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Contents

Two tales of platform regimes in China's food-delivery platform economy

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Abstract

This article brings the often-overlooked concept of the labor regime back to the study of China's food-delivery platform workers. Two tales of platform regimes emerge: individualized platform despotism and bureaucratized platform despotism, which apply to crowdsourcing couriers and dedicated delivery couriers, respectively. This study compares these two types of platform regimes in terms of their institutional foundation and labor organization. Despite different institutional arrangements and labor organization, both types of food-delivery couriers belong to a despotic platform regime revealing workers' subordination to the platform. In conclusion, it discusses the implications and limitations of this study.

Keywords: Platform despotism, Food-delivery platform, Couriers, Platform regime, China

Introduction

Over the last decade, rapidly expanding information communication technologies (ICTs), big data, and cloud computing have enhanced digitally-enabled platforms, which has overwhelmingly transformed the worldwide economy (De Stefano 2016; Kenney and Zysman 2016; Srnicek 2017). Different types of platform enterprises have emerged across the world. In 2017, the combined value of the platform companies with a market capitalization of more than $100 million was estimated at more than $7 trillion—67% higher than in 2015 (United Nations 2019: xvii). China is one of the centers of this wave, with more than 75 million people working on digital platforms,[1] which creates a large-scale digital working class (Qiu 2018). This article focuses on the food-delivery industry and the platform workers within it.

The scale of the food-delivery industry in China has gone through tremendous growth in the past few years. It was estimated that the scale of the online food-delivery industry was 664.6 billion RMB in 2020, 15% higher than in the previous year.[2] The COVID-19

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[1] China National Information Center, "Annual Report on China's Sharing Economy Development (2019)", see http://www.sic.gov.cn/News/557/9904.htm, retrieved on 8 January 2021.

[2] https://www.chyxx.com/industry/202106/956697.html, retrieved on 9 January 2022.

pandemic further accelerated this growing process. Accompanying this industrial growth, many job seekers enter this industry and choose to become food-delivery couriers. There are two dominant food-delivery platforms in China, Meituan and Ele.me, which account for more than 90% of couriers. For example, in 2020, the number of registered couriers in Ele.me was 3 million, while the size in Meituan was close to 4 million.[3] Based on the survey reports released by the two platforms, 80% of platform workers come from rural areas concentrated in Henan, Anhui, and Sichuan provinces. The workers are male-dominated (92%), and the average age is 30.[4] In the report of the Ele.me platform, more than 80% of workers chose the work for its flexibility, and most of them were factory workers before joining the food-delivery industry.[5]

There are two types of food-delivery platform workers in China: dedicated delivery couriers (*Zhuansong* in Chinese) and crowdsourcing couriers (*Zhongbao* in Chinese). The dedicated delivery couriers are manufactured by the platforms to maintain a disposable and reliable labor force, while the crowdsourcing couriers are made to keep a flexible labor force (Lei 2021). Both Meituan and Ele.me operate the *Zhuansong* and *Zhongbao* service platforms. The workers themselves decide whether they want to be *Zhuansong* or *Zhongbao* couriers. These two companies subcontract the food-delivery business to other companies, which set up and operate service stations in specific areas to provide food-delivery service. The franchisees establish district managers and station supervisors to manage the couriers. The service stations are responsible for recruiting *Zhuansong* couriers and managing the labor force with the technological system provided by the platform. *Zhongbao* couriers simply register via the app, log in to take orders, and compete for orders independently; that is, apart from the platform, they are not supervised by any other organization. *Zhongbao* workers can decide when to log into the app to start working. Due to their differences, our article aims to compare these two types of platform workers in terms of their working conditions and the institutional environments that shape them.

Many sociological studies have explored the working conditions of platform workers, especially through the lens of labor process theory. However, to our best knowledge, scant research has examined the configuration of labor regimes among platform workers, which comprehensively considers multifaceted dimensions of workers' control and management. This study aims to bring the concept of the labor regime back to the study of platform workers. The concerning question here is: how is the labor regime of food-delivery couriers configured? With Burawoy's conceptualization of the production regime, we explore and compare similarities and differences between dedicated delivery couriers and crowdsourcing couriers in China.

Theoretically, this article proposes the concept of a platform regime referring to the specific labor regime in the platform economy. The platform regime delineates the working conditions of platform workers and the institutional apparatuses shaping the labor relations between the platform and workers. Empirically, this study presents how institutional arrangements create a despotic platform regime among food-delivery couriers in China. Furthermore, it also shows two different subtypes of this despotic platform

[3] https://fengniao.ele.me and https://peisong.meituan.com, retrieved on 9 January 2022.

[4] http://www.199it.com/archives/823693.html, retrieved on 3 March 2021.

[5] https://pdf.dfcfw.com/pdf/H3_AP202004241378553199_1.pdf?1587845818000.pdf, retrieved on 3 March 2021.

regime. The first is an individualized platform despotism characterized by individual and sole interactions between workers and the platform. The crowdsourcing couriers (*Zhongbao* workers) apply to this type of platform regime, in which the platform algorithm plays a dominant role in its labor organization. The second is a bureaucratized platform despotism characterized by workers' double subordination to organizational and algorithmic control and management simultaneously. The dedicated delivery couriers (*Zhuansong* workers) apply to the regime in which the hierarchical organization and authoritative personnel play significant roles in labor organization and control. We compare these two types of platform despotism regarding institutional foundation and labor control.

In what follows, we first revisit the literature on platform workers revolving around their labor process and build a basic analytic framework to compare the two types of food-delivery couriers. Then, we present the two types of platform regimes with empirical data. In conclusion, we summarize our findings and discuss the implications of our study.

Labor process of platform workers

The platform economy creates new jobs and transforms old jobs, ranging from transportation, logistics, and the food industry to online gig work or crowd work (Prassl and Risak 2016; Howcroft and Bergvall-Kreborn 2019; Wood et al. 2019). The platformization of the service industry also creates different types of workers depending on the platform for obtaining income. While legal scholars are mainly interested in exploring the ambivalent legal role of platform workers because of the ambivalence of existing legal regulations (Aloisi 2016; Holloway 2016; Malin 2018), sociological studies on platform workers largely focus on how the labor process is organized or the dynamics between control and resistance among platform workers.

In the platform economy, the internet platform can transcend the limitation of stable temporality and spatiality to match the supply and need of the labor force in a timely manner, which creates the digitalization of workers' labor processes (Stanford 2017; Wood et al. 2019). Sociologists have comprehensively recorded the distinctive features of the labor organization of platform work via the assistance of digitally enabled infrastructure and new advances in technology, characterized by "fissuring of the workplace" (Weil 2014), "digital Taylorism" (Cherry 2016), and a trend of the disembeddedness of labor (Wood et al. 2019). Saliently, data become a valuable resource for platforms, enabling them to track, record, and codify the data that different users produce so the platforms can utilize the data to make profits (Doorn and Badger 2020). Based on the enormous amount of data they collect, platforms can direct, monitor, and control platform workers through algorithms such as "algorithmic management" (Kyung et al. 2015), "technology-normative control mode" (Gandini 2019), "technology-mediated control" (Wiener et al., 2020) or "digital control" (Chen 2020).

The main features of this control mode centered on "algorithms" can be summarized as follows. First, the platform app becomes the center of the labor organization for both the platform workers and the platform enterprise (Gandini 2019; Veen et al. 2020). Through the users' clickwrap agreement, users' page, the guidance of users' labor process, and evaluation of users' performance, the platform

has absolute authority and becomes a nonnegotiable 'employer' (Moore et al. 2017; Srnicek 2017:47). Second, multiple mechanisms are designed and applied by the platform to reinforce its management, control, and supervision of platform workers. For example, the piece-rate incentive system based on algorithmic management that can flexibly adjust the wage structure according to the changing market environment encourages workers to put more effort into their work (Rosenblat and Stark 2016; Gandini 2019). Furthermore, the platform constantly and efficiently collects and records workers' activity data during the labor process, which benefits the platform optimization of their algorithms, eventually contributing to the platform's stringent control and precise projection of platform workers' activities (Chen 2020). Finally, customers are introduced by the platform into the workers' management and control process via the algorithmic evaluation system (Veen et al. 2020). Customers are given the power to evaluate workers' performance with the rating mechanism, which accelerates the interaction and conflict between platform workers and customers, leaving the platform more as a moderator between them (Rosenblat and Stark 2016; Kirven 2018).

While platform workers are subject to the platform monopoly and its centralized algorithmic management, platform workers could recognize those algorithms and fight against the rise of the platform (Chen 2018; Sun 2019; Sun and Chen 2021) because of a "structured antagonism" between the platform and labor (Wood and Vili 2019). Labor scholars also record platform workers' resistance during and beyond the labor process. During the labor process, platform workers can identify the technical loopholes of the algorithms and use them to realize their interests (Jarrahi and Sutherland, 2018; Sun and Chen, 2021). The practices of workers' everyday resistance include sharing accounts, buying reviews on platforms, negotiating working hours and wages, and creating multiple accounts (Anwar and Graham 2019; Wood et al. 2019). Due to the fragmentation of the labor process and atomization of platform workers, it is assumed that it is difficult for platform workers to initiate collective action (Heiland 2020). However, platform workers could still overcome the obstacles and collectively fight against the platform through workers' online communicative networks (Lehdonvirta 2016; Tassinari and Maccarrone 2020).

Sociological studies on platform workers' labor process show us how workers are subject to the platform and workers' responses to platform algorithmic management. However, there are two weaknesses in the literature. First, while existing studies have greatly added to our knowledge about platform workers' control and resistance, especially the role of algorithms, little is known about the institutional conditions that shape workers' status and their relations with the platform. In other words, we know a lot about the micro-politics of the platform workers instead of the macro foundation of such labor politics. Second, few studies on platform workers have considered their internal variations. It is recognized that the differences among platform workers in different industries are huge (De Stefano 2016; Howcroft and Bergvall-Kreborn 2019), and we barely know the differences between platform workers in the same industry. A more varied and comparable study on platform workers further contributes to our understanding of this group.

Labor regime of Chinese platform workers

To fill the research gaps, in theory, we go beyond the platform and link platform labor politics to state politics. The concept of the labor regime distinguishes the labor process from the political apparatuses of production that regulate and shape struggles in the workplace, which links state politics to factory politics (Burawoy 1985:87). Exploring the labor regime of specific workers means a detailed presentation of labor organization and the institutional forces that shape labor relations at the point of production. Through the case of food-delivery couriers in China, this article brings the concept of the labor regime back into the study of platform workers. It examines how institutional, technological, and managerial conditions regulate and shape those couriers' working conditions and status. In the empirical study, we probe two different types of food-delivery platform couriers in China and examine their differences in working conditions and the forces behind them.

The theoretical agenda of the labor regime in Chinese labor politics traces back to Ching Kwan Lee's formulation of disorganized despotism within reformed state-owned enterprises (SOEs). It analyzes how the reform measures in SOEs contribute to workers' subordination to managerial force (Lee 1999; Cai 2002; Hurst 2004). Moreover, the arrangements shaping SOE workers' status could also be found among migrant workers. Rich literature demonstrates how migrant workers' labor power was exploited at the point of production, and their lawful rights were violated, implying an asymmetric power relation between labor and management (Chan, 2001; 2010; Lee, 2007).

The literature suggests two institutional arrangements regulating and shaping the despotic labor regime. The first aspect is the continual efforts of the state to channel labor relations into the juridical arena (Lee, 2002; 2007; Su and He, 2010; Gallagher, 2017; Estlund, 2017). However, the enforcement of legal regulations usually does not favor workers' interests (Eli and Lee 2010; Pickles and Zhu 2015). The second aspect relates to the role of trade unions in shaping workers' labor power. With a dual identity of a state agency and workers' organization, the trade union often fails to represent workers' interests, which leaves workers without formal organizational support (Chen 2003; 2009; Hui and Chan 2015).

Compared with the traditional manufacturing industry in China, the labor organization in the platform economy is undergoing a great transformation. However, the key institutional arrangements that regulate the labor field remain intact in the platform economy because of the continuity of Chinese labor relations institutions. To apply the conceptualization of the labor regime to food-delivery platform workers in China, we develop an analytic framework premised on the concept of the platform regime.

The platform regime is proposed here to replace the common usage of the labor regime. While the concept of the labor regime is a generalized articulation that links labor politics to state politics, the platform regime is specific to articulating the labor relations between platform workers and platforms. As evidenced by the literature, platforms and their algorithms play centralized roles in organizing the labor force and coordinating workers' interests. Due to its centralized role, we believe it is a more suitable concept than a generalized labor regime to present platform workers' status.

Similarly, Lei develops the concept of "platform architecture" to examine the technological, legal, and organizational aspects of control and management in the labor

process to explain the variation in labor contention among food-delivery couriers (Lei 2021). Inspired by this concept, the platform regime cares about technological, legal, and organizational aspects revolving around the platform. However, while the platform architecture is developed to explain the collective labor contention, the platform regime is suited to the theoretical tradition of the labor regime. To encapsulate, the analytic agenda can be divided into two parts through the lens of the platform regime. First, we present the institutional context that each type of platform regime faces and explain how it lays the foundation for its despotic nature. Second, we show the labor organization process under each platform regime and analyze how workers are subject to the platform differently.

Method and data

This study chose food-delivery platform workers in China as a case to elaborate the configuration of the platform regime for the following practical reasons. First, the food-delivery industry constitutes an important part of China's platform economy. In 2019, the scale of the food-delivery industry in China reached 653.57 billion—39.3% higher than in 2018,[6] attracting more than 7 million workers. Second, the status and working conditions of food-delivery couriers are the most contested and controversial in China's platform economy because of their precarity. Studying this contested terrain can help us understand platform labor's complex and multifaceted dynamics.

This study used qualitative research methods. The data mainly came from interviews of food-delivery couriers and participant observations at two service stations (*zhandian*) in two Chinese cities: Wuhan and Changsha. Other complementary data included online participant observations in a WeChat group consisting of 437 food-delivery workers in Wuhan and the analysis of a large number of relevant reports on food-delivery couriers and official documents of the food-delivery platform through websites such as "Baidu forum," "Meituan forum," and "Ele.me forum."

In January 2020, the second author conducted ten in-depth interviews with eight food-delivery couriers and two food-delivery station supervisors in Wuhan. The second author participated in a large survey project on food-delivery couriers in Wuhan and had the chance to interview some of them. The interviewed couriers were male crowdsourcing couriers who were in their twenties. In July 2020, the third author interviewed 13 platform workers at a Changsha station. The third author entered the field through personal contacts and established rapport with some couriers who eventually became her interviewees. All the interviewees were male; most were married and approximately 30 years old. The interviews lasted between 30 minutes and an hour. The interview topics included their working experience, how their work was organized, the role of algorithms in the labor process, how these workers understood their labor process, and what strategies workers adopted to strive for autonomy. The second and third authors also conducted observations at two stations to observe the operation of the stations, including couriers' morning assemblies and station supervisors' coordination of order dispatches. To protect the privacy of the interviewees, all the informants use pseudonyms.

[6] The data were released by *Meituan Takeout*, a famous platform company in the food-delivery industry in China, see at https://www.sohu.com/a/409725269_99900352?_trans_=000014_bdss_dkwcdz12zn, retrieved on 10 January 2021.

Two types of platform regimes

Before examining the platform regimes among *Zhuansong* and *Zhongbao* couriers, it is necessary to describe the general working process for both types of food-delivery couriers. A food-delivery courier has to download the app, register to have an account, and prepare electric motors and food-delivery bags. The typical procedures for couriers to finish the delivery are as follows: (1) workers log into the platform app and wait for order requests; after getting order requests from the app, workers go to the restaurant addresses with the app's navigation function. (2) Workers pick up food from the restaurants and confirm it on the app. The app will show workers the customer addresses and the dispatch time. (3) Workers reach customers within the time according to the route provided by the app navigation and confirm the deliveries on the app.

Despite the similar working process, the configuration of the platform regime is different between the *Zhongbao* and *Zhuansong* platform couriers. While platform despotism generally applies to food-delivery couriers, *Zhongbao* couriers are characterized by a regime termed individualized platform despotism, and *Zhuansong* couriers belong to bureaucratized platform despotism. We will present each platform regime with empirical data.

