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Social relations and worker resistance in the platform economy: towards a future research agenda

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ABSTRACT

This paper examines how the social relations of platform work shape workers' acts of resistance. We critically discuss the broad spectrum of resistance approaches employed by platform workers, bringing attention to how the heterogeneity and novelty of some practices stem from the dynamic and complex social relations of platform work. Accounting for resistance practices at both individual and collective levels, as well as across different types of platform work, enables one to consider the extent to which worker resistance has evolved from its more traditional association with the presence of a 'shopfloor' and established organisational structures and processes for social relations with supervisors and co-workers. We elucidate how worker resistance has emerged despite the considerable efforts by platform firms to marginalise the potential for resistance through their business models and conclude with an agenda to guide future research efforts.

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Introduction

Worker resistance has traditionally been understood as individual and/or collective actions that are undertaken with the intention of either advancing workers' claims against management or limiting management's claims over workers (Hodson 1995). Accordingly, the workplace has been the starting point for understanding why, how, and when workers secretly or publicly resist. Sociological theorisation on worker resistance suggests that social relations within the workplace, alongside union presence and mobilisation legacy, determine the likelihood of labour organisation and movements (Roscigno and Hodson 2004). Forms of individual resistance have commonly comprised worker absenteeism, work avoidance, delinquent acts of theft, pilferage, and the use of derisive behaviours (such as mocking) to undermine supervisors (Hodson 1991, 1995). In contrast, collective resistance has traditionally been demonstrated by striking or go-slows. However, as technological advancements have transformed the nature of work and working relationships, new approaches to resistance have emerged, particularly within the platform economy (Briziarelli 2019, Umney *et al*. 2024), which Kellogg et al. (2020, p.386) have labelled as 'algoactivism'.

The past decade has seen the emergence of digital labour platforms (DLPs), predominantly in the transportation, food delivery, courier, and domestic services sectors (ILO 2021). DLPs connect customers/clients with freelance workers for fixed-term tasks on an on-demand basis. Collectively, DLPs (most notably Uber, Lyft, Deliveroo, DoorDash, TaskRabbit, etc.) comprise a major part of the

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platform economy and have refashioned contingent forms of work, commonly referred to as 'gigs', using algorithmic technologies (Duggan *et al*. 2020). The use of algorithms is a characteristic feature of platform work. Using 'illusions of control and freedom' (Woodcock 2020), DLPs deploy algorithms that regulate the labour process through 'hard controls' that track workers' active hours, punctuality, and attendance, and 'soft controls' such as programmed gamified nudges, surge pricing, or other incentivising techniques. These controls prompt the worker into working longer while making their choice to do so appear consensual rather than forced. This closely aligns with the neoliberal agenda of DLPs and their ethos of 'entrepreneurial governmentality' (Galière 2020, p.366). However, a more nuanced view of these relatively new work arrangements recognises how several DLPs tend to classify these workers as 'self-employed', and by doing so significantly undermine labour protection and decent working standards, thus rendering labour disposable and precarious. This also underscores the need for a better understanding of how workers have expressed and enacted resistance in response to these challenges (Hadwiger 2022, Umney *et al*. 2024).

The extant literature has examined various individual and clandestine tactics through which platform workers manipulate and counter the ways in which they are algorithmically controlled and monitored within the platform ecosystem (Anwar and Graham 2019, Cameron and Rahman 2021, Heiland 2021, Vasudevan and Chan 2022). These tactics may include deliberate micro-acts of data obfuscation by workers to circumvent the algorithmic monitoring system (Kellogg *et al*. 2020). There has also been a focus on understanding how platform workers have succeeded in undertaking collective and more explicit acts of resistance, including organising and participating in wildcat strikes, demonstrations, or protest activities (Cini *et al*. 2021, Woodcock and Cant 2022), in addition to strategic litigation (Aslam and Woodcock 2020). For example, scholars have examined the processes that have led to the consolidation of worker solidarity and the emergence of collective action (Ford and Honan 2019, Tassinari and Maccarrone 2020, Lei 2021). The ways in which workers have developed capabilities and mobilised themselves by actively identifying and leveraging their work and non-work-related resources have also been explored (Cini and Goldmann 2021). This includes the spontaneous adoption of diverse worker-led organisational forms that have enabled certain collective and radical acts (Webster *et al*. 2021). These acts, beyond differing in their scale and manifestations globally (Bessa *et al*. 2022), have not just targeted platform organisations, but also have been directed towards customers and regulatory authorities. Wood *et al*. (2023) have attributed the varying targets of these acts to the complexities of the social relations in platform work between workers, customers, platforms, and the wider regulatory context of the state.

