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Neither timeless, nor placeless: Control of food delivery gig work via place-based working time regimes

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Abstract

Working time regimes in platform labour are so far either ignored as a topic in research on gig work, or they are framed as an allocative instrument only. This article argues that working time regimes instead have both a coordinating and controlling effect. Adopting the analytical framework of labour process theory, the article hence focuses on the interrelation of working time and control regimes. The empirical material presented stems from research on platform-based food courier work in Germany and is based on a mixed methods research design consisting of interviews, multi-sited ethnography and a survey. The findings show that platforms implement hybrid control regimes that are not only based on the sufficiently analysed algorithmic management, but also on complementary control through working time regimes: temporal control. Platforms organise intra-platform markets where workers compete for shifts by means of performance. Thus, platforms are able to ensure an efficient and simultaneously reliable use of an autonomous and spatially distributed workforce. Furthermore, it is shown that platform labour is not placeless, either. The effects of its control regime vary according to different local conditions. As a result, platforms cannot be analysed only as techno-cultural ecosystems, but also as local-specific socio-economic structures.

Keywords

gig work, labour control, labour flexibility, labour process theory, local labour markets, non-standard employment, platform, scheduling practices, working time regimes

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Introduction

With regard to platform labour, working hours and especially their flexibility have been discussed ambivalently. Many researchers interpret the free choice of working hours as empowering and inclusive, since it allows the workers to determine the frequency and intensity of their work themselves (Berg, 2016; Codagnone et al., 2016; Hall and Krueger, 2018; Taylor et al., 2017; World Bank, 2015), which is generally considered to be an important aspect of 'good jobs' (Kalleberg, 2011). In contrast, this 'extreme flexibility', along with income instability and the shifting of risks to workers, has been considered as the main criticism of platform labour (De Stefano, 2016: 480; Scholz, 2017: 56, 160). And in general, flexible working hours are closely linked to precarious working conditions (Arnold and Bongiovi, 2013; Kalleberg and Vallas, 2018). As a result, it seems that the flexibility of platform labour can both increase and limit the autonomy of workers. This leads to the question whom the work is flexible for – platforms or workers? Working time regimes are an organisational element that caters for the allocation of workers in the labour process and have therefore to be examined to answer this question. The article analyses these working time regimes.

Furthermore, it identifies working time regimes as being part of *temporal control*, which combines the issues of flexibility and control of platform labour. The article investigates platform-mediated food delivery labour in Germany and asks how the control and working time regime is designed to ensure a platform's efficient and simultaneously reliable use of a self-employed and spatially distributed workforce. Working time regimes are generally understood to be solely an allocative instrument and are usually not associated with the control of the labour process. In contrast, the argument of this article is that working time regimes in food delivery labour are an organisational element that is technologically mediated and has an impact on the control of the labour process. This argument will be examined with the help of labour process theory (LPT), which is promising for the analysis of platform labour (Gandini, 2019). Based on a mixed methods design with qualitative interviews, ethnography, content analysis of chat groups and an online survey, case studies of two platforms are presented in a comparative perspective.

This study of platform-mediated food courier labour in Germany results in three main statements: first, it argues that the literature on platform labour focuses on technological control mechanisms and thus fails to consider complementary organisational aspects that lead to hybrid control regimes. Second, working time regimes do not only serve the efficient allocation of labour, but also the temporal control of the labour process and are thus an organisational form of control. In platform-mediated food delivery, this organisational control is expressed in intra-platform markets on which workers compete for shifts by means of their performance. The third contribution is that the effects of control regimes depend on their environment. Even digitally mediated labour, especially food delivery work, is a local phenomenon and applies different employment models. Thus, the analysis must take into account differences of local labour markets and forms of employment.

Subject: Platform labour, food delivery work and its control

Platform labour refers to labour that is mediated by or provided through platforms. This term covers a very wide range of tasks, so the phenomenon is rather diverse, ranging

from globally distributed small and even highly qualified tasks to locally bound services such as passenger transport or cleaning. Compared with traditional forms of work, its scope is limited, with 0.5% of adults EU-wide (Eurofound, 2017) and 0.9% in Germany (Bonin and Rinne, 2017). Nevertheless, it is a central subject of discussion in the media and scientific discourse (Howcroft and Bergvall-Kåreborn, 2018; Kenney and Zysman, 2016; Srnicek, 2017; Woodcock and Graham, 2019). The reason for this is its innovative and transformative character. Platform labour is identified as being part of the general trends of the 'fissuring of the workplace' (Weil, 2014) and an increase of non-standard work (De Stefano, 2016; Eurofound, 2017; Garben, 2019; Huws, 2016).

A major field is food courier labour, which is discussed in this article. These platforms not only handle the digital mediation, but they also organise the actual delivery of ordered meals from restaurants to customers. This work has existed in Germany since 2014 and is the most important form of locally linked platform labour here. The market is identified as still 'immature', but the platforms are said to have 'huge growth potential' (Blumtritt, 2018: 8). In Germany, at the time of the survey (February to October 2018), two platforms were particularly relevant: Foodora in 34 and Deliveroo in 15 cities.[1] The German case was special since despite a largely identical labour process, the workers were tied to the platforms differently. Deliveroo worked exclusively with self-employed couriers, whereas Foodora hired drivers on temporary contracts. The employment contract of Foodora riders, as the couriers are called, included an hourly wage. Estimates for 2018 assume 2500 to 5000 active couriers in Germany (Heiland, 2021: 2).

In general, platform-mediated food delivery work is well researched, with most approaches focusing on technological forms of control. Concerning working time, only the subjective temporality of Chinese riders has been the subject of investigations (Chen and Sun, 2020). While spatially independent types of platform labour are said to have limited schedule flexibility (Lehdonvirta, 2018), this perspective on location-specific platform labour has not been in the focus so far. On the other hand, the control of the labour process of food delivery by means of platforms has been examined repeatedly, most often focusing on technology (Cant, 2019; Griesbach et al., 2019; Heiland, 2021; Heiland and Brinkmann, 2020; Shapiro, 2018; Veen et al., 2019; Waters and Woodcock, 2017). Following these analyses, platform labour in general and food delivery in particular are organised via algorithmic management by means of which 'human jobs are assigned, optimized, and evaluated through algorithms and tracked data' (Lee et al., 2015: 1603). By means of permanent GPS monitoring, this instrument allows to control even the spatially dispersed food courier workers. This automated control appears as an 'algorithmic panopticon' (Waters and Woodcock, 2017; see also Veen et al., 2019: 388) with a technological infrastructure that workers cannot escape. This is underlined by the fact that 39% of a representative sample of employees in Germany reported feeling at the mercy of technology very often or often, while this is true for 63% of German riders – only 10% of the latter stated that they were not aware of this feeling (Heiland, 2019a: 302).

