interviews conducted: 29 couriers (including the FCN leaders, FCN members and non-FCN members), two gig company managers. All audio-recorded and transcribed. Note 1: Interviews lasted between 45 min and 2 h, with an average duration of 1 h.	Gather data about changes in algorithmic management as a company practice. Gather data about the impacts of algorithmic change in the control over the labour process. How couriers' collective agency is perceived; organising efforts and action raised through FCN; the role of technology in constraining workers' organising efforts.
Nonparticipant observation	Four FCN meetings: 1 February 2019, 4 March 2019, 25 March 2019, 10 June 2019 Researcher's handwritten notes. The last three meetings were also audio-recorded. Five FCN leadership meetings: 21 March 2019, 28 March 2019, 5 April 2019, 8 May 2019, 8 July 2019 Researcher's handwritten notes. All meetings audio-recorded. Note 2: Average duration of the FCN meetings and leadership meetings was 2 h.	Gather data regarding the operation of meetings, procedures, practices and behaviours during meetings. Contextualise interview narratives. Triangulate facts.
Other documents	1. FCN meetings' minutes. 2. Email communication between FCN and gig economy company. 3. Emails and communication between couriers and gig economy company.	Contextualise meetings and interview narratives. Triangulate facts.

Abbreviation: FCN, Food Courier Network.

couriers' experiences at work. The second subsection covers how such changing dynamics produce effects far beyond the operational realm and shape workers' willingness and capacity to organise collectively.

How algorithmic changes are enabled and their impacts on labour and the labour process

An important theme from interviews with managers is the food delivery company's determination to ensure a smooth and reliable supply and demand of deliveries and labour. As mediators of logistic services, food delivery platforms need to indirectly coordinate with customers, restaurants and couriers. In their initial operating stages within a specific city, platforms may find it challenging to coordinate the unpredictable number of food orders and logged-in couriers that undertake the deliveries. Therefore, platforms need to have specific procedures and requirements that ensure a reliable match between labour supply and demand in these initial stages. As operations stabilise and the pool of customers and workers becomes increasingly reliable, changes may occur in the algorithm that controls these activities to adjust to the new supply and demand dynamics. Data suggest that algorithmic changes can be categorised into minor adjustments regarding how the digital platform works or procedures to make the coordination process more efficient (for instance, a more direct way of communicating with restaurants, bug fixes and other changes that go unnoticed by couriers); and major changes that significantly shape labour and the labour process (such as pay rates, logging in method, shift and working time patterns). This article is particularly concerned with changes identified by respondents as major or significant changes. According to the analysed data, imposing algorithmic changes was enabled by two main mechanisms. First, the opaqueness that the algorithm and platform provide makes it easier for the company to implement algorithmic changes that go unchallenged. This is because couriers are aware of a change only once it is implemented and the platform is updated. Second, the employment status of couriers as independent contractors enables management to impose algorithmic changes to increase flexibilisation. As independent contractors, couriers are outsiders to business optimisation process decisions.

Regarding the opaqueness of the algorithm and platform, most couriers commented on the asymmetry between how the labour process was transparent to the company, but the company and its technological elements were opaque to the couriers. The analysis of data shows how the opaqueness in the platform enabled a level of inaccessibility ($n = 21$),[1] as the company was able to 'hide behind a platform and an algorithm without having to even bother answering emails and communications properly' (FCNM17, Interview). This experience was particularly associated in couriers' interviews with the difficulty in communicating with the company to enquire about changes made to the labour process. One courier highlighted that whenever he attempted to communicate with the company to seek clarification about specific changes, the answer 'seemed to use automated responses (...) making it very impersonal' (C16, Interview). One FCN leader also commented on how the opacity of the company and algorithm is experienced by couriers and enables a changing process:

> Programmers see us as numbers, the same way [the algorithm] does (...) they couldn't be farther from us, from the experience of cycling [city's] streets, in the sense that we experience the change they implemented and rarely we have any

concrete understanding of how or why a particular change has been made. We just wake up the next day to a new version of the app with new features. (FCNL5, Interview)

The managers also identified the obscurity that algorithms provided as a critical feature to enable the company to implement changes in the labour process without much awareness from couriers. Both managers corroborated FCN leader views that the opacity of the algorithm permitted the company to introduce frequent changes. One particular manager suggested that the distancing from couriers facilitated such changes:

[Company] is always trying out new strategies to optimise operations. We like to try different models, which ones are easier to operate and which ones couriers react better. Because one thing is theory and what has been planned on paper distant from the actual places, and another thing is the practical side of that plan. When you operationalise that plan, does it actually work? [The algorithm] enables us to implement changes without much trouble (...) there is that level of distance that the algorithm provides. (M20, Interview)

The interviewed managers also referred to the algorithm's complexity and its lack of transparency as a black box. This feature enables the changes but also obscures its understanding:

Because the algorithm is a machine learning and therefore it's an algorithm that will learn more and more, and this will result in us, in [Company], not knowing exactly what it learns, that's why we also consider it a black box. It's very difficult and complex to understand and foresee what the algorithm will decide and how it will evolve to optimise the models it has been built on. (M20, Interview)

Another key mechanism that enabled changes in the algorithm was the company's emphasis on flexible employment and viewing couriers as flexible, independent contractors. Managers justified this employment strategy because

The [company's] business model is based on flexibility; anyone can and should log in and out whenever they want. [Food delivery company] envisaged this business as a gig that anyone can do on top of their main jobs, to bring extra cash. (M20, Interview)

Although reducing labour costs was one of the main drivers that interviewees associated with the use of a flexible workforce, findings show that flexible employment practices are also used to implement changes in the algorithm to manipulate the labour process conducive to the company's business objectives. This was particularly evident in the algorithmic changes discussed next.

Two intraplatform algorithmic changes were observed during fieldwork, which significantly impacted labour and the labour process. First, a significant algorithmic change emphasising flexibility was the replacement of the self-service booking (SSB) with a free login system. In the SSB system, the platform established a limit of couriers for specific time slots to which individuals were required to sign up in advance. The most sought-after shifts were those with

high demand in terms of orders (termed as super-peak). According to one manager, the SSB system aimed to 'reach a balance between flexibility and pay where it attempts to guarantee couriers won't be in a situation with too many couriers for very few orders' (M20, Interview). Most couriers ($n = 19$) thought this system afforded them significant freedom, autonomy and stability. Although couriers had to ensure specific shifts were covered (usually on Fridays or weekends), all interviewees who could book the desired shifts reported being comfortable with this commitment because it entailed a level of certainty of how much they would earn at the end of the day.

However, the change to a free login system meant that any courier would be able to sign up to the app at any given time regardless of tenure, individual performance, or level of customer demand. As one manager commented, 'couriers are independent contractors, and therefore they want as much flexibility as possible, and the company wants to offer that to them as well' (M22, Interview). This is elaborated by another manager, who argues that the algorithmic change obeyed the logic of the free market and increased flexibility:

> From an operational point of view, it's not important whether one specific courier or the other courier does the drop - the priority is 'has the drop been made with as few frills possible?'. If so, it's all good. It is simpler to make [login] of more couriers and let the logic of the free market manage the operation at the local level rather than have a platform like SSB, which controls how many people can make the login. The free login enables us to get closer to an optimum match between supply and demand and that we do not have a gap in this relationship. The SSB is a lot more difficult to operate from a business point of view because it's more complex and brings more problems [in terms of] the quantity of things and models that the company needs to manage. (M20, Interview)

Over-hiring couriers resulted in a flooding of flexible workers into the local labour market, enabling the food delivery company to ensure that all orders were accepted and completed sooner rather than later. Analysis of the data from interviews with couriers and social media group chats indicate that to remain competitive in the labour market, workers have to accept any order regardless of the value, delivery location or even the restaurant preparing the order (some restaurants had gained a poor reputation for taking too long to prepare an order). In addition, most interviewees ($n = 23$) mentioned the increasing lack of autonomy in rejecting undesirable orders or needing to be quicker in completing the deliveries due to higher intracourier competition.

Through the change in the algorithmic login system, the workforce saw a fundamental reconfiguration of its characteristics and power dynamics (this latter aspect will be fleshed out in the following subsection). Interviewees described a transition from a state where the company was more dependent on a small group of couriers to one where the company could rely mainly on an increasingly larger group of transient couriers. This shift from SSB to free login removed couriers' prerogative over the busier and profitable shifts, impacting the workforce's configuration and social relations. Consequently, the workforce grew to be characterised by occasional and transient couriers, who use gig work intermittently to make extra cash. Although some couriers ($n = 11$) welcomed the possibility of increasing income and joining the food delivery labour market, others saw this expansive and flexible supply of labour as a reserve army of workers prepared to accept and complete orders previously regarded as undesirable.