Considering the broad portfolio of resistance practices that workers have engineered and adapted, alongside the moving targets of such acts, prompts us to ask, *how have the social relations of platform work shaped workers' acts of resistance*? Joyce (2020, p.541) conceptualises the social relations of platform work as 'an emerging labour-capital relation – which establishes a cash nexus between the platform and worker as a result of a process of subsumption'. The concept of subsumption is central to what Joyce refers to as a re-theorisation of social relations, proposing a labour-capital relationship between the platform and the worker as opposed to a multi-party/stakeholder relationship. This relationship is held in place through a cash nexus as against the normative accountabilities of a traditional, formal employment relationship. Joyce (2020, p.549) proposes the possibility of 'integrating the dynamics of subsumption and the cash nexus into accounts of platform-worker organisation and resistance'. We take our cue from this line of enquiry and seek to probe this assertion further. Whilst we aim to advance Joyce's conceptualisation through framing and illustrating how the social relations of platform work have influenced the acts of resistance adopted by platform workers, we also draw attention to outlier practices that may not support Joyce's postulation due to the dynamic and multifaceted nature of the relationships that these workers are embedded in as part of the labour process.

Our first contribution stems from synthesising the extant literature to demonstrate how the social relations of platform work have influenced the adoption of various heterogeneous and novel approaches to resistance by platform workers globally. Specifically, we consider resistance at both

individual and collective levels and elucidate the extent to which specific forms of resistance may be commonplace across diverse types of platform work i.e. in location-based vis-à-vis online web-based labour platforms. This enables us to demonstrate how some practices and approaches observed in the platform work context represent a critical departure from worker resistance in traditional work settings, which has been heavily centred on organisational attributes, social relationships with management, and union presence. For example, the orthodox starting point for understanding worker resistance has been the workplace, in particular the interactional dynamics on the shopfloor (Roscigno and Hodson 2004) – a feature which is largely absent in platform work, owing to their novel use of algorithms for work organisation, labour extraction, and control.

Our second contribution emerges from the future research agenda which we propose as a guide to shape ongoing research efforts in this rapidly growing field where technology, work, and labour relations intersect in a vivid and nuanced manner. We call for further consideration of the role and impact of different stakeholders enmeshed in the social relations of platform work, the extent to which these relations conform to the requirements of the capital upon subsumption, and how this may influence the manifestation of resistance practices, including what success may look like for workers when they engage in various forms of resistance.

DLPs and the social relations of platform work

The proliferation of hyper, short-term, freelance forms of work that are digitally mediated by platforms represents a contemporary variant of non-standard employment relationships. These DLPs have primarily been classified as *location-based platforms,* where tasks are fulfilled locally and offer a wide range of on-demand services such as ride-hail, courier and delivery, domestic, and care work; and *online web-based platform*s, where tasks are performed remotely and include human-intelligence digital/data work such as micro-tasks, transcription, translation, app development, web design, programming, etc. (ILO 2021, p.40). This work purportedly provides individuals with alternate modes of income generation, and seemingly high flexibility with the attractive choice of being 'self-employed' and financially independent. Individuals are promised greater control over when and where they work, without the burden of hierarchical power structures. However, these benefits are more indicative of initial impressions rather than being a genuine reality (Woodcock 2020, Rani and Furrer 2021).

Further, the self-employment classification of workers is a strategic feature of the platform business model (Walker *et al*. 2021). This enables DLPs to transfer most risks and liabilities onto the worker and at the same time exploit the lack of systematic coverage and gaps that exist within current labour law frameworks. This is most evident in relation to the provision of employment protection which is typically connected to the exertion of control by the employer over various performance parameters; however, such control becomes difficult to discern in the context of algorithmically mediated organisation of labour as exemplified in platform work. Rather, it engenders a state of dependence and vulnerability among workers, which is concealed through the opaque workings of the platform algorithms. Therefore, platform workers find themselves excluded from the entire body of statutory employment protection such as the provision of minimum wages, sick-pay entitlements, unemployment benefits, income security, and rights to information, consultation, participation, and collective bargaining in many countries (ILO 2021).

As such, worker feedback channels and/or grievance addressal mechanisms are provided in highly restrictive forms or markedly absent. The latter has been perceived as a tactic to simultaneously distance and silence worker voice (Kougiannou and Mendonça 2021). The absence of a traditional shopfloor or centralised point of production (Gandini 2018) is also a notable de-collectivising strategy of the platform which estranges workers. Their precarity is further exacerbated by automatic sanctions, restrained choice over work allocation, use of clickwrap agreements, and data lock-in features that prevent the portability of performance ratings or customer reviews, thus

limiting workers' mobility and increasing their economic dependency on a particular platform (Lei 2021, Wood and Lehdonvirta 2021).

