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Gig economy and algorithmic human resource management: Forging transparency, adapting behaviors, expanding control

Gig economy *e gestão algorítmica de recursos humanos: forjando transparência, adequando comportamentos, ampliando o controle*

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Abstract
Algorithmic HRM is a characteristic aspect of the gig economy and platform work, but its transparency and its effects on workers' behavior are still little explored in the literature. From gig workers' interviews (rideshare drivers), this article explored how algorithmic management influences the working day, especially the dichotomy of transparency vs. opacity. In so doing, we find three main influences of algorithms on HRM practices: work assignment, remuneration, and performance management. We identified that workers have high distrust and uncertainty regarding these practices, which develop in a context of surveillance, control, and punishment. The study expands the discussions on the effects of adopting algorithms for HRM, especially in a domain characterized by precarity and informality of labor relations.
Keywords: gig economy; human resource management; algorithmic management; algorithms.

Resumo
A gestão algorítmica de recursos humanos é um aspecto característico da gig economy e do trabalho em plataformas, mas sua transparência e seus efeitos sobre os comportamentos dos trabalhadores ainda são poucos explorados na literatura. A partir de entrevistas com gig workers (motoristas de aplicativos), este artigo explorou como a gestão algorítmica influencia no cotidiano de trabalho, sobretudo em relação à dicotomia transparência vs. opacidade. Ao fazê-lo, identificamos três principais influências dos algoritmos nas práticas de GRH: distribuição do trabalho, remuneração e gestão de desempenho. Identificamos que os trabalhadores possuem forte desconfiança e incertezas em relação a essas práticas, que se desenvolvem em um contexto de vigilância, controle e punição. O estudo amplia as discussões sobre os efeitos da adoção de algoritmos para a GRH, em especial em um domínio caracterizado pela precarização e informalidade das relações de trabalho.
Palavras-chave: gig economy; gestão de recursos humanos; gestão algorítmica; algoritmos.

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1 Introduction

The emergence of the digital platforms that make up the gig economy is one of the most significant transformations in the world in recent years (Woodcock & Graham, 2020). Platform companies mediate the relationship between clients (users) and workers who perform services and activities on demand. This dynamic forms a context of precarious labor relations, marked by informality, insecurity, and the absence of labor rights and benefits (Duggan et al., 2020; Abílio, 2021). Some notable examples are the activities provided through platforms such as Uber, 99, Rappi, iFood, Lyft, and MTurk.

A characteristic element of work through digital platforms is the wide use of algorithmic management (Walker, Fleming & Berti, 2021). This form of management is defined as a "diverse set of technological tools and techniques that structure the conditions of work and remotely manage workforces" (Mateescu & Nguyen, 2019, p. 3). It constitutes an alternative model of human resource management (HRM) (Cheng & Hackett, 2021; Meijerink & Bondarouk, 2023), in which the algorithms take on managerial functions previously delegated to the boss/manager (Duggan et al. al., 2020; Lee et al., 2015). This allows platform companies to manage and control many globally dispersed workers efficiently. Such dispersion is essential for the growth of business models in the gig economy (Mateescu & Nguyen, 2019).

Algorithmic management is a topic addressed in various studies (e.g., Wood et al., 2019; Curchod et al., 2019; Kellogg, Valentine & Christin, 2020; Jarrahi et al., 2021). However, the literature has not yet answered all questions about its adoption, operation, and influence on HRM applied to digital platforms (Duggan et al., 2020; Connelly et al., 2021; Meijerink & Bondarouk, 2023). The peculiarities of algorithmic management and how it affects workers' activity and behavior require better understanding (Duggan et al., 2020; Meijerink & Bondarouk, 2023; Wu, Liu, Qu, & Wang, 2023), especially concerning the transparency and autonomy of HRM policies and practices implemented by platform companies (Bucher et al., 2021; Woodcock; Graham, 2020; Meijerink & Bondarouk, 2023).

This article addresses this gap and aims to understand gig economy workers' perceptions of the algorithmic management of their activities. It discusses how this form of HRM influences daily work concerning the dichotomy of "transparency vs. opacity." The multiple ways of acting in the gig economy were considered, and the research focused on urban transport applications – pioneers in the area. More precisely, the study is about the work of app drivers in the metropolitan region of São Paulo.