Individualized platform despotism

Individualized platform despotism refers to a platform regime featured by an individualized labor process in which the platform app dominates, and *Zhongbao* couriers are solely and directly regulated and controlled by the algorithmic platform management. This despotism is manufactured by an institutional and legal ambiguity that fails to mediate the interests of the platform, restaurants, and *Zhongbao* couriers.

The institutional context of Zhongbao couriers

The app's design makes *Zhongbao* workers independent contractors of the platform, who work independently and are responsible for themselves; the platform has no responsibilities for providing protection. *Zhongbao* workers are not permitted to sign a labor contract with any entities. For workers choosing to sign up as a *Zhongbao* type, the platform app designs a clickwrap agreement stipulating the food-delivery couriers as independent contractors rather than employees of the platform, and workers must accept the agreement to be a courier. Therefore, the platform can easily avoid its responsibilities when *Zhongbao* workers are involved in disputes. We extract some clauses from the M crowdsourcing platform to reflect *Zhongbao* couriers' status and the conditions of their labor rights:

1. The platform delivery couriers are defined as persons with full civil capacities who accept and consent to all the rules and terms stipulated by the platform.
2. The crowdsourcing platform is an information platform that provides couriers with information on customer needs, the delivery fee per order, and confirmation of completed service. The couriers can autonomously choose their tasks.

3. The couriers are aware of and willing to take the risks of providing the food-delivery service. The crowding platform will not provide any type of explicit or implicit warranty.
4. The couriers must strictly follow the platform rules. The couriers will individually bear the corresponding responsibilities if they violate the rules and cause losses for the third parties or the platform.

Under the clickwrap agreement, *Zhongbao* couriers rely on the platform for providing service but are entitled to no protection or social welfare. It is also difficult for these couriers to confirm their employment status in China's current labor jurisdiction. The Ministry of Labor and Social Security released "Issues Confirming Labor Relations" in 2005, implying that the labor relation can be confirmed only with evidence ranging from wage payment records and social insurance payment records to employee ID and attendance records. Employee status also means that an employee's activities are part of an employer's business and that an employee is under an employer's command and control to complete the working tasks. However, this notification lags behind what these *Zhongbao* workers face, putting the confirmation of their employment status into question. According to the notification, there are evidential elements supporting either employee or independent contractor status for these *Zhongbao* couriers. On the one hand, they can decide when and where to work; at the same time, their labor organization is tightly guided and controlled by the technological system inside the platform. The existing legal system fails to classify *Zhongbao* workers as employees and endows them with the corresponding labor rights protection. This legal ambiguity of *Zhongbao* couriers makes them particularly vulnerable. For example, if a traffic accident happens, workers must adduce evidence to prove their labor relations with the platform by themselves during the litigation process, and the litigation process could be too costly to bear.

Regarding the collective organization of *Zhongbao* couriers, establishing a traditional workplace trade union does not apply to platform workers. Until now, the All-China Federation of Trade Unions has not created any trade union units among platform workers.

Zhongbao couriers' vulnerability is further strengthened by the fact that the platform company can arbitrarily change the rules and terms of the platform without the agreement of the *Zhongbao* couriers. If the *Zhongbao* couriers do not agree to the changed rules and terms, the couriers can only terminate their accounts. Most *Zhongbao* couriers are migrant workers who are excluded from social welfare protection and establishing any collective organization to negotiate with the platform company.

Platform control in Zhongbao couriers' labor process

Zhongbao couriers' labor process is solely directed and controlled by the platform app. For *Zhongbao* couriers, the digitally-driven platform is a monopolized entity that dominates every detail of their labor organization (Moore et al. 2017), which means the platform becomes an algorithmized, nonnegotiable "employer" (Srnicek 2017:47).

Since the labor process builds upon the digitally enabled platform app, the app becomes the center of labor organization and service provision (Gandini 2019). The platform uses big data and algorithms to analyze couriers' locations, restaurant locations,

and customer locations to assign orders to the most suitable courier. With the algorithms, the platform directly assigns orders to the couriers. Couriers cannot determine their work content and must obey the algorithmic assignments of the platform. If the mandatory assignment is rejected, there is a heavy price for couriers to pay, such as a decreasing rate of obtaining orders and income loss.

Zhongbao couriers' labor is highly affected by the "order dispatch index (*paidan zhishu* in Chinese)," which directly affects the quantity and quality of subsequent orders that couriers receive. This order dispatch index is affected by couriers' behaviors, such as the number of rejected orders, the on-time delivery rate, the number of canceled orders, the number of complaints, and the couriers' level. Every courier seems to have a digital document formed in the platform according to work performance. The platform uses the order dispatch index to "sort" couriers and establishes dispatch priority. The higher the dispatch index, the more likely couriers are to obtain better orders with a short distance and higher prices.

If *Zhongbao* couriers reject orders frequently, the dispatching system reduces their order amount, decreasing their income. Workers' behaviors that do not conform to the interests of the platform are punished by the platform, which disciplines couriers to put more effort into the labor process. Although every courier has 2–4 chances to transfer orders a day, this must be taken by other couriers within 3 minutes. Even so, the more orders the couriers reject, the fewer orders they will receive in the future. If couriers want to deliver more orders and obtain higher income, they must maintain good performance.

To motivate *Zhongbao* couriers to work harder, the platform designs a differential payment system that gamifies workers' labor process. The M platform initiates a weekly "Happy Running Rider" activity to encourage workers to work as long as possible. Workers' wages are composed of two parts: the corresponding piece rate and a weekly bonus. The piece rate increases as the volume of workers' orders increases. The bonus is awarded to those who reach specific valid online days in a week. For example, workers online for five days per week are rewarded with 160 yuan; the reward is 400 yuan for six days. It can be seen from the income structure that the food-delivery platform implements an accumulative piece-rate system. Under this system, income depends on the number of delivery orders couriers complete daily, which provides a strong incentive.

The study also finds that the platform encourages workers to exert more effort through multiple programs initiated by the platform, such as ranker rewards, severe weather subsidies, and peak-hour subsidies. For example, in the E platform, the food-delivery platform classifies couriers into ordinary knights, bronze knights, silver knights, golden knights, and diamond knights based on the scores couriers receive. Couriers receive one point for each completed order and an additional 0.5 point for each order during breakfast and dinner. The labor process is simulated as a game, with narratives and settings such as "killing monsters and upgrading." The platform launches various activities on the app interface, like the game setting. Under this gamified setting, couriers can only choose to improve their working ability and dedicate more time to upgrade levels.

The platform can also use its algorithms to monitor the couriers' labor process without any physical contact. Couriers' moving statuses are visualized in the app and are tightly

supervised by the platform app, including when they arrive at the restaurant and pick up the delivery, the route couriers take, and the time it takes to finish the delivery. The courier becomes a "number" and is calculated, programmed, and sorted by the platform algorithm. To gain an advantage in the competition, the couriers can only obey the system's arrangements and follow the system's dispatch instructions. This all-pervasive supervision of the platform is accompanied by asymmetrical information between the couriers and the platform (Rosenblat and Stark 2016). Without disclosing much information about the algorithmic operation, the platform maneuvers the supervision of couriers without generating much resistance from them.

The platform also encourages customers to evaluate couriers' performance after the delivery is completed, which ultimately affects the assessment of couriers. The evaluation of couriers in the platform is relatively simple. For example, on the M platform, consumers have two options when evaluating the services: satisfied and dissatisfied. On the E platform, there are three options: very poor, average, and excellent. For both platforms, bad reviews mean fines. There are many reasons why couriers receive bad reviews, including low-quality food, a sprinkling of meals, wrong orders, poor service attitudes, and malicious or unintentional negative reviews by consumers, but the delivery timeout is the most common reason. Regardless of the reasons that couriers receive bad reviews, the consequences are borne by the couriers themselves, even though the platform estimates the delivery time that individual couriers have no method to control it. By transferring the evaluation of workers' performance to customers, the platform quantifies the couriers' services into data that are utilized by the platform as the basis for rewards, punishments, and restraints of the couriers' behavior. The platform uses customer feedback to monitor, evaluate, and constrain workers, reinforcing the platform's domination over the couriers.

With the aid of new technologies, the platform automates the control and management of *Zhongbao* couriers' labor process through its digitalized and algorithmized order dispatch. To summarize, we examine how individualized platform despotism is configured among *Zhongbao* couriers in this section. The political apparatuses of legal ambiguity and the absence of social welfare protection and collective organization provide an institutional context for a despotic platform regime. Without managerial personnel, *Zhongbao* couriers' labor process is individualized through the interaction between the couriers and the technological interface that is dominated by the platform.

Bureaucratized platform despotism

There is a dualism between labor recruitment and organization because platforms cannot solely depend on *Zhongbao* workers to meet market needs. A more reliable and disposable labor force of *Zhuansong* couriers was created, characterized by the regime of bureaucratized platform despotism. The status of *Zhuansong* couriers is analogous to migrant workers who have been trapped in the dilemma of the nonenforcement of legal regulations (Gallagher 2017), which lays the foundation for a despotic labor regime. Unlike the *Zhongbao* workers solely dominated by platform algorithms, *Zhuansong* couriers' labor process is subordinated to two authoritative entities: the bureaucratized service station and invisible algorithms.

The institutional context of Zhuansong couriers

China has promulgated multiple laws and regulations to protect workers' labor rights. The Labor Contract Law, which came into force in 2008, stipulates that all employers must sign a work contract with their employees. A work contract is a springboard for employees to guarantee their basic labor rights of working time, wage payment, and social insurance programs, and state bureaus treat the labor contract as the most important evidence during labor mediation, arbitration, and litigation when dealing with labor disputes. Platforms usually transfer their juridical responsibilities to couriers' labor rights by franchising their business to other franchisee companies. The franchisee is responsible for signing a labor contract with *Zhuansong* couriers, who are treated as employees. However, according to our informants, they barely realize the necessity to sign a contract with the service station. One informant working as a *Zhuansong* worker on the M platform told us that no one mentioned the contract issue when he was recruited and what he cared about was delivering more orders every month to increase his income. In her ethnographic study, Lei also mentioned that these *Zhuansong* workers usually have low expectations of social protection (Lei 2021). Therefore, there is low enforcement of labor law among these *Zhuansong* workers, which once again places workers in a precarious position vis-à-vis the platform or other managerial representatives.

For those *Zhuansong* workers who signed an agreement with the service station, it stipulates the length and content of the service, payment details, and the requirements of the working process. The following clauses are extracted from an agreement between a franchisee company and the couriers:

1. The couriers can arrange their working time themselves since the employment begins; the franchisee company is not obligated to pay social insurance fees or provide any economic compensation.
2. The couriers are responsible for delivering orders based on the labor needs of both sides. The couriers' task is food delivery, and the working area is Wuhan and its suburbs.
3. The franchisee will pay the couriers daily only when the couriers finish the tasks and the franchisee finishes the couriers' evaluation. The price for every delivery is 3–5 yuan, depending on the distance.
4. The couriers should hold a qualified license for motorcycling. If the couriers encounter traffic accidents without qualified licenses, all the consequences will be paid by the couriers.
5. The termination of the employment agreement will be dealt with according to stipulated procedures. Both sides can terminate the agreement at any time. When the couriers submit the application, the couriers can leave only when the franchisee consents and the couriers finish handing over the job.

It is obvious that the stipulated clauses in this employment agreement (rather than a labor contract) are despotic and unfavorable to the couriers. This despotic agreement barely provides any protection or social welfare to the couriers, while the couriers are under stringent regulations by the service stations. Furthermore, the couriers are excluded from state social welfare. Indeed, the service station only buys accident

insurance for each courier, and the fee is deducted from the courier's wage. At the same time, most *Zhuansong* couriers are also migrant workers who do not share social welfare protection as urban citizens.

Dual control of platform and service station in Zhuansong couriers' labor process

The salient feature of *Zhuansong* couriers' labor control is the workers' double subordination to the managerial force of the service station and the platform algorithms. Compared with *Zhongbao* couriers, *Zhuansong* workers' labor process is largely regulated by the service station. When franchising the business to the franchisee companies, the platform sets up key performance indicators (KPIs) for them to achieve, such as the number of total orders, on-time rates, and customer complaint rates. The platform can terminate the franchising contract if the franchisee companies fail to do so. To meet such KPIs, the franchisee and its service stations adopt several methods to control and manage *Zhuansong* workers.

First, the service station has a working schedule for the *Zhuansong* couriers, which means the workers could not decide when to log into the app and accept delivery orders. Based on our interview data, there are three working shifts for *Zhuansong* couriers in the station: the morning shift from 8 a.m. to 10:30 a.m., the noon shift from 10:30 a.m. to 4 p.m., and the night shift from 9 p.m. to 2 a.m. (midnight in winter). In addition to their respective shifts, all *Zhuansong* couriers must be online and accept orders during the noon and night peaks. Many *Zhuansong* couriers are aware that the flexibility and freedom of platform workers declared by the platform are fantasy. Even when they are not accepting orders, they are waiting outside the station to be dispatched by the platform.

Second, to improve *Zhuansong* couriers' efficacy, the station supervisors adopt several disciplinary measures: (1) the couriers must have 27 days of attendance every month; otherwise, they lose the full attendance bonus. (2) The supervisor has a morning assembly for all *Zhuansong* couriers every day. The supervisor emphasizes the significance of teamwork and encourages couriers to work harder. The supervisor also blames couriers for misbehaving, such as late deliveries, a bad attitude toward customers, and breaking traffic rules.

Third, the station supervisor uses the technology provided by the platform to intervene in couriers' labor process, including rearranging their order dispatch, mediating conflicts among couriers, and managing bad reviews from customers. The supervisors can monitor the delivery process through the technological system at the station. For example, the supervisor said that as the new courier may be late with the delivery, the supervisor can transfer the task to a more experienced courier to finish the delivery on time. When there are conflicts between couriers involving order dispatch (every courier wants orders with a short distance and a higher piece rate), the supervisor must mediate. The supervisor can delete bad reviews within a month from the background system when the quotas are within five; otherwise, the service station fines the couriers 30 yuan per bad review.

In addition to the organizational management of the station, *Zhuansong* workers also depend on the app and its algorithms to finish their food-delivery service, as we described among *Zhongbao* couriers. The algorithmic design functions to realize

continuous time compression for capital, which makes couriers work in an unprecedentedly fast way (Li and Jiang 2020; Chen and Sun 2020). In the food-delivery platform's business model, meeting customers' timely needs is the primary task. The platform utilizes slogans such as "XXX takeout, fast delivery of everything" or "delivery on time, compensation for overtime." The timeliness of time has become an important basis for the platform to produce high-quality services, and it is used as a criterion to discipline couriers. The platform has strict requirements on the timing of the food-delivery process, and punctuality has become an important evaluation criterion. The system automatically counts the time when the couriers receive the order to determine whether each order is late.

"Racing against time" has become a daily experience for couriers. Couriers do not often take one order each time but many orders at the same time. The platform will also send multiple orders to couriers to improve delivery efficiency and plan the optimal route for couriers. When the couriers take multiple orders at the same time, the delivery time becomes tight. Sometimes couriers even need to complete six orders within an hour, meaning the actual delivery time would be above 10 minutes instead of 30 minutes as customers see on the app. Therefore, any timeout will cause multiple orders to time out altogether. Based on a journalist report, the delivery time has been compressed during the last few years. In 2016, the maximum time for a three-kilometer delivery was one hour; in 2018, it was 38 minutes.[7] The time gradually disappears on the platform. While time compression is proudly claimed by the platform as technological advancement, it is a tragedy for couriers. The continuous time compression sets the couriers into a trap of "race to bottom time"—the faster they run, the faster the algorithm operates, and the less time workers have for the delivery.

Zhuansong couriers' double subordination to the bureaucratized service station and platform algorithms shows how these couriers directly rely on the service station and indirectly rely on the platform to participate in service work for their livelihood in the city. Due to the double subordination, the platform and its franchisee company can impose coercive modes of labor control. This double subordination has institutional roots: *Zhuansong* couriers' labor rights are not well protected by the existing legal regulations, and there is no organizational foundation to support couriers' collective bargaining with the platform company, the franchisee company, and its service stations. The combination of institutional apparatuses and their double subordination creates what we call bureaucratized platform despotism among these *Zhuansong* couriers.