While the use of algorithms is common across DLPs, their configuration for coordinating different aspects of the labour process, i.e. on location-based vis-à-vis web-based labour platforms, tends to differ significantly (McDonnell *et al*. 2021). For example, most location-based DLPs use algorithms to conduct the work that was originally carried out by managers, such as organising the workflow and overseeing the 'employment' life cycle of workers from onboarding to task allocation, compensation, and exit; while performance management is outsourced to the customer where they are deputed with real-time managerial powers to evaluate the worker's task performance. At times, there may be an additional operational stakeholder, for example, a 'supplier' as in the case of food delivery (Duggan *et al*. 2020). For online web-based platforms, such an arrangement may look considerably different, with the customer playing a more central role, ranging from defining the task, its success measures, compensation, skill prerequisites, and worker selection, while the platform's algorithm assists the matching process by providing automated suggestions or a shortlist of worker profiles to the customer based on a set of past performance indicators (ILO 2021). As such, it is evident that there are multiple parties, in varying capacities, involved at different points of the labour process.

In most cases, the immediate social relations of the labour process in platform work consist of the algorithmic intermediary that organises the work, customer, and worker. Joyce (2020, p.545) considers these social relations as 'new relations of domination and subordination … introduced in previously existing patterns of work' by the capital through a process of 'formal subsumption' or through its 'transitional sub-form' where the capital does not intervene in the production stage yet extracts labour on grounds of providing the conditions of work', via the platform's infrastructure. This rethinking can help breakdown the complex social relations into an overarching labour–capital relation with a direct cash nexus in platform working arrangements. The concept of subsumption is central to understanding how capital establishes itself, through gradual reshaping and transforming of the social relations until they are thoroughly aligned and imbued with the nature and demands of the capital, upon which the labour process gets 'subsumed' within its realm. This leaves behind a heavily transactional labour–capital relationship hinged on a mere cash nexus, i.e. a monetary exchange in return for piecework – an aspect that reflects the frail 'employment' dynamics of platform work. While the centrality of pay has been a key explanatory factor for worker resistance in traditional work arrangements, it tends to be more pronounced in the case of platform work due to its non-standardised, relatively opaque algorithmic piece-rate model and the absence of employment protection. Consequently, there is widespread evidence of platform workers finding novel and creative ways and means to resist the repressive aspects of platform work through various self-organisation efforts (Anwar and Graham 2019, Joyce *et al*. 2020, 2022, Cini *et al*. 2021). Such heterogeneity in practices arguably merits further consideration given the dynamic social relations of platform work, which we delineate by considering manifestations of resistance at the individual and collective level.

Manifestations of resistance at the individual level

Location-based labour platforms

In the context of location-based labour platforms, Walker *et al*. (2021) suggest that algorithms tend to function as a 'biopower', taking over and regulating the worker's body, time, and everyday choices by creating an illusion of autonomy. In response, workers have been observed to channel their opposition through the platform's application interface and/or the device used to gain access to work (Newlands 2021, Vasudevan and Chan 2022). These comprise of a range of individual micro-acts that are often an outcome of trial and experimentation. Through these actions, workers tend to circumvent and obfuscate their performance data, which is often linked with various conditional

incentive schemes and increased income opportunities. As such, this underlines the prevalence of a cash nexus and its role in inciting such acts of worker resistance (Joyce 2020), which may involve gaming or manipulation of the platform's algorithm itself. Specific examples include food couriers swapping devices or accounts through which they access work (Newlands 2021). Heiland (2021) also notes the use of fake GPS devices by food couriers to manipulate their location. This tactic enables them to bypass the algorithmic monitoring while avoiding pay deductions or sanctions on their ability to seek work beyond designated delivery zones. The use of fake GPS devices and bot apps is also prevalent in on-demand ride-hailing services where drivers distort their actual location to enter a high-demand work zone with surge pricing incentives (Panimbang 2021) – a practice referred to as 'Mario-karting' (Vasudevan and Chan 2022, p.876).

Beyond this, ad-hoc acts of labour withdrawal that breach the circuit of production by creating choke points and potentially disrupting the platform's labour process are prevalent amongst food couriers (Briziarelli 2019, Newlands 2021). These involve workers refusing to fulfil the delivery despite picking up the food from the restaurant (supplier), arbitrarily logging off from the platform during the task, or rejecting orders from certain locations or from restaurants with longer waiting times (Briziarelli 2019). There are, however, instances where workers have exploited the supposedly subsumed social relations with a supplier to also deceive the platform. Yu *et al*. (2022) highlight one such practice that requires cooperation and complicity between new restaurants and food couriers, wherein the restaurant generates fake orders by acting as a customer. In doing so, the restaurant tries to fabricate its demand on the platform to boost its popularity, while couriers benefit from receiving task fees without performing the task.