The research is relevant due to the exponential growth of platform work, especially in the area of transportation, and the growing application of algorithmic management as an HRM model – not only on gig economy platforms but in different economic sectors (Duggan et al., 2020; Meijerink & Bondarouk, 2023). Through interviews and discussions, the analysis reveals and discusses how this new form of management involves contradictions, opacity, and mistrust, in addition to reinforcing potential biases and prejudices.

2 Theoretical Framework

2.1 Gig economy and platform work

Gig economy refers to "labor markets that are characterized by independent contracting that happens via and on digital platforms" (Woodcock & Graham, 2020, p. 10). The term portrays the emergence of a new capital-labor relationship between workers and digital

platforms that mediate and control the supply and demand of work but do not consider themselves employers (Gandini, 2019; Abílio, 2021). The fixed relationship between employee and employer is replaced by a new mediation structure (the platforms), configuring digital labor markets supported by labor precariousness, flexibility, and deregulation (Vaclavik & Oltramari, 2022). The platforms constitute the common denominator of all types of gig work mediated by technology, distinguishing them from other alternative and/or precarious forms of work (Duggan et al., 2020).

This way of connecting supply and demand for paid work involves at least three actors: digital platforms, a worker, and an end customer. Others may be involved, such as a provider in cases of delivery services (Duggan et al., 2020). The speed with which new tasks are offered and accepted through the platforms and the workers' ease of access to them leads to a segmentation of the job offer at the level of individuals, providing platform companies with on-demand hiring and an easily scalable workforce (De Stefano, 2016; Woodcock & Graham, 2020).

Duggan et al. (2020) classify digital work platforms into three typologies: i) capital platform work: which consists of using platforms to connect people to sell or rent an asset or capital (such as Airbnb); ii) crowdwork: work performed remotely on platforms that make tasks available to a globally dispersed crowd without the need for geographical proximity (such as Amazon Mechanical Turk and Freelance.com); and iii) app-work: work intermediated by platforms that use individuals to perform geographically and temporally restricted tasks. These usually consist of traditional services and activities (such as urban transport – Uber, 99, Lyft – and deliveries – iFood, Rappi).

Uber is an emblematic example of a platform that uses this type of work. The company became so well known that it originated the neologism "uberization," often used to refer to the expansion and changes resulting from working via digital platforms. This activity does not provide for any labor benefit or even an effective employment relationship since Uber does not consider itself a transport company but a technology company that facilitates the connection between potential users (passengers) and potential workers (not by chance called "partner drivers") (Franco & Ferraz, 2019; Gandini, 2019). Workers often see the app as a way to obtain a main or supplementary source of income (Valente et al., 2019), even if they must assume responsibility for business risks, such as those related to the car, cell phone, internet, passenger safety, among others (Franco & Ferraz, 2019).

Uber had about 5 million drivers and delivery people worldwide in the first quarter of 2022. Of these, 20% - or 1 million – were in Brazil (Uber, 2022). At the end of the third quarter of 2022, around 1.7 million people worked in the on-demand transport sector on platforms in the country. Of this group, 62.8% were app drivers, 14.2% were motorcycle taxi drivers, and the rest were delivery drivers (Ipea, 2022).

2.2 Algorithmic human resource management

Human resource management activities have been increasingly intermediated and executed by algorithmic software to automate them and improve decision-making (Meijerink, Boons, Keegan & Marler, 2021), not only in the scope of the gig economy. The international literature has called this phenomenon 'algorithmic HRM' (Cheng & Hackett, 2021). It has been driven by the expansion and cheaper access to the internet and smartphones, the speed, scale, and ubiquity of new surveillance and data processing technologies, and developments in machine learning (Woodcock & Graham, 2020). The use of algorithmic HRM may be a)

entirely through computerized systems, without human intervention, b) with the supervision of human managers, or c) as a form of support for human decision-making (Bucher et al., 2021). In the three cases, this form of HRM is characterized by abundant data collection, real-time responsiveness to data supporting management decisions, and automated or semi-automated decision-making (Mateescu & Nguyen, 2019).