In addition to reshaping the workforce configuration, this algorithmic change ultimately affected couriers' working conditions, such as discretion in choosing working hours and increased work intensity. Shapiro (2018) refers to 'autonomy over minute decisions' of local gig workers concerning choices they can make about when to work and which orders to accept or reject. However, most of the interviewed couriers ($n = 23$) saw this autonomy curtailed by the change to a free login system and the flooding of new couriers in the local labour market, as one commented:

> Before, I used to reject orders, and in one minute, another would pop up. I'd do this over and over until pay was good enough. But now it all changed. There is this massive low peak in customers ordering food, but then you start realising the sheer number of couriers on the road. So, what I'm doing over the past months to boost my earnings and orders is to be the ideal courier, if you like. I don't reject any order; I come back to the main square asap, I maintain my stats spot on. You've got to be top of the game, always. (C21, Interview)

The change to a free login system also meant couriers had to work for longer hours to maintain the same pay. Although managers referred to the free login as a system that meets couriers' expectations for more flexibility, couriers mentioned having to adjust their working and social lives to the gig work. For example, some couriers revealed having to quit food delivery ($n = 6$) or work for longer hours ($n = 11$) to compensate for lower demand:

> It is less flexible now because I have to be logged in almost the whole day, whereas before [with SSB system] I could actually do shifts of 4 hours. (C19, Interview)

> I used to work 30 hours per week, plus [super-]peak [shift], which for that amount of time and comparing to what's out there, I could earn quite good money. But now I must do 50% more to earn the same—roughly 60/65 hours a week and weekend. (C25, Interview)

For individuals that relied on gig work as a strategy to top-up their earnings, working longer hours for the food delivery company meant clashes with their primary job.

> The free login means I need to put on long shifts to get the same amount of money, which means it clashes with my job at [caffe]. (C21, Interview)

In addition to the experiences of reduced autonomy and working longer hours, data also show increasing levels of work effort dispended by couriers. The oversupply created a feeling of competition for orders amongst couriers. A courier's alternative strategy to compensate for shrinking wages was via increased work intensity, such as completing as many orders as possible and as quickly as possible. One courier highlights the strategy adopted by many others ($n = 24$) and the tension between the increasing number of couriers and workload:

> There are so many couriers now [that] you have to see this as a competition. You no longer can enjoy cycling; you have to drop the order and run back to where restaurants are [and] wait for orders to come in. (C19, Interview)

In a later fieldwork stage, data showed another key intra-platform algorithmic change. The opaqueness provided by the platform and algorithm enabled the company to change the algorithmic control in the allocation of orders, prioritising moped couriers at the expense of other couriers. This change was particularly mentioned in interviews with FCN leaders and members as an illustrative example of how the platform could take advantage of the opaque nature of the algorithm to covertly produce changes that the vast majority of couriers did not even realise. On the one hand, the algorithmic change resulted in bicycle couriers having to expend more effort to compete with a more efficient mode of transportation. At the same time, bicycle couriers experience fewer earnings due to lower levels of customer orders. When couriers questioned the company about this change, they referred to the algorithm as an entity that constantly seeks to achieve the most efficient way to respond to customers' and couriers' expectations. All moped couriers but one acknowledged experiencing a higher volume of orders.

The data in this section has shown that changes in algorithmic management are facilitated by an overemphasis on flexible employment status and the opaque nature of the platform and algorithm. Furthermore, it was demonstrated that these intraplatform algorithmic changes are an effective instrument of control over the configuration of labour and the labour process, enabling higher levels of productivity and efficiency from the company perspective. The following section will discuss how these algorithmic changes impact workers' collective organisation and agency.

Impact of intraplatform algorithmic changes on workers' willingness and capacity to organise

Given such systems of labour and labour process control, this section now discusses couriers' engagement with different steps of mobilisation and how these were shaped by the company's organisational and technological dynamics previously described. The analysis of findings identified that couriers' collective organisation was constrained by the company's capacity to implement algorithmic changes.