Similarly, workers have exploited the platforms' reliance on customers for performance evaluations. This is particularly common in ride-hailing due to the limited capacity of algorithms to account for customer-worker interactions. For example, Cameron and Rahman (2021) found that workers tend to have maximum control before the task is initiated, which tapers from thereon. Therefore, the platform's control over task execution and monitoring progressively shifts, and is externalised, to the customer, thus showcasing how these 'new relations of domination and subordination' are introduced into the labour process through formal subsumption (Joyce 2020, p.545). Accordingly, workers may choose to adopt 'preemptive tactics' to safeguard their ratings before task acceptance (Cameron and Rahman 2021). These tactics involve asking customers to cancel their ride if the drop-off location is unappealing, or taking on customers who are more likely to provide high ratings. Drivers may also engage in 'shuffling' (Vasudevan and Chan 2022), a tactic used to simultaneously discipline customers and increase earnings by charging the customer a penalty fee for providing an inaccurate pick-up location. At other times, they have negotiated independent transactions with the customer outside the platform (Panimbang 2021); by doing so, they work towards building an independent customer base for their 'pirate taxi' business (Maffie 2022, p.2). This enables performance of the task offline, while retaining the full fee, and reducing income dependence on the platform. This approach has also commonplace amongst on-demand beauty workers who provide at-home services (Tandon and Sekharan 2022).

Additionally, workers may adopt 'interactive tactics' such as segmenting the task into multiple activities, nudging the customer to rate favourably, or engaging in unapproved actions such as ending or cancelling the task prematurely (Cameron and Rahman 2021, Panimbang 2021). Other tactics include 'long hauling' wherein drivers deliberately ignore the route suggested by the platform and instead select a longer route in anticipation of higher earnings (Vasudevan and Chan 2022). With respect to task completion, workers may rely on 'reactive tactics' to minimise damage from a negative or low customer rating. This may involve filing a complaint on the platform regarding the customer or rating the customer poorly with the expectation that the ratings would nullify each other (Cameron and Rahman 2021). Instances of workers taking screenshots of the platform interface, recording videos, and using social media and public forums to post about their negative work experiences have also been observed. These actions enable workers to defend

their ratings and avoid unforeseen income deductions, while simultaneously damaging the platform's reputation.

Online web-based labour platforms

In online web-based labour platforms, time-stamped screen captures of the workers' personal devices used for accessing work are tracked for their working hours as a performance measure (Anwar and Graham 2019). A global survey conducted by ILO in 2019–2020 found that these mechanisms for monitoring (i.e. taking screenshot of the work) were more regularly exercised and experienced by 51% of workers (study respondents) belonging to developing countries (ILO 2021, p.178). Beyond this, web-based platform workers also face substantial difficulties in securing their initial piece of work due to the algorithmic infrastructure which evaluates and ranks them based on factors such as previous work history, frequency of hire, and customer ratings. Accordingly, such platform controls instigate a range of tactics that workers use to evade digital surveillance, improve their chances of winning a bid, or getting hired by a customer. For example, some workers use multiple display screens while performing tasks to avoid surveillance and penalties for engaging in non-work activities (Anwar and Graham 2019). Creating multiple work accounts, fraudulent purchase of customer ratings, reviews, and/or highly rated work accounts to manipulate the algorithmic ranking mechanism are also widespread; so too are accounts of highly rated workers becoming labour market intermediaries by taking extra gigs, and subsequently hiring other workers to undertake this work on their behalf through a process of re-intermediation. Likewise, practices of disintermediation also exist, where workers sidestep the platform by persuading the customer to transact directly (Graham *et al*. 2017, Wood and Lehdonvirta 2021). This is particularly the case when workers have established their credibility and developed a good working relationship with the customer through repeated high-performance deliverables.

Finally, in the absence of protection and governance measures, workers adopt strategies to discipline customers against non-payment/wage-theft, which may include submitting partially completed outputs or withholding the finished product (Anwar and Graham 2019). This demonstrates the customer's prominence within the labour process, where despite the labour-capital relationship between the platform and worker, the platform hardly intervenes when the labour process is being carried out (Joyce 2020) and yet preserves the cash nexus through transitional forms of subsumption.

Manifestations of resistance at the collective level

Location-based labour platforms

The decentralised organisation of work in location-based labour platforms amplifies the worker's sense of struggle and precarity, providing an impetus to network with other workers (Hadwiger 2022). Compared to traditional work settings where a common workspace or shopfloor exists and supports these relationships, platform workers leverage the powers of communication technologies and digital connectivity to create and identify *spaces* away from organisational surveillance and oversight (Kwan 2022). These consist of physical and/or virtual settings which enable social interactions and lessen individualisation at work.