Conclusion and discussion

Labor process analysis has extensively been utilized to understand the dynamics of control and resistance among platform workers (Gandini 2019; Veen et al. 2020; Tassinari and Maccarrone 2020). Unfortunately, the concept of the labor regime that links state politics to labor politics is largely missing in the study of platform workers. This article aims to bring the labor regime back to the platform labor study and examines how the

[7] https://new.qq.com/omn/20200918/20200918A0M0DN00.html, retrieved on 6 March 2021.

political apparatuses shape workers' working conditions and status through the case of food-delivery couriers in contemporary China.

To elaborate on food-delivery couriers' status and the institutional forces that shape it, we develop a concept of the platform regime that encompasses the legal, technological, and organizational aspects regulating the relations between the platform and workers. Furthermore, we compare two different types of food-delivery couriers and present two platform regimes that apply to dedicated delivery couriers and crowdsourcing couriers. Our arguments are twofold. First, despite its new mode of labor organization among food-delivery platform workers, the institutional ambiguity and nonenforcement of legal regulations lay the foundation for platform despotism in the food-delivery platform economy. Second, there are two types of platform regimes between *Zhongbao* and *Zhuansong* couriers due to different combinations of institutional, technological, and managerial elements. Individualized platform despotism applies to *Zhongbao* couriers who work individually and are regulated and guided only by the platform app and its algorithms. *Zhuansong* couriers belong to bureaucratized platform despotism, which emphasizes couriers' double subordination to bureaucratized service stations and platform algorithms.

Due to data limitations, we do not elaborate on couriers' labor politics. It would be sociologically interesting to explore how food-delivery couriers resist its control and how it differs from migrant workers in the manufacturing industry. The despotic platform regime among food-delivery couriers is expected to induce worker grievances and generate labor protests. Protests against food-delivery couriers in other countries have been recorded (Tassinari and Maccarrone 2020; Veen et al. 2020). In our data, while we did not encounter any collective labor protests, media coverage shows that the couriers could initiate strikes to defend their rights.[8] However, until now, the scale, frequency, and coordinated mobilization have not been comparable with those of migrant manufacturing workers. Future studies could further examine how the labor protests of platform workers would be different from those in traditional industries.

The state plays a significant role in adjusting the labor relations between the platform and workers. Some local governments have already taken actions to regulate platforms' misbehaviors and their franchisee companies. For example, multiple state bureaus in Nanjing collectively issued guidance on labor use in food-delivery couriers to protect couriers' rights.[9] Therefore, if the state continues to intervene to reduce workers' dependence on the platform for labor power reproduction, set limits on platforms' coercive managerial measures, and increase platform workers' collective bargaining power, it is also possible that the despotic platform regimes could be transformed to hegemonic regimes.

Abbreviations

ICTs	Information communication technologies
SOEs	State-owned enterprises

[8] "Pessimism and Action 2020: An Inventory of Top Ten Workers' Rights Protection Events", see at https://mp.weixin.qq.com/s/aAae6IC6o0EIib5symqZZQ, retrieved on January 3, 2021.

[9] See at http://rsj.nanjing.gov.cn/njsrlzyhshbzj/202104/t20210430_2902108.html, retrieved on June 7, 2022.

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Author contributions
ZL and DP designed the research plan and collected data, WH and LG contributed to the analysis and writing. All authors read and approved the final manuscript.

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Availability of data and materials
We based our study on qualitative data of participant observation and depth interview.

Declarations

Competing interests
The authors declare they have no competing interests.

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Publisher's Note

"Competing personas": aesthetic labor in the Chinese fitness industry

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Abstract

Given the proliferation of lifestyle consumption, industries such as the fields of fitness, fashion, and beauty and makeup have experienced rapid growth in terms of employment numbers, leading to fundamental challenges to working patterns. Based on ethnographic data concerning two fitness clubs in Shanghai collected over 13 months and 35 in-depth interviews with managers, fitness trainers, and customers, this article draws on the concept of aesthetic labor to examine how a "persona," a combination of an ideal physique and a desirable personality in line with the aesthetic tastes of socio-economically diverse clientele, is developed through the labor process of the fitness trainer. The author introduces the term "competing personas" to characterize shopfloor politics in the fitness industry. By understanding the process of packaging and selling their bodily, gendered, and affective resources as a "game," fitness trainers draw symbolic boundaries to distinguish themselves from each other, thereby justifying their aesthetic competencies and self-identities. This article distinguishes three types of personas: advisor, friend, and idol, and these types are characterized by different corporeal and affective strategies. The article reveals how the exercise of agency by both male and female workers in the process of persona-building fuels the symbolic reproduction of class and gender inequalities by naturalizing the domination of an ostensibly legitimate taste.

Keywords: Fitness industry, Aesthetic labor, Labor process, Competing persona

Introduction

"This industry kicks out unstylish bodies."

——fitness trainer in Shanghai.

When studying the ever-growing obsession with maintaining health and appearance among the contemporary populace, fitness is undoubtedly relevant. The omnipresence of perfectly proportionate figures on social media alongside the marketing of a hygiene and sophisticated lifestyle has turned fitness into a social construct that displays far more complicated meanings than in previous decades (Bordo 1993; Maguire and Mansfield 1998; Tang and Xie 2021). At the beginning of the twentieth century, the desire of the Chinese people to engage in bodily training was understood in terms of a national revolt against the image of a weak, closed, and undeveloped country implied by the "Sick Man of East Asia" (dong ya bing fu) (Yang [2006] 2013; Zhong

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2009). Before reform and opening-up, a healthy body was further extolled by the state as a prerequisite for one's devotion to socialist ideals (Yang 2017).

In 1983, the first National Bodybuilding Competition was successfully organized in Shanghai by the National Sports Commission (Zhao 2015). In addition to the sensual pleasure and the sense of self-empowerment that can be attained through bodily training, this success also revealed an untapped Chinese fitness market that afforded tremendous opportunities to global capital. Over the next 40 years, the fitness industry developed into one of the most lucrative businesses in China. The rapid development of the fitness industry is also closely related to the support of national policies and the rise of lifestyle consumption in China as a response to social stratification (Maguire 2001). The continuous policy support provided by the state not only contributes to the "savage growth" of the fitness industry but also confers on physical exercise an individualistic meaning.

The "Outline of Sports Reform and Development (2001–2010)" promulgated by the General Administration of Sport of China in 2000, for example, identified exercising as an individual responsibility to increase the country's overall standard of living. While writing this article, the "National Fitness Program (2021–2025)" was issued by the State Council of China on July 18, 2021. One of the general goals stated in the program is that by 2025, the overall scale of the Chinese sports industry should reach 5 trillion yuan. Innovations and reforms of the business model employed by the fitness industry are highlighted as a crucial part of achieving this goal.

Paradoxically, the growth of an industry that promotes physical health, knowledge, and confidence in our bodies has caused anxiety and even antagonism for those bodies. The marketization of fitness has driven people of all ages to engage in never-ending combat against bodily decay. The moral imperative that people attach to body modification is considered to be both a victory of consumer capitalism (Baudrillard [1970]1998) and a metaphor for biopower (Foucault 1978). In recent years, China's growing concern with "keeping fit" has been discussed widely in the academic world (Zhong 2009; Xiong and Zhang 2011; Tang and Xie 2021; Xiong et al. 2021).

As an essential part of the fitness industry, fitness trainers have hitherto received limited attention from Chinese scholars. Most studies have chosen to examine how fitness consumption has been framed as a manifestation of social privilege through the lens of consumption (Zhong 2009; Tang and Xie 2021; Xiong 2021). However, the emergence and expansion of the occupation of fitness trainers have played an essential role with respect to raising the status of physical exercise as a mode of bodily care (Maguire 2002). By 2018, more than 170,000 Chinese people had applied for the national fitness training qualification examination, and the number of fitness trainers with national certificates reached 79,073.

The objective of the research is to examine the labor process of fitness trainers. The research starts with the tension that fitness trainers encounter on the selling floor. On the one hand, as individuals who live by "producing" and "selling" delicately trained and maintained bodies, fitness trainers are instinctively expected to be professional, indefatigable, confident, and eye-catching. Therefore, they must work on and with their bodies to "be" the type of person who can live such a life with confidence and

ease as a means of impressing target consumers. On the other hand, people who apply for the job are primarily new generations of migrants[1] from all corners of the country.

Given this situation, how do fitness trainers construct and negotiate the desired aesthetic styles and dispositions with customers when they are unfamiliar with them? How do such negotiations (re)shape the subjectivity of workers? What are the unintended social consequences of these ongoing dynamics in the workplace? Drawing on the concept of aesthetic labor, the article presents a nuanced picture of fitness trainers' labor process in the context of the fitness industry in terms of what I call "competing personas." I discuss fitness trainers' active participation in the process of establishing "personas," the attempt to maximize and marketize their bodily resources to create distinguishable selves that satisfy the aesthetic tastes of specific customers in the context of an ongoing symbolic competition among trainers.

From emotional labor to aesthetic labor: reframing the body in the service world

What makes the labor in the service sector different from its counterpart in the manufacturing industry? Hochschild's (1983) ingenious elaboration of flight attendants' "emotional labor" provides the most widely acknowledged and convincing answer to this question—unlike individuals who work with their hands, workers in the service sector live by commercializing their "feelings." Although this notion sheds a great deal of light on the essential attributes of the process of working in the service sector, the explanatory power of emotional labor has been decreased by the fact that it downplays the role of the body with respect to labor in the service industry (Warhurst and Nickson 2001; Witz at el. 2003).

The paradigm of emotional labor is problematic in two respects. First, despite being defined as "the management of feeling to create a publicly observable facial and bodily display" (Hochschild 1983: 7), the exact type of "body" that engages in those smiles and gestures is "analytically abandoned" (Witz et al. 2003: 36) by examinations of the managed production of feeling. This research gap then leads to the second problem. The "surface-deep acting" frame establishes a dichotomy between body and soul or between performativity and authenticity. The bodily presentation of workers is then presumably recognized as performative, superficial, and ephemeral, in contrast to the deep and authentic nature of the mind.

Many scholars focusing on the sociology of labor have tried to address this issue. Lan (2003) uses the notion of "bodily labor" to examine the ways in which the bodies and identities of saleswomen in the cosmetic industry are constructed during the labor process. She proposes "the tripartite components" of bodily labor as a means of going beyond this dichotomic framework, a notion that includes the disciplined body, the mirroring body, and the communicating body. Yang (2017) introduces the concept of "holistic labor" to account for the multiple job requirements of female beauticians. In addition to beauty care, female beauticians are expected to give their clients "emotional,

[1] The term "new generations" was introduced by Wang (2003) in his study of the social identity of migrants of China. He defines migrants who traveled to the cities in the 1980s as the first generation and those who did so in the 1990s as the "second " or "new" generation. New generations differ from the first generation in terms of age, educational background, and social experiences.

psychological, and moral support" (Yang 2017: 118). Additionally, female workers extend beauty care to emotional nourishment through bodily exfoliation and transduction. The notion of affective labor (Hardt 1999; Hardt and Negri 2004) is also borrowed by Ip (2017) to study how workers in the beauty parlor industry use their bodies to create affection and intimacy during the labor process.

These studies (1) epistemologically and pragmatically reveal the constitutive relationship between the commercialization of the body and the formation of workers' identities, (2) incorporate the perspective of feminism into class analysis, examining the role of gender inequality with respect to the body, and (3) situate the body within various cultural and political contexts, thereby facilitating a spatiotemporal analysis of the body and labor. However, existing investigations of the body in service labor are incomplete. One fundamental problem is that these analytical frameworks have not yet transcended the binary body-mind framework. For example, an emphasis on a body that is "exfoliative" or "transductive" (Gil 1998) indicates the dichotomy between an "outer body" and "inner self."

As a result, what is now called the Strathclyde school introduces the concept of "aesthetic labor" to emphasize the synergy of the body and the mind in service work. Aesthetic labor is the employment of workers with desired bodily dispositions (Warhurst and Nickson 2007a: 107), and it is not "performed by" but rather "embodied in" an individual as "the durable ways of standing, speaking, walking, and thereby of feeling and thinking" (Bourdieu [1972]1977: 69–70). In this context, aesthetics denotes the sensory components of production (Fine 1992: 1269). More specifically, aesthetics is composed of "the knowledge originating from our senses—sight, hearing, smell, taste, or touch and the meanings of this knowledge" (Karlsson 2011: 51). In this sense, the labor conducted by fitness trainers can be understood as aesthetic labor since what they are "selling" is not only their professional fitness knowledge but also their ability to meet the aesthetic demands of a particular lifestyle that is established as desirable by the company and its target consumers.

Finally, I use *competing personas* to characterize fitness trainers' aesthetic labor process. The notion of analyzing shopfloor culture originates from Burawoy's theory of the labor process (1979; 1985), in which he creatively relates the story of how workers' mutual competition for exceeding their work quotas through a game known as "making out" led to the justification of an organizational setting featuring a strict quota system. Thereafter, many scholars have attempted to study the labor process that produces consent in various work sites.

For example, Sallaz (2002) focuses on the American gambling industry and proposes the notion of "making tips" in order to characterize the competition among servers in gambling establishments to earn extra "tips" during the gambling service process. Zheng et al. (2015) discuss "the game of boss" to illustrate why informally employed garment workers continue to work diligently under unprotected working conditions in China. Shi (2016) coins the term "making VIP" to explain Chinese female beauticians' emotional labor process.

According to my observation of fitness trainers' labor process, the game played by fitness trainers on the selling floor can be conceptualized as that of "competing personas." A "persona" is composed of a physically appealing appearance and a symbolically

Table 1 Work condition of the dual track

Basic information Employment track Case selected	Club B		Club W	
	Senior trainer	Rotating trainer	Senior trainer	Rotating trainer
Minimum Wage/month(yuan)[a]	2000–3000	below 1500	2000–5000	1000–2000
Insurance Coverage[b]	Partial	N/A	Partial	Partial
Daily working hour	6–8	8+	6–10	8+
Locality[c]	Fixed	Contingent	Fixed	Fixed/contingent
Daily customer Traffic(individual)[d]	267.9		414.3	
Approximate staff ratio[e]	1:4		1:3	

The data represent only the branches that I observed, provided by the personnel sector of both companies (Club B and Club W)

[a] The total amount of wage is not fixed for trainers in both clubs. In general, senior trainers earn 10,000 to 15,000 yuan per month, while rotating trainer 3000 to 8000 yuan per month

[b] According to the Labor Law, laborers shall enjoy social insurance benefits that include retirement; illness or injury; being disabled or suffering from occupational disease due to work-related injury; unemployment and reproduction. "Partial" refers to medical and work-related injury insurance. "N/A" refers to no insurance provided

[c] The stability of the work location is different for fitness trainers with varying conditions of employment. Compared with senior trainers who are allowed to work in the same during their stay, rotating trainers are required to work in different club branches

[d] Data provided denote the average daily access of customers monitored and calculated by automatic online recorder of the fitness club

[e] Staff ratio here represents the senior-rotating rate

distinctive disposition in this context. Therefore, the game of "competing personas" refers not only to the physical domain of appearance management but also to the competition among fitness trainers to generate a symbolically distinctive disposition that can allow them to outperform their fellow workers, i.e., in terms of voice, posture, demeanor, body language, and self-presentation (Elias et al. 2017: 35).

Research methods: data collection and analysis

Data collection for this research was conducted at two intermittent stages. The initial research stage took place from January 2019 to June 2019 in one branch of a high-end chain fitness club (Club B) located in Y district, known as the "educational center" of Shanghai, since it contains more than 14 colleges and universities. From July 2019 to February 2020, I proceeded with the second round of data collection in another fitness club (Club W), which is located in a well-known business center in Shanghai and features a relatively larger scale of business (higher average business revenue and more customer traffic; see Table 1 for detailed information).

Data were collected through semi-participatory observations, in-depth interviews, and analysis of related publications (industrial reports, manuals) over the past ten years. With the assistance of my informant, who has worked at both clubs, I was given access to observe what happened on the selling floor in two different fitness clubs, which also included attending assemblies held during the morning and evening two to three times per month and observing the training sessions held by the clubs once or twice per week. I was also granted permission to observe the entire labor process of the fitness trainers. The interviewees were selected by snowballing and purposive sampling to maximize the variations in age, job position, registered residence, and educational level within the sample.