Data show that the change to a free login system reconfigured the workforce by increasing the quantity of transient and less dependent couriers in the local labour market. This reconfiguration enabled the company to better coordinate restaurants, customers, and couriers. It also reshaped the existing power dynamics, constraining couriers' capacity to collectively organise. Data from interviews with managers, FCN leaders and members and other couriers suggest that the increasing number of transient/occasional and less dependent couriers resulted in weaker collective grievances due to the dilution of the power of couriers that were more active in organising and protesting for better working conditions. The managers recognised that the promotion of an expansive transient/occasional workforce could potentially result in less worker resistance:

> [Company] envisaged this business as a gig that anyone can do on top of their main jobs, to bring extra cash and so on. I think having tenured couriers turns this strategy around (...) if you look at couriers' profiles engaging in protests and other activities, you'll often see tenured, more experienced couriers. Rarely do you see new couriers because these are more aligned with the company's vision; they see it as a gig just as the company intended. [The company] wants to move in that

direction. (...) In my view, new couriers will bring fewer disturbances. (M20, Interview)

Couriers mirrored management views by commenting how the increase in transient gig workers resulted in the dilution of collective power amongst the workforce. For instance, interviews with three occasional couriers show unawareness of FCN's existence. Another five interviewed occasional couriers referred that they were actively disengaged from FCN's activities. Data from these interviews suggest that couriers embraced their identity as flexible, independent contractors and saw themselves as competing directly with their fellow workers. Some couriers ($n = 6$) mentioned being willing to work during collective actions. Occasional couriers tended to see this positively because it meant less competition for orders and higher rates at specific times. Another courier mentioned, 'I'm in this [job] to get few extra quid [...] I understand their [FCN] demands and why they protest, but that's not for me' (C12, Interview).

The analysed data show how social relations between the expanding occasional/transient workforce and the other couriers became more challenging to sustain, which posed challenges in defining common interests amongst the workforce (Kelly, 1998). In addition, the change from SSB to a free login system created divisions amongst the workforce. From the algorithmic change onwards, interviewees were strikingly divided into those who preferred the former system and those who were quite satisfied with the free login system, interpreting it as an opportunity to access peak times and higher earnings.

Couriers affiliated with FCN also emphasised the impact that the shift from SSB to free login had on their organising efforts and the potential impact on their collective actions against the company. Couriers referred that the expanding workforce and consequent increasing order scarcity and competition among couriers resulted in extended working hours and higher turnover. This situation substantially impacted couriers' capacity and availability to meet and organise. After the algorithmic change, data from interviews and observations show decreasing levels of participation in the network meetings and protests. One FCN member mentioned that

> [Company] sets up things in a way, so you don't get much contact with other couriers (...) nowadays [after the algorithmic change] the way it is set up you are always back and forth trying to catch up [so] there's almost no time to spend with [other couriers], and you see less and less large protests. (FCNM17, Interview)

During meetings and interviews, all FCN leaders expressed concerns that couriers had increasingly less time to hold organisational roles in FCN or attend FCN gatherings because of longer working hours or quitting the job altogether. For instance, in three of the FCN leaders' meetings, the main topic of discussion was finding strategies to attract couriers willing or interested in undertaking organising duties in FCN because the previous officer had quit the job.

Concerning the second significant algorithmic change, the control over allocating more orders to moped couriers created affordances the company could exploit that promoted divisions between couriers, which further diluted power amongst the workforce. Interviews with both bicycle and moped couriers show a clear division in interests between the groups. On the one hand, the former group argued that bicycles were the original means of transport the company promoted and, therefore, mopeds should not be given priority in allocating orders. This priority, they argued, could be seen in the company's campaigns where 'idealised images of bike couriers' (FCNL3, Interview) are promoted to recruit new couriers. The majority of

individuals ($n = 19$) belonging to this group of couriers also argued that bicycles were a more environmentally sustainable means of transport and thus were more in line with the city's efforts to reduce pollution levels. On the other hand, moped couriers argued that priority was reasonable as they were the ones that could do longer distances in less time. Moreover, all moped couriers asserted that they had more inherent operating costs (e.g., vehicle insurance and petrol), and therefore the prioritisation results in a fairer distribution of wages. These contrasting views illustrate clear divisions in interests and interpretations over the labour process between groups of couriers.