Participation in online communities (Maffie 2020, Parth *et al*. 2023) provide workers with an outlet to openly vent and collectively articulate their grievances pertaining to the tasks received, rewards, customer issues, and work intensification (Zhou and Pun 2024). As such, these communities become sites for mutual-aid, information sharing, and synergising heterogeneous work experiences (Ford and Honan 2019). This facilitates workers to develop collective approaches to navigate some of the challenging constraints imposed by the platform's algorithmic surveillance mechanisms, which Vasudevan and Chan (2022, p.880) refer to as the 'sensemaking game'.

In addition to online spaces, workers have been known to leverage a range of physical settings for socialisation in-between tasks. Examples include common pick-up points (Tassinari and Maccarrone 2020), car washes, petrol stations (Iazzolino 2023), airport or railway parking spots (Parth *et al*. 2023), city square, and zone centres (Briziarelli 2019). These face-to-face interactions facilitate social identification, cultivating new relationships external to the hyper-individualised labour process. It also promotes a sense of collective identity and belonging (Tandon and Sekharan 2022). For example, driver communities in Indonesia, functioning as a 'taskforce', provide support to those dealing with problems such as account suspension, traffic accidents, or personal issues (Panimbang 2021). This shows how location-based platform workers synchronise online and physical spaces to navigate difficult work circumstances and conditions by relying on supportive networks (Parth *et al*. 2023).

Walker (2021) notes that peer-to-peer discussions within these communities can encourage camaraderie and create fertile conditions for collective action. This is prominent in the way workers have succeeded in converting these 'free spaces' into active sites of contestation through their associational powers (Parth *et al*. 2023). They have organised themselves into worker associations (Panimbang 2021), informal cooperatives (Webster *et al*. 2021, Bunders *et al*. 2022), and worker-led micro-collectives, grassroots, or informal unions (Cini *et al*. 2021) observed across multiple contexts. Notably, these organisational forms and their distinct protest repertoires have varied based on the type of work, industry, and institutional context (Umney *et al*. 2024). While there are instances of workers forming cooperatives to gain greater control over their earnings (Salvagni *et al*. 2022), it is suggested that these have been more successful in the transportation sector, where such a model has been active and often institutionally supported over 'investor-owned platforms' (Bunders *et al*. 2022). Similarly, the success of informal or grassroots unions in organising physical demonstrations and unofficial protests have depended on the support received from civil society advocates, academics, and media journalists (Cini 2022).

Protests and strike actions, predominantly related to poor pay (Bessa *et al*. 2022, Umney *et al*. 2024) have combined physical and digital pickets such as 'coordinated log-offs' during peak business periods or 'critical mass ride-outs?' (Joyce *et al*. 2022, p.11, Tandon and Sekharan 2022). Apart from protesting at the platform's head offices (Dhar and Thuppilikkat 2022), other targets and sites for campaign activity and demonstrations have included the client's premises or supplier outlets (Cant and Woodcock 2020, Joyce *et al*. 2022). Briziarelli (2019) note how food couriers protested at the same 'zone centres', where they earlier congregated for socialisation purposes. Although falling short of orchestrating a complete shutdown or work stoppage, workers have achieved small wins and succeeded in expressing their labour power by disrupting the platform's services and the production of data (Iazzolino 2023). These actions also proved to be effective in drawing attention to the workers' presence and overall visibility within urban spaces and the public arena. For example, Kougiannou and Mendonça (2021) noted how food couriers have discovered a multi-foci voice approach through their relationship-building efforts with the wider community, public, and city council. By deliberately framing their struggles using moral and human rights terms (Però and Downey 2024), workers have garnered support to influence various aspects of their work, including working conditions.

Finally, beyond establishing relations with fellow workers and the local community, workers have capitalised on available contextual resources, leveraged the political climate, and drawn motivation from past legacies of activism (Cini and Goldmann 2021). Efforts in this direction can be noted in the strategic alliances that were forged by food couriers within the European context (Cini 2022, Joyce *et al*. 2022). Here, certain grassroots, rank-and-file unions with political positioning have been observed actively leveraging prevailing solidarities which were consolidated in various worker-led networks/communities to amplify the workers' agenda and grievances (Cant and Woodcock 2020). On the other hand, the participation of mainstream traditional unions in this context has been limited to geographic regions, most notably in some European countries, Australia, New Zealand, and the US (Johnston 2020, Umney *et al*. 2024). Whereas in the Global South, particularly within the ride-hailing sector, more hybrid forms of organisations have emerged (Schmalz *et al*.