Table 2 Summary of demographic profiles of the interviewees

Interviewee code	Demographic characteristics				
Manager	**Title**	**Gender**	**Birth year**	**Registered residence**	**Years of education**
MM01	Manager	Male	1987	Anhui	12
MM02	Assistant manager	Male	1989	Shanghai	16
MM03	Sales manager	Male	1991	Shandong	16
MM04	Sales manager	Male	1993	Jilin	16
MM05	Chief manager	Male	1994	Hubei	15
MF01	Assistant advisor	Female	1992	Shanghai	16
MF02	Assistant advisor	Female	1992	Fujian	16
Trainer					
WM01	Rotating trainer	Male	2002	Shandong	12
WM02	Rotating trainer	Male	1997	Hebei	15
WM03	Rotating trainer	Male	1996	Hebei	15
WM04	Rotating Trainer	Male	1993	Henan	15
WM05	Rotating trainer	Male	1994	Fujian	15
WM06	Senior trainer	Male	1991	Hubei	16
WM07	Rotating trainer	Male	2000	Henan	9
WM08	Senior trainer	Male	1994	Henan	12
WM09	Rotating trainer	Male	1993	Henan	12
WM10	Senior trainer	Male	1989	Hubei	16
WF01	Rotating trainer	Female	1999	Liaoning	9
WF02	Rotating trainer	Female	1993	Liaoning	12
WF03	Senior trainer	Female	2002	Shandong	9
Consumer					
CM01	Student	Male	2000	Hunan	16
CM02	Student	Male	1994	Shanghai	16
CM03	Bank manager	Male	1997	Jiangsu	16
CM04	Civil Servant	Female	1992	Shanghai	19
CF01	Student	Female	1995	Shanghai	19
CF02	Student	Female	2001	Jiangxi	14
CF03	Student	Female	1998	Hubei	16
CF04	Student	Female	2001	Hunan	16
CF05	Junior manager	Female	1994	Shandong	19
CF06	Junior manager	Female	1993	Jiangsu	16
CF07	Department leader	Female	1990	Anhui	16
CF08	Senior manager	Female	1991	Gansu	16
CF09	Researcher	Female	1988	Shandong	24
CF10	Senior manager	Female	1983	Shanghai	19
CF11	Retired	Female	1949	Hubei	16

As presented in Table 2, I interviewed 35 people, including seven managers, 13 fitness trainers, and 15 customers. The interviews took place in three modes: online, face-to-face, and focus groups. After serious discussions with my key informants and the interviewees who participated in the research, I decided to renumber interviewees by removing all English names (pseudonyms) that I used in my transcript. The reason for this choice was that one of my interviewees pointed out that the pseudonyms

I used could potentially be revealing since one might be able to speculate on their actual identities based on the information provided in the article.

Historical development of the Chinese fitness industry

As Brownell (1995) notes, the way in which the body is trained and modified should always be situated in a specific "body culture," which is demarcated by class, gender, and sovereign power. Therefore, before examining the content of the notion of "competing personas" further, it is necessary to trace the historical development of the Chinese fitness industry.

In contemporary China, the obsession with sculpting the shape of one's muscles has the social function of expressing one's individual aesthetic tastes and class identity; however, that function emerged only recently. Counterintuitively, when the notion of fitness was first introduced to China in the early twentieth century, it was regarded by that generation of Chinese intellectuals as a form of national mobilization closely linked with the rejuvenation of the country. Before reform and opening-up, the government vigorously promoted physical exercise by the people; however, in the meantime, activities focusing on "body-building" were identified as bourgeois and prohibited (Zhao 2015).

In 1987, the first commercial fitness club appeared in Guangzhou, which served as the prelude to the marketization of fitness. Years later, the establishment of the first chain fitness club—Will's in Shanghai set the tone for the standardization of the fitness market. Due to investments by capital from Hong Kong, the Westernized business model was widely adopted by such clubs. In the twenty-first century, alongside the swift development of the Chinese economy, the fitness industry also expanded rapidly, especially after China's successful bid to host the 2008 Olympic Games. From 2012 to 2017, an increasing number of global fitness industry giants opened branches on the Chinese mainland. The total output value of the fitness industry increased from 106.83 billion yuan to 154.53 billion yuan, with an annual compound growth rate of approximately 7.7% (The 2018 Industrial Report of the Chinese Fitness Industry). The industry grew in size and in terms of technical developments and level of standardization. (Figure 1 presents the total number of fitness clubs established in the China mainland between 2010 and 2018.)

This transition is intrinsically related to China's stable economic growth and the birth of the middle class. The expanding scale of commodity production and the increasing middle-class purchasing power signify the advent of "the third consumer era." What Miura (2012) calls "creative consumption" took the place of conspicuous consumption. People no longer adopt the consumer mentality of "the more expensive, the better." Instead, they pursue "aesthetics," that is, they focus on factors related to the "style" of the product (i.e., originality, customization) (Qiu 2020). During this period, consumers began to pay attention to the expressivity of goods with respect to their class, gender, and occupation. This change in consumer mentality can also be seen in fitness, a form of lifestyle consumption that serves as a battlefield concerning taste and self-identity (Bennett 1998).

In response, fitness clubs have attempted to develop new business models and marketing strategies, and "branding" plays a critical role (Pettinger 2004). As a manifestation of brand image, the body of the fitness trainer is treated as a piece of hardware that contributes directly to brand value (Warhurst and Nickson 2001). It has become a vital

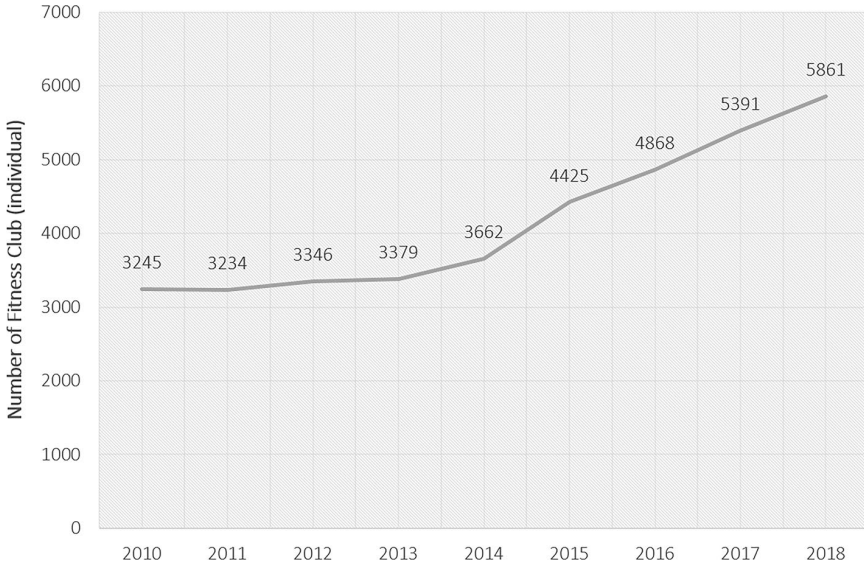

Fig. 1 Total number of fitness clubs established in the Chinese mainland, 2010–2018

niche marketing strategy for fitness clubs to construct a differentiated "aesthetic style" by recruiting trainers with different physical appearances, body shapes, genders, and sexual orientations.

The difference here is that fitness trainers in China do not resemble their American counterparts, who typically have decent educational backgrounds or "middle-class" origins (Warhurst and Nickson 2007b). In contrast, Chinese fitness trainers are recruited in entry-level positions and are frequently young men and women from rural regions. As illustrated in the Industrial Report of the Fitness Industry for 2020, nearly 70% of fitness trainers working in Beijing and Shanghai are migrants who began their migration just after completing their middle or high school education. Meanwhile, few fitness trainers have related work experience. Fitness trainers have a variety of employment histories, ranging from front-line service workers to security guards and retired athletes.

Therefore, fitness trainers must develop aesthetic skills that can allow them to "look good and sound right." Here, the notion of "aesthetic skills" refers to two capabilities: that of maintaining an aesthetically pleasing physical appearance and body shape and that of making aesthetic judgments concerning how to match these bodily resources with their temperamental characteristics in order to satisfy the preferences of the target consumers. In the following section, I first introduce the dual labor regime of the two fitness clubs in question and the process of aesthetic labor that occurs in this context.

"Competing personas": the aesthetic labor process of fitness trainers

Due to the situation described above, the two fitness clubs that I observed feature an expanding external labor market full of potential young and inexperienced employees. They must also face a tight internal market with high demand for professional trainers with relevant educational backgrounds and technical skills. Hence, these clubs exhibit a dual employment track often seen in the construction and delivery service

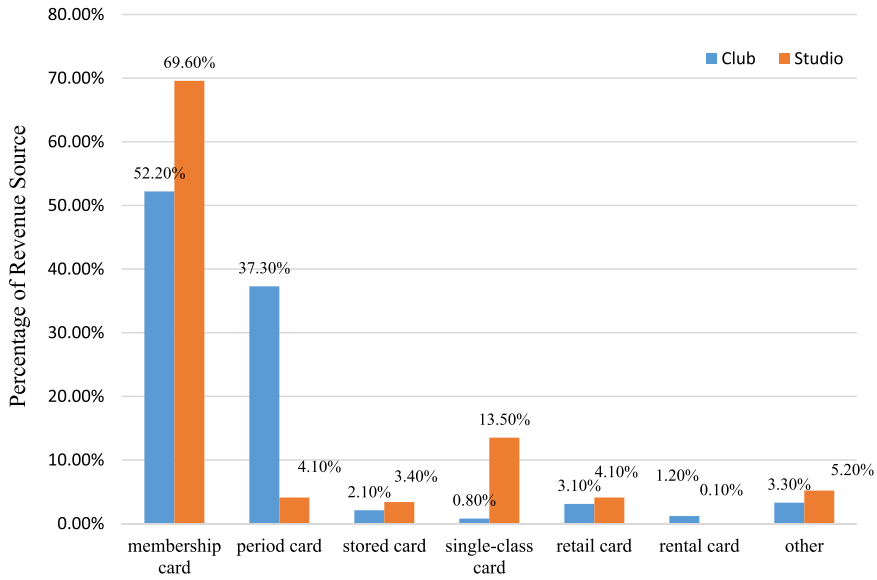

Fig. 2 Percentage of general source of sales revenue in the Chinese fitness industry *Source: < 2018 Industrial Report of Chinese Fitness Industry: A White Book of Survival Guidance >, released in 2018 by SanTiYun Data Research Center, see* https://www.styd.cn/default/data_report.

industries (Shen 2007; Zhang 2014; Lei 2020). This track establishes two categories of employees, namely senior trainers and rotating trainers.

As shown in Table 1, the working conditions of employees vary across these two different working tracks. In both clubs, social insurance is not fully covered. In Club W, both types of trainers are provided with medical and work-related insurance, while in Club B, rotating trainers are not included in the insurance system. Furthermore, unlike senior trainers, who have a written labor contract, rotating trainers are hired with a stipulation of a paid probation period (ranging from 1 to 3 months) and do not have formal labor contracts. In Club B, rotating trainers are recruited as "apprentices" from variegated occupational origins, ranging from food couriers to security guards.

Additionally, as the business model of the fitness industry has transformed from a membership-based model to one that focuses on providing custom-designed fitness training services (see Fig. 2 for detailed descriptions of the revenue composition of the fitness industry), fitness trainers must therefore act simultaneously as personalized trainers and as salespeople. Before checking and cleaning fitness equipment and attending the daily morning assembly, a typical day for fitness trainers both begins and ends with working out and identifying daily sales records.

It is conceivable that a "fit" body shape is a way in which fitness trainers are assessed at first sight. In addition to the visible exercise they receive while coaching clients, fitness trainers have to strengthen their bodies by engaging in training programs such as aerobics and strength-building exercises. In Club W, fitness trainers are required to report their workout and sales progress during the daily night assembly, while in Club B, this information is gathered through a joint training program led by experienced trainers.

Moreover, as salespeople, fitness trainers are aware that "being fit" has very material consequences, which can be seen through sales records. The hiring ratio of senior to rotating trainers is 1:4 in Club B and 1:3 in Club W, which means that the number of rotating trainers in fitness clubs is at least three times larger than senior trainers. As the manager of Club W explained, the club's adoption of what is called the "best or none" policy aligns with a highly competitive environment:

> *"We want them to know that we are holding a very high standard here, that one should feel proud being in part of the club. And we also want individuals who regard it [i.e., the club] as their own business because, essentially, it is they themselves who are paving their path to success. You can choose to work harder, and you would be paid accordingly" (MM03, male, sales manager of Club W).*

In this respect, fitness trainers, especially rotating trainers, make every effort to win customers' hearts. Experienced trainers can then engage in flexible negotiations given their personal experiences and relationships with customers. To mitigate their "distance" to customers quickly, fitness trainers first identify customers' desires, known as fitness trainers' ability to "sense the taste."

> *"I think the most important thing is to have that kind of 'sense'; you have to know who you are capable of talking with, who has the most probability of buying your courses – it's all about your ability to 'sense.' Anyway, when I first came here, I was so 'out' that it was almost impossible for me to talk with clients. No one wants to buy a class from someone they cannot trust" (WM06, male, senior trainer at Club B).*

The ability to "sense" refers to fitness trainers' ability to make the aforementioned "aesthetic judgments" and requires them to combine the "instrumental action of economic production" with "the communicative action of human relations" (Hardt 1999: 95). Unlike young female restaurant workers or careworkers, who try to affect their customers by constructing a "subservient" body, fitness trainers employ a different strategy: They embody "personas" that satisfy customers' tastes based on their evaluation of their own personal strengths. The formation of a "persona" is thus the outcome of dyadic and relational negotiations between fitness trainers and customers. Here, I divide the notion of "persona" into three types, advisor, friend, and idol, each portrayed by different bodily and affective strategies.

Advisor

Fitness trainers who employ this persona are usually retired athletes or those who have received education at sports colleges, and they tend to target "freshmen," i.e., those who have limited purchasing power and knowledge of body shaping and the idea of "working out." Additionally, this persona is adopted by fitness trainers who consider themselves not to be good-looking or physically attractive at first sight, and they consider themselves to be equipped with "cultural prestige" or "kudos" (Entwistle 2002). In most cases, the clothing of fitness trainers reveals their level of professionality. "Professional" trainers tend to wear the company's uniform, removing any ornaments that could reveal their personal characteristics. In other words, they understand this depersonalized clothing

style as a symbolic representation of their expertise and respect for organizational aesthetics (i.e., they abide by the dress code).

Fitness trainers of this variety also erect another kind of corporeal boundary by developing large and firm muscles that cause them to appear robust or even intimidating. They have to spend more time breaking a sweat than other trainers to maintain their body shape and training techniques, which is an identifying characteristic. One female customer explained her choice to purchase a course from a fitness trainer as follows:

> *"I remember that day I just passed by the gym, and I took a look at their poster. Then, Chack saw me, and he walked out to chat with me; he's really got a robust figure. I remembered that he was wearing a tight sports suit that day. He was patient, and he told me that I had a problem with scoliosis and a hunchback. I was kind of shocked and then decided to take some training courses to cure these problems" (CF10, female, group leader).*

In addition to these attributes, fitness trainers also stress their persona in their distinctive behaviors and dispositions. The "advisor" persona is used by male trainers to justify their lack of communication skills. One of the rotating trainers at Club W recalled his experiences with and reasons for becoming a star trainer, given that he was shy.

> *"I'm not like those who are talented at communication. I'm often told by my clients that I am too 'straight' to communicate with. However, I believe that actions always speak louder. As you saw just now, I was training my back on this advanced equipment; trainers seldom know how to operate it correctly. I'm like always the first to try new types of equipment to break the limitations of my body" (WM03, male, rotating trainer at Club W).*

In this example, the trainer noted a symbolic binary—"talented at communication" versus "poor at communication"—to highlight his professionality. This binary was evident when the fitness trainer joked about other trainers' winning star-trainer bonuses by being good at "dashan" (hooking up with clients). Moreover, male trainers also mentioned another benefit of being less sentimental: a higher probability of attracting male "freshmen." When asked about their standards for choosing fitness trainers, students with zero experience in fitness training prioritized "professionality" without hesitation.

During the interview, one male client explained why he chose fitness trainers who spoke less. His core demand for fitness training was "to find someone to provide him with virtual instructions on professional training techniques." He had previously been recommended a digital fitness training application called "Keep" by his classmates, but an accidental injury made him realize the importance of offline guidance for beginners. According to him, a trainer's body shape indicates his or her professionality.

