Imbricated to Platforms: The (Re)production of Differences in Food-delivery Work

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Abstract
The debate on digital labour platforms (DLPs) postulates that algorithms engineer pervasive organizational control, but it often observes that workers can evade and resist this control by manipulating algorithms' decisions. This article aims to unpack this dichotomic view, shedding light on the more intricate dynamics at play in the everyday interaction between workers, algorithms and related technologies in the context of food-delivery platforms. Based on a seven-months ethnographic fieldwork conducted in Milan in 2020, during which the author worked as a food-delivery courier, this article highlights the internal differentiation within an emerging occupational field that is often considered homogeneous. First, it compares two food-delivery platforms – Glovo and Deliveroo – to uncover differences in the way they prefigure couriers' work, enabling or constraining their agency. Second, it illustrates how two groups of workers with uneven cultural and socioeconomic resources engage with both platforms. The analysis shows that pre-existing social stratification of workers is reproduced through the processes of "imbrication to platform", leading to the emergence of different ways of working and dispositions – namely, reactive and strategic. In conclusion, however, it is argued that strategic "imbrications" result less in practices of resistance to organizational control and more into self-optimization tactics that, to some extent, are envisaged and tolerated by DLPs.

Keywords
digital platforms; algorithms; food-delivery work; ethnography; imbrication.

1. Introduction

In the literature on digital labour platforms, algorithmic management is described as a profound transformation in the capitalist history of work rationalization, in relation to other technical or bureaucratic forms of labour-process control (Vallas and Schor 2020). Algorithms are observed to be more "comprehensive" and "opaque" in terms of directing, evaluating and disciplining workers, and to enable a more "instantaneous" and "individualized" control based on vast amounts of crowd-sourced data (Kellogg et al. 2020). These arguments are supported by a significant number of empirical studies that have addressed the implica-

tions of algorithmic control in different work contexts, in terms of workers' precariousness (e.g., Polkowska 2019) and social insecurity (e.g., Wood et al. 2019). On the other hand, given the risk that platforms may reduce workers' capacity "to resist, elude, or challenge the rules and expectations that firms establish as conditions of participation" (Vallas and Schor 2020, 278), scholars have also investigated how workers circumvent algorithmic-driven decisions and regain control over the labour processes (Kellogg et al. 2020). But how can we explain, both theoretically and empirically, that workers continue to have agency while claiming that their behaviours are rigidly constrained by algorithmic control? This paper aims to address this issue by focusing on food-delivery platforms, a well-debated sector in the platform economy, particularly due to the controversial self-employment status of couriers.

The article is based on two premises. First, by understanding algorithmic management as a socio-technical process that is "mutually constituted with organizational surroundings" (Jarrahi et al. 2021, 3), I[1] relate it to a specific organizational model: digital labour platforms[2] (DLPs). The organizational novelty of DLPs lies on their capacity to build on the activities of actors who are neither formally part of the firm nor involved in long-term, trust-based relationships (Stark and Pais 2020). In the context of DLPs, workers are usually enrolled as independent contractors, which deprives them of traditional labour protections, while providing a certain degree of autonomy in terms of when and how work is performed. Nonetheless, this autonomy is constrained within a set of limits inscribed in the platform architecture[3], which aims to align workers' behaviour with managers' intentions without formally denying their self-employed status. Partly due to the lack of comparative studies between different platforms and work contexts – with a few exceptions, such as the research of Griesbach and colleagues (2019) – the existing literature has overlooked the diversity of these technical systems, essentializing notions as "algorithms" and "algorithmic management" regardless of how their specificities vary from case to case. In this article, I assume that considering the specific configuration of workers in the platform architectures is crucial in order to understand how the tension between autonomy and control is articulated.

The second premise of this study is that most of the literature on DLPs refers to worker resistance as exceptional occurrences of their interaction with algorithms. However, there is usually little explanation of what is required to resist "algorithmic power" (Ferrari and Graham 2021). Here, I assume that workers engage with DLPs technologies with varying intentions and skills, resulting in a range of practices that are not necessarily resistant. To illustrate this point, I examine two distinct groups of food-delivery workers and show how their ways of interacting with algorithms and related technologies lead to the emergence of different work practices and dispositions.

The article is structured as follows: the next section summarizes the debate on algorithmic control and resistance in the platform economy. The third paragraph outlines how the concept of "imbrication" formulated by Paul M. Leonardi (2012; 2013) can be employed to unpack both deterministic and voluntaristic assumptions regarding the interactions between workers and DLPs technologies. After a brief outline of the research's context and methodology, I discuss the main findings. First, I compare the digital architecture of two food-delivery platforms, Glovo and Deliveroo, highlighting the differences in how they prefigure workers' behaviours and their space of autonomy. Second, I illustrate how two groups of riders[4] with uneven cultural and socioeconomic resources engage with these platforms. The analysis illus-

trates two types of imbrications – namely reactive and strategic – and shows how they lead to the emergence of different ways of working. In the conclusions, however, I contend that most strategic imbrications result less in practices of resistance to organizational control and more into self-optimization tactics that, to some extent, are envisaged and tolerated by DLPs.