This division amongst couriers was also clearly observed during protests. Although FCN protests were increasingly encompassing the wider community, there were visible rifts between different groups of couriers. For instance, similarly to transient/occasional couriers, FCN leaders and members referred that moped couriers were more prone to work when the FCN organised protests and strikes, which undermined the potential impact of such actions. Moped couriers, concerned with their interests, would also protest, but these were usually organised independently from FCN (similar to 'wildcat protests'), using their own social media group.

Indeed, the reconfiguration of workforce social relations deriving from the algorithmic changes resulted in a dilution of power and the impact of couriers' organising efforts and actions. Illustrative of this was how often managers referred to protests as being undertaken by a 'minority of couriers' or 'small groups of troublemakers' (M20 and M22, Interview). Furthermore, managers argued that most couriers were generally happy with their conditions and highlighted the protesters' lack of significance:

> There are protests, but we have to acknowledge that many of these protests are not generalised, are only organised by around 5% of the couriers that protest for anything and everything. We don't want to compromise 95% of the couriers because 5% are against a specific change. It is very difficult to please all couriers. (M20, Interview)

DISCUSSION AND CONCLUSION

This article contributes to knowledge by examining how intraplatform algorithmic changes within the food delivery gig work to shape the labour process and workers' capacity to collectively organise. Previous research has accounted for algorithmic variations across different platforms (Griesbach et al., 2019; Shapiro, 2020; Tassinari & Maccarrone, 2020), yet intraplatform algorithmic changes and the impacts on labour and the labour process remain to a large extent a black box.

To shed light on this black box, this study captures, in real-time, platform workers' experience of intraplatform algorithmic change. First, the shift from SSB to a free login system, and second, the prioritisation of specific groups of couriers at the expense of others. The findings in this study show algorithmic changes affording the gig economy platform company access to enhanced labour coordination and optimisation of operations (Gandini, 2019; Heiland, 2021; Hutchby, 2001; Wajcman, 2006; Shapiro, 2020) but also to a reconfiguration of the workforce and enhanced labour control. Notably, the shift from SSB to a free login system became an effective mechanism in shaping the workforce into having the desired flexible and compliant characteristics. Against this empirical background, this article shows how platforms can be seen as permissive potentates where value is extracted through a structural form that

concedes some control over aspects of the labour process, but retains and concentrates on increasing power (Vallas & Schor, 2020). This is particularly evidenced in the gig economy platform company relaxing the entry requirements to the labour process with the free login and affording workers some autonomy over when and how often to work. However, by reducing the entry barriers, the company also fostered greater workforce variation and reconfigured the sociodemographic composition of its workers. The outcomes were the labour process becoming more intense, providing less scope for workers' autonomy, resulting in clear differences in workers' interests and motivations to work for the company, and, consequently, generating disparities in the demands for improved working conditions.

This article also adds to knowledge by demonstrating how intraplatform algorithmic changes impacting the labour process contribute to variation in workers' experiences. LPT is used to analyse the efforts of companies to control the indeterminacy of labour. The findings show the company achieving it through the interplay between flexible employment and technological mechanisms (Smith, 2015). Sophisticated technology allows the company to unilaterally implement changes in the algorithm, creating a reconfiguration of the workforce that enables the company to access a flexible *always-available* pool of workers. In supporting previous research (Cant, 2019; Gregory, 2020; Griesbach et al., 2019; Veen et al., 2020), this article advances new knowledge by providing finer granularity to show how sudden intraplatform algorithmic changes create variations in experience depending on workers' profiles (Joyce et al., 2019). The observed variations in experience related to dependence-level over gig work (whether workers are transient or more full-time) and the means of production to undertake the labour process (the tools that workers use to complete their gigs).

On the first factor, the shift to a free login system meant that the transient, less dependent labour force could access more easily and flexibly the food-delivery labour market and the peak earning days and hours. However, this change also meant that more gig-dependent workers (individuals that rely more on a full-time basis on gig work) started to experience longer working hours, intensification of work, and more competition for orders. The new recruitment practices restrict the workforce to those willing to or prepared to comply with the intensified labour process (Campbell, 2018; Ivanova et al., 2018; Meijerink & Keegan, 2019). As a result, both groups of couriers started to experience less autonomy and flexibility. In turn, a contradiction occurs. The increasing demand from the company for greater flexibility, which is realised when logging in to the platform and accessing the labour process, results in workers experiencing less flexibility once within the labour process. In other words, workers have flexibility in accessing the labour process, but their autonomy and involvement in the labour process are significantly limited once they enter as they must comply with the increasing levels of work effort.