Algorithms have been used in the most diverse HRM activities, such as recruitment and selection (via chatbots, profile tests, and resume scanning); training and development (such as identifying skill gaps and custom training); performance management (such as rating systems and other automated indicators), emotional support (or lack thereof) for workers; and others (Duggan et al., 2020; Kellog et al., 2020; Queiroz & Rodrigues, 2021; Meijerink & Bondarouk, 2023). Algorithms help to scale operations by coordinating a large and disaggregated workforce (Mateescu & Nguyen, 2019), expanding the capacity for surveillance and control over workers (Wood et al., 2019). In this sense, Kellogg et al. (2020) refer to this process as the "6 Rs": restricting, recommending, rating, recording, rewarding, and replacing.

Although platform companies advertise themselves as intermediaries between supply and demand for work, they play the role of managers/employers, mainly by imposing rules and control mechanisms that shape how work should be performed (Woodcock & Graham, 2020). Companies determine minimum standards of care, quality of service, selection, and management of the workforce; exert a high degree of control over workers; oversee where the labor activities are carried out and the time until completion; and determine the remuneration (De Stefano, 2016; Woodcock & Graham, 2020).

Another relevant feature of algorithmic HRM is gamification to control workers and stimulate engagement, attention, and extended periods of higher productivity (Gandini, 2019). Gamification refers to techniques that structure social behavior using metrics and systems taken from games, such as competition and rewards. Woodcock and Johnson (2017) propose using the term gamification-from-above to refer to the type of gamification we observe in app-work platforms. In this type, standardization, surveillance, and regulation systems are imposed through interaction techniques originated in games, separated from their original ludic context. In short, these are stimuli – "nudges" or penalties – to encourage certain behaviors directly and/or indirectly (Mateescu & Nguyen, 2019). Rosenblat and Stark (2016) call these control mechanisms (that are more subtle, sophisticated, and therefore more difficult to be perceived by workers) "soft control."

Despite seeking to convey the perception of objectivity and impartiality, algorithmic HRM processes may not be implemented neutrally (Rodgers et al., 2023). The goals, interests, and agendas they intend to serve and who is involved in their creation and implementation must be considered (Duggan et al., 2020). Rosenblat (2018, p. 19) analyzed the algorithms Uber uses to manage work and observed that they "intermediate transactions according to a set of company rules that may have built-in biases in favor of the company's own results." Algorithms and new production and control technologies are therefore implemented to maximize the value created by the workforce (Kellog et al., 2020) and significantly shape workers' behavior (Bucher et al., 2021). In the case of platform companies, due to the possibility of evaluating, giving opinions, or influencing the decisions and results from the algorithms, there is still the presence of passenger biases, including discriminatory ones (Silva & Kenney, 2019).

The emergence of algorithmic management requires a debate about opacity and lack of transparency (Rodgers et al., 2023). The opacity of algorithms refers to the lack of understanding of the logic behind the decisions they suggested. The receiver does not know how or why a particular decision was made or what data were used as inputs for the process

(Burrell, 2016). Jarrahi et al. (2021) propose two facets to analyze algorithmic opacity: i) technical, based on design and specific material resources of emerging algorithmic systems, and ii) organizational, based on the absence of disclosure of information by organizations, to protect strategic interests. For Bucher et al. (2021, p. 60), opacity allows for control over workers' behavior since behavior is not necessarily altered by punishment but by fear and ignorance of how algorithms work. In the case of transport companies, algorithmic HRM usually includes bonuses, rewards, and promotions with participation criteria that are little or completely unknown to workers (Woodcock & Graham, 2020). There is also evidence that platforms constantly and unilaterally change the amounts paid, limiting workers' autonomy (Rosenblat, 2018).

Thus, this research aims to answer the problem-question: how do gig economy workers perceive the algorithmic HRM of their activities, especially regarding the transparency and opacity of HRM practices?

3 Methodology

This is a qualitative, descriptive, and exploratory research. For data collection, individual semi-structured interviews were conducted with eleven app drivers in the metropolitan region of São Paulo, Brazil. Data were collected between May and November 2022. Among the participants, eight were men, and three were women, aged between 28 and 72 years, with experience as a driver between two and six years, and declared working between 15 and 70 hours a week. Codes were assigned to the respondents to preserve their identity and maintain the ethical commitment of the research. Table 1 presents the participants' sociodemographic profiles.