Additionally, Veen et al. (2019: 396–400) identify information asymmetries and performance management systems as equally relevant elements of the control regime. The former is also evident in Germany: over 90% of German couriers said they sometimes lacked the information to successfully complete their task (Heiland and Brinkmann,

2020: 131). Since even these mechanisms are mediated via the apps, technology seems to be the main instrument of control.

With this focus on technology, the discussion on control regimes in platform-mediated food courier work resembles the call centre debate. In this debate's initial phase, primarily technological forms of control with a panoptical dimension were identified. Later, Bain and Taylor (2000: 15) criticised that 'the omnipotent "electronic panopticon" appears as a simplistic, lazy and mistaken formulation'. Instead, hybrid control regimes came into view, which were characterised by various interconnected mechanisms rather than being based solely on technology (Callaghan and Thompson, 2001). Moreover, the technological potential is not necessarily identical with its use, and loopholes were identified, which give workers the opportunity for 'organizational misbehaviour' (Ackroyd and Thompson, 1999). The latter has been spotted in courier labour, too (Heiland, 2021; Heiland and Brinkmann, 2020), and even collective action was particularly evident in Europe and has already been the subject of various analyses (Cant, 2019; Heiland, 2020; Heiland and Schaupp, 2021; Joyce et al., 2020; Tassinari and Maccarrone, 2019). So far, these analyses unanimously emphasise the technological modes of coordination and control.

Instead, the perspective should be broadened by examining hybrid forms of control as well as contextual variables – specifically, organisational elements and the local nature of courier work. Undoubtedly, technology is a central enabling condition for this kind of labour. According to Deliveroo, at its core lies a 'super smart algorithm' that is 'made up of machine-learning technology'[2] automatically assigning orders to the riders. The analysis of this technological fix allows for a valuable critical examination of platform labour. However, if the focus remains solely on digital control mechanisms, the platforms' solutionist narrative is adopted, according to which the labour process can be controlled by means of technology alone (Heiland, 2019b). Concerning spatially independent platform labour, it has already been emphasised that both organisational and technological forms of control are 'complementary and interwoven' (Heiland, 2019b: 646), that workers are 'embedded in a larger ecosystem' and that 'platforms do not organize people just through the "doing" of digital procedures' (Jarrahi et al., 2020: 177). Furthermore, platform labour is not placeless (Anwar and Graham, 2018) and food delivery labour in particular is located in finite urban spaces (Heiland, 2021). Therefore, it cannot be assumed that the control mechanisms of the platform labour process have a homogenous effect in different local structures. As a result, the analysis of platform labour must not only consider the digital ecosystems but also the specific spaces and local structures in which these labour relations are embedded.

Analysed as such, other aspects than solely technological ones come into focus. Technological control aims primarily at an efficient and effective use of labour power. Algorithmic management should check that couriers deliver orders quickly and smoothly. In addition to this efficiency, the labour process needs to be reliable. First, the workers must be available, and second, this must be the case at specific times when their workforce is in demand, which represents the challenge of capacity management (Gurvich et al., 2016; Taylor, 2017). Delivery platforms face this challenge in three ways:

1. They have a very high fluctuation of their workforce in a situation where their growth is constrained by a limited availability of local workers rather than customers (Farrell and Greig, 2016).

2. Additionally, the promise of platform labour is self-determined working times. This is at odds with the need to ensure that orders are taken at unattractive times – for example, on snowy Saturday evenings.
3. Beyond that, the platforms have to avoid that too many people work at the same time. This is expensive if the couriers are employed, and if they are self-employed, they might not get enough orders and turn away from the platform.

Therefore, the platforms have to find forms of control that match the supply of courier work with its demand, thus ensuring an efficient and effective fulfilment of all orders. The challenge for the platforms is thus to make the labour process in each city both efficient and reliable. The location-specific forms of technologically mediated working time regimes resulting from this challenge are the subject of this article.

Working time regimes

Working time has been the subject of conflict since the rise of capitalism and the starting point for both de- and re-commodification of labour. Marx (1962: 316) states that the conflict over time is a hidden civil war between capital and labour. During and after the industrial revolution, working time became commodified and control over it increasingly shifted from workers to employers (Marx, 1962: 249–258; Thompson, 1967). Over time, and as a result of workers voicing their demands, state regulation increasingly led to a temporal restriction of the working day. The result was a de-commodifying standard employment relationship (SER), which standardised a working time regime in which work was mainly carried out for about 40 hours from Monday to Friday between 7 a.m. and 5 p.m. (Berg et al., 2014: 808; Bosch, 2006). As the SER is under pressure, recently, for example, from platform labour, 'the restructuring of employment relations can be viewed as a restructuring of the temporalities of work' (Harvey, 1999: 22). This development focuses particularly on making working hours increasingly flexible at the expense of workers, resulting in a 'new flexible capitalist temporality' (Wood, 2018: 1063; see also Rubery et al., 2015).

Owing to its specific constitution, this is especially evident in jobs in the low-end service sector and manifests itself in flexible scheduling. Services are not storable and production and consumption coincide. This *uno actu* principle means that it must be possible to make workers available for the event of their use, and that services are thus associated with unproductive costs and uncertain returns (Berger and Offe, 1984). This creates a trade-off between efficiency and flexibility: a staffing based on the minimum number of workers required is cost-effective, but does not allow flexible response to demand. The result is an increasing use of flexible scheduling by means of which firms achieve temporal flexibility and transfer the fluctuating demand for labour to the workers (Chun, 2001; Henly et al., 2006; Hyman et al., 2005; Lambert, 2008; Lambert et al., 2012; Price, 2016; Rubery, 2005; Wood, 2016), who then function as 'time adjusters' (Jany-Catrice and Lehndorff, 2005: 224). The challenge for employers is that '[s]uch scheduling in turn implies careful monitoring, often facilitated by new technologies' (Campbell, 2017: 118). With new information and communication technologies, extended possibilities have evolved of hiring and firing labour as needed as well as to

coordinate and control the labour process. As discussed before, both are particularly applied in platform labour.