2. Algorithmic management in digital labour platforms

Algorithmic management refers to "the use of computer-programmed procedures for the coordination of labour input in an organisation" (Baiocco et al. 2022, 6). The notion entered into the debate on digital labour platforms (DLPs) with a rather negative connotation, as part of a broader critique of the "sharing euphoria" (Grabher and König 2020) that characterised the early stages of Uber, Airbnb and the likes. Critical scholars have sought to peel away the supposed neutrality of terms such as "coordination" or "intermediation" associated to digital platforms, conceiving algorithmic management as a form of neo-Taylorism (Haidar and Keune 2021) capable of undermining labour power and enhancing processes of value extraction. In a highly influential paper, Gandini advocated the adoption of the Marxist approach of Labour Process Theory (LPT) to understand how algorithmic management reconfigures the relations of production between employers and workers in the gig economy, by exerting "nuanced and innovative forms of technologically centred, normatively driven practices of control over workers" (2019, 1051). At the heart of his argument is the identification of the platform as a "digital-based point of production, intended as the 'place' where the labour process is enacted upon workers" (*ibid.*, 1040), and where processes of capital accumulation take place. In this regard, algorithms have been conceived as entities that enforce managerial power on workers by partially automating decision-making processes (Kellogg et al. 2020). The efficacy of algorithmic control has been claimed as evidence that platforms act as employers (Prassl and Risak 2015), regardless of their ambiguous institutionalization (Frenken and Fuenfschilling 2020). In the context of food-delivery platforms, Veen et al. (2020) have identified three techniques of algorithm control: the use of a panoptic technological infrastructure, the existence of information asymmetries and an opaque performance-management system. Opacity and information asymmetries have been identified also by Griesbach and colleagues as critical aspects of what they refer to as "algorithmic despotism" (2019). Additionally, Healy and Pekarek have pointed out that the efficacy of algorithmic control relies on the customers' involvement as "*de facto* managers" (2023). By conceiving platforms as the digital point of production in the labour process, algorithms have been also depicted as a "new *contested* terrain of control" (Kellogg et al. 2020, *emphasis added*), in the sense that they embed the "structurally antagonistic character of employer-worker relations" (*ibid.*, 383). To assume that this terrain is "contested" identifies algorithmic systems as the site in relation to which workers might enact forms of organizational misbehaviours – what Kellogg and colleagues have called "algoactivism" (2020). Insights on this come from a number of empirical studies that have surveyed workers' strategies of resistance in the everyday use of platforms, both at an individual (e.g., Yu et al. 2022) and at a collective level (e.g., Leonardi et al. 2019; van Doorn 2020). These studies have illustrated

that algorithmic control is not frictionless, calling into question the "digital cage" metaphor (Vallas and Schor 2020) and renewing attention to the agency of workers. However, framing the relationship between workers and algorithms – and, by extension, technologies – as a dialectic between control and resistance risks to hide "the more intricate [...] dynamics that happen between total domination and total emancipation" (Meyer et al. 2019, 2) in work contexts. For instance, although researchers have analysed an array of conflicting tactics in relation to algorithmic decision-making, they have underestimated their implications at the organizational level (Huang 2023) and on the material properties of the algorithms themselves (Meijerink and Bondarouk 2023). As some authors have noted, the manipulation of algorithmic decisions may still comply with the organizational logic of DLPs (Bonifacio 2023; Massimo 2020) and, in turn, trigger "the purposeful redesign of software algorithms" (Meijerink and Bondarouk 2023, 9) to further restrict workers' autonomy and enhance organizational efficiency. In this sense, Meijerink and Bondarouk have proposed a dualistic view of algorithmic management, according to which algorithmic systems both "limit and foster autonomy, while simultaneously being shaped by the actions of workers" (*ibid.*, 7). In a similar vein, Lizzie Richardson has described food-delivery platforms as dispersed organizations, whose members are governed by a "coercive flexibility" (2020). In her ethnographic study of Deliveroo, the author contends that flexibility is what "enable restaurants to switch on or off the app to increase or decrease orders; clients to order when and where they want through the mobile app, and riders to decide when to work and whether to accept an order" (2020, 10). The coercive nature of flexibility, on the other hand, depends on the set of limits and constraints inscribed in the digital architecture, which are designed to align workers' behaviours with managerial intentions without exerting a direct control, so as to not contradict the claim that riders are independent contractors. For instance, food-delivery couriers are relatively free to choose when to work and can work simultaneously for competing platforms – as most couriers do. However, DLPs embed lock-in mechanisms to encourage riders' participation when surges in demand are predicted, and regulate their access to work (Kellogg et al. 2020) by means of a working calendar and a peer-to-peer reputation system. Nonetheless, these constraints hardly result in the routinising of tasks or the direct imposition of formal rules (Vallas and Schor 2020). While workers are nudged to be active and compliant with clients, they are also granted significant discretion in how to practice their work, particularly in terms of how they engage with algorithms and related technologies. Workers' activity is fundamental to the functioning of DLPs, which "would remain 'empty boxes' if [they] did not continuously perform, refine and repair them" (Bruni and Esposito 2019, 670), feeding the platform with data that are algorithmically processed to make decisions. In this light, "actually existing platforms" (Timko and van Melik 2021, 501) take shape through the everyday use of workers, who can "ascribe different meanings to algorithms as resources to achieve other outcomes than intended by designers" (Meijerink and Bondarouk 2023, 7). In other words, the everyday interaction between workers and DLPs technical systems is where the actual balance between control and autonomy becomes stabilized in practice, as a result of the recursive entanglement between the social agency of the former and the material agency of the latter. In the following section, I outline a theoretical framework to illustrate this process, drawing on the concept of imbrication (Leonardi 2012; 2013).