Table 1
Sociodemographic profile

Interviewee	Age	Education	Marital status	Gender	Experience as a driver
I1	62	Higher education	Separated	Male	4 years
I2	36	Vocational high school	Married	Male	5 years
I3	68	Higher education	Married	Male	2 years
I4	48	Higher education	Married	Male	5 years
I5	28	High school	Married	Male	6 years
I6	61	Higher education dropout	Separated	Male	4 years
I7	64	Higher education dropout	Widow	Male	5 years
I8	72	High school	Widow	Male	6 years
I9	39	Higher education	Single	Female	3 years
I10	34	High school	Married	Female	6 years
I11	39	High school	Divorced	Female	3 years

Source: Elaborated by the authors (2023).

The interviews were guided by a semi-structured script and lasted 30 to 60 minutes. The questions covered remuneration, work evaluation, strategies and criteria used by drivers to accept or reject rides, decisions about the work routine, learning about the applications' resources, and the perception of the transparency of each aspect. The questions were designed based on evidence from previous studies (Lee et al., 2015; Woodcock & Graham, 2020;

Rosenblat, 2018) and the authors' experience and knowledge of the applications' terms and conditions.

As a criterion for participating in the research, the drivers had to have at least six months of experience working on platforms, the time considered sufficient for accumulated experience and knowledge at work. All respondents worked as Uber drivers. In addition, three previously worked through 99, and five worked simultaneously through both applications. Some differences exist between the apps related to pay, functionalities, and features. However, similar to other studies, such as Lee et al. (2015), who interviewed Uber and Lyft drivers, we understand that these platforms share fundamental characteristics that allow their joint analysis without major losses. Furthermore, as they all worked at Uber, the possible effect caused by the difference in application management is mitigated.

For data analysis, we used the thematic-categorical content analysis technique (Bardin, 2006). All interviews were recorded and transcribed. The exploration and analysis stage of the transcripts involved repeated listening to the audio and consulting the theoretical framework. The speeches were encoded by selecting and highlighting where the interviewees referred to aspects of interest to the research. We then reread the material looking for patterns in the data and organized the information into a table. Initially, 34 codes were generated to synthesize the content of the speeches. It was then possible to identify repeated statements, frequently used words, themes with a great diversity of perceptions or unanimity, or other possibilities. The codes were clustered into five categories: i) assignment of rides; ii) work evaluation; iii) remuneration; iv) obtaining information; and v) desired changes. Each category was analyzed cross-sectionally regarding "transparency vs. opacity," trying to show the interviewees' perceptions of these two aspects in each category. Finally, such contents were clustered into the three analytical categories described in the next section. The entire analytical procedure was performed manually.

4 Results

The methodological procedures led to the identification of three categories that represent the main influences of algorithmic HRM management: work assignment, remuneration, and performance management.

4.1 Work assignment

The algorithms used by transport platforms to connect passengers and drivers seek to assign rides to meet certain goals. The physical proximity between the driver and the passenger, for example, is an important criterion for the platforms, as it reduces the waiting time for the driver to arrive, making the application more attractive to users.

We identified two distinct driver profiles regarding the behavior adopted to accept or decline rides directed by the platform. One group does not have or has few criteria and preferences in choosing a ride. Therefore, they accept most rides, as they understand they came "to work." The other group's criteria included considering region, security, and time, among others. The responses of drivers I8 and I2 indicate, respectively, these different approaches:

> *I have no preference. If you're in your house, you're close; it doesn't matter where you're going, I'll pick you up and take you, it doesn't make any difference to me. [...] It's rare for me to refuse* [a ride]*, you know why? Passengers are not to blame; if it weren't for passengers, there would be no app (I8).*

> *It has to be a worthwhile trip; it has to be strategic. You already have to think about the beginning, the middle, and the after. If the ride is not too far away for you to accept it, if it ends in a location, let's say, where you will have a return, where you will be able to accept another ride to go somewhere else. [...] It's a bit of strategy and a bit of luck too (I2).*

The perception of these two groups was analyzed regarding the transparency of the criteria used by the platforms to assign the rides. Despite the workers in both groups stating that they know the platform's rules, we identified a high degree of distrust and uncertainty because it is impossible to verify how the algorithm operates. Drivers' observations and practical experience often do not correspond with what is disclosed or the information they receive from the platform. Statements such as "according to Uber," "theoretically," "they say," and "impression" were used to explain how ride assignment works, revealing the perception of little transparency:

> *It's all automatic, you don't know how it works behind the scenes [...] They have an algorithm there; what is it called? I don't know, an algorithm, if I'm not mistaken, which is automatic [...] So, the moment you call, theoretically, the closest car is the one they will send you (I7).*

> *You can't trust it. This is something that today I speak freely without hiding. It is a company that is not transparent; it is not honest, okay? And it manipulates the situation to take advantage of it and favor a passenger and not favor the driver. That's clear. Everything is done by the application's algorithm, right? It is an artificial intelligence (I6).*

In addition to this distrust, the platforms allow workers to previously control certain requirements for rides, such as destination region, payment method, and customer gender. However, many workers reported that using these requirements can substantially decrease the number of rides received, decreasing the income earned from the job. Finally, drivers demonstrate satisfaction with the possibility of determining the places and hours of work. This makes it possible for those with other income sources to work for the apps at preferred times, earning extra income. It also allows them to work in better-known regions, where they feel safe or which they deem more profitable. The possibility of interrupting work on the application for long periods was also positively evaluated, being able to return in the future without major difficulties. In this sense, we can say that workers have some degree of autonomy to choose the days and hours of work. However, the discourse of total autonomy propagated by the platforms does not correspond to the reality observed. The remuneration structure and other strategies used by these platforms increase their control over workers while limiting autonomy to choose regions, hours, and duration of work, as discussed below.

4.2 Remuneration

As with the work assingment, we noticed uncertainty and distrust among drivers about the criteria and processes that determine ride prices and possible bonuses. This occurs for two main reasons: i) the complexity of checking the calculations that lead to the composition of the ride's final price; and ii) dynamic variations in prices due to increased customer demand or weather conditions:

> *The price is per kilometer. It's hard for me to get an idea, because, honestly speaking, I can't calculate (I8).*
>
> *There are times when we think that the application is transferring a different value to us. I'll explain. You're charging the customer a lot more, or like a dynamic price, and for us, it's not a dynamic price. It pays the regular price. So, we often think that the application is not good or transparent with us (I5).*
>
> *I always tried to make a spreadsheet with the day's rides, how much I made, and how much I didn't, and sometimes I noticed that it made a certain difference. Sometimes, in one ride, I got cents; in the other ride, there was a difference of one real, and I wanted to talk to them, ask why there was this difference, and I couldn't. I couldn't [...] I said, "you know what? Whatever they pay, it's paid, it's fine with me," so I gave up the spreadsheet, I gave up everything (I1).*

Respondents perceive that they are at the mercy of changes in the amounts paid and fees charged by platforms, which they decide unilaterally. Phrases like "Uber doesn't oblige you," "you don't have to accept it," "no one is obligated," are present in the speeches, but some also mentioned "be quiet" and feel "hostage" or "tied" by the apps due to the need to work and get some source of income. This shows that the control exercised by the platforms over working hours and remuneration affects the subjectivity of workers and reduces their agency:

> *Nowadays, you're kind of a hostage to what it* [application] *wants to pay, and that's it. It's not being fair (I2).*
>
> [I work] *from nine to ten* [hours a day] *because, in terms of profitability, less than that... doing this* [working that many hours] *is already difficult* [...] *When you engage in work like this, for nine, ten hours, you do not have enough time to do something else. I wanted to disconnect from Uber, but I can't leave anymore (I6).*
>
> *They* [applications] *don't do anything; they just have the platform, who puts gas, who does everything is the driver, and they charge a very high fee, which we can't even understand, and there's no way to talk, to appeal (I11).*

Drivers' perceptions of using gamified resources – such as dynamic pricing (increased value of rides due to increased demand) and promotions that reward certain behaviors – were also analyzed. We identified that the dynamic price does not substantially influence workers' behavior. Three aspects explain this indifference: i) distrust due to the perception that the dynamic price is used to manipulate drivers, encouraging them to move to an area with greater demand and then normalize the price again; ii) the fact that the change in prices does not compensate for the trip to the region; and iii) workers' reluctance to leave more familiar and well-known regions, especially for security reasons.