> *"I prefer fitness trainers who can cut all the crap and focus on training. I'd love to choose those who look strong, which means they are very strict with themselves. My fitness trainer has a Dwayne Johnson[2] type of body shape. And since he has a wonderful musculature, he must know how to train different parts of the body effec-*

[2] Dwayne Douglas Johnson, also known by "The Rock," is an American and Canadian actor, producer, and professional wrestler.

tively" (CM02, male, student).

Meanwhile, the reaction of female trainers to such demands indicates the hegemonic gender aesthetics of this persona. When a female trainer tries to showcase her professionality, she must consciously embrace her departure from "typical" feminine body ideals.

> *"As a former weightlifter, my body shape is different from many female trainers. I look stronger than other girls, I know that, especially my back muscles. Many male trainers say I am much better trained than them! They'd call me "buddy" sometimes, haha. I kind of like that, though" (WF01, female, rotating trainer at Club B).*

The narrative related by WF01 serves as a perfect contrast to WM03's description of himself as being "straight" and insufficient with respect to human interaction. According to WF01, her problem does not pertain to communication but to a lack of hetero-feminine attractiveness as a female trainer, which is the (at least partial) result of her appearance. These bodily strategies indicate the domination of heterosexual masculinity in the context of this "advisor" persona, which features the admiration of strength and rationality as opposed to appeals to sensitivity and tenderness.

Friend

Fitness trainers who try to be "friends" with customers typically consider themselves to be sophisticated, emotionally intelligent, and good at understanding other people's thoughts. They oppose the idea that professional ability is the only criterion that defines a "good" fitness service—from their perspective, communicating and making a customer "like you" matters most. They believe that the competition required for sales performance is ultimately the competition of "guanxi." Fitness trainers tend to employ this persona with clients they consider "experts." "Experts" refer to young and ambitious boys and girls who work for world-class companies, come from wealthy families, and graduate from top universities. To customers of this type, their body shape functions identically to the brands that they wear. One rotating trainer described one of his female clients in the following way:

> *"She always meticulously shapes her bodily figure, and she's also very self-disciplined, although I think she's already perfect enough. All eyes are on her when she walks into our fitness club. You know, that reminds me to work harder; I have to be good enough to coach her" (WM07, male, rotating trainer at Club W).*

In this case, fitness trainers attempt to act as their clients' friends because they know that these customers are looking for something other than "professional advice." As a result, they are better able to adapt themselves to the needs of their customers. For example, one client who worked as a group manager for a foreign-funded cosmetic enterprise noted that she wanted a trainer who embraced a similar aesthetic taste with respect to the notion of "fitness." Such criteria require fitness trainers to be dedicated to their clients in both bodily and affective ways. The former sense is realized by fitness trainers through consumption. The literature on aesthetic labor has particularly discussed the role played by consumption in constructing workers' brand identification and class habitus (Pettinger 2004; Cutcher and Achtel 2017; Boyle and Keere 2019).

In the fashion retail industry, the consumption of branded clothes is beneficial or even essential as a way for workers to identify themselves with brand aesthetics. This process is usually facilitated by companies offering staff discounts to potential applicants. Such an offer is highly appealing to workers in luxury retail companies, although such discounts are relatively limited compared with their wages (Maitra and Matria 2018). Moreover, mastery of stylish dressing is closely related to work competence in this industry. Williams and Connel (2010) note that, compared with workers from the working class, high fashion brands tend to hire people of middle-class origins because they tend to share similar consumption practices with target customers.

This ability to consume goods entails a better understanding of customers' demands and the possession of better communicative techniques. On the other hand, consumption is seen as an effective way for workers to refashion themselves for workers from socioeconomically underprivileged backgrounds. They accomplish this task by devoting more time and energy to polishing their personal image as self-disciplined and attractive. When discussing his most unforgettable training experience, one rotating trainer suddenly became extremely talkative, albeit slightly anxious. He confessed that he took cultivating his attractiveness and "middle-classness" seriously by wearing branded clothes.

> *"I would never have gone to a luxury store before. I would not even think about it! Then, my colleagues reminded me that I could pay by installment. Let me show you my 'huabei' (an online consumer credit service). Now, I have almost spent all the amount I saved before. It's unbelievable to think that I owe more than 60,000 yuan on 'huabei'!" (WM04, male, rotating trainer at Club W)*

As it happened, he did get the chance to approach these upscale clients. After becoming familiar with him, he invited me to dinner with his client, who had become a friend. We met at a Western restaurant in the Jing'an district, and by the time his client walked in, I understood why fitness trainers had to spend time "polishing" themselves to "match" their clients' styles. The client wore a suit and tie and told us that he had recently been too busy to go to the club. After some small talk, I expressed my interest in knowing how the two got along. The client gently made the following observations:

> *"I've been working out for years, so I wasn't looking for some intro or basic guidance. I just want someone who can help me with the equipment I'm not familiar with and help me with my training. He did not talk much when we met, but I could tell from his appearance and look that he's experienced and trustworthy. And one thing I appreciate is that he often sets up a late-night class for me after he finishes his work. That's really helpful since I can sometimes be so occupied with my work" (CM03, male, bank manager).*

As explained by the fitness trainer, a "late-night" class is a training class in which trainers coach after their regular working hours. Such classes usually occur when clients are occupied during the day or require intensive training from their personal trainers. In this case, the fitness trainer (WM04) would wait for his client (CM03) to come to "work out together" or simply record a video demonstrating how to use the equipment. This unpaid training session is "paid off" by clients' support for the monthly sales performance evaluation by the fitness clubs:

"Whenever I'm desperate to meet the KPI of the month or something, he (CM03) is the first one that I'll find. He will buy the rest of my training courses without hesitation; he's such a bro! And I always give him the biggest discount in return."

The picture of these two individuals having dinner together illustrates or at least suggests the decreasing social distance between service providers and consumers. However, behind the scenes is fitness trainers' unseen efforts to meet the expectations of these "loyal" clients, who nevertheless take this work for granted.

Idol

In contrast to friends who attempt to develop reciprocal relationships with their clients, the idol persona is typically deployed to attract what fitness trainers refer to as the "big names," exceptionally wealthy clients. Successfully capturing a "big name" usually guarantees that the trainer will continue to be employed. In this case, fitness trainers strategically form highly exclusive and unique relationships through obedience and desirability. When I asked WM09 to account for his success, he attributed it to his "hard work" and endless patience with clients. The secret to his success, according to him, was remaining confident and alert in the face of "impossible chances," in general, by "always being prepared."

"Just keep trying. You will find that nothing is impossible. Once, a client of mine forgot to take her sports suit to class, so I tried to borrow some for her. When I found that she was upset, I directly bought one for her at the shopping mall. Can you imagine that? I've also biked a long way down to my client's workplace to cheer her up when she was troubled by her work and family issues" (WM09, rotating trainer at Club B).

In *Class Acts*, Sherman (2007) illustrates the similar behavior performed by waiters at luxury hotels, which she called the normalization of customers' "unlimited entitlement." Service workers must personalize, anticipate, legitimate, and resolve even the most unreasonable needs of clients through unlimited physical labor and a deferential and sincere demeanor (Sherman 2007: 25). This sense of "self-accomplishment" was expressed in other terms by a female trainer who claimed to be good at "detecting what guys want."

One female fitness trainer with a palm-like face, big eyes, and a perfect figure narrated how she wisely navigated relationships from reciprocity to intimacy. As she noted, she understood very well "what straight guys want from her." For her, "maturity" and "the sense of accomplishment" were better reflected by mastering "upper-class" standards of living that were sponsored by her affluent clients, who adored her. On occasion, she secretly received gifts from her clients, ranging from cosmetics to luxury handbags or VIP cards for shopping malls. In return, she managed to (according to her description) "appropriately flirt with clients." Regarding what was counted as "appropriate flirting," she explained this term as follows:

"It was very natural, like, once a guy approached me and told me I've got a sexy booty and said something like 'it's a shame that you are not my girlfriend!', I smiled back and went, 'You bet! Come on and get trained; I like hot guys with a great body shape.' He laughed out loud, and then the next day, he signed up for my class... Also,

I like wearing skinny shorts and leggings and makeup, not heavy, but those 'right on' types of makeup that make your lips juicier and your skin lighter. You've got to dress yourself up since the coat they offer is so ugly" (WF03, female, senior trainer at Club W).

According to WF02, this approach of "dressing up" and "flirting" was considered to be unprofessional and vain. As WF02 told me, trainers have a strict dress code in Club W. They are provided with club uniforms when they are recruited. She herself wears this uniform whenever she is on the selling floor. To her, wearing this clothing is a way of showing her professionality. For WF03, however, the reverse is true. In her words, what she did was completely natural. As she explained, "I'm not crossing the line; anyway, I earned it, and it is a pity that they lack this emotional intelligence to please people. Everybody wants to be pleased; that is human nature, isn't it?" She also did not seem bothered by the gossip circulating on the selling floor. As she commented, "girls get jealous when they think you're good-looking, haha. And I don't know why those girls never dress themselves up."

These quotations show how trainers defend and justify their personas by erecting symbolic boundaries with respect to gender and work ethos. For quite a long time, the intimacy that trainers and clients develop in the fitness industry has been controversial and even stigmatized. This situation was evident when I asked my consumer interviewees their impressions of the fitness industry: "I would think some of those male trainers are hot and seductive. So, what you mentioned makes sense" (CF07, female, department leader).

Additionally, if you search the fitness industry on "Zhihu"[3] for the string "what do you think of the fitness industry of China?", the top-rated answer discusses how fitness trainers manage to "fool around" with their clients. By reference to the story of Cinderella, saleswomen in Lan's (2003) case were able to answer this "charge of vanity" by overtly expressing their desires for extravagant lives and wealthy men. The narratives of these saleswomen, similar to my observations, showcase how they adopt an idolized persona that is self-empowered and entrepreneurial.

In *Dealing in Desire*, Hoang (2015) brilliantly interprets workers' agency by describing them as "shrewd entrepreneurs" who make conscious efforts to realize upward mobility through maneuvering their desires. On the other hand, there have also been cases in which such a relationship has led to negative results. During my last interview with a fitness club manager, he had just fired a rotating trainer for having "affairs" with two of the trainer's female clients.

"There are opportunities and temptations around here. You cannot control human nature. Because all the 'big names' we deal with in this industry are quite rich, those children cannot keep themselves from these temptations. However, no matter how excellent you are, this is the bottom line" (MM05, male, chief advisor of Club W).

[3] An influential online, user-generated content platform in China, for which most content is generated in a Q&A style. According to the "Decade Report of Zhihu (from 2010 to 2020)," the platform has over 20 million active users monthly nationwide.

Although the opportunity to approach these clients can help fitness trainers satisfy their KPI, it can also lead to the sudden ruin of their careers. If this deviant behavior eventually occurs within a relationship, the boundary between the customer and the trainer is broken.

Conclusions

The commercialization of fitness renders bodily training simultaneously a component of welfare guaranteed by the state and a moral obligation for the individual, both a blessing of modern medicine and a curse of consumer capitalism. This article describes these tensions in the fitness industry by presenting a micro-level picture of the practice of selling fitness services in contemporary China. This analysis, which focuses on fitness trainers' creation and negotiation concerning the discursive meanings of body and gender, contributes to the service labor and sociology of inequality literature in two ways.

Theoretically, I analyze the fitness labor process from the perspective of aesthetic labor. I maintain that the body should not be understood as less important than feeling and emotions in service work dynamics, as shown in the emotional labor literature. In contrast, the body pertains to every aspect of a human being, from sensual pleasures and desires to unspoken lived histories and forms of self-expression, through how we dress, walk, speak, and move. The way in which fitness trainers present themselves through postures, gestures, and kinesthetic characteristics plays a non-negligible role in determining their idiosyncrasies and their ability to shape their service interactions.

Empirically, I describe the aesthetic labor process in the fitness industry as a game of "competing personas," as part of which fitness trainers progressively habituate symbolically distinctive dispositions in order to outperform their fellow workers. The article distinguishes three types of personas: advisor, friend, and idol. The "advisor" persona is deployed by fitness trainers who consider themselves knowledgeable about fitness training but not as good-looking and communicative as their colleagues. The robust physique that is characteristic of this type of persona is taken as an indication of professionality and the authority to coach people with little workout experience.

Fitness trainers who portray themselves as "friends" of their clients consider themselves sophisticated, emotionally intelligent, and good at understanding other people. Physicality is not a protocol that distinguishes "professionals" from "amateurs" but a medium for nourishing mutual human bonds. The final type of persona, that of the "idol," is mostly used by fitness trainers who understand the body as a vehicle for eliciting sensual gratification and expressing attractiveness. According to trainers of this type, the secret to making a deal lies in their ability to elicit adoration or worship from target clients.

These findings can also be applied to many other service sectors in which nicely presented bodily dispositions and a carefully cultivated sense of "middle-classness" among workers are key aspects of employment (Pettinger 2004; Entwistle and Wissinger 2006).

I am aware of the way in which the harmonious embrace of "appearance supremacy" by the culture alongside the "middle-class" dispositions of fitness trainers may contribute to the perpetuation of existing class and gender hierarchies by rewarding fitness

trainers with recognition and admiration rather than leading to grievances with respect to "the symbolic dominance" of the privileged class.

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Author contributions
The author conducted the field research, including the in-depth interviews, ethnographic observation, and the collection of secondary material (i.e., industrial reports, relative statistics, and historical files from physical and digital archives). The author also transcribed and coded the interview material, designed the research framework, and wrote the manuscript. The author read and approved the final manuscript.

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Declarations

Competing interests
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Publisher's Note

Bureaucratic control across enterprise boundaries: labor organization and the control of the online car-hailing platforms

Lei Zhao and Yue Han*

Abstract

This article shows that the online car-hailing platforms, supported by the digital technology of information matching, are more than some "flat" market organizations but are essentially bureaucratic organizations that are market-oriented and rely on business rules, digital technology, and third-party management institutions. By taking advantage of its monopolistic position, the car-hailing platform has built a bureaucratic control system with multilayer hierarchies in which various market players outside the enterprise participate. The platform first organizes production in a cooperative way by setting up external jobs, then guarantees that both drivers and leasing companies will follow the business rules and improve predictability. Finally, the platform uses digital technology and leasing companies to realize driver management and rule implementation.

Keywords: Platform enterprise, Bureaucratic control, Enterprise planning, Leasing company

Introduction

With the rapid development of information technologies, such as the internet, big data, and cloud computing, internet-based platform enterprises have largely subverted the traditional modes of organizing labor (De Stefano 2016; Wu and Yang 2018). These platform enterprises not only complete work tasks "cut" by technology based on the social division of labor but also bring external partnerships into enterprise management (Kaine and Josserand 2019). The new mode of organizing labor reduces labor and structural costs for platform enterprises (Tassinari and Maccarrone 2020) and helps them simultaneously realize scale expansion. Taking one of the leading enterprises in the online car-hailing industry as an example, since its establishment in 2012, the W platform has created jobs known as the "online car-hailing driver" and the "business partners in service of drivers" outside the company. It has also employed a considerable number of employees, among whom the number of ride-hailing drivers itself exceeds more than 30 million.

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How did this online car-hailing platform realize its organization and effective management toward a tremendous number of drivers within just a few years? The literature mainly focuses on how platforms achieve their management from the perspective of labor control but ignores labor organization in the early phases. Current research emphasizes the role played by digital technology in the replacement of managers within the organization (Kellogg et al. 2020), which facilitates enterprise management in a more detailed (Rosenblat and Stark 2016) and de-hierarchical way. However, these findings may not be sufficient to solve all puzzles in reality. For instance, how can nontransparent algorithms discipline car-hailing drivers with relatively low educational attainment? How can platform companies relieve the confusion, anxiety, and helplessness of car-hailing drivers brought by algorithms (Kellogg et al. 2020) and dissolve the homogeneous drivers' collective resistance due to overlong and highly intensified labor conditions with inadequate social insurance (Edwards 1979: 128–129)? Taking the online car-hailing platform W in T City as a case, this article attempts to answer the following two questions. How was the considerable number of car-hailing drivers organized and effectively managed by the online car-hailing platform in quite a short period? Can bureaucratic control be replaced by technical control, or have digital technologies penetrated the verticalized bureaucratic system?