3. Theorizing workers' imbrication to platform

The notion of *imbrication* was coined by Paul M. Leonardi to elucidate the entanglement of social and material agencies in organizational and work practices (2012; 2013). With this concept, Leonardi addresses the complex debate on sociomateriality that has involved many organization and STS scholars since the publication of the Wanda Orlikowski's paper "Sociomaterial Practices: Exploring Technology at Work" (2007), in which the author radically argued that both techno-centric and human-centric perspectives on technology and organizing have failed to develop a general proposition capable of taking into account the foundational role of materiality in organizations. Building on Barad's "agential realism" (2003) and on the Actor-Network-Theory (ANT) principle of symmetry, the concept of sociomateriality conveyed an ontological understanding of organizations – e.g. human actors, norms, institutions – and technologies – e.g., software, hardware – as "constitutively entangled" (Orlikowski 2007, 1437) or "inextricably fused" (Orlikowski and Scott 2008, 463). To a wide extent, the debate on sociomateriality has remained at a highly theoretical level, creating a "philosophical battleground" (Cecez-Kecmanovic et al. 2014, 810) that has undermined its heuristic relevance (Leonardi 2013). Sociomateriality has been described as a refined reworking of existing concepts from ANT and the socio-technical approach (Barley et al. 2011; Monteiro et al. 2012), offering nothing new except for a memorandum to "raise the profile of materiality (and, by extension, technology) in organizational research" (*ibid.*, 921). Leonardi's concept of imbrication is complementary yet distinct from Orlikowski's constitutive entanglement. It is theoretically founded on "critical realism" (2012) and rests primarily on two points. First of all, social and material elements are ontologically distinct and *become* inseparable in practice. According to Leonardi, materiality exists in the realm of structure and prefigures social agency, which rather resides in the realm of action. Furthermore, he makes a distinction between *materiality*, which refers to the digital/material[5] properties of objects and technologies that do not change across space and time, and *material agency*, that indicates what technologies *do* when human agents provoke them (*ibid.*). Differentiating materiality from sociomateriality means that technologies exist and preserve their properties beyond social action, despite their *inherently* social nature. "Materiality exists independent of people", Leonardi argues, "but affordances and constraints do not" (*ibid.*, 70), as they emerge from the encounter with a social agency and then in the presence of a user. The second assumption is that the social and the material are not perfectly symmetrical, but they differ in terms of intentionality (Leonardi 2013). For instance, Leonardi notes that while "Microsoft Excel has many features that do not change across contexts (materiality) [...] those features do not automatically calculate modal values in a numerical list (material agency) until some user (with social agency) tells that materiality to do so" (*ibid.*, 70). Thus, imbrication is the process through which materiality *becomes* entangled with the social context in which it is introduced. "Over time", Leonardi argues, "the material and the social become sociomaterial through the process of imbrication and stay conjoined through continued imbrications" (*ibid.*, 72). The concept of imbrication is well-suited for illustrating the mutual intertwining of social and material agencies in structuring the practices of food-delivery workers, for two key reasons. First, it assumes the enduring nature of the DLPs architecture. Avoiding the voluntarism of certain

interpretations of algorithmic resistance, the concept of imbrication assumes that DLPs prefigure workers' interactions with algorithms and related technologies and maintain their material properties, independently of the social context in which they operate. For instance, the organizational rules that allow riders to refuse jobs or decide when to work are encoded in the platform architecture, whose script remains invariant regardless of workers' intentions and dispositions. What rather changes from context to context, and this brings us to the second point, are the platforms' affordances, which only emerge in relation to the social agency of a user. As Leonardi argues, it is precisely because "people come to materiality with diverse goals, that they perceive a technology as affording distinct possibilities for action" (2013, 70). As we will see in the following sections, within the realm of possibilities afforded by different DLPs, workers can leverage some technical properties to manipulate algorithmic decision-making in their favour. However, it is worth noting that workers' agency is not solely dependent on their explicit goals, but also stratified by their socio-cultural and technical competencies. This is particularly crucial in the context of this study, because the absence of barriers to entry allows food-delivery platforms to absorb a very large and heterogeneous workforce in terms of economic needs, motivations, and sociocultural resources.

4. Context of research and methods

This paper is based on a seven-months "observant participation" (Wacquant 2010) conducted between January and July 2020, during which I worked as a rider for the platform Glovo. The study was conducted in Milan, a notable city in the Italian context due to the high penetration of food-delivery platforms and the heterogeneity of its workforce. The ethnographic fieldwork was supplemented with 21 in-depth interviews with riders[6], most of whom were simultaneously working for multiple platforms, and semi-structured interviews with DLPs managers, restaurant owners and a dispatcher. This paper compares Deliveroo and Glovo as two maximally dissimilar cases of food-delivery platforms in terms of how their technical systems enable and constrain riders' autonomy. The platforms were compared through an analysis of the riders' app scripts, using the walkthrough method (Light et al. 2018).

A distinctive feature of food-delivery platforms is that their location in the urban space allows riders to gather in micro-aggregations where informal processes of work socialization take place (Lave and Wenger 1991). Studies have documented how workers use online contexts – such as instant messaging apps – to overcome their spatial fragmentation and engage in collective learning processes that are crucial to leverage the opacity of algorithms (Bonini et al. 2023). Focusing on physical contexts of socialization allows us to see how these processes and their outcomes are influenced by the workers' heterogeneity – from basic socio-demographic characteristics to more granular factors of stratification related to the skills required to do this work. In this article, I will compare two distinct groups of riders. I will refer to them as the *park riders* and the *square riders* based on their respective meeting places. Taking my own work socialization as a specific object of inquiry, in the section 6 of this paper I will illustrate how the encounter with both groups of couriers has shaped my own process of imbrication and my way of working as a rider.

5. The materiality of food-delivery platforms

In order to empirically analyse the relationship between organizational processes, work practices and algorithmic systems, some analytical clarifications are required. From a managerial perspective, algorithms play an "infrastructural role" (Shove 2016) as part of the technological system – consisting of data, devices, tracking systems, GPS – that enables the remote coordination of the actors enrolled in the organizational process, as in the following scheme.

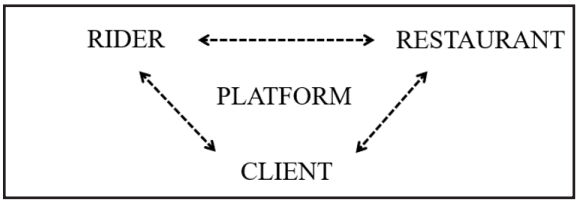

Figure 1.
Food-delivery platforms' organizational model.

In this organizational arrangement, algorithms operate as "calculative agents" (Richardson 2020) allowing food-delivery platforms to:

1. Optimize the job-matching procedure, based on the data collected by riders, clients and restaurants;
2. Monitor each step of the delivery process through the riders' GPS, verifying the correct alignment between virtual and physical flows of goods;
3. Define the number of couriers needed for each service shift;
4. Calculate the (flexible) price of each delivery[7], based on the distance to be covered;
5. Calculate the rating of each rider;
6. Sort riders into a ranking that regulates their access to work.