On the other hand, promotions were cited as effective incentives and prompting respondents to work longer hours when this resulted in completing the requirements for a bonus. One difference that explains the efficiency of promotions, as opposed to the inefficiency of dynamic pricing, is that they do not require drivers to change regions and reward other types of behavior (such as reaching a minimum number of trips in a given period or working a certain amount of consecutive days).

> *It ends up being addictive* [working through applications]. *You know you're going to leave; you're going to make some money.* [...] *you end up in a vicious cycle of having*

> *that money daily. You're not doing anything else; what are you going to do? Turn on the application (I5).*

4.3. Performance management

Performance management on the platforms is based on two indicators: customer evaluation and acceptance and cancellation rates. In both, there is the possibility of punishment for low performance through temporary bans and/or definitive bans from the platform.

Drivers reported knowing how the evaluation system works. It is composed of a score that assigns from one to five stars based on the average rating passengers provide. The biggest dissatisfaction of the interviewees with the system is the absence of objective and standardized evaluation criteria, generating, once again, the perception of injustice and distrust. There are no ways to gauge whether the assessment made by passengers was honest or based on elements beyond the drivers' control, such as traffic:

> *If you* [passenger] *evaluated* [score] *1, you must justify it, right? The guy's car is dirty, or he treated you badly; something happened. This feedback would be interesting for me. I don't get it* [this feedback]. *I don't know who evaluated me with a low score and I don't know why either, you know? I treat everyone the same (I7).*

There is also the perception that passenger biases and prejudices can influence grades:

> *There are people who evaluate you, not your work. If they* [a passenger] *get to my car and see* [me] *a long-haired, bearded black man, wow... When they get out, they won't see my work, that I drove well, I was polite, I opened the door, I was friendly. They will analyze me for what they saw. [...] You have to evaluate the work, not my appearance, I'm not pretty. So don't judge me by beauty, or I will get one star every time* [lowest score] *(I8).*

> *I once picked up a couple on a ride, and the husband complimented me; he said I drove well. The wife got jealous, I think, and she went there and gave me one star (I10).*

Drivers' biggest fear is the possibility of being punished for a passenger's excessively negative evaluation or constantly refusing rides. The interviewees mentioned that there is no transparency regarding the criteria for possible penalties. For example, two interviewees reported that there is a minimum score required for drivers to remain in the application. However, they did not know what this score was (each one cited a different score). As a result, drivers felt pressured to keep very high scores:

> *You start with a 5, and it goes down 4.3, 4.2; when you get 4.2, 4.1, 4.3 in Uber, they cancel your registration. you know? So you have to be sure, to keep 4.99, 4.9 (I3).*

> *These days I was at 4.99* [in the rating], *I wanted those 5 stars because the more you have, the more you change your status, and you are assigned better rides. Then, I lost a star, I don't know what happened, who it was, because we don't know who the passenger is, what happened, we imagine, but we are not sure. Then it went to 4.95. Then I lost another star and it went to 4.85. Then when you reach 4.85 they say you need 99 five stars for you to reach 4.87. You know? One punch is enough to put you down, but it takes time for you to get back on your feet (I9).*

The perception that punishments are applied inconsistently and without justification also adds to this picture. Thus, some drivers reported feeling they could be punished anytime. For them, passengers are disproportionately favored to the detriment of drivers, as a single complaint, even if unfounded, can lead to punishment even for those who have high rates consistently:

> *It* [the platform] *does not assess passengers. They can do whatever they want, it doesn't care. What it wants is the money for the trip* [...] *it restricts us, we are penalized, and the passenger is free to do whatever they want. If they get out of the car and say anything rubbish about us, it is accepted. It* [the platform] *won't do anything. Depending on the passenger's evaluation, it can ruin the driver, right? (I6).*

The possibility of bans after ride cancellations and refusals is understood as a limiting factor of the autonomy propagated by the platform companies since it forces workers to accept unattractive rides:

> *You see, with all the ratings I had… I think this was wrong. With everything I had, there was not enough reason to ban me from the platform because of a complaint... I think it's unfair, it* [the platform] *didn't even listen* [to me]*... it just listened to me because I went there and opened my application and they saw that my average was really great, many compliments in writing. Then I went back to the platform. I thought it was unfair; it's not serious (I8).*