Subsequently, the question is whether working time regimes and flexible scheduling serve the purpose of efficient coordination and are pursued by companies solely in order to reduce costs (Lambert, 2008; Lambert et al., 2012; Rubery et al., 2015), or whether they additionally serve to control workers and the labour process as a *temporal control*. For time is 'a regulatory device with a very strong compelling force' (Elias, 1992: 45). Along these lines, Heyes (1997: 68) shows that 'the issue of working time is inseparable from the question of control over the activities of labour'. Beynon (1973), Price (2016) and Wood (2018) also point to the control of managers over workers and the labour process, mediated by working time regimes. Beyond this, and especially with regard to platform labour, the connection between working time and control regimes has not yet been addressed and will therefore be analysed below. Before, the necessity of control will be discussed according to LPT.

The double indeterminacy of labour: Effort and mobility power

Working time regimes are organisational instruments designed to coordinate the labour process efficiently. However, their allocation of labour in time and space does not mean the workers are actually working. To make workers work employers have other instruments at their disposal. Based on the assumption of antagonistic relations between capital and labour, LPT focuses on these control mechanisms of the labour process. Following LPT, control is necessary owing to the indeterminacy of labour power. That means that there is a difference between labour capacity and concrete labour (Marx, 1962: 187–188) that is the workers' *effort power* (Smith, 2006), allowing the workers to restrain their labour power. In the 19th century, the focus was on the extension of working time and not on its efficiency (Braverman, 1974: 42; Thompson, 1967). But, longer working hours are not directly related to more work performance, as work is not a simple commodity. Firms purchase from workers a limited amount of working time during which the latter are expected to perform their work. However, labour power 'is infinite in *potential*, but in its *realization* it is limited' by the labour process and its subjects (Braverman, 1974: 39). This challenge has also been addressed in principal–agent theory (Lazear and Gibbs, 2015), in systems theory (Luhmann, 1978), in transaction cost theory as 'opportunistic behaviour' (Williamson, 1983), and was characterised by Blau (1964) as the opposition of economic and social exchange. Employers are thus obliged to install control mechanisms to ensure the realisation of the labour power. The employers' focus is therefore on a 'closer filling-up of the pores of the working day, i.e. a condensation of labour' (Marx, 1962: 432), since the extension of working hours with equal pay has only limited success and is subject to legal constraints.

LPT shows that control can never be absolute and workers encounter it with resistances, so that the labour process is a 'contested terrain' (Ackroyd and Thompson, 1999; Burawoy, 1979; Edwards, 1979; Friedman, 1977). Hybrid managerial strategies are applied and complement each other to overcome the indeterminacy of labour power (Callaghan and Thompson, 2001).

Additionally, as Chris Smith (2006) shows, workers cannot only restrain their efforts, but also withdraw from work altogether, which points to a second indeterminacy of labour. Since the workers are not only 'freed' from the means of production but also formally free subjects (Marx, 1962: 183), they can use their exit-option. In capitalist societies, workers are free to change their employer. They can end a conflict with their employer by quitting. This strategy, which Smith calls *mobility power*, is closely linked to the state of the labour market. In times of low unemployment or for highly qualified workers it represents a power resource for the labour side. Likewise, a high labour turnover is able to endanger the efficiency of the labour process. Thus, companies need to restrict this 'mobility power' to ensure an efficient and effective labour process (Smith, 2006: 391) and subsequently 'labour mobility has outcomes for work organization and management control' (Smith, 2010: 285). In this way, the well-paid five-dollar day not only provided Henry Ford with a large reservoir of workers, but also allowed 'the intensification of labor within the plants, where workers were now anxious to keep their jobs' (Braverman, 1974: 103).

When not only effort but also mobility power is examined, it becomes evident that the local environment in which the labour process is situated is particularly relevant. With its focus on individual firms, LPT has been criticised for its disregard of 'structural factors, such as the nature of labour markets' (Littler, 1990: 47). The mobility of workers depends on their market power, which is based on local conditions. Local labour markets have their 'own geographies, [their] own employment and wage processes . . . an assemblage of non-competing submarkets which, nevertheless, are linked together to varying extents via direct and indirect webs of local economic dependency' (Martin, 2000: 461). An analysis of the labour process must take account of its local integration and best adopt a 'multi-site' perspective and compare various workplaces (Thompson and Smith, 2009: 923).

In conclusion, the indeterminacy of labour has a dual character – effort and mobility power. Both are exit practices that influence the efficiency and reliability of labour. If the workers make use of the former, they withdraw internally and partially from the labour process by restraining their work performance. If they use mobility power, they withdraw from the labour process altogether by terminating the employment or make use of a worker-led flexibility and reduce their working hours. The possibility to make use of effort power is determined by the predominant control of the company. Monitoring, performance control, performance-based pay, a strictly predetermined and controllable labour process, among other practices, may limit the possibilities of retaining labour power. The use of mobility power, on the other hand, is determined primarily by the dependence of the workers on their specific job. The more alternatives are available to them, the more pronounced their mobility power is, so here local labour markets are crucial. For employers, this means that they do not only face the challenge of limiting the effort power to ensure an efficient and effective realisation of the working capacity, but they must also control the workers' mobility power. The latter is particularly relevant in the case of platform labour, as here the usually self-employed workers have a high mobility power, value the flexible working hours and rarely engage in this form of work over a longer period of time. Nonetheless, it remains unclear how especially mobility power is restricted by employers and how it is linked with effort power.

Methods

Research into the platform labour processes of food courier work is primarily based on qualitative interviews with riders in single cities. In some cases, these are supplemented by ethnographic data (Cant, 2019; Shapiro, 2018) or an online survey (Griesbach et al., 2019). In the case presented here, a multi-site analysis based on mixed methods was used, which provided an overall perspective to the development of locally embedded organisational control practices that were connected to the working time regimes.