To automate decision-making processes, platforms rely on users-generated data – e.g., couriers' localisation – through which algorithms "transcend their operational closure as computational procedures" (Alaimo and Kallinikos 2022, 20). As stated by a Glovo manager, this automated process is intended to enhance logistics efficiency:

> Glovo's algorithm analyses all new orders and all available riders in an urban context to make the optimal matching. This automated procedure ensures the process' efficiency, as it objectively calculates the shorter route for each rider from one point to another. In addition to the pickup location, the customer address, and the courier's current location, the algorithm considers the estimated time required for preparing the order, the type of vehicle used by the riders, and other parameters.
> (Interview with a Glovo manager)

The flexibility granted to riders, restaurants and clients makes their remote coordination a very delicate organizational process, as any actor can easily circumvent algorithmic decisions – in the case of riders, for example, by refusing the assigned job. To align users' behaviour with managerial intentions, a set of constraints is configured in the platform architecture that "make certain actions possible and others impossible, or at least more difficult to achieve" (Leonardi 2013, 31). The calendar system which regulates riders' access to work is a common example to both platforms (Kellogg et al. 2020). Every Monday and Thursday, platforms unlock the calendar of work shifts for the following week. Riders' access to the calendar is regulated by their rating, a numerical score that is constantly updated based on a set of parameters – for example, total number of orders delivered, punctuality of check-in, clients' and restaurants' reviews. The lower a rider's rating, the later he can access the new calendar, the lower his likelihood to find available shifts[8]. Besides these common traits, Glovo and Deliveroo differ in the way they enable and restrict riders' autonomy, particularly with regard to three aspects:

1. *The reputational system*. While riders on Glovo are not allowed to rate restaurants and clients, Deliveroo allows them to do so. The possibility of rating clients and restaurants partially protects riders from the discretion of their counterparties, balancing the power asymmetries inscribed in the triangular relation.
2. *High-demand hours*. Both platforms set *high-demand hours* in the evenings at weekends, when peaks of orders are expected. In the case of Deliveroo, from 8 to 10 pm on Friday, Saturday, and Sunday. In the case of Glovo, from 7 to 10 pm on Saturday and Sunday. Both platforms push riders to work during high-demand hours by reducing the rating of those who do not do so. However, while in the case of Deliveroo it is sufficient for a rider to login and remain active for the scheduled time, Glovo also takes into account the number of orders actually delivered by a rider during high-demand hours. Said number is compared to the orders delivered 28 days before and increases or decreases the riders' rating by the difference between the two scores. This becomes particularly crucial in combination with the following factor.
3. *The possibility to reject deliveries*. Deliveroo allows riders to automatically reassign orders, even if they have initially accepted them, without incurring penalties. Glovo allows riders to automatically decline a total of 5 orders per day, but only when they are notified of the assigned delivery. Beyond this threshold, and once a delivery has been accepted, Glovo riders can only request to reassign the order by texting a chatbot, which is a much more time-consuming process.

It is worth noting that the last two rules encoded in the Glovo platform are completely opaque to riders, who may – or may not, as we will see in the next section – learn about them during their work experience. The possibility to re-allocate deliveries directly increases riders' autonomy, as it allows them to decline inconvenient jobs and to avoid long and often tense waits outside restaurants. As a rider noted in her interview, Deliveroo prefigures a more autonomous work experience compared to Glovo:

> With Deliveroo you work better. With Glovo, if I encounter issues with a restaurant, I have to type on the chat and manually ask to reassign the delivery. I waste my time. With Deliveroo, I simply press a button to leave the order and move on to the next one. You don't waste

> time, and for us *time is gold* [...] With Deliveroo, you can always select your deliveries. With Glovo, I do choose deliveries, but I do so arbitrarily, because I don't care. I type "reassign it" in the chat, but I'm always at risk of getting penalized [...] Also, huge differences occur over the weekend. With Glovo, orders must be delivered in order to save your rating. With Deliveroo this is not mandatory. It is necessary to be online, but orders can be safely declined. You are *really autonomous*. Therefore, if you have any important commitment, you can reassign everything at your discretion without being penalized. *It's a completely different world*. (Interview with Dolores, 33, F)

This interview excerpt shows that Glovo and Deliveroo incorporate different working conditions that have significant implications on the workers' experience and autonomy. Deliveroo, for example, affords riders greater discretion in their work by allowing them to easily reassign deliveries. In contrast, Glovo heavily restricts riders' autonomy, hindering the possibility of selecting orders. The rules embedded in the platform architecture set the conditions under which riders operate, and in relation to which they learn how to accomplish their work. Specifically, DLPs encourage riders to develop a greater or lesser sensitivity to a strategic choice of deliveries – hence to practise their (relative) autonomy. The following excerpt offers a comprehensive explanation of this process:

> I wasn't a rider who used to select orders. *I didn't learn this habit*, because Glovo didn't give you these instructions. [...] Glovo's stance is that if you receive the orders, it's your duty to fulfil them. Reassigning orders with Glovo is a frustrating process. You have to speak with the support chat, which can take a long time. As a result, you might just give up and pedal instead of spending so much time on it. This is how Glovo operates. [...] I didn't understand how important it is to select the right order until I got a Deliveroo account. With Glovo, you have to quickly pick up and go. If you try to reassign an order, it could take up to 10 minutes, and sometimes you won't even receive a response. I believe this is a strategy to discourage you from asking again. You might end up saying: forget it, I'm just wasting my time... (Interview with Antonio, 50, M)

This interview excerpt highlights that Antonio's work practices depends on the possibilities and constraints encoded in the platform architecture. The transformations in his way of working are the result of the continuous imbrication of his social agency into the space of possibilities inscribed in the platform materiality, which pre-exists and prefigures his actions. What distinguishes Glovo from Deliveroo is that the digital properties of the former hinders the possibility for riders to build algorithmic competencies (Jarrahi and Sutherland 2019). In other terms, Glovo jeopardizes the formation of a strategic disposition towards the selection of work tasks. In contrast, Deliveroo encourages riders to use their knowledge to decide whether or not to decline a delivery. Interestingly, riders acknowledge these differences, often describing the transition from Glovo to Deliveroo as *a turn to professionalism*.

It is also worth noting that the imbrication between social and material agencies is an ongoing and open-ended process. After realising the benefits of selecting deliveries when working with Deliveroo, Antonio himself transferred this selective disposition to his work with Glovo,

developing strategies to "de-script" (Akrich 1992) the expected use configured in the platform architecture. Having understood the potential benefits associated with a careful selection of deliveries, Antonio returned to Glovo with a different set of goals and a different perception of what the platform's technical features could afford. To elucidate this, I will focus on the collective processes through which DLP technical properties are translated into social affordances.