Labor process theory: from the industrial economy to the platform economy

The core concern of labor process theory is capital control and workers' resistance in the surplus value production process. Marx proposed that workers created surplus value in the process of commodity production. However, the labor force purchased by capitalists is not the amount of labor agreed upon by both parties but the potential labor capacity within an agreed period (Braverman 1978: 50–51). Therefore, the labor process must be controlled since it is uncertain whether the potential labor force can be transformed into actual labor, which creates surplus value. Retrospectively, studies on the labor process in the era of the industrial economy generally analyze the capital's strategy in labor control from three major perspectives: the organizational, the technological, and the ideological perspective.

Three major perspectives on labor control in the era of the industrial economy

Marx (2004) proposed the basic analytical framework of labor process studies in the first volume of *Capital*, which analyzed the ways that capital seizes relative surplus value from both organizational and technological perspectives. The organizational foundation for capital to control labor is cooperation based on labor division. The commodity production process has been divided by capitalists into many work stages, each of which is assigned to certain workers to complete, and the entire commodity production can be fully completed only through workers' cooperation in different work stages. In addition, machines serve as the technological foundations for capital to control labor, as they not only replace workers' skills and physical strength but render the labor process subjective rather than objective obedience. Meanwhile, machines also increase the reserves of industrial workers, weakening workers' resistant capacities but strengthening capital control (Wang 2011).

Following Marx's analytical framework, Harry Braverman first criticized Taylor's scientific management principles from the organizational perspective in the first place and then analyzed the impact of machine production on labor from the technological perspective. In Taylor's opinion, scientific management is not only an innovation of capital controlling and organizing labor but also an advanced form of labor division proposed by Marx, which refers to the fact that labor divisions between mental and physical power within enterprise lead managers to be specifically responsible for completing the "design" of work, while workers are only required to strictly "implement" manager's work design or arrangements (You 2006). Moreover, scientific management is not restricted to the group of industrial workers who witness such a division between mental and physical power. Instead, it also exists among the groups of managers and service workers. Braverman deemed that workers become only "a living tool of managers" with their working skills degenerated under the "separation of concept and implementation" (Braverman 1978: 108). Therefore, he criticized scientific management as some "pseudoscience" with no humanity under its cloak of science. He also believed that machinery automation would further decrease the workers' skill level and reduce their control over the labor process (1978:171–172).

Richard Edwards put forward the concepts of "technical control" and "bureaucratic control" from technological and organizational perspectives. Edwards pointed out that the capitalist control system generally consists of three elements: guidance, evaluation, and discipline (Edwards 1979: 18). So-called technical control refers to capital embedding its control system into materialized technological structures. The assembly line can guide workers to work and set the work rhythm, and numerical control with computer technology can supervise and evaluate the workers' working process. However, technical control cannot fully complete the discipline of workers, which consequentially needs to be supplemented with the introduction of bureaucratic control (Edwards 1979:115–125). Bureaucratic control refers to embedding the control system into organizational and social relations, which means that work guidance, performance evaluation, and rewards and punishments should all follow the "company rules" or the "company policy." Bureaucratic control reveals the characteristics of dehumanization, as it locks the operation of internal power within an enterprise into some institutional cage. In addition, based on its classified management of workers through salary grading and a system of reward and punishment, capital has shaped workers' behavior and driven them to pursue individual interests in the name of personal identities to prevent the occurrence of collective actions (Edwards 1979: 145).

Michael Burawoy brought workers' subjectivity into the study of the labor process as he examined how workers perceive the strategies of capital control and how they form their subjective identities from the ideological perspective (Burawoy 1979). Before Burawoy, scholars including Marx and Braverman mainly regarded the labor process as a mandatory process when labor is transformed into something that creates surplus value. However, in Burawoy's opinion, the transformation process should be considered as the voluntary consent of workers. He proposes three mechanisms that cause workers to agree, namely, the "piece rate wage system," the "internal labor market," and the "internal regime." The "piece rate wage system" attracts workers to participate in catch-up games actively and transforms the conflicts between labor and capital into internal conflicts

among workers. The "internal labor market" refers to a set of procedures in promotions or job transfers and the rules to price labor within the bureaucratic organizations, which not only reduces the labor-capital conflicts but also improves the workers' commitment to the organization. The "internal regime" refers to the collective bargaining schemes and appeal institutions, which maintain the essence of capitalist ownership and labor-capital relations.

The missing organizational perspective in the era of the platform economy

As human society has left the era of the industrial economy to enter the era of the digital economy, especially with the emergence of platforms that match both the ends of labor supply and demand with the aid of digital technologies such as the mobile internet, big data, and cloud computing, the modes of organizing labor and employment in traditional enterprises have been largely subverted (Wu and Yang 2018). Platform companies adopt the "Asset-Light" strategy to outsource heavy assets, including labor (Kaine and Josserand 2019). Online car-hailing drivers are regarded by the platform as "independent contractors," as they take orders from the platform with their own production tools, share the revenues paid by passengers with the platform in proportion (Josserand and Kaine 2019), and enjoy their work autonomy to some extent (Wu and Li 2018; Hall and Krueger 2018). Due to the immediacy and uncertainty of consumers' travel demand, platform enterprises must meet consumers' needs by ensuring a continuously stable supply of online car-hailing drivers when they match the transactions in the travel service market to make their profits (Wu and Yang 2018). Therefore, our question concerns how platform enterprises manage the labor force outside their company to meet consumers' immediate yet uncertain needs. That is, an important issue is how platforms manage their "independent contractors" by crossing the boundaries of enterprises.

The literature mainly focuses on platform companies' labor control strategies from a technical perspective, which scrutinizes how platforms have controlled workers through digital technologies, such as artificial intelligence (AI), big data, and algorithms. At the macro level, the platform develops the market through financing in the capital market and continuously optimizes the algorithm with the aid of big data thus realize monopolies on information and data as the means of production. The imbalance between information and power forces workers to rely on the platform and be controlled and exploited by the platform (Rosenblat and Stark 2016; Ren and Wang 2019; Qi et al. 2019). At the micro level, Taylor's scientific management has been embedded into the digital algorithms of platforms (Aloisi 2016; Staab and Nachtwey 2016). Such a "Digital Taylorism" (Chen 2020a) helps the platform realize its detailed or fine management of workers' behavior (Feng and Zhan 2019). The platform not only redistributes the control power through digital technology (Chen 2020b) but also instantly collects and processes workers' behavioral data in batches. In addition, the collected data and customers' evaluations can be exploited as the basis for rewarding and punishing workers (Rosenblat and Stark 2016; Liang 2017; Veen et al. 2020) and maintaining the labor order for the platform (Chen 2020b).

Therefore, scholars have proposed that digital technology has replaced the role of managers in bureaucratic organizations and has realized the de-hierarchy of organizational structure. They have compared Edwards' structural control with algorithmic

control; they consider algorithmic control a new rational control mode different from technical control and bureaucratic control. In addition, they have proposed the "6R" control mechanism of algorithm control, which refers to guiding work through constraints and advice, evaluating work through scoring and ranking, and disciplining through elimination and reward (Kellogg et al. 2020). In addition to the technical perspective, studies from the ideological perspective scrutinize how platforms have formed the subjective identification of workers through salary, scoring, and other mechanisms (Wu and Li 2018; Xu and Zhang 2019).

However, the research mentioned above cannot fully explain a few problems in practice, such as how workers are organized into complex algorithmic control systems, how they are disciplined by algorithms, how digital technology can resolve the negative emotions of workers, and how workers' consciousness of collective resistance can be dispelled. In addition, current research can hardly answer theoretical questions such as what serves as the foundation of legitimacy in the management of workers through digital technologies. Will digital technologies infiltrate the bureaucracy?

Other issues under-examined in current scholarship lie in the following: first, the role of digital technology in labor control is confused with the role of rules; second, the efficacy of digital technology in labor control has been exaggerated, while the role of third-party institutions has been deliberately avoided. Therefore, Lei (2021) argued that in addition to technology, platforms' labor control should be understood as multifaceted. She proposed the concept of "platform architecture" to discuss the regulatory role of technology, law, and organization during the labor process. As she pointed out, the service platform often adopts both franchising and cooperation with the site to implement a key performance indicator (KPI) assessment toward site management to ensure a stable labor supply. The sites will sign labor contracts with riders and will serve as employers to manage riders by manually adjusting their orders and resolving their complaints toward the algorithm. Although Lei's research goes beyond the mainstream technological perspective by exploring the role played by sites in labor control, it still fails to clarify the relationship among the three parties known as technology, organization, and laws.

In addition, from the empirical perspective, no labor relationship exists between online car-hailing drivers and leasing companies; therefore, the conceptual framework may not be applied to explain how leasing companies control drivers to ensure the stability of labor supplies. While scholars have mentioned the role of third-party organizations in technological control, such as domestic work companies (Liang 2017), online car-rental companies (Qi et al. 2019), the labor unions of live-broadcasting platforms or multichannel networks (MCNs) (Xu and Zhang 2019), and online food delivery sites (Li and Jiang 2020), they generally fail to explain either the specific relationship between internet platforms, third-party institutions, and workers or the relationship between technology and third-party institutions.

Accordingly, although labor process theory has focused on the labor control strategies from the organizational, technological, and ideological perspectives, recent studies that concern how platforms control labor mainly emphasize the technological perspective. However, the emergence of third-party institutions requires us to supplement the research on platform labor control to explore other types of power relations

that may affect the labor process from an organizational perspective, which would help us better understand platform labor control.

Case selection and research method

In 2016, the Chinese government strengthened its stance toward the online car-hailing industry and required all drivers operating through platforms to apply for the "online car-hailing driver's license" (OCDL) and all vehicles operating on platforms to apply for the "online car-hailing transportation registration permits" (OCTRP). The authors selected T City as the field site because T City was a key region for implementing a three-year environmental protection plan initiated by the State Council. The T City Government required that all online hailing vehicles must be replaced with new energy vehicles by the end of 2020, meaning that only new energy vehicles can receive the OCTRP. The leasing companies were thus involved in cooperation with the local government in the early stage of policy implementation to get priority for approving all vehicles owned by leasing companies, which made the leasing companies the main providers of the cars that obtained the OCTRP. Leasing companies generally recruit drivers by selling the cars with the OCTRP and therefore become an important institution to assist the platform in the offline management of car-hailing drivers.

The authors chose the W platform as the main research object because, first, the W platform has an absolute advantage in the market share regarding the number of operating vehicles and the number of cooperative leasing companies in T City. By March 2020, 18 platforms obtained operating licenses for online car-hailing in T City, among which the volume of daily orders from the W platform accounted for more than 85% of the total volume in the whole city on average. Furthermore, the number of hailing vehicles on the W platform accounted for more than 65% of the total vehicles, and the number of cooperative leasing companies with the W platform reached 40. These statistics all far exceed those of other platforms. Second, since its establishment, the W platform has set up external working posts outside the company to outsource the service provided to passengers and car-hailing drivers, which forms a cooperative relationship between leasing companies and the platform. The W platform has set up posts such as the "car manage-service partner" (CP) and "driver manage-service partner" (DMP) to transfer functions such as driver recruitment and vehicle and driver management to the leasing companies. This mode of organization has turned out to be very successful in practice and has become a model for other platform enterprises in the industry to learn from or emulate.

The W platform has maintained cooperative relationships with leasing companies since it entered T City in 2014. At first, the leasing companies were only responsible for recruiting drivers, but with the change in the national regulations regarding the online car-hailing industry afterward, the leasing companies gradually began to assume functions to manage vehicles and drivers. The duty of CP posts is mainly to recruit drivers and manage licensed company vehicles responsible for annual vehicle inspection and the operation of insurance payments. The duty of DMP posts is to assist the platform in managing drivers, including managing their driving behavior and providing special training to drivers. The W platform chose excellent leasing companies based on the performance of CP posts to let them assume DMP posts simultaneously. Thus, this study

will mainly focus on the role of the leasing companies undertaking DMP posts (hereafter referred to as "leasing companies") in platform labor control.

The data of this study come from participatory observations and in-depth interviews. Since October 2019, when the author entered the field, 68 online car-hailing drivers have been interviewed by the author as passengers. In addition, the author also took a 3-month internship to work at the M leasing company (hereafter referred to as "M company"), which undertakes the DMP post functions. The M company initially cooperated with the W platform in selling the licensed company vehicles to drivers for profit. As a participant observer, the author's main work was to assist Ms. Miao, a "driver service manager" of the M company whose job is to help the W platform manage car-hailing drivers, teach drivers how to use the software, and answer their questions in the work process. At the same time, the author also helped Ms. Miao produce a driver management summary and submit it to the W platform according to the requirements of the platform.

During the internship within the M company, the author observed the process of managing and being managed among the three parties—the W platform, the M company, and the online car-hailing drivers. Meanwhile, the author also interviewed another four "driver service managers" (hereafter referred to as "service managers") of the M company, who are subordinate to the driver management service department of the W platform's branch in T City. In these interviews, the author learned about their strategies and methods of managing online car-hailing drivers. In addition, the author interviewed eight head operators of leasing companies on how the platform manages leasing companies and how leasing companies manage online car-hailing drivers. The head operators of leasing companies told the author how the platform managed their company unfairly through various enterprise rules and expressed their dissatisfaction with the W platform. All of the above in-depth interviews lasted between 1.5 h and 2 h. To ensure academic norms, the authors anonymize all the names of the people and companies involved.

Platform: a builder crossing the boundary of enterprises with a bureaucratic control system

Weber (2019a: 401) regards bureaucracy as "the purest type in exercising legitimate authority." The exercise of legal authority depends on rationality, that is, "the belief in the legitimacy of established rules and the right of those who have authority to give orders according to these rules (legal authority)" (Weber 2019a: 396). The core feature of bureaucratic control is that the organizational operation depends on impersonal organizational rules (Edwards 1979: 140), and the organizational rules are implemented by the managers (Weber 2019a: 398). Organizational rules may not only define the qualification, the work contents, the jurisdiction, and the reward and punishment behaviors of each position but also define the hierarchical relationship, which indicates that "each lower level of official position should be controlled and supervised by a higher level of official position" (Weber 2019a: 399).

With the aid of enterprise rules, digital technology, and leasing companies, the W platform has built hierarchical control systems outside the company to manage the car-hailing drivers. As its first step, the W platform utilizes enterprise rules to set up positions such as "online car-hailing drivers" and "service partners" outside the company

to complete the labor division and stratification among its cooperative partners. Second, the W platform utilizes enterprise rules to guide and evaluate drivers' behaviors and enforce the reward and punishment on leasing companies to ensure the consistency between partners' behavior and the platform's interests. Finally, with the help of digital technology and leasing companies to enforce the enterprise rules, the W platform achieves its management over the order of driver labor.

Enterprise rules are the core of the bureaucratic control of the W platform, which can be expressed in two forms: the first form is the agreement on cooperation with its attached documents, and the second form refers to regulations, platform rules, policies, and normative documents. The first form clarifies the legal and hierarchical relationship among market subjects, defines the responsibilities of posts and jobs, and determines rights, obligations, and liabilities for breach of contracts. The second form guides the daily working behavior of drivers and leasing companies, sets work assessment indicators, and defines behaviors and measures in terms of reward and punishment. Notably, compared with civil contracts and regulations in traditional enterprises, rules implemented in the W platform lack consensual autonomy and democratic procedures. They are unilaterally determined and standardized by the W platform and are designed to constrain partners' behaviors. Market participants only have the right to choose whether to cooperate or not but have no right to negotiate or formulate the rules. This article employs an analytical framework based on Edwards' three elements of the control system and attempts to discuss how the W platform guides, evaluates, and incentivizes the drivers and leasing companies through its implementation of enterprise rules.

Regulating the work behaviors of online car-hailing drivers

Clarifying responsibilities, obligations, and standards of work

Before starting service on the platform, drivers must sign an agreement with the W platform and register as platform users. The agreement consists of 12 parts, including "account registration and user qualification," "service use and code of conduct," and "liability for breach of contract." The agreement defines the civil juristic relationship between the information providers and the users, stipulating the drivers' performance conditions, work responsibilities, and rights and obligations. Among them, the job duties of online car-hailing drivers are to provide transportation services for passengers in a timely and safe way. Part of the drivers' obligations are to "strictly abide by the agreement, the platform rules, and other relevant agreements signed between the business parties." In addition, drivers' obligations include stipulations such as "in case of violating agreement or platform regulations, the platform has the right to take measures such as warning, suspension of service, termination of service, or cancellation of accounts based on the severity of violation behavior." This allows the W platform to set up its enterprise rules on evaluation and reward and punishment.