The two platforms – Deliveroo and Foodora – were investigated by means of two case studies (Yin, 2018). Using a fully integrated mixed design (Teddlie and Tashakkori, 2006), various complementary methods were used: interviews, ethnography, content analysis of chat groups and a quantitative online survey. Thus, both an emic and emtic orientation were adopted (Onwuegbuzie, 2012).

Between February and October 2018, 35 semi-structured interviews were carried out with food couriers from seven German cities, with an average duration of 80 minutes. Of the interviewees, five were female, eight had no German nationality, the average age was 27 and most had at least a university entrance qualification. They thus reflected the social structure of the riders found in the quantitative survey. Seventeen of the interviewees were either former managers or Rider Captains (Foodora) or Senior Riders (Deliveroo) and thus familiar with internal processes. The latter two were riders who acted as a link between platform and riders and as such were the other riders' primary contacts. No riders were interviewed who worked directly under one of the interviewed supervisors and the interviewees did not know if their colleagues were interviewed too. The interview guideline focused on the riders' backgrounds and motivation, the labour process and its changes as well as resistances and was supplemented by open-ended questions. The choice of interviewees was based on a theoretical sampling with the aim of developing object-related theoretical concepts (Glaser and Strauss, 1967). The sampling criteria and strategy were continuously updated and adapted in interaction with the findings from the other research methods.

The interviews were supplemented by an ethnographic investigation. This was used to directly analyse both the couriers' process knowledge and the app with its functions and control practices. More than 500 hours of courier work were performed and accompanied. In order to check for regional differences, the ethnographic investigation was conducted in five different cities. Both participating observation and observing participation were applied (Parkin, 2017; Wacquant, 2006). Using participating observation, couriers were accompanied during work and to their meetings, allowing for observation of courier work non-reactively and in practice. With observing participation, the author carried out courier work himself, which provided a nuanced first-hand understanding of the labour process and an insider role. Thus, the functions of the app could be analysed by means of targeted stimuli in the form of 'a sequence of experiments that continue until one's theory is in sync with the world one studies' (Burawoy, 1998: 17–18).

Since digital communication is widespread, it should be included in the analysis of contemporary societies (Garcia et al., 2009: 57). Thus, as chat groups and online forums were of great relevance to many riders, they were also included in the data collection (Nam, 2019). Six courier-specific chat groups were analysed. Three of these were

supra-regional and used for the practical exchange and complaints among the riders. The other three chat groups were local; two were organised by Rider Captains on behalf of the platforms and one by riders with the aim of initiating a works council. Of all, only one of the groups was public. For the other five, the author was invited by their administrators. In all chat groups, the role of the author as both rider and researcher was made transparent at the beginning. Data were collected over the entire period of the survey and then anonymised and qualitatively evaluated in their entirety.

The investigations were completed as soon as – following the criterion of theoretical saturation – no new insights could be gained, so that a 'conceptual representativeness' was achieved (Saunders et al., 2018). Transcripts of the interviews, excerpts from chats as well as field notes were encoded and analysed using qualitative analysis software (Kuckartz, 2016).

These qualitative insights were complemented with a quantitative online survey. A random sample was not feasible as there was no specific knowledge of the population of the riders (see Farrell et al., 2018: 25; Griesbach et al., 2019: 4 or Maffie, 2020: 133 for the same challenge) – a fact that would not change with a larger number of respondents (McFarland and McFarland, 2015). Since the aim of the survey was initial exploratory and descriptive insights, a purposive sampling strategy was pursued and active couriers were addressed directly and recruited for the survey. On the basis of the qualitative findings in particular, this represents a promising sampling method (Barratt et al., 2015) that avoided self-selection biases. In this way, 252 participants could be obtained – representing about 5–10% of the population at the survey period (2500–5000). In addition, some of the queried items were constructed by analogy to the nationwide, representative 'Good Work' survey of employees in Germany, conducted by the German Trade Union Confederation. Its sample of 2016 includes 9341 employees between 15 and 65 who worked at least 10 hours a week. This made it possible to compare the data collected from riders with employees in Germany.

Findings

In the following, first the challenge for the platforms to match supply and demand for labour will be presented. Then, the working time regimes on the two platforms will be described separately, followed by a look at the consequences.

The challenge of staffing

The staffing of the platforms has to navigate between the promise of self-determined working hours on the one hand and the demand for orders on the other hand. At the time of the investigation Deliveroo advertised with: 'enjoy the freedom to work when you want';[3] and Foodora with: '[d]ecide when and where you want to work and use your free time for things you love'.[4] In contrast to this, the actual workload depended solely on the orders placed and thus occurred at traditional mealtimes. A first peak at noon was followed by a low order volume in the afternoon until the largest amount of orders arose between 6 p.m. and 9 p.m. Accordingly, 91% of respondents to the online survey said they worked very often or often between 6 p.m. and 11 p.m. – which compares with only 27% of all employees in Germany ('Good Work' Index). Furthermore, variations existed

between the different days of the week. In fact, 88% of respondents reported that they worked at weekends very often or often, compared with 28% of German employees in general. Apart from that, the number of orders depended on the weather and the season: 'The worst weather is the best business for us' (I7: 22)[5] said a rider and another summarised: 'Shortage of shifts in summer and shortage of drivers in winter' (I14: 66). Furthermore, other aspects were relevant as a Rider Captain described:

> Shift allocation . . . depends on the number of employees, what kind of contracts, how many hours and what our forecast is. The workload is variable. And that is quite difficult. (I16: 54)

> Shift planning is what makes everything about this job complex. (I16: 88)

In this situation the platforms' priority was to satisfy the demand, as a former Deliveroo manager said: 'The system needs a minimum number of drivers to operate, the worst case . . . is an order that is not delivered. A driver who does not receive an order does not matter' (I6: 103).

Working time regimes were crucial to align the different variables of the labour process with each other. The CEO of Foodora's parent company promoted technology for addressing this challenge: 'We need more people on Sunday evenings than on Monday mornings, also when it rains, and during football matches. That is why our technology is so important. . . . We must be able to anticipate demand and react quickly' (Schröder, 2016). Yet, the effectiveness of technology proved to be limited, as one rider explained: 'The only thing they can't control is the human factor. But as to the technical side, the power is absolutely with them' (I32: 46). To control this human factor, the platforms had established specific working time regimes. Since Foodora's riders were employed and Deliveroo's were self-employed, these regimes differed. Foodora had to ensure the efficient realisation of the couriers' working capacity, since the workers' attitude tended to be, as one rider said: 'Minimum wage, minimum effort' (I19: 131). Deliveroo on the other hand had to ensure that the independent riders were reliably available.