6. Platforms imbrications in the making

6.1 A reactive imbrication

At the beginning of my ethnographic journey, I purposely approached a group of Sub-Saharian riders which resembled the most typical representation of food-delivery workers active in Milan. They used to gather in a small park near a train station in the north of the city, which they reached every day, coming from the suburbs where they lived – most of them in reception centres. It was from them that I received my first work socialization. They gave me with their recommendations on how to interact with the app, even though they often lacked basic resources that allow a logical sensemaking of the algorithmic processes (Jarrahi and Sutherland 2019). First, they were unaware of the complex computational procedure that Glovo follows during high-demand hours. Therefore, they were unable to understand the weekly movement of their own rating, which has dramatic impact on the possibility to book work shifts. Without the technical skills needed to understand the computational functioning of algorithmic systems, *park riders* displayed a compliant attitude towards the platform, particularly evident in the unquestioning acceptance of any assigned delivery, as showed in the following interview excerpt.

> When I receive an order, I just accept it and I drive down to the restaurant. I don't like to refuse orders. I never cancel an order, even when it is to a very distant place, because... *I don't want problems. There is nothing I can tell Glovo*. [...] I always accept the orders to avoid any argument with the platform.
> (Interview with Idris, 34, M)

The *fear of Glovo* evoked by Idris is reinforced by a lack of cultural – primarily, linguistic – and social resources necessary for resolving any disputes that may arise with the platform – e.g., any discretionary accounts' suspensions that sometimes follows workers' misbehaviours. But to say that riders sensemaking is not informed by effective resources does not mean that they do not make sense of the platform's functioning. Park riders used to "tell stories" (Orr 1996) about Glovo, sharing with each other any new epistemic achievements about the platform's operation. Interestingly, algorithms were rarely explicitly mentioned in these stories, which suggests that many riders were not even aware of the computational process underlying DLPs operation. Park riders used to share mechanical tips about how to interact with the Glovo app, which were inductively elaborated by generalizing specific episodes into practical beliefs. For instance, the rider Obi was an expert in suggesting *when* it was preferable "to roll the calendar", beyond the canonical Monday opening time, in search of residual working hours.

> You must log-in every hours at minutes .31, .33 and .37. At those times, you have a better chance of finding available hours, because that is when Glovo opens up new shifts. (Interview with Obi, 24, M)

Obi's "folk theory" (Ytre-Arne and Moe 2020) lacks a rational, albeit approximate, technical understanding of the algorithmic process. He was not able to explain *why* Glovo was making work shifts available at certain times of the day. He merely experienced it and acted accordingly. Moreover, since most of *park riders* had very low ratings – and therefore, limited possibilities to book shifts – their main concern was not to select the deliveries to be made, but to look for available working hours. Their reactive imbrication to the platform is well exemplified by the habit of frequently refreshing the app's interface looking for available shifts – the practice described by Obi as "rolling the calendar". The video linked to the QR code below shows this practice.

Figure 2.
Video recording of a rider looking for available work shifts.

6.2 A strategic imbrication

The reactive imbrication observed in the previous section reflects riders' subordination to the opaque algorithmic systems coordinating the labour process. A comparison with the second group of riders I later encountered in my ethnographic fieldwork supports this argument. This meeting happened by chance, while I was waiting for the pick-up of a McDonald's order. I was impressed by a couple of Italian riders with high-value electric bikes, who seemed to be acquainted with the restaurant staff. After a short chat with them, I was invited to *their* little square in a pedestrian area near the restaurant, where they used to gather before, during and after work. The very rationale behind the choice of this location stemmed from a refined understanding of how food-delivery platforms function, particularly in terms of the parameters that are algorithmically calculated to allocate and price deliveries. Firstly, a higher inflow of orders was expected as the area had a significant concentration of restaurants and clients. Secondly, orders received in pedestrian areas tend to be paid more than average, because food-delivery platforms calculate the price of deliveries based on the route a car would take, regardless of the effective distance covered by the rider. Moreover, this group of couriers owned a detailed understanding of how Glovo works. As instance, three months after I started the ethnography, they informed me about the abstruse algorithmic calculation of the rating during high-demand hours. Furthermore, their "algorithmic competencies" (Jarrahi

and Sutherland 2019) relied on greater social resources compared to the *park riders*. Some of them were also familiar with Glovo's dispatchers and shared a *secret* Telegram chat with them, where they could receive useful information and privileged treatments – e.g., in case of accounts' disconnection. This communication channel, arbitrarily granted outside the platform-mediated space, is an organizational resource that improved riders' understanding of the platform's operation. I learned from these workers about the advantages of working in a limited area of the city, of refusing long orders – especially those destined to peripheral areas where there are fewer restaurants and it is more difficult to receive new ones – and of accepting short orders, even though they were paid less. The following screenshots (see Figure 3) show two work shifts, corresponding to the first and the second period of my ethnographic journey respectively. Comparing these two images highlights how encountering the *square riders* influenced my imbrication to platform and radically changed my own way of working. In turn, these images also show that "actually existing" platforms (Timko and van Melik 2021, 501) are shaped by the social contexts in which they become imbricated.

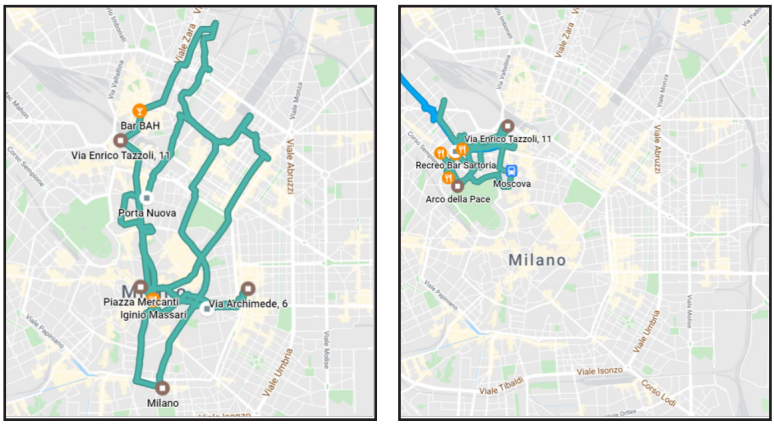

Figure 3.
On the left, the screenshot of my work shift on 20th March 2020;
on the right, the screenshot of my work shift on 7th June 2020.