> *When they say that we are autonomous, that we choose, and do what we want, it's a lie. If I fail to make a ride for the third time, Uber "logs me out." It's the algorithm. Then I have to "log in" again, put in a password, and start all over again. And we know that there are cases that, if you repeat this a lot, it gives you a punishment of half an hour off the air, an hour without you being able to answer the application. Where is our autonomy in choosing? I don't say it forces me, but it blocks you, so you have to go (I6).*

Considering these aspects, the interviewees perceive that they are continuously watched, both by the platform and by the passengers. However, although punishment is a consequence of the surveillance exercised, workers have a diametrically opposite perception of them: surveillance is seen as a resource for the safety of drivers themselves, while punishment is perceived as negative and unfair:

> *For me, I think it's much better. Because you're dealing with people you don't know, you're putting them in your car. So your safety, whether you like it or not, you are putting yourself at risk. So it's good that you are always being monitored (I5).*

> *If I change the route the next day, a message comes to me: "why did I change the route?" It is accompanying you. I think it's great, you know? It's not interfering with anything; it's a security you have (I3).*

5 Discussion and contributions

This article contributes to and expands the literature on different labor relations and HRM aspects of gig economy digital platforms. The first is the identification that algorithmic HRM influences, in particular, three main HRM activities: i) work assignment, ii) remuneration, and iii) performance management. It is noteworthy that these practices are not exhaustive. Previous national and international studies suggest other HRM practices within the gig

economy that are different from traditional work models, such as recruitment and selection of workers, training and development, and career understanding (Crayne & Brawley Newlin, 2023; Meijerink & Bondarouk, 2023; Queiroz & Rodriguez, 2021). This research adds to the discussion by registering that HRM practices are based on three interrelated characteristics that configure the daily life of gig economy drivers: i) the lack of transparency regarding practices, which brings uncertainty, mistrust, and a sense of injustice; ii) the uninterrupted surveillance and control established by the platforms, which may entail punishment; and iii) the ability of algorithms to influence workers' behaviors, both to obtain rewards and to avoid punishments.

Each of these characteristics offers specific contributions. We found that the difficulty for workers to understand how the algorithms work may be associated with the lack of transparency in the processes. There is high distrust and uncertainty regarding the platform HRM practices. Workers have difficulty understanding how payment is calculated and how algorithms assign a passenger to a driver. Despite the assertion that the platforms seek to identify the closest drivers capable of assisting the passenger more quickly, there is suspicion that other aspects, such as performance ratings and drivers' "time at work" influence this process, corroborating previous evidence (Lee et al., 2015; Rosenblat, 2018).

This condition challenges the drivers' decision-making freedom, reducing their agency and autonomy. In addition, it generates a sense of opacity that opposes a supposed attempt by the platforms to promote greater transparency about their actions. The opacity of algorithmic management results from organizational decisions and the technical characteristics and logic of complex algorithms (Burrell, 2016; Jarrahi et al., 2021). Thus, a situation of complete transparency is hard to imagine. This was evident when the interviewees reported that, even after the changes implemented in the remuneration and ride targeting system, they still perceive injustice and feel manipulated by the platform. A striking example is when they notice a remuneration reduction but cannot calculate it accurately.

Another contribution of this article is the understanding that the three HRM practices develop a straightforward process of surveillance and punishment. As in previous studies (Walker, Fleming & Berti, 2021; Amorim & Moda, 2020), respondents reported that the platform monitors them around the clock. This can include GPS position, duration of trips or waiting time, driving speed, access to apps, audio and video recordings of rides, and cameras, among others (Duggan et al., 2020). Paradoxically, despite the constant surveillance to which they are subjected, workers perceive it as a form of protection and security, given the intrinsic risks of the work.

There are also strong uncertainties and distrust regarding the platforms' punitive criteria. In addition, some workers reported perceiving that their race, ethnicity, and gender influence the users' evaluation, indicating that biases and prejudices can influence algorithmic HRM. Added to an information and power asymmetry (Curchod et al., 2019), the complex configuration of punishment mechanisms makes companies exercise a "soft control": an effective and relentless control, but softened by algorithmic HRM, the absence of a manager figure, and the ideology of autonomy (Robenblat & Star, 2016). The rating of each driver is obtained from the average of the passengers' evaluations, configuring a practice of "management by customers," in which the managers no longer give feedback or evaluate the work (Gandini, 2019). In addition, companies monitor a series of indicators, such as acceptance and cancellation rates, online hours, and the number of rides completed (Rosenblat, 2018). This is an efficient form of work control, as it leads drivers to pursue high averages, which will only occur through providing excellent service (Wood et al., 2019). It is a set of aspects aimed at disciplining workers (Kellogg et al., 2020).