Working time regime at Foodora

The working time regime at Foodora changed constantly, starting as a manually operated and comparatively flexible process and emerging into a performance-based system that was able to assign shifts automatically. Initially, riders could choose their shifts manually for every week (I16: 90). Then, the process was automated. The couriers first had to report their availabilities and later their non-availabilities; that is, the times when they could not work, one week in advance and were assigned corresponding shifts (I8: 10; I24: 24). Assigned shifts could only be cancelled 48 hours before they were due to start if other riders took them over, which 'often led to people simply going on sick leave' (I4: 106).

In response, from mid-2017 onwards, Foodora added a minimum number of hours in new employment contracts. How and whether these were enforced was up to the platform and depended on the season and the size of the city, as the field notes show: 'There are currently few orders. The number of shifts has been reduced and I rarely reach my minimum hours, but that doesn't seem to be a problem' (FN5: 26). Three months later,

summer ended, the order volume increased and the platform's policy changed: 'Shifts are available at any time. I can start working spontaneously. As soon as I have fewer shifts than my contractual minimum hours, I am automatically and randomly assigned additional shifts' (FN9: 2). During the observing participation, the minimum hours were only enforced in larger cities with a large number of couriers (FN12: 13).

In summer, when order volumes were low, riders had to give very wide temporal corridors of availability in order to be able to work at all. Asked if he got enough shifts, a rider responded:

> Usually it is less. And usually, they make use of all your availability but not in one shift but in two with a break in between. So, if I wanted to work six hours, I will end up working five but in two separated shifts in different zones. (I8: 84)

As a result, 52% of the Foodora couriers surveyed said they usually worked fewer hours than were in their contract and 19% worked more. If the answers are sorted according to their location, it becomes clear that respondents worked less in larger cities and more in smaller cities.

Additionally, the riders' individual performance became more important. Rider Captains were assigned access to their colleagues' 'Key Performance Indicators' and had to control them:

> There are figures where Foodora says this is the target level, which is then highlighted, from green to red. For example, in summer, your average speed should be 15 km/h. . . . I had to call everyone . . . who has red fields, so that they try to improve their speed a bit. (I25: 87–89)

Other relevant indicators were: fulfilment of the contractually agreed hours, reaction time to new orders, avoiding 'no shows' and 'late logins', and the time spent with customers. The duration of the last parameter could be influenced by the riders and was therefore relevant for the labour process: 'When you have delivered an order, you just don't confirm this yet in the app. Then you can take a break. The next order will only come after you have completed the previous one' (CH2: 243).

In April 2018, Foodora introduced a new shift system. The riders could choose shifts at different times. Weekly, they received an email with their latest performance data. Next to the mentioned 'Key Performance Indicators', these included the number of completed weekend shifts and the quantity of orders delivered. Each figure was set in relation to all other riders in the same city. 'These statistics are then sorted by ranking' (I24: 46), described a rider. Based on this, Foodora formed four groups:

> Batch 1 – Top 30% [of the couriers].
>
> Batch 2 – Medium 40%.
>
> Batch 3 – The last 30%.
>
> Batch 6 – At least four weeks inactive.

Depending on their batch, the riders had access to the available shifts at different times:

> Batch 1 – Select open shifts from Monday 5 p.m.
>
> Batch 2 – . . . Tuesday 11 a.m.
>
> Batch 3 – . . . Tuesday 5 p.m.
>
> Batch 6 – . . . Wednesday 11 a.m. (FN11: 5)

Thus, performance became the prerequisite for flexible working hours: 'The earlier you have access to the shift schedule, the better shifts you get, or the longer shifts' (I24: 44). With less shifts in summer, work performance could provide the basis for the possibility to work at all. When demand was high and the riders did not choose as many hours as specified in their contracts, they were assigned shifts automatically, as a rider described: 'If you do not reach those shifts by a certain deadline during the week, an algorithm gives you random shifts until you reach those minimum hours. The whole thing eats up flexibility like hell' (I24: 26).

This type of shift allocation coupled labour closely to the actual demand. Despite the riders' minimum working hours, it was possible that couriers received no shifts: 'Foodora then argues that one could have looked for something among the free shifts. But these are often shifts at times that one can't make' (I31: 96). As a result, shifts at unfavourable times or in remote delivery zones were taken by workers from the last 'batches', or they were automatically assigned to those who had not yet reached their minimum hours. Thus, 71% of the sample's Foodora riders said they had been assigned shifts that did not suit them; 40% of them stated that this was the case very often or often.

There were also regional differences. In Cologne, the existing works council prevented the introduction of the new shift system. In medium-sized cities, the number of batches was reduced to three instead of four batches (I34: 102). In addition, fieldnotes and a works council member showed that 'the old system exists in the smaller towns' (I30: 49), where only few couriers were active.

Working time regime at Deliveroo

A similar development occurred at Deliveroo. Until the end of 2017, the platform let couriers in Germany choose whether they wanted to work as an employee on a monthly hourly quota or whether they preferred to be self-employed. Thus, a core workforce of employed riders could be assigned unpopular shifts and orders that would be unprofitable for freelancers: 'They have their employees for the slots where there is little traffic, which the freelancers wouldn't do because they would not receive their hourly wages' (I1: 56) and '[e]mployees cannot reject orders. So there always will be an employee to step in' (I15: 34). Self-employed riders gave the platform numerical flexibility, as they worked out of economic self-interest at times when many orders had to be handled. Asked about her preferred working hours, a self-employed rider named the most challenging times for Deliveroo: lunchtime, evenings and bad weather (I3: 44).

When some drivers organised a works council election in Cologne in 2017, Deliveroo decided 'overnight that they only wanted to hire freelancers' (I32: 46). With this change, Deliveroo got rid of the works council and at the same time of the challenge to ensure the realisation of the working capacity of the employed couriers. Self-employed riders tried to optimise the labour process out of self-interest, as one rider described: 'When [the customers] open, they are at home. So, I accept the next order. And while I climb the stairs, I maybe already receive it. And this improves the amount of orders a little' (I15: 48).