In the fifth section, I noted that Deliveroo riders were advantaged in selecting deliveries. Now, it is worth stressing that, among the *square riders*, even those working with Glovo learned how to manipulate algorithmic decisions in their favour. The following episode is particularly illustrative:

> It's a dreary Saturday with few incoming orders. Giovanni is feeling anxious because if he doesn't confirm the delivery of 10 orders, as he did last month, his rating may significantly decrease. From his extensive experience, Andrea observes that a rider should not deliver 10 orders on a Saturday in May, because "summer months are around the corner, ready to

> bite into your rating". Giovanni replies in frustration that he knows Glovo does not permit refusing deliveries over a certain number. But Andrea explains: "it's not just a matter of refusing deliveries... this is where the real mischief comes in! Imagine that you have completed 3 orders and you need a fourth one to balance the score you did 28 days ago. You are only half an hour away from the end of your last shift when you receive a fourth order. You accept it, but you take it veeeeery slow and easy, cycling as if you were on holiday. Otherwise, you can wait to close the order on the app after you delivered it, and if Glovo calls, you say: "Oh, I am sorry, I didn't notice". This way, you will not receive any more orders, and you will not have to re-assign anything!
> (Fieldnote, 16/6/2020)

Delaying or anticipating the closing of an order shapes the abstract timeline of micro-tasks into which a Glovo delivery is divided. It is noteworthy that Andrea's tactics are not only based on a knowledge of algorithms as such, but also on other contextual factors – e.g., work seasonality, as the city becomes empty of potential clients during the summer – that contribute to shape this work. Another common tactic to continue working close to the *square* is to temporarily deactivate the automatic assignment of orders (A.A.) on the Glovo app: the green button on the screenshot below, next to AUTO-ASSEGNAZIONE, which riders must activate in order to receive new deliveries (see Figure 4).

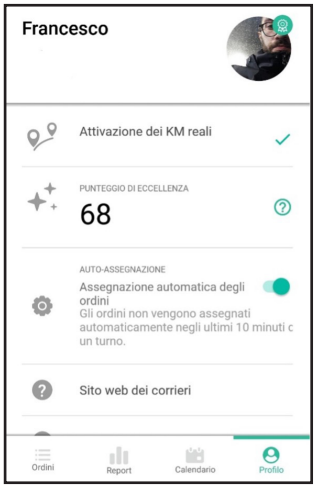

Figure 4.
Screenshot of the profile section of a Glovo account

By deactivating the A.A., riders can *hide* themselves from the algorithmic calculation until reaching the area where they want to receive new deliveries. In this manner, they can avoid automatic rejections, which are useful for reassigning very long deliveries.

> If you look at my stats on the app, you'll see days when I made 16 deliveries from McDonald's. It works in this manner: you pick up the order from McDonald's. Before delivering it to the customer, you remove the A.A. on your app and go back to McDonald's to reactivate it. *Dolores is special in this, but so are we*. There was a time when we were like working as private McDonald's couriers.
> (Interview with Alberto, 36, M)

The last two interview excerpts show a strategic imbrication to DLPs, based on the riders' ability to turn a material feature of the app into an affordance to improve their work. In particular, the last example emphasizes the relational nature of affordances (Plesner and Husted 2022, 94), which are not intrinsic to a technological property – the A.A. – but result from the encounter with a social agent who perceives in that property the possibility of acting in a certain way – working in a selected urban area.

7. Conclusions

The literature on digital labour platforms has consolidated upon the paradox that algorithms are a pervasive instrument of organizational control, yet workers are observed to circumvent and resist this control quite easily. This article aimed to address this dichotomic view, shedding light on the more multifaceted and intricate dynamics at play in the everyday interaction between workers, algorithms and related technologies in the context of food-delivery platforms. To this end, I first compared the digital architecture of two platforms, uncovering how they prefigure workers' agency in different ways. Second, I illustrated how platforms are shaped by the social contexts in which they are introduced, describing the processes of work socialization taking place within two informal groups of riders. The analysis shows that the pre-existing social stratification of workers is reproduced through processes of imbrication, resulting in heterogeneous work practices and dispositions. In particular, I distinguished the reactive imbrication of *park riders* from the strategic imbrication of *square riders*. Whilst I do acknowledge that these differences sprout from the interactive entanglement between qualitatively different social and material agencies, I do not explain it in terms of a lower or higher degree of algorithmic resistance. The concept of imbrication provides a more precise understanding of the dual nature of algorithmic management (Meijerink and Bondarouk 2023), as a software of organizational control that both enables and constraints workers' agency while being shaped by their everyday use. From this standpoint, many forms of algorithms manipulation seem less organizational misbehaviours that create "fissures" in the algorithmic power (Ferrari and Graham 2021), and more self-control tactics enacted by workers to improve their performances, which are envisioned and – to some extent – tolerated by DLPs. The use of the category of resistance was initially motivated by the need to counter the threat of a new wave of technological determinism linked to the power of digital platforms and algorithms. However, given the mature stage of this debate, it now risks of overstating the real implications of so-called "algoactivism practices" (Kellogg et al. 2020) at both the individual and the organizational level. From a more balanced perspective, the concept of imbrication