In addition to the agreement, to ensure the stability and predictability of the driver's work quality, the W platform has formulated a variety of rules, such as the *"overall guidelines of the W platform operating rules," "general guidelines of the W platform," "safety rules," "special rules on customers' rating,"* and *"explanations of complaint and appeal procedures."* These rules can be divided into two categories. One is the general rules represented by the *"overall guidelines of W platform operating rules,"* which is similar to an

employee manual in traditional enterprises. Such rules define the level and scope of various rules in the enterprise regulation system and specify the code of conduct, responsibility due to violation, and measures related to other business scenarios. In contrast, the other type of rules are specialized rules, as represented by the *"special rules on customers' rating,"* the *"rules of the achievement score calculus,"* and the *"safety rules,"* which are set and supplemented by the platform regarding specific products under various business scenarios and define the drivers' work code of conduct, rights and benefits, liability in breaching the contract, and the appeal measures.

Taking the workflow of online car-hailing drivers when picking up and seeing off the passengers as an example, the safety rules and supporting instructions establish the service standards for the drivers, which guide the drivers' work behaviors in detail to ensure that passengers will be picked up safely and smoothly. First, the driver must stop on the passengers' front side if the passenger arrives earlier; otherwise, the driver must contact the passengers in advance to inform the passenger where the vehicle stops and waits. Second, the driver needs to check the last digits of the passenger's mobile phone number, tell the passenger to fasten the safety belt, and check whether the surrounding area of the vehicle is safe and whether the door has been closed before the driver may slide the apps on the mobile phone to start the journey. Finally, after arriving at the destination, the driver should stop the vehicle along the roadside, tell the passengers to take all their belongings with them, and pay attention to the cars behind him before he may slide the apps on the mobile phone to end the whole journey.

Determining the contents and methods of evaluation

"The special rules on customers' rating score" is the fundamental basis for the W platform to comprehensively evaluate drivers' work performance and contribution. Its purpose is to guide drivers to comply with the regulations, drive safely, and meet passengers' travel needs. Customers' rating score consists of the travel score, service score, compliance score, and safety score, with a possible total of 310. The travel score consists of the basic travel score and peak-hour score. The basic travel score can be easily obtained if an online car-hailing driver takes more than 3 orders monthly. The peak-hour score is obtained based on the accumulated number of orders taken by a driver during peak hours, an important indicator that measures the attendance rate of drivers in rush hours. The service score is a standard that evaluates how drivers meet the service needs of passengers. It is calculated daily based on the effective passenger evaluation or complaint in the driver's most recent 500 orders. When the driver's point-deduction behaviors specified in the "detailed guidelines on service standards," such as deliberate detours, cancellation with full responsibility, raising prices or negotiating prices, and rejection midway, are complained about or negatively evaluated by passengers, the platform will deduct the driver's service score accordingly based on the rules and regulations. An additional score will be given based on the assessment of the degree of drivers' compliance. For instance, compliance scores will be obtained if drivers upload the OCDL and OCTRP to platform applications. The safety score is a deduction item. A driver's initial safety score is 150, and when a driver has any potential unsafe behaviors, such as driving with tiredness or sexual harassment during the service process, the platform will deduct his safety score according to the relevant regulations. Compliance, the attendance rate in rush hours,

the quality of service, and abiding by the enterprise rules are the main contents of the W platform's evaluation of the drivers. Meanwhile, drivers' work behaviors are guided and further standardized by customers' rating scores, since their rating score is closely linked to not only the rules for the platform to distribute and price orders but also how much benefit and interest will be obtained by the drivers.

Defining punishment rules

The enterprise rules discipline online car-hailing drivers mainly through defining behaviors to be punished and clarifying the corresponding punishment rules in detail. These rules provide a written basis for digital technology to judge and punish the violation behaviors of drivers.

Take *"the safety rules"* as an example. The punishment rules of the W platform cover categories such as personal safety, property safety, traffic safety, and sexual harassment. On this basis, the platform defines specific violations and punishments by listing out detailed articles, for example, that sexual harassment refers to both verbal harassment and behavioral harassment, with verbal harassment including harassing others with vulgar words or information and with obscene language or information. When the driver harasses others with obscene language or information, the platform will permanently terminate the driver's service as punishment.

Defining the lawful jurisdiction of leasing companies

Outsourcing the driver management function can reduce the operation cost of the W platform but simultaneously increase the transaction cost. The reason is that principal-agent relationships based on commercial cooperation can bring not only conflicts of interest between the two parties but also speculation and moral hazards caused by information asymmetry (Furubotn and Richter 2015: 130). Enterprise rules, training, and digital technology can solve such problems.

Supervising work to avoid speculation via cooperative agreement

In the bureaucratic system, candidates for managers are selected on the basis of their professional qualifications and enjoy a fixed salary after taking office (Weber 2019a: 401). The W platform selects DMP based on evaluating CP's professional qualifications, and the service fee paid by the platform is obtained according to its performance every month. Before cooperation, the leasing company may, for example, submit false registration materials, exaggerate managerial ability and strength, or "take money without doing work;" therefore, it is a way for the W platform to investigate and sign agreements to avoid leasing companies' misconduct.

First, before signing agreements on the driver management service, the W platform sets a three-month inspection period for "DMP upgrading" and selects 10 out of the 24 CP companies to be promoted to DMP based on monthly performance. The indicators for performance evaluation include the hardware on site, number of service partners, driver retention rate, share of licensed drivers, driver activeness, and service score per capita. These indicators may not only measure the hardware facilities and driver management abilities among leasing companies but also avoid companies' speculation behaviors, such as submitting false registration materials or exaggerating managerial strength.

For example, the hardware on site includes whether there is a special training classroom that is more than 30 square meters in size, whether there is an office space that can provide consultation for drivers, and whether every 100 drivers are equipped with at least 1 service partner to provide consultation and management services.

Second, the W platform and the leasing companies promoted as DMPs signed a series of exclusive agreements, which include the "agreement on recruitment cooperation" and "agreement on consulting service." Similar to online car-hailing drivers, these agreements define legal relations and guide the work of leasing companies. The agreement stipulates the contents of cooperation between the two parties and the responsibilities of leasing companies, such as "providing drivers with consultation and training about the legal policy and platform system operated on the W platform, assisting drivers to complete platform registration and data supplement, providing vocational skill training for drivers, answering drivers' questions, and assisting the platform to complete other offline work on driver management." This clause not only defines the hierarchical relations among the service manager (platform), service partner (leasing company), and the online car-hailing driver but also provides a reasonable basis for the service manager to assign work tasks to the leasing company or to supervise their work. In addition, the agreement stipulates the rights and obligations of leasing companies and the liabilities for breaches of contract, such as "prohibiting the leasing company from cooperating with other competitive platforms, and terminating the cooperative relationship once being found."

Finally, the W platform also uses deposits to force leasing companies to comply with contracts and avoid moral hazard issues. According to "the contract of consultant services," both parties agree that the M company needs to pay a deposit of 50,000 yuan to the W platform, which stipulates that "when the leasing company violates the agreement or the platform rules, or when the service fee is not enough to deduct the liquidated damages or the compensations, the platform has the right to deduct it from the deposit."

Evaluating the behavior of leasing companies through platform rules to solve interest incompatibility

The main idea of performance evaluation and reward and punishment rules is to guide the leasing company to perform the driver management function according to the platform's requirements through a KPI evaluation, reward and punishment of the working process, and results of the leasing company. *The Evaluation Rules for Leasing Companies* formulated by the W platform divide the performance evaluation into a DMP access evaluation and a key indicator evaluation. A "DMP access evaluation" is a comprehensive investigation of the working process and results of the leasing company. The conventional evaluation indicators include "organized achievement," "safety management," "training project," and "platform cooperation." Each indicator also includes three to four decomposition indicators, which are measured by the data of driver behavior and the task completion of the leasing company. For example, the decomposition indicators of "organized achievement" include the "per driver service score," "driver retention rate," and "rate of the qualified driver," which are measured by the service score of drivers at the leasing company, the proportion of drivers leaving the leasing company, and the proportion of drivers with double certificates. "Platform cooperation" is measured by the

number of completed tasks assigned by the service manager every day. Each task completed by the leasing company is photographed and sent back to the service manager with jurisdiction through "Dingding" software for statistics. In addition to the conventional indicators, the W platform modifies the temporary indicators on a monthly basis according to the production and operation tasks and notifies the leasing company via e-mail. For example, to urge drivers to install in-vehicle monitoring equipment, the W platform names the "rate of equipment installation" as a temporary index to evaluate the leasing company. The W platform designs a "key indicator evaluation" about driver attendance and service quality, which is a key investigation of the performance of leasing companies in driver management. It is mainly composed of indicators such as the "number of online drivers," "online hours during the peak times," and "the rate of the licensed driver service."

Combining reward and punishment rules with a performance evaluation is an important strategy for the W platform to encourage leasing companies to perform driver management functions, divided into reward and punishment for work results and behavior. The evaluation coefficient is the basis for the reward and punishment of the work results for the W platform. The coefficient relates to the above two sets of evaluation indicators to determine the amount of service fees the leasing company can obtain every month, which implies that leasing companies can obtain high income as long as they perform management functions according to the requirements of the W platform. Based on the evaluation coefficient, the W platform will reward the leasing companies with the top scoring in the three-monthly key indicators and terminates the cooperation with the leasing companies that fail to meet the DMP access evaluation for three consecutive months. In addition to the reward and punishment of results, the W platform also punishes violations according to *The Reward and Punishment Rules for Leasing Company Services*, such as a "failure to cooperate with the platform, charging driver management fees, and being complained about by drivers, damaging the interests of the platform and drivers, and divulging privacy." If the leasing company had conducted the above behaviors, the W platform imposes "penalties such as fines, deduction of performance points, warnings, and termination of cooperation." In the meantime, the W platform will constantly improve and supplements the above rules according to their successful or failed management experiences. For example, after several petitions of taxi drivers organized by leasing companies, the W platform adds that "the cooperation agreement shall be terminated if organized group events or violations happen in leasing companies" to *The Reward and Punishment Rules for Leasing Company Services*.

Improving management through training and digital technology

Weber suggests that managers in bureaucratic organizations need specialized knowledge; therefore, "professional training" is indispensable (Weber 2019a: 399). The W platform provides two types of training to improve the managerial ability of leasing companies. One is designed for the chief management of leasing companies whose content includes the W platform's corporate culture and business management concept, the latest policies, rules and regulations, and enterprise operation and management knowledge. The other type of training is designed for the staff of the leasing company. The training content includes the enterprise rules of the platform, software system operation,

emotion management, and communication skills. However, regardless of the type of training, the W platform holds tests at the end of the training to ensure that the personnel of the leasing company have mastered the training content.

Implementing enterprise rules through digital technology and leasing companies

"Ruling a considerable number of people usually requires a team, which is a specific group that can be entrusted with the implementation of overall policies and specific orders" (Weber 2019a, b: 392). In the bureaucratic control system of the W platform, digital technology, leasing companies, and passengers (Gandini 2019) form an "administrative team" to jointly implement enterprise rules.

Implementing enterprise rules through digital technology

The major difference between the bureaucratic control of platforms and that of traditional enterprises is that digital technology executes enterprise rules, which greatly reduces the possibility of managers' selective execution of rules. In the traditional bureaucratic system, although enterprise rules restrict the power of managers, there is room for operability since managers cannot monitor employee behavior in real-time when implementing rules, and they will selectively execute the rules according to their own preferences. This equips the rigid system with a flexible aspect and generates the possibility of rent-seeking. The implementation of enterprise rules by digital technology can effectively avoid these problems. Taking fatigued driving as an example, the *safety rules* stipulate that "fatigued driving refers to the imbalance of physiological and psychological functions and the decline of driving skills when driving continuously for a long time"; "if the driver is found to have dangerous driving behavior such as fatigued driving, 150 safety bonus points will be deducted, and the platform will require him to participate in offline training many times." Fatigued driving behavior is monitored, judged, and punished in real time by digital technology. First, the drivers' facial expressions and movement data during driving are collected in real time by the monitoring equipment in the vehicle. Second, artificial intelligence filters the collected behavioral data to identify whether drivers have fatigued driving characteristics such as yawning, continuous blinking, long-term eye closure, and nodding. Finally, artificial intelligence compares the filtered data with the driver's driving track collected by digital sensors to comprehensively determine whether the driver has fatigued driving behavior. When the digital technology determines the driver's fatigue, the platform warns the driver through the vehicle monitoring equipment, deducts his safety bonus according to the rules, and notifies the leasing company for safety education and training. Moreover, the W platform publicizes the driver's name, mobile phone number, city, and punishment level on the "violation bulletin board" in the driver's app to reaffirm the platform rules.

Implementing enterprise rules through the leasing company

Although implementing enterprise rules through digital technology can solve the problem of system distortion in traditional bureaucratic control, it furthers the dehumanization of the dehumanized system, and some drivers quit the platform because the platform has no humanity. The W platform falls into the dilemma between labor order and driver stability. The premise of the platform labor order is that the enterprise rules

have been learned by the workers and implemented in action. However, the fact is that the education level of online car-hailing drivers is generally low (Zhao and Deng 2021), and even though the W platform can train drivers on rules through technical means, it cannot ensure that drivers can understand and master them accurately. Therefore, digital technology cannot solve the problem of how enterprise rules can be effectively digested and absorbed by workers, and it cannot solve the problems of driver recruitment and negative emotion relief. Digital technology can only undertake standard and rigid management functions such as task allocation, supervision, and reward and punishment. In contrast, nonstandard and flexible management functions such as driver recruitment, guiding work content, training, consultation, and psychological counseling still must be completed by people. Digital technology cannot eradicate the hierarchical relationship among people.

Neoclassical economics and transaction cost theory point out that production costs and transaction costs are the decisive factors for enterprises to choose whether to be completed by enterprises or by the market when organizing production. When the transaction costs from market are less than from enterprises, enterprises will complete the transaction through purchase (Zhou 2003: 30–40). According to China's labor laws and policies, the W platform chooses to hand over the nonstandard driver management functions that cannot be completed by digital technology to the leasing company through the market, which can reduce the labor costs and transaction costs in the process of driver recruitment and management, such as search cost and coordination costs. It can also block the legal risks and labor costs identified in the employment relationship due to the direct management of drivers (Zhao and Deng 2021). This is similar to the labor dispatch and labor outsourcing of traditional enterprises. The difference is that the W platform also manages the working process of the leasing company. The support of digital technology for management and the monopoly of the W platform on information, data, and market share are the fundamental reasons why the platform can control the contractor's work process across the enterprise boundary.

In summary, the W platform embeds the control system into organizational and social relationships and presents it through enterprise rules. Digital technology and leasing companies jointly implement enterprise rules to maintain the labor order of the platform.

The leasing company: managers in a bureaucratic control system

Leasing companies are a useful supplement to digital technology. They also play the managerial role in the W platform's bureaucratic control system and undertake driver management functions such as recruitment, training, and emotional counseling. The right of reward and punishment is a prerequisite for capitalists to ensure workers' cooperation and obedience (Edwards 1979: 18). In this regard, the W platform is different from the takeout platform (Li and Jiang 2020; Lei 2021). First, there is no employment relationship between the leasing companies and the online car-hailing drivers who obtained vehicle registration and service consultation from the leasing companies; therefore, the leasing companies cannot control the driver as an employer. Second, the W platform does not give the right of order allocation to the leasing companies; accordingly, the leasing companies do not have the authority to force the driver to obey the

management or to have a good relationship with management through emotional communication. A leasing company without the right of reward and punishment is similar to a manager who has lost real power and can only search for another way to enhance his managerial authority from the aspects of professional knowledge and value-added services.