2023). Unions such as the Transport and Allied Workers' Union of Kenya, affiliated to the Central Organisation of Trade Unions and the International Transport Federation, have also been noted diversifying their organising strategies to emphasise on sector-wide collective bargaining (Webster and Masikane 2021). Beyond this, the use of strategic litigation, more prominent in the Global North (Aslam and Woodcock 2020), as well as parliamentary and political lobbying techniques through public meetings and letters by driver associations have been observed at the national level (Morales-Muñoz and Roca 2022). In summary, the expansive array of resistance practices at the collective level illustrates how the multifaceted and complex social relations of platform work not only creates grassroots avenues for worker organising, but also empowers and shapes their action repertoires, by enabling workers to access and effectively combine community, political, and institutional resources.

Online web-based labour platforms

The global organisation of the labour process on online web-based labour platforms dis-embeds the worker from a particular geographical context, limiting their avenues for socialisation to online settings. Though scholarship notes their participation on various social media forums, online communities, and collectives (Salehi *et al*. 2015, Wood *et al*. 2018, Soriano and Cabañes 2020), such exchanges appear limited to seeking or giving advice and assisting fellow members on how to bid for higher value tasks. This includes identifying well-paying customers, avoiding unpaid labour, running skill-training sessions (Anwar and Graham 2019), or developing strategies to cope with reputational insecurities. Thus, self-organised acts have been limited to public letters and online or social media campaigns (Panteli *et al*. 2020), predominantly to generate awareness regarding their invisibility and to humanise their labour. In this regard, these workers have received support from academic researchers, where an online platform named 'Dynamo' was co-designed to support such collective acts and issue guidelines to promote ethical customer behaviour and relations (Salehi *et al*. 2015). Another example includes the co-development of a web-based activist system called 'Turkopticon' that allowed workers to review and rate the customer (Irani and Silberman 2013) and share these evaluations within the worker community.

Overall, examples of self-organised resistance have remained limited. This may be due to the remote nature of the work which makes it harder to build trust, camaraderie, and identify targets for action. Another reason may be the value and high worth that workers tend to attribute to their freelancer or entrepreneurial identity (Schou and Bucher 2023). This corroborates their low support for bottom-up, grassroots organising (Wood *et al*. 2018, Hadwiger 2022), in addition to their fear of being replaced by others from an international labour pool should they choose to withdraw their labour in protest (Graham *et al*. 2017). Even instances of trade union involvement have been confined to the development of the 'Crowdsourcing Code of Conduct' and subsequently the 'Crowdwork Agreement' within the German context that was initiated by the trade union IG Metall (Berg *et al*. 2018, Gegenhuber *et al*. 2022). Scholarship notes that the agreement was driven by Germany's labour relations context, the signatory platforms' desire to evade public regulation while distinguishing themselves from American platforms, and the union's aim to organise new, technology-mediated work arrangements (Johnston 2020, Gegenhuber *et al*. 2022).

Discussion and future research agenda

The objective of this paper was to examine how the social relations of platform work shape workers' acts of resistance. We drew on Joyce's (2020) work that offers a conceptualisation of the social relations of platform work as a labour-capital relation with a cash nexus that arises from the process of subsumption. We found this a helpful starting point to provide an overview of platform-worker resistance practices at both individual and collective levels. In doing so, we note that

the heterogeneity and novelty of some practices tend to stem from the multiplicity of social relations tied to the way in which work (i.e. the platform's labour process) is organised. This is also reflected in the varying targets and the underlying motives behind these acts, including how they have differed in their scale and manifestation based on the type of labour platform. To explicate our argument, we identify and discuss certain outlier practices that workers have devised or engaged in, and which intimate that the social relations of platform work are considerably more intricate than currently portrayed.

At the individual level, resistance practices comprise a breadth of everyday actions that are largely interpretive and have been exercised by the worker within the micro-political system (i.e. the algorithmic architecture of the platform). The individualised nature implies that workers are not passive consumers of organisational discourse; rather, they tend to possess analytical capabilities and wider know-how of organisational control mechanisms that enable them to devise workarounds and 'hidden transcripts' using their creative powers (Anwar and Graham 2019). Therefore, these acts illuminate the workers' motivation to *get by* using their tacit knowledge and to also *get back* at the platform (Nechanska et al. 2020). More importantly, it highlights how technology use by DLPs and corresponding counter-use by workers as evidenced in various everyday actions, are both intimately enmeshed in the social relations of platform work, wherein such interactions are an outcome that is shaped by the social relations themselves (Joyce *et al*. 2023).

In a similar vein, work avoidance, absenteeism, and conditional labour withdrawal have all been long-standing traditional forms of informal resistance by workers. These remain viable and utilised acts even within the platform economy as workers exploit technology and digital connectivity to achieve similar outcomes. However, certain elusive or subtle tactics, like 'mockery', ingratiating techniques with the supervisor for favours or privileges, or 'making out' on the shopfloor (Burawoy 1979, Hodson 1991) have been reimagined and expressed through 'work games' (e.g. long hauling, Mariokarting), sometimes at the customer's expense.