Owing to their self-employment, the riders were no longer bound to specific working times and focused on profitable orders and shifts. Thus, it became difficult for Deliveroo to ensure that sufficient drivers were available for less busy shifts and zones. For the riders, the choice of shifts became particularly important:

> They want you to make a binding decision beforehand. I was able to sign up an hour in advance, but by then the attractive zones might already be gone. It doesn't matter for an employee how many orders she is assigned, but to me as a freelancer it does. (I1: 28)

At Deliveroo's start in Germany in 2015, shifts were several hours long and booked on a first-come-first-served basis (I17: 40). From autumn 2017, shifts were only one hour and were assigned on the basis of two variables:

> *Attendance*: percentage of booked hours you attended.
>
> *Late cancellation*: percentage of bookings you have cancelled without giving notice 24 hours in advance.

Based on these figures, the riders were put in relation to other couriers of their cities and could select their shifts for the following week either at 11 a.m., 3 p.m. or 5 p.m. on Mondays:

> It's all about reliability. You are assigned to a group. Group one can help itself. The next group two hours later. The third group comes in last and gets the rest. I was once in the second group when I had that at 95 [attendance] to 2 [late cancellation]. And there I only got fragmented days. Sunday 12–2 [p.m.], then a bit was missing. So, I had to switch to other districts. (I13: 41)

A missed shift affected the riders' statistics:

> [A] colleague . . . had a major accident a few days ago. . . . On the following day he could not ride. And when he came back to ride, he lost his shift and so he lost his priority and so he is in a worse position to choose the shifts. It is clearly like different classes with the good ones and the not so good. (I7: 42)

Since there were rarely enough shifts to meet the workers' demand, being in one of the last groups could mean losing the possibility to work at all (I7: 46). Therefore, some riders accepted every offered shift, regardless of its profitability or attractiveness, in order to improve their status and to become able to choose shifts as part of the first group:

> When I came back, I had to work as a jumper . . . I always had to see if someone cancelled a shift during the day. On my plan, there were always all shifts occupied. It took a while, but now I can log in at 11 a.m., now the whole schedule is available to me. (I27: 69)

To have a shift registered as attended, the riders had to be present for its first 15 minutes. Couriers usually booked several one-hour shifts in a row. If the first shift turned out to be unprofitable, the riders had to attend the following shifts in order to not endanger their status: 'The moment I go home because nothing is going on . . ., then I'm only 80% reliable and can only log in at 3 p.m. next week' (I27: 75).

Additionally, the performance-related shift allocation automated and transferred the challenge of a balanced staffing between the different delivery zones to the couriers. The lack of shifts and the importance of improving their statistics created a situation where riders scattered themselves to the various available zones and filled the shifts offered by the platform:

> There's always something available somewhere. But if I have to drive there for one-and-a-half hours it is shitty for the hourly wage and unattractive. It has often happened that there was nothing free in the zone I wanted to work in. Then I just worked in another zone. (I1: 70)

Furthermore, the effect of the working time regime differed between locations. Especially in larger cities with many riders there was a constant struggle for shifts. In other cities, where Deliveroo sometimes had problems to acquire enough workers, riders with bad statistics could be in the first group as the field notes show:

> I log in after a two-month break to book shifts. I expect to have access to the shift schedule on Monday at 5 p.m., but I discover that I am still in the first group and can book shifts at 11 a.m. despite my lack of performance. (FN5: 1)

Other smaller cities revealed the same pattern. In a few larger cities, on the other hand, a week without a shift could be enough to lose privileged access to the shift schedule.

Consequences of the working time regimes of both platforms

Contrary to the platforms' promises, a rider stated: 'We are not granted flexibility' (I18: 299). The couriers of both platforms had to adjust their individual schedules according to the platforms' schedule; that is, the number of expected orders, so they worked for fragmented times, especially on weekends and evenings. Additionally, the work and its times changed constantly: 'At least every three months the structure is changed in some way and you have to organise your whole working day differently, completely differently . . . They don't just change your salary, your life suddenly changes' (I20: 72).

A former manager of Deliveroo described the system as follows:

> As a courier . . . you are like a light bulb and the platform can turn these bulbs on and off at will: 'We have rain, we need some more people.' And they would open more slots for two or three hours . . . [T]hat works especially with people who have poor statistics. They depend on making money and take everything they can get to bring their statistics back up. (I13: 131)

The availability of 'light bulbs' and the volume of orders were in an inverse relationship with weather conditions as an intervening variable. In summer, the riders had to grant the platforms control over their private time, as one rider described it: 'I started to declare the whole day as free. Then I got hold of a shift' (I4: 133). In adverse weather, the situation reversed and the riders were usually free to choose their working hours: 'In winter, I signed up for the shifts when I started working' (I23: 18).

With the new shift booking systems, the individual status on both platforms was of particular relevance, since it was linked to the riders' performance or reliability. Thus, 58% of the respondents of both platforms stated that they had gone to work feeling ill at least once. One rider described:

> It is all loose. For example, I'm sick now, I have a broken toe. I have been working with this broken toe and hellish pain for three weeks. And if I cancelled my shifts for a weekend now, then I would get rid of my shifts. (I27: 73)

Access to sufficient and, in the case of Deliveroo, to profitable shifts could have a significant impact on the individual income. A total of 63% of the sample reported that their income varied every month. Of these, 75% said that the fluctuations were usually above 100€. The main reason for this was lack of work: 71% of the surveyed couriers stated that they had received too few shifts. Of these, 59% answered that this was the case very often or often. Accordingly, 49% of the sample said that they would like to work more and only 3% stated the opposite. This shows that not only does the weather influence the flexibility and thus also the income possibilities of the couriers of both platforms, but also the number of drivers competing for shifts. The previously identified pattern of spatial differentiation emerged again, since especially riders from larger cities, where more couriers worked, indicated a lack of shifts.

New drivers were constantly being recruited. One works council member stated that Foodora was faced with an 'average length of stay of two months' (I30: 134), which other respondents also confirmed for Deliveroo. The Deliveroo manager quoted earlier said:

> The strategy is to make the company very efficient in terms of human resources . . . [Y]ou take all the staff that comes in. Then you have this internal evaluation system with which you turn off the app for people who don't perform . . . [Another manager] said: 'First we take everyone, harvest everything and then the rotten apples are sorted out.' (I13: 134)

> There are light bulbs 10 a penny. You only need to place small advertisements in Berlin and you have a thousand people on your doorstep. (I13: 155)

In contrast, in smaller towns and in winter the platforms offered up to 200€ for newly recruited riders (FN12: 4). Alternatively, new workers were recruited in refugee homes (I33: 125).