Finally, according to the results, the algorithms can influence workers' behavior, adapting them to the needs of the platform, especially to balance supply and demand for travel. This occurs through gamification particularly, which includes determining dynamic prices (albeit less effective) and bonuses to encourage drivers to work longer hours and in specific locations, thus increasing the labor supply (Woodcock & Graham, 2020). These are the "behavioral nudges" to which Duggan et al. (2020) refer. As Meijerink and Bondarouk (2023) pointed out, the influence on behaviors reveals the duality of algorithmic HRM. In this research, this duality is manifested by the notion that platform work is a game, triggering, on the one hand, a perception of "addiction" to work and, on the other, the possibility of obtaining monetary rewards as long as it is "played correctly" following the rules unilaterally defined by the platform.

Despite the continuous propagation by platform companies that drivers have autonomy, these professionals have to provide passengers with a standardized experience, or they will be blocked or permanently banned – there is no room for manoeuver. Furthermore, they are constantly subjected to management practices that shape and control how they should behave at work (Rosenblat, 2018). Respondents report feeling "tied" or "hostages" to the structures created by the platforms. The control of cancellation rates, the continuous fear of arbitrary punishments, the remuneration structure imposing extensive working hours, and the need for strategic decisions to minimize losses curtail their autonomy.

These findings allow us to understand how algorithmic HRM constitutes an alternative HRM model. Platform companies carry out the typical HRM responsibilities and functions, such as performance appraisal and compensation. However, the approach to these activities differs significantly from the established models, both in terms of their strategic purposes and their implementation (Duggan et al., 2020; Crayne & Brawley Newlin, 2023; Meijerink & Bondarouk, 2023; Queiroz & Rodriguez, 2021). This condition is expressed in the contradiction between "transparency vs. opacity" that configures the daily work of application drivers, as found in this research. One cannot rule out the possibility that this is a deliberate opacity: platform companies need it to support their business model globally and virtually. Mistrust and perceptions of manipulation, biases, and injustices are thus generated.

5.1 Limitations and future studies

All aspects identified require new and deeper investigations. For workers and researchers, there is still much to know about the functioning of algorithms and their influence on HRM, workers' behavior, and their potential to appropriate biases and discrimination. This article contributes to the advancement of these discussions. However, we recognize its limitations, especially methodological ones – such as the small number of women interviewed (a gender bias that materializes the very configuration of the gig economy in the transportation sector) and its realization in a single location (which can reinforce, to a greater or lesser extent, local particularities).

Future studies, therefore, can emphasize how algorithmic HRM influences and is perceived by women and how it has spread to other professions, locations, and economic sectors. Analyzing similarities and differences between activities will provide a deeper understanding of the fundamental properties of algorithmic HRM and how it can develop in the future. Furthermore, specific research on biases and prejudices can contribute to understanding how algorithms produce and reproduce injustices and social inequalities. In addition, the three HRM activities analyzed in this article are not exhaustive, and future research may look into other

practices, such as recruitment, training, emotional support, socialization, and others inevitably modified by the use of algorithms. Finally, workers' resistance strategies to these new forms of management, whether individual or collective, also require further studies, including considering how workers use their own algorithms for their own benefit.

6 Final considerations

This article aimed to understand the gig economy workers' perception of the algorithmic management of their activities. The research contributes to and expands the existing literature by pointing out that, based on precarious and informal labor relations, algorithmic HRM occurs in three main practices: work assignment, remuneration, and performance management. These practices are in line with a set of interrelated aspects that allow us to conclude that algorithmic HRM: i) cannot hide the opacity of its policies and practices, even with attempts to promote a forced and fake transparency; ii) seeks to adapt workers' behaviors to align with the platform companies' imposed/desired behaviors; and iii) it expands surveillance and control over workers, including the possibility of punishment, which opposes the platform's much-propagated narrative of autonomy and freedom.

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