Engaging with customers and suppliers as either a target or an accomplice to resistance indicates a complex, yet novel practice (Vasudevan and Chan 2022, Yu *et al*. 2022). For example, the practice of colluding and deceitfully generating fake orders which involve food couriers and newly opened restaurants in China appears quite dubious and indeterminate (Yu *et al*. 2022). Arguably, this can be explained as transitional forms of subsumption where the capital (i.e. the platform) does not intervene in the production process yet retains a commission from the exchange (Joyce 2020). However, it is important to question the suppliers' motive and possible gains from partaking in such acts. Our understanding of this is limited with key questions that remain to be answered such as, how are restaurants able to recover platform sign-up and commission pay-outs without generating any 'real' revenue from this practice?

Beyond this, workers have engaged in a range of practices involving the customer as well. We particularly note that while the cash nexus may motivate resistance, it is the human-algorithm nexus that defines the social relations at the point of production, and in many cases plays a pivotal role in informing and facilitating several of these worker practices. One such example includes a widely enacted tactic used by both location-based and web-based workers wherein they sidestep the platform, which arguably can dismantle the labour-capital relation between the platform and the worker (Graham *et al*. 2017, Maffie 2022, Tandon and Sekharan 2022). As such, these may be understood as outlier practices, yet we contend that it also demonstrates that the social relations of platform work are more complex than accounted for. This can probably be attributed to the 'nearly' voluntary involvement of different stakeholders within the labour process, each participating based on a relatively disconnected set of individual interests. Additionally, most of these outlier practices are neither foolproof nor uniformly applied and are often used on a case-by-case basis, suggesting variability and inconsistency in the outcomes for workers. Yet, through these low-profile practices, workers can be seen to simultaneously persevere against these 'new relations of domination' (Joyce 2020), while gambling with greater risks of being met with harsh and permanent sanctions from the platform that could limit their access to work or threaten their

income source. This raises important doubts regarding the impact and success attained by workers from engaging in such practices. It is likely that the impact of these acts may alter over time as the platform introduces new algorithmic checks and balances. Therefore, a fruitful avenue for future research could be to explore the role of these other marketplace actors (suppliers and customers) and elucidate the longevity and impact of such practices.

Other prominent resistance practices have included varying degrees of self-organisation by a spatially dispersed workforce that demonstrate the development of a new set of social relations external to the labour process. The formation of distinct organisational forms (e.g. worker communities, grassroots unions, cooperatives) operating at varying scales, capacities, and logics reflect different levels of worker participation, composition, and motives. Once again, the shifting utilisation of technology as a social and political instrument for framing and informing several collective level practices and action repertoires is distinctive, compared to traditional approaches. This includes workers leveraging online communities for mutual-aid, learning, and for socialisation purposes (Anwar and Graham 2019, Ford and Honan 2019, Kwan 2022), or using mainstream and social media channels for knowledge sharing, public advocacy, and outreach activities. It is observed that such efforts are notably diffused across both location-based and web-based platform workers.

Beyond this, some organisational forms have supported informal industrial action against the platform, such as strikes, protests, and online/offline campaigns (Joyce *et al*. 2022). These acts, in comparison to the traditional go-slows and strikes, have been more spontaneous with heavy dependence on technology and social media for planning, broadcasting, and coordination (Woodcock and Cant 2022). In this regard, researchers could explore this shift in the process of organising from solely in-person efforts to where these technological advances have been central. More specifically, we allude to prominent interventions by academic researchers towards the co-creation of online activist systems that facilitated web-based workers to rate/review their customers (Irani and Silberman 2013), and to coordinate campaigns (Salehi *et al*. 2015). We also note how several acts by location-based workers have moved beyond the absent 'shopfloor' or employer-owned sites into the public arena – both online and in-person via urban areas, including supplier locations (Hussain 2023) and client premises (Joyce *et al*. 2022). These examples underline a spatial shift in collective action – a key departure from specific traditions of worker organisation and resistance (Nowak 2016). The workers' motive to sensitise and generate awareness within the sphere of consumption (i.e. the wider public who use DLP services) is noteworthy and reflects their ability to effectively mobilise community relations. However, the use of supplier and client locations for demonstrations, informal protest activities and workplace organising gives reason to speculate on why some stakeholders condone such practices rather than taking action against the workers. It raises an important question as to whether these stakeholders can be theorised as 'new relations of domination' that are introduced and subsumed under the capital (Joyce 2020), or whether they hold an independent position and social relation with the worker. Thus, we reiterate the need for further theoretical and empirical consideration given to the role of these stakeholders, their relationship with the worker, particularly the impact of such practices on them, and the motivations behind why they adopt such (in)action.