highlights how social and material agencies gradually become entangled in practice, leading to the emergence of relatively stable ways of working. It enables to highlight the social agency of workers in shaping the use of algorithms and related technologies, rejecting deterministic explanations. But it also assumes that algorithmic manipulation does not radically alter the material architecture of DLPs, which is the enduring furniture that pre-exists workers' actions and prefigure their deviations from managerial intentions. In fact, while the process of imbrication continues as workers gain experience (social agency), it does not change the architecture of the platform (materiality) until the next update by a designer. For example, as a rider becomes aware of how the Glovo calendar works, he can certainly improve his financial performances by maintaining a high rating and privileged access to shifts booking. However, this does not remove the existence of a calendar system nor the meritocratic logic underlying the distribution of shifts in food-delivery platforms. In addition, it is worth noting that while algoactivism practices are often developed collectively, they are primarily enacted to enhance individual performances, potentially leading to anti-solidaristic consequences for other colleagues – e.g., reducing their work opportunities. This is not dependent on algorithms as such, but rather on the organizational conditions with which they are intertwined in the context of food-delivery platforms. The concept of "imbrication to platform" is thus proposed to include algorithms into the more complex socio-technical system made by organizational and technical elements that platform workers engage with during their work. In this respect, our research shows that algorithmic management in food-delivery platforms – that is, decentred organizations with poor labour protections, no formal socialization processes and unequitable distribution of resources – creates winners and losers, reproducing pre-existing inequalities. What is new about platforms, as an organizational model, is their capacity to manage this heterogeneity of workers and behaviours without the need to homogenise them within a unique normative standard. In this regard, rather than assuming resistance as the explanatory category of workers' agency, addressing how workers imbricate to platforms as an empirical problem opens up the possibility of exploring the ways in which platforms exercise power, not only in coercive terms – as algorithmic management is usually understood – but also in terms of subjectification (Fleming and Spicer 2014).

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Notes

[1] To facilitate the reader in the frequent transitions from a theoretical discussion to the researcher's auto-ethnographic account, it was decided to adopt a first-person narrative.

[2] More recently, algorithmic management has been studied also in traditional work contexts (e.g., Baiocco et al. 2022; Jarrahi et al. 2021).

[3] I adopt the definition of platform architecture provided by Bruni and Esposito as "the design elements and procedures inscribed in the platform's interface, which are visible by accessing the website or mobile phone app as a user" (2019, 666).

[4] Food-delivery workers are commonly known as riders.

[5] On how we can consider digital artifacts as materials, see Leonardi (2010).

[6] Riders' names reported in the article are fictious. Due to the majority of male riders (19 out of 21 interviewees), it was decided to use the masculine form when referring to them, with the exception of one extract from the interview with a female rider reported in section 5.

[7] Exept for Just Eat, all platforms adopt a flexible pay-per-delivery system.

[8] Since 2021, Deliveroo has replaced the calendar with a free login system. As we will later outline, this change is supposed to reinforce pre-existing differences between Deliveroo and Glovo.

References

Akrich, Margaret (1992) *The De-scription of Technical Objects*, in Wiebe E. Bijker and John Law (eds.), *Shaping Technology/Building Society: Studies in Sociotechnical Change*, Cambridge, MIT Press, pp. 205-224.

Alaimo, Cristina and Kallinikos, Jannis (2022) *Organizations Decentered: Data Objects, Technology and Knowledge*, in "Organization Science", 33(1), pp. 19-37.

Baiocco, Sara, Fernández-Macías, Enrique, Rani, Uma and Pesole, Annarosa (2022) *The Algorithmic Management of Work and its Implications in Different Contexts*, JRC Working Papers Series on Labour, Education and Technology.

Barad, Karen (2003) *Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter*, in "Signs: Journal of Women in Culture and Society", 28(3), pp. 801-831.

Barley, Stephen, Meyerson, Debra and Grodal, Stine (2011) *E-Mail as a Source and Symbol of Stress*, in "Organization Science", 22(4), pp. 887-906.

Bonifacio, Francesco (2023) *Fare il rider: Pratiche, saperi e traiettorie di una professione emergente*, Milano, Mimesis Edizioni.

Bonini, Tiziano, Treré, Emiliano, Yu, Zizheng, Singh, Swati, Cargnelutti, Daniele and López-Ferrández, Francisco Javier (2023) *Cooperative affordances: How instant messaging apps afford learning, resistance and solidarity among food delivery workers*, in "Convergence", 30(1), pp. 554-571.

Bruni, Attila and Esposito, Fabio Maria (2019) *It Obliges You to Do Things You Normally Wouldn't: Organizing and Consuming Private Life in the Age of Airbnb*, in "Partecipazione e Conflitto", 12(3), pp. 665-690.

Cecez-Kecmanovic, Dubravka, Galliers, Robert, Henfridsson, Ola, Newell, Sue and Vidgen, Richard (2014) *The Sociomaterialty of Information Systems: Current Status, Future Directions*, in "MIS Quarterly", 38(3), pp. 809-830.

Ferrari, Fabian and Graham, Mark (2021) *Fissures in algorithmic power: Platforms, code, and contestation*, in "Cultural Studies", 35(4-5), pp. 814-832.

Fleming, Peter and Spicer, André (2014) *Power in Management and Organization Science*, in "The Academy of Management Annals", 8(1), pp. 237-298.

Frenken, Koen and Fuenfschilling, Lea (2020) *The Rise of Online Platforms and the Triumph of the Corporation*, in "Sociologica", 14(3), pp. 101-113.

Gandini, Alessandro (2019) *Labour process theory and the gig economy*, in "Human Relations", 72(6), pp. 1039-1056.

Grabher, Gernot and König, Jonas (2020) *Disruption, Embedded: A Polanyian Framing of the Platform Economy*, in "Sociologica", 14(1), pp. 95-118.

Griesbach, Kathleen, Reich, Adam, Elliott-Negri, Luke and Milkman, Ruth (2019) *Algorithmic Control in Platform Food Delivery Work*, in "Socius", 5, pp. 1-15.

Haidar, Julieta and Keune, Maarten (2021) *Introduction*, in Julieta Haidar and Maarten Keune (eds.), *Work and Labour Relations in Global Platform Capitalism*, Cheltenham, Edward Elgar Publishing, pp. 1-27.

Healy, Joshua and Pekarek, Andreas (2023) *Consumers in the gig economy: Resisting or reinforcing precarious work?*, in Immanuel Ness (ed.), *The Routledge Handbook of the Gig Economy*, New York, Routledge, pp. 246-257.

Huang, Hui (2023) *Algorithmic management in food-delivery platform economy in China*, in "New Technology, Work and Employment", 38(2), pp. 185-205.

Jarrahi, Mohammad Hossein, Newlands, Gemma, Lee, Min Kyung, Wolf, Christine T., Kinder, Eliscia and Sutherland, Will (2021) *Algorithmic management in a work context*, in "Big Data & Society", 8(2).