Discussion

The study leads to three main findings concerning the understanding of temporal control in platform labour: (1) control regimes in food delivery platform labour are not solely

technologically driven, but hybrid and use digitalised internal markets to organise and control the labour process; (2) labour markets are location-specific and as such they influence the effects of control regimes; (3) different employment models result in different control needs.

The first and main result of this study is that the use of technological control alone proves to be insufficient and the use of organisational instruments in the form of internal markets is a complementary supplement to the control regime. Although a technological fix leading to comprehensive control and though shifts can be distributed automatically, the riders can still influence the intensity of the labour process (effort power) and can decide not to deliver at certain times (mobility power). This threatens both the efficiency and the reliability of labour. The focus of research on control concerning platform labour should therefore not be limited to algorithmic management, but ought to include the analysis of a broader spectrum of mechanisms. Following Beverly Silver (2003), this can be understood as an organisational fix that acts complementarily to its technological counterpart (Heiland, 2019b).

In platform-mediated courier labour, this organisational fix to control the labour process manifests itself in working time regimes. To deal with the problem of fluctuating demand by means of variable work schedules and thus the transfer of market risks to the workers is common in many sectors (see discussion above). In the case analysed here, it is furthermore apparent that the control of working times not only served the efficient allocation of labour, as emphasised by economists (Cachon et al., 2017; Gurvich et al., 2016), but was a central element of the control of the labour process; that is, the restriction of effort and mobility power.

The analysed food delivery platforms organise their working time regimes by means of internal markets, which leads to an indirect control. Markets can efficiently coordinate complex preferences of individuals (Hayek, 1945) while their objectivity abstracts from the subjects' individuality (Marx, 1953: 913; Weber, 1980: 383). Furthermore, markets are 'a form of behavioural control through positive and negative sanctions' (Heinemann, 1976: 55). The interplay between supply and demand allows market actions to be evaluated for their success and to be adapted to the objective market situation. However, markets are neither spontaneous (Hayek, 1945) nor primal (Williamson, 1983: 20), but instead always regulated, constructed and political (Block, 1994; Fligstein, 2001; Polanyi, 1944). Furthermore, as markets are organised (Ahrne et al., 2015), they can also be found in organisations. Geranmayeh et al. (1993: 4) state: 'Internal markets bring all the advantages of free markets inside large organizations', and Halal (1994: 74) argues that 'all market functions can be replicated within organizations'.

Platforms often operate on inter- and intra-platform markets (Kirchner and Beyer, 2016: 331). The first represents their environment, where they compete with other platforms for customers, restaurants and workforce. Most relevant to the temporal control of the labour process are the intra-platform markets (see Figure 1).

In these internal markets, the competition is not to negotiate prices, as is the case on other platforms (e.g. AirBnB or eBay), but status is the key category, and money is not the currency used to acquire it, but the couriers' performance in the labour process. As gatekeepers, the platforms control the number of market participants through the granting of access rights. In addition, they are responsible for the regulation of all parameters of the internal markets.

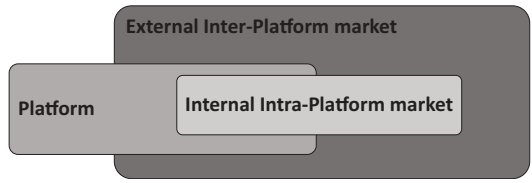

Figure 1. External and internal platform markets.

A prerequisite is the technological fix with its automated recording, quantification and codification of the individual performance. It 'standardizes those activities and their component elements and thereby prepares them . . . for an eventual transition to market-based relationships' (Agre, 1994: 120). With both platforms' use of algorithms, the previously manual shift assignment was automated, making it difficult for the workers to object to these quasi-objective data.

The use of the remaining control gaps that the technological fix left was sanctioned by its organisational equivalent. For example, if riders prolonged the time at the customer to take a break, they bypassed technological control, but the individual performance deteriorated. Therefore, technological and organisational control of the labour process did not act independently but complemented each other and were interconnected.

As a result, the couriers were forced into a competition with each other, which controlled their actions indirectly. Since the riders' performance was the currency, the organisational fix – that is, the internal markets – made it possible to control the comparatively free and flexible couriers. Direct control over the labour allocation by frontline managers is common in low-level hourly service jobs (Lambert et al., 2012: 303) and is central in other working time regimes as well (Beynon, 1973; Chun, 2001; Heyes, 1997; Price, 2016; Wood, 2018). In the case analysed here, personal control by managers was replaced by direct technological and indirect market control.

Utilising automated and market-based scheduling systems, the platforms solved the challenge of balancing demand and supply of flexible and, in the case of Deliveroo, even free workers at specific times. At the same time, platforms could limit workers' effort power by defining criteria that workers had to comply with. Furthermore, labour was tied to demand and thus the costs for the platforms remained low.

In addition, the individual status limited the riders' mobility power since it bound riders to the platforms. Multi-homing, using multiple platforms at the same time, or switching to another platform became an irrational strategy. The platforms could only limit the mobility of the workforce within the framework of the platform itself; that is, only the temporal flexibility. Because '[u]nlike slavery, . . . mobility is owned by the individual worker' (Smith, 2006: 394). The workers were left with the possibility of handing in their notice as the last resort of their mobility power. The riders used this exit option frequently, as the high fluctuation rates show, and at the same time this was only available to those who were not dependent on this source of income.

This points to the second aspect, the rarely considered spatial constraints of platform labour and thus of control regimes. Since food courier labour is a local phenomenon, it shows local differences. These local characteristics affect the effectiveness of internal

markets. Prerequisite for them is the presence of a sufficiently large reserve army, since 'the mass of employment cannot be separated from its associated mass of unemployment' (Braverman, 1974: 267; Marx, 1962: 666; see Heiland, 2020: 22–23 for this aspect in platform labour). Workers will only compete for shifts if there is a shortage of shifts. A shortage of couriers, on the other hand, undermines the performance-based scheduling system. Where the latter was the case, Foodora did not introduce this system in the first place. And if intra-platform markets were used despite a limited number of workers, the platforms' demand for the couriers to perform remained ineffective, as even the riders without a good status had access to the entire shift plan. This confirms that 'capitalists need to develop place-based labour control practices [and] must incorporate, and adapt to, the uneven development of labour market conditions' (Jonas, 1996: 325).