On the second factor related to the means of production that couriers use to conduct the labour process, the algorithmic change that prioritised one mode of transportation over the other resulted in varied work experiences. As a result, the bicycle couriers started to experience lower customer demand compounded with higher levels of competition with more efficient and faster means of transport (such as mopeds). This meant that bicycle couriers expended higher levels of effort to compensate for decreasing order levels and lower earnings. However, moped couriers also experience more bureaucratic and costly entry requirements to the labour process due to requirements in terms of insurance and presentation of drivers' licence. Beyond the food delivery platform, an algorithmic change in means of production priority could also occur in hail-riding platform services. For instance, the platform company could prioritise electric cars

over petrol/diesel to adhere to customer demands for eco-friendlier transportation, which would then result in varied experiences of work for different drivers.

Finally, this article builds on previous literature (Cant, 2019; Griesbach et al., 2019; Ivanova et al., 2018; Veen et al., 2020) to show intraplatform algorithmic changes as a critical mechanism in reshaping couriers' capacity for collective organising (Kelly, 1998). Adding to previous research (Wood et al., 2021), this study shows how the reconfigured fragmented workforce and the intensified labour process unsettled couriers' existing power and social relations and prevented them from fully engaging with and participating in collective organising activities. This article shows intraplatform algorithmic changes disrupting workers' efforts in building common interests due to an increasing 'reserve army of labour' that was more likely to engage in competition and less willing to participate in collective actions (Flecker et al., 2013). The expansion of a transient labour force resulting in an increasingly more fragmented workforce collides directly with the precondition of defining common interests that Kelly (1998) identifies as a determinant factor for collective organising. While increasingly expansive workforces may hamper the articulation of a shared sense of injustice (Heery, 2004; Gumbrell-McCormick & Hyman, 2013), technology also created affordances that the company could exploit to implement divisions amongst the workforce. As the articulation of a sense of injustice became more challenging to achieve, the growing number of transient couriers also highlighted the difficulties of collective organising. Findings show that continuous algorithmic changes unsettle previously established power and social relations amongst the workforce (Kelly, 1998), with the platform empowering specific groups of couriers at the expense of others (Franke & Pulignano, 2021).

In addition, this article contributes to the debate on the opaque nature of the algorithm and its impact on workers' collective agency. Prior research has suggested that replacing human managers with opaque algorithms is purposively used to 'invisibilise' the organisation and management (Gandini, 2019), creating spaces free from management control and facilitating the socialisation and organisation of workers (Tassinari & Maccarrone, 2020). This study adds to knowledge by demonstrating how couriers experience the difficulties with opaque intraplatform algorithmic changes. After the change in the login system, findings show a decline in couriers' capacity to achieve some 'autonomy over minute decisions' (Shapiro, 2018) with lower scope for discretion over work tasks, effort and working time. Due to the change in the login system, which resulted in more flexible entry criteria for couriers and caused increased competition for the same amount of orders, couriers experienced less discretion over working hours and less autonomy to reject undesirable orders. Furthermore, the algorithmic change in prioritising moped over bicycle couriers also meant that the latter group's autonomy over effort and work tasks became increasingly limited. These findings demonstrate that the opacity of the algorithm and platform, that is, the technological black box (Thompson & Van den Broek, 2010), that allows sudden changes to be implemented without objection, also enables the company to deflect accountability for workers' adverse working outcomes to the self-learning capabilities of the algorithm.

In conclusion, this article offers novel insights by empirically capturing the real-time impacts of intraplatform algorithmic change on different groups of workers and how this produces distinct experiences over the labour process and their capacity to collectively organise. In doing so, this article advances the current debate on algorithmic management by highlighting how the process of implementing algorithmic changes reconfigures workforces and unsettles its power and social relations. By conceding some control over the labour process,

this article shows platform companies introducing algorithmic changes to create affordances that companies can exploit to concentrate power over labour.

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ENDNOTE

[1] The remaining couriers did not comment on the opaqueness because they never had the need to communicate with the company or never enquired themselves how the algorithm worked.

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