Jarrahi, Mohammed Hossein and Sutherland, Will (2019) *Algorithmic Management and Algorithmic Competencies: Understanding and Appropriating Algorithms in Gig Work*, in Natalie Greene Taylor, Caitlin Christian-Lamb, Michelle H. Martin and Bonnie Nardi (eds.), *Information in Contemporary Society*, Cham, Springer International Publishing, pp. 578-589.

Kellogg, Katherine C., Valentine, Melissa A. and Christin, Angèle (2020) *Algorithms at Work: The New Contested Terrain of Control*, in "Academy of Management Annals", 14(1), pp. 366-410.

Lave, Jean and Wenger, Etienne (1991) *Situated Learning: Legitimate Peripheral Participation*, Cambridge, Cambridge University Press.

Leonardi, Daniela, Murgia, Annalisa, Briziarelli, Marco and Armano, Emiliana (2019) *The ambivalence of logistical connectivity: A co-research with Foodora Riders*, in "Work Organisation, Labour & Globalisation", 13(1), pp. 155-171.

Leonardi, Paul M. (2010) *Digital materiality? How artifacts without matter, matter*, in "First Monday", 15(6).

Leonardi, Paul M. (2012) *Materiality, Sociomateriality, and Socio-Technical Systems: What Do These Terms Mean? How are They Related? Do We Need Them?*, in Paul M. Leonardi, Bonnie Nardi and Jannis Kallinikos (eds.), *Materiality and Organizing: Social Interaction in a Technological World*, Oxford, Oxford University Press, pp. 25-48.

Leonardi, Paul M. (2013) *Theoretical foundations for the study of sociomateriality*, in "Information and Organization", 23(2), pp. 59-76.

Light, Ben, Burgess, Jean and Duguay, Stefanie (2018) *The walkthrough method: An approach to the study of apps*, in "New Media & Society", 20(3), pp. 881-900.

Massimo, Francesco S. (2020) *Burocrazie algoritmiche: Limiti e astuzie della razionalizzazione digitale in due stabilimenti Amazon*, in "Etnografia e ricerca qualitativa", 1, pp. 53-78.

Meijerink, Jeroen and Bondarouk, Tanya (2023) *The duality of algorithmic management: Toward a research agenda on HRM algorithms, autonomy and value creation*, in "Human Resource Management Review", 33(1), pp. 1-14.

Meyer, Uli, Schaupp, Simon and Seibt, David (2019) *Digitalization in Industry: Between Domination and Emancipation*, London and New York, Palgrave Macmillan.

Monteiro, Eric, Almklov, Petter and Hepsø, Vidar (2012) *Living in a Sociomaterial World*, in Anol Bhattacherjee and Brian Fitzgerald (eds.), *Shaping the Future of ICT Research: Methods and Approaches*, Berlin, Springer, pp. 91-107.

Orlikowski, Wanda J. (2007) *Sociomaterial Practices: Exploring Technology at Work*, in "Organization Studies", 28(9), pp. 1435-1448.

Orlikowski, Wanda J. and Scott, Susan V. (2008) *Sociomateriality: Challenging the Separation of Technology, Work and Organization*, in "Academy of Management Annals", 2(1), pp. 433-474.

Orr, Julian E. (1996) *Talking About Machines: An Ethnography of a Modern Job*, Ithaca, Ilr Press.

Plesner, Ursula and Husted, Emil (2022) *L'organizzazione digitale*, Bologna, Il Mulino (Original work published in 2020).

Polkowska, Dominika (2019) *Does the App Contribute to the Precarization of Work? The Case of Uber Drivers in Poland*, in "Partecipazione e Conflitto", 12(3), pp. 717-741.

Prassl, Jeremias and Risak, Martin (2015) *Uber, Taskrabbit, and Co.: Platforms as Employers – Rethinking the Legal Analysis of Crowdwork*, in "Comparative Labor Law & Policy Journal", 37(3), pp. 619-652.

Richardson, Lizzie (2020) *Platforms, Markets, and Contingent Calculation: The Flexible Arrangement of the Delivered Meal*, in "Antipode", 52(3), pp. 619-636.

Shove, Elizabeth (2016) *Matters of practice*, in Allison Hui, Theodore Schatzki and Elizabeth Shove (eds.), *The Nexus of Practices: Connections, constellations, practitioners*, London, Routledge, pp. 155-168.

Stark, David and Pais, Ivana (2020) *Algorithmic Management in the Platform Economy*, in "Sociologica", 14(3), pp. 47-72.

Timko, Peter and van Melik, Rianne (2021) *Being a Deliveroo Rider: Practices of Platform Labor in Nijmegen and Berlin*, in "Journal of Contemporary Ethnography", 50(4), pp. 497-523.

Vallas, Steven and Schor, Juliet B. (2020) *What Do Platforms Do? Understanding the Gig Economy*, in "Annual Review of Sociology", 46(1), pp. 273-294.

van Doorn (2020) *At what price? Labour politics and calculative power struggles in on-demand food delivery*, in "Work Organisation, Labour & Globalisation", 14(1), pp. 136-149.

Veen, Alex, Barratt, Tom and Goods, Caleb (2020) *Platform-Capital's "App-etite" for Control: A Labour Process Analysis of Food-Delivery Work in Australia*, in "Work, Employment and Society", 34(3), pp. 388-406.

Wacquant, Loïc (2010) *Participant observation/Observant Participation*, in Anthony Giddens and Philip W. Sutton (eds.), *Sociology: Introductory Readings*, Cambridge, Polity Press.

Wood, Alex, Graham, Mark, Lehdonvirta, Vili and Hjorth, Isis (2019) *Good Gig, Bad Gig: Autonomy and Algorithmic Control in the Global Gig Economy*, in "Work, Employment and Society", 33(1), pp. 56-75.

Ytre-Arne, Brita and Moe, Hallvard (2020) *Folk theories of algorithms: Understanding digital irritation*, in "Media, Culture & Society", 43(5), pp. 807-824.

Yu, Zizheng, Treré, Emiliano and Bonini, Tiziano (2022) *The emergence of algorithmic solidarity: Unveiling mutual aid practices and resistance among Chinese delivery workers*, in "Media International Australia", 183(1), pp. 107-123.