The constitution of local labour markets thus determines the strength of the workers' mobility power. When demand for labour was low – especially in the summer or in large cities – the riders' possibility of pursuing individual resistance was limited. Similarly, temporal control had a negative effect on the collective voice. The riders competed with colleagues for working shifts and were involved in constant status labour. The automated control regime interpreted participation in strikes as a decrease of a rider's reliability, which had a negative effect on the individual status. In other cases, the platforms have been able to counteract work stoppages by spontaneously opening further shifts and, owing to the availability of a 'reserve army', succeeded in avoiding a temporary standstill of the labour process (Marrone and Finotto, 2019: 705–708).

The third finding is that the relation of effort and mobility power and thus the control regime's configuration is determined by the different employment models. Deliveroo's self-employed riders had a limited effort power, since the realisation of their labour power was in their own interest. As shown, they even tried to speed up the labour process themselves. On the other hand, they had a pronounced mobility power, as they could refuse orders and stop working at any time. Foodora's employed couriers had a limited mobility power as they were contractually obliged to fulfil their working hours. Not completing deliveries or shifts could lead to their dismissal. Their pay was independent of their work commitment and their effort power allowed them to delay or undermine the labour process in their favour – as they did for instance with prolonging the time spent at the customer. This was reflected in the parameters that were relevant for a good status on the platforms. Foodora riders could improve their status through efficient work performance and shifts on highly frequented evenings and weekends. Good results regarding these two parameters were achieved by the independent riders at Deliveroo out of self-interest. In contrast, for their status reliable shift fulfilment was relevant, so that the use of their mobility power was sanctioned.

The different employment models also explain the different lengths of shifts on the two platforms. As the riders' mobility power was less of a challenge for Foodora owing to their status as employees, the platform offered shifts of several hours. These could not be ended spontaneously by the riders without sanctions, which increased predictability for the platform. Deliveroo, on the other hand, tried to limit the riders' pronounced mobility power by only offering one-hour shifts. In order to avoid a deterioration of their status, the riders had to work all individually booked shifts even in the case of a low number of orders.

Conclusion

The article asked how food delivery platforms keep labour efficient and reliable at the same time and what role working time regimes play in doing so. Following LPT, the focus is thus not only on controlling the realisation of the labour force (effort power), but also on controlling the time, extent and place of its deployment (mobility power).

This study's results suggest three insights. First, even in algorithmically managed platforms labour control regimes are not purely technologically driven. Hence, the current discourse, which unanimously stresses the relevance of digital technologies for the control of platform labour processes, should be broadened. The analysis of technological control involuntarily follows the platforms' narrative and 'mythinformation' (Winner, 1984), according to which new technologies alone are responsible for potential revolutionary transformations. As shown, the riders' effort power is limited by means of technological control. Despite this, loopholes remain, allowing the riders to act autonomously, so that complementary control forms are needed.

This leads to the second insight, concerning the relevance of working time regimes. The focus on technology ignores the challenge of staffing, as the platforms have to fill unattractive and unprofitable shifts with workers and thus limit the mobility power; that is, the riders' temporal flexibility. Furthermore, working time regimes do not only coordinate the labour process but control it, too. By means of this, both the workers' effort and mobility power are restricted. In platform-mediated food delivery work, it is expressed in particular through intra-platform markets, which enable an automatic and performance-based shift assignment, connecting working time and control regimes; that is, temporal control. Platform-based courier work is thus driven by a hybrid control regime that uses both a technological and an organisational fix to control the labour process.

Additionally, as this type of platform labour is location-specific, its control regime is also place-based and ought to be analysed as such, which should be considered in future studies. If the control of the platform labour processes in just one major city is analysed, as it is frequently done, the results cannot be generalised, as labour markets differ locally and have an important influence on both the effort and the mobility power of workers. As a result of these three insights, platforms should be analysed not only as techno-cultural ecosystems, but also as location-specific socio-economic assemblages with specific temporal control regimes.

Concerning the research design, the use of both quantitative and qualitative instruments and in particular multi-sited ethnography proved to be a beneficial mix of methods allowing deep as well as broad insights. The flip side is the primarily explorative character of the quantitative data owing to their lack of representativeness. Even though representative surveys in the field of platform labour are difficult to conduct (Heiland, 2020: 10–12), further and more comprehensive data would be desirable. Additionally, the findings presented here are limited to the field of platform-based courier work in Germany. Since this is location-specific as the control regime is, too, it would be promising to investigate the varieties of platform capitalism in other countries and other forms of platform labour. In general, an analysis of the use of internal markets in platform economies to coordinate and control labour would be worthwhile. Furthermore, the effects of

the resulting working time regimes on the individual time arrangements of workers and their often hybrid employment contexts would be of interest. What is more, the temporal control, which is the connection between working time and control regimes as outlined in the article, deserves to be examined also in other employment relationships.

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Notes

1 Deliveroo withdrew from 10 cities in August 2018 and left the German market in August 2019. The parent company of Foodora was taken over in December 2018 by the competitor 'take away'. This makes platform-mediated food courier work in Germany an example of the monopolising tendency of platforms. COVID-19, on the other hand, has brought a new dynamic to the field. Its impact has greatly increased the demand for food delivery. In addition, some platforms are expanding their services and no longer offer only the delivery of meals from restaurants, but also everyday goods. As a result, new platforms have emerged or entered the German market, so that both increasing relevance and competition can be observed.

2 https://roocommunity.com/tech-round-up-how-and-why-am-i-offered-specific-orders/ (accessed 12 August 2019).

3 https://deliveroo.de/de/ (accessed 12 August 2019).

4 https://rider.foodora.de/ (accessed 23 September 2018).

5 In the following, quotations are attached to identifiers. 'I' represents an Interview, 'FN' field notes and 'CH' a comment from a chat. The following numbers first identify the transcript and then the respective paragraph.

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