Despite such wide-ranging approaches to resistance, the platform's dominance continues to prevail – until challenged by the institutional/regulatory context within which it operates. Karanović *et al*. (2021) report that even workers' responses towards DLPs tend to vary based on the regulatory context and its structures. They establish the centrality of regulations in shaping and influencing the power dynamics and mutual dependence between workers and the platforms, i.e. the social relations of platform work. They further suggest that workers supplement or respond to platforms' organising solutions when the regulatory context is more stringent and direct as against an indirect regulatory setting (ibid). In this regard, the reprioritisation of legal action by workers against DLPs in several contexts emphasises the long-pending need for regulatory and policy interventions that provide clarity on the employment relationship and improve working conditions (Wood *et al*. 2018). Therefore, future studies could explore how strategic litigation or regulatory reform impacts workers and

their nascent collective forms. Beyond that, there is notable involvement of various external actors (e.g. civil society activists, lawyers, political leaders, academics) who have been crucial for bringing in intellectual capital and alternate power resources and approaches. This demonstrates the continued 'liberalisation of industrial relations' (Bondy 2022, p.695) and the accompanying decline in traditional union presence and potential, especially evident in the neoliberal platform economy.

We call for greater research engagement with trade unions to better understand their motivations for (not) supporting and organising workers in the platform economy, and to establish their role and contributions towards these worker struggles. It may also be worth exploring how workers and worker-led organisations view these new relationships, particularly with regards to the varying degrees of union participation and the involvement of other parties (e.g. academics, journalists) in their struggles. This may require probing deeper, to understand any underlying dynamics and conflictual relations with more traditional actors, and whether this could explain their seemingly limited involvement and interest in organising platform workers. Finally, as grassroots organisations have emerged as a popular model of association amongst workers, investigating the possibility for mergers between these and traditional unions remains to be a promising avenue for research (Hadwiger 2022). Despite long histories of collective action in the informal sector and previous, often unsuccessful, endeavours by trade unions to integrate associations of informal workers into their ranks, this remains a noteworthy direction for future research (Lindell 2011, Rizzo and Atzeni 2020). In this regard, we draw specific attention to experimental trends in platform unionism, emerging from the Global South, where hybrid organisational forms have been noted (Schmalz *et al*. 2023). Arguably, there is a useful learning opportunity for unions that could assist the evolution of their organising strategies in line with accommodating the needs of a changing and increasingly precarious workforce and consider how they could harness the energy brought by such grassroots enthusiasm, especially in unfavourable institutional contexts (Webster *et al*. 2021).

We have recognised how resistance practices by platform workers have been digitally adapted and spatially unfixed, bringing to the forefront a technology-empowered grassroots wave of labour activism. Here, some acts have demonstrated a greater potential to have a more disruptive effect on the platform's business model than others. For example, acts that inflict damage to the DLP's brand image, sabotage their customer base, or prompt stricter regulations from governing bodies, could be viewed as threatening the DLP's positioning as a technological intermediary rather than a conventional employer. In this regard, scholarly research has provided few insights into DLPs' reactions and responses to workers' resistance practices. Although Joyce (2020) places the platform (the capital) at the centre of analysis, the DLP's perspective remains markedly absent. Their inclusion will aid our understanding on three fronts; first, whether they recognise these heterogeneous worker practices as acts of 'resistance'; second, how they view the involvement of customers and/or suppliers, particularly when they act as an accomplice to some of these practices, and at times jeopardise the platform-worker cash nexus; and third, how they tackle or respond to these practices.

We also note a need for more granular assessment of the potential of these resistance practices to impact both policy and practice levels. This will expand our knowledge on the workers' scope for negotiating a meaningful relationship that enforces better working terms with the platform and other stakeholders (e.g. national policy and regulatory agencies). Here, a worker-centred approach could be helpful to investigate which resistance practices are perceived as effective and to examine how success is defined. Further, since the workforce participating in platform work is predominantly male, there is a necessity to also consider female workers, examining issues around direct and indirect discrimination. This might include challenges in managing their digital reputation, as well as understanding the variations in their organising and resistance practices (see Dhar and Thuppilikkat 2022, Kwan 2022, Tandon and Sekharan 2022). Accordingly, we call for more in-depth qualitative work which remains necessary, but there is also merit to large-scale quantitative studies along the lines of Bessa *et al*. (2022), Joyce *et al*. (2020), Wood *et al*. (2018, 2023), and Umney *et al*. (2024). Such research can analyse the variety of resistance practices, and the underlying

agenda, target, and frequency of these acts based on worker attitudes, attributes, income dependence, intersectional categories, and circumstantial factors across the different types of platform work in both global north and south contexts. Longitudinal, multi-stakeholder designs would be especially welcome for gaining an understanding of how social relations of platform work unfold over time, although data access remains a challenge, especially from the platform perspective.

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