Recruitment: attracting drivers to join

The W platform realizes the accurate cutting of effective labor and other labor through digital technology. To meet consumers' demand for instant services, the W platform needs to generate and maintain a stable labor reservoir so that effective labor can be purchased anytime. Recruitment is the water pump of the reservoir, which can continuously absorb fresh water droplets from the labor market for the W platform. Therefore, recruiting drivers has always been the top priority of all leasing companies. During the market expansion period of the W platform, leasing companies helped the platform quickly organize labor by importing driver data. In the stable period of the W platform, they attracted drivers to join through value-added services and licensed vehicles.

Importing driver data

> *"W platform chose to cooperate with us when entering T City, first, because our company has cooperated with other platforms before and we have data of more than 3,000 drivers; second, as a local enterprise, we have quite a lot of social resources to help them quickly obtain driver data; third, we have office space and manpower to help them recruit drivers offline" (20,200,321, chief manager of YBL leasing company).*

At the initial stage when the W platform entered T City, leasing companies were an important force to help the platform promote the offline market. At this time, there was only one condition for the W platform to cooperate with leasing companies; the leasing companies should have a certain amount of driver information inventory so that the W platform can quickly share ready-made driver resources. Certainly, having driver data is not enough; the W platform also needs to activate these drivers. The W platforms encouraged leasing companies to recruit and activate drivers by paying high commissions. The commission is determined by the total daily flow of drivers recruited by the leasing company, and the maximum proportion can reach 20%. To activate the existing drivers, leasing companies issue prizes and cash awards, send gas cards, and provide vehicle maintenance services to make the drivers work.

Attracting drivers to the W platform

Compared with importing the original data of drivers, it is more difficult to register new drivers with the W platform. Therefore, the leasing companies not only recruit drivers through general methods such as outdoor promotion, media advertising, and online job platforms but also recruit drivers through WeChat and the QQ of company employees, online car-hailing drivers, and their relatives and friends. To mobilize the enthusiasm

for recruiting online car-hailing drivers, the leasing companies also adopt a cash award policy.

> *We use cash to encourage drivers to pull more people to join our company. The activity at that time was to recommend new people to register as online taxi drivers and complete 20 orders. The driver and the recommender would get 200 yuan, respectively. The effect of the activity was very good. More than 4,000 new drivers registered in just one month, including many drivers from other platforms. To a large extent, many drivers of the W platform were stolen from other platforms when we worked offline" (20,200,424, the chief manager of JC leasing company).*

In addition to attracting drivers through incentives, leasing companies also recruit drivers through value-added services and licensed vehicles. When the W platform entered T City, the customer service and customer experience functions were not perfect. Therefore, providing offline value-added services for online car-hailing drivers has become an important strategy for leasing companies to attract drivers. Value-added services include software operations and methods to adjudicate complaints and driver-passenger disputes for drivers. Of course, the most exciting service for drivers is that the leasing companies can solve the problems of the redemption of vehicles from the local government and applying for reimbursement of administrative fines from the W platform for drivers who are subject to an administrative penalty. Although the online car-hailing platform existed under the banner of the sharing economy during the market expansion period, it disturbed the traditional taxi market to a great extent. Before the introduction of the online car-hailing policy, the municipal government of T City imposed administrative penalties in the form of fines and the seizure of online car-hailing vehicles on the grounds of illegal operation to protect the taxi industry. Although the W platform would fully reimburse for fines to stabilize the drivers' supply, it could not solve problems such as redeeming the car back. The leasing companies could calm drivers' emotions in time and communicate with the traffic management department to return the detained vehicles and handle the drivers' fine reimbursement.

After the local government issued the online car-hailing regulation, selling licensed vehicles has become the primary means for leasing companies to recruit drivers and earn profits (Zhao and Deng 2021). Qualified cars with the OCTRP have become scarce goods for a time and have become a useful weapon for leasing companies to attract drivers.

> *When the policy first came out, everyone was saying that the government wanted to limit it (the number of cars), so those who had licensed vehicles did not worry about recruiting drivers. The 4S store was out of stock for several models that sold well at that time. I directly pulled back more than 20 cars from the manufacturer through personal relationships and sold them out in less than a month" (20,200,321, the general manager of YBL leasing company).*

Training: teaching drivers how to work online

The W platform requires leasing companies to provide training and consulting services for online car-hailing drivers. On the one hand, there is a digital gap between the

complex functions of the W platform's digital technology and taxi drivers with low education. On the other hand, online car-hailing drivers not only need to understand traffic safety laws and regulations and online car-hailing laws and policies but also need to understand the platform rules, road conditions, and communication skills with passengers. In interviews, the author found that there are differences in the service score, order receiving volume, and income among drivers with the same working hours. The ability to work is the main reason for this phenomenon, and having related knowledge and skills is the key to the ability to work. Therefore, leasing companies teach drivers professional knowledge and skills, carry out safety production education, guide drivers to learn, and improve their professional skills and service efficiency.

Professional knowledge and skills

The training of professional knowledge and skills is the platform's requirement and is in line with the interests of the leasing companies since the training can indirectly increase the service fee and enable the leasing companies to obtain the authority to manage the driver. However, to avoid being recognized as an employment relationship, the leasing companies sign the consulting service agreement provided by the W platform with online car-hailing drivers. The agreement stipulates that it is a civil relationship between the company and drivers and that the leasing companies should provide consulting services for drivers in terms of online car-hailing laws and policies, traffic safety laws and regulations, enterprise rules, and software operation. The agreement also requires the leasing companies to "organize regular group activity at least once a month, integrate the drivers with the leasing companies and the driver with the W platform," and accept the driver's supervision and complaints." Online car-hailing drivers must agree to the leasing companies using its business data to manage them and to "regularly participate in the safety training or business training organized by the leasing companies."

There are various forms of training for car-hailing drivers, such as one-on-one guidance for software operation, new driver training meetings, and experience sharing. To improve the training quality, some leasing companies' managers or service partners will study the order sending software, platform rules, order receiving skills, and communication methods with customers and share their learning with their online car-hailing drivers.

Safety production education

The W platform requires the leasing companies to organize offline safety production education and training every quarter. The time and content of the training shall be determined by the W platform, but the leasing companies are responsible for notifying drivers to attend and organizing the drivers to sign in, maintaining the order of the venue, and explaining the training content. The training focuses on safe driving, including road safety laws, regulations, and safe driving rules. In addition to safety training, the W platform requires the leasing companies to carry out "return to the furnace" training and one-to-one safety education for drivers with violations.

Last month, the company fined [a driver]150 yuan for speeding and recalled the

driver to the company for safety education. First, [the company] let him see [in] the driver management system that the company was fined for speeding, then, [it] calmly analyzed the causes and hazards of speeding with him, and then told him the precautions and scoring skills" (20,200,822, head of M company).

To strengthen safety education, leasing companies will also publicize safety knowledge online and strive to eliminate potential safety hazards. First, safety knowledge such as road traffic rules, platform safety rules, and safety inspections are conveyed to drivers through WeChat groups, the driver's app, and SMS. For example, during the epidemic, the leasing companies reminded drivers through WeChat groups to measure their body temperature before driving, wear masks, and install protective isolation films. Second, the companies find potential safety hazards in time through WeChat groups and remind drivers to avoid risks. If the secretary and service partner heard a driver saying he was sleepy in the driver group, they would immediately remind the driver to go home and rest.

Psychological counseling: retain the driver

As atomized individuals, online car-hailing drivers were originally controlled by non-humanized algorithms. Humans are prone to the negative emotions of loneliness, depression, and even anger when they have disputes with customers or are punished by algorithms for no reason. Therefore, the W platform needs the leasing companies to conduct psychological counseling to reduce drivers' turnover rate. The M company has worked on two aspects: building a driver team and relieving negative emotions, which not only improves the work enthusiasm of drivers but also reduces their dissatisfaction to maintain an outlet for the reservoir of the labor force.

Team building: improving work enthusiasm

Team building is one of the task indicators that the platform requires the leasing companies to complete. When establishing the team, the M company divides the drivers into three categories—good, medium, and poor—according to the working frequency, service score, and turnover in business and selects a certain number of drivers from each of these three categories to form a team with a leader. The team leader is generally nominated by the M company and appointed after being assessed as excellent by the platform. The role of the team leader is to assist the M company in managing car-hailing drivers, provide business consultation and psychological counseling for the drivers, urge the team members to go online to receive orders, and report the difficulties raised by drivers to the leasing company. Similarly, the W platform also formulated a set of performance evaluations for the team leader and carried out rewards and punishments according to the team leader's work performance. In this way, the W platform forms a managerial structure of service manager (the W platform)—service partner (the M company)—team leader—team member within the online car-hailing driver team.

The W platform and the M company hold competitions or internal team rallies among online car-hailing driver teams in T city on holidays, rainy and snowy days, or other peak periods of vehicle demand and offer cash rewards to the winning drivers. These activities stimulate the drivers' team spirit and competitive consciousness and mobilize

the drivers' work enthusiasm. In addition, the M company divides drivers into grades according to their service score, online hours, and income data when forming a team. The drivers can find the business data of other team members in the driver app at any time. This not only enhances the awareness of competition among drivers and stimulates their work enthusiasm but also emphasizes the individual differences among drivers to divide the homogeneous driver group.

Emotion management: relieving negative emotions

The leasing companies have adopted four strategies for relieving drivers' work pressure and negative emotions. First, a WeChat group was organized. The driver WeChat group strengthens the emotional connection among team members at work, and drivers can vent their dissatisfaction at any time in the group. When they tell one another tragic experiences and comfort one another in the group, their negative emotions are vented to a certain extent. Second, offline emotional counseling services are provided. The chief of the M company claims that "the most important function of leasing companies is to provide emotional counseling to drivers. When they are tired, bored, or depressed, they come to the company to have a cup of tea and chat with me. After releasing emotions, I would give positive guidance in the spirit or give them free car wash tickets, and they will happily continue to drive." The third strategy is to relieve the negative emotions of drivers. When an event causes drivers' resistance, the leasing companies first observe the trend of public opinion in the WeChat group and find the problem in time. Then, it finds the aggrieved drivers and asks them to talk offline. Finally, the leasing companies listen to the drivers' demands and relieve their negative emotions. Fourth, when a driver encounters an accident or driver-passenger dispute, the leasing companies assist the driver in addressing the problem and alleviating the driver's anxiety.

In summary, the W platform has approached the problems of labor organization, training, and psychological counseling, which are hardly solved by digital technology, through its cooperation with leasing companies and has formed a hierarchical managerial structure comprised of platform enterprises (digital technology), leasing companies, team leaders, and online car-hailing drivers. However, this vertical bureaucratic structure at the market end is obscured by digital technology, which forms a mirage of a flat organizational structure.

Discussion and conclusion

The school of transaction cost theory represented by Ronald Coase and Oliver E. Williamson indicates that the significance of bureaucratic organization lies in resolving the speculation caused by information asymmetry (Zhou 2003: 38). However, does the emergence of platform enterprises that integrate market resources and conduct collaborative production through digital technology indicate that digital technology can eliminate bureaucracy? Taking the W platform of car-hailing in T City as an example, it is found through a field investigation that the W platform has built a hierarchical bureaucratic control system out of the platform enterprise that comprises leasing companies (with digital technology), team leaders, and drivers. First, to reduce costs, the W platform sets up posts of "online car-hailing drivers" and "business partners in service of

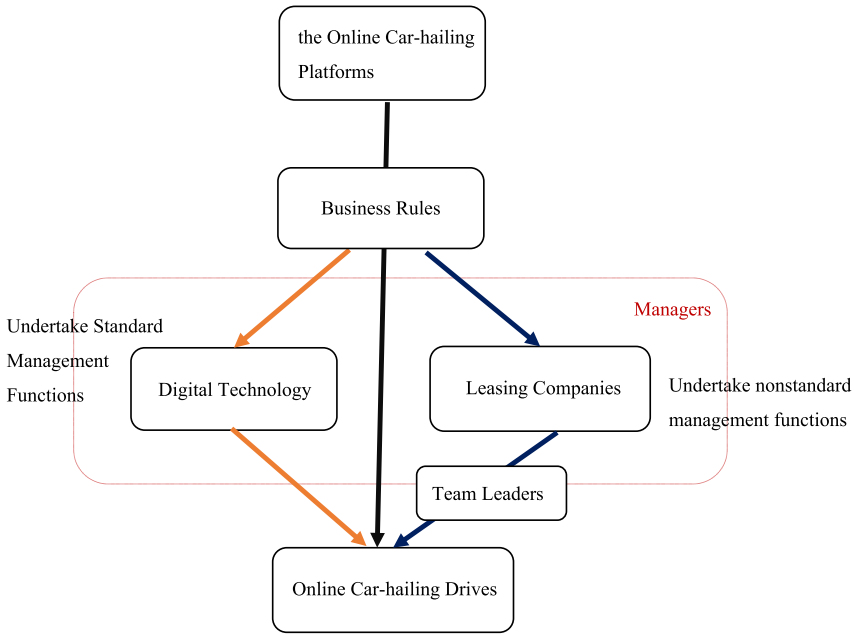

Fig. 1 The relationship among the platforms, business rules, digital technology, leasing companies and drivers

drivers" outside the enterprise, which are outsourced to the drivers and the leasing companies in the name of cooperation. Second, the W platform guides, evaluates, rewards, and punishes drivers and leasing companies through enterprise rules to ensure that their behaviors are consistent with the interests of the platform. As partners, the difference between the drivers and the leasing companies is that the drivers' labor process is constrained by the platform enterprise and the leasing companies' arrangement. Third, both digital technology and leasing companies are the executors of enterprise rules, while the leasing companies are responsible for completing the nonstandard driver management function that is difficult to realize through digital technology. Finally, under the platform control, the leasing companies organize drivers and improve their work efficiency and sense of belonging from the three aspects of recruitment, training, and emotion management (Fig. 1). Digital technology cannot eliminate the bureaucratic system. The W platform is not a flat market organization that manages car-hailing drivers through digital technology but rather a market-oriented bureaucratic organization that controls drivers through enterprise rules, digital technology, and leasing companies.

Unlike traditional bureaucratic organizations, the W platform moves the bureaucratic control system from the inside of the enterprise to the outside and implements the enterprise rules through digital technology and third-party institutions. Enterprise rules authorize digital technology and leasing companies to manage drivers. In turn, digital technology improves the efficiency and accuracy of the implementation of enterprise rules and reduces the possibility of the selective implementation of rules by managers; the leasing companies respond to criticism of the dehumanization of digital technology and help the platform solve the problems of organizing drivers, training drivers, and preventing the collective resistance of drivers. Accordingly, this research reveals that behind

the flat organizational structure of the online car-hailing platform is the bureaucratic and vertical control logic of the market end.

The theoretical contribution of this research is to expand the research perspective of labor process theory from micro-production to the market, to address how the power relationship between market participants affects the labor process of workers, and to emphasize the important role of third-party institutions in platform labor control. The existence of third-party organizations and their role in platform labor control are not limited to the online car-hailing platforms but generally exist in takeout, housekeeping services, and live streaming platforms. The motivation of platform enterprises to cooperate with third-party institutions is to quickly organize labor, reduce labor costs, and avoid the legal risk of recognized employment relationships due to the direct management of drivers. The disadvantage of organizing production through market transactions lies in transaction costs such as searches, investigations, and negotiations (Furubotn and Richter 2015: 47). The hierarchical control of online car-hailing platforms across the enterprise boundary can not only reduce the labor costs and risks of enterprises but also solve the transaction cost problem caused by information asymmetry in the market.

The school of new institutionalism suggests that the enterprise, market, and state are the three basic organizations. Of course, there are also special mixtures of market and bureaucracy such as franchising, leasing, and agencies (Furubotn and Richter 2015: 192,122). The work-on-demand model represented by Uber resets the boundary between the market and enterprises (De Stefano 2016), which is defined as "hierarchical outsourcing" (Muehlberger 2015). Although these studies address the nature of the platform from the perspective of the dominant relationship between it and workers, they neglect the worker management by third-party organizations and fail to see the control of the platform over the third-party, which shows that platform enterprises are also a mixture of market and bureaucracy. Compared with other mixed forms, platform enterprises not only prevent the opportunistic behavior of market participants through contracts but also evaluate, reward, and punish partners' work through enterprise rules, digital technology, and the guidance of third-party institutions. Therefore, market-oriented bureaucratic organizations have more rigorous control over market participants and are inclined to follow the control mode in bureaucratic organizations.

Power is the possibility of imposing one's will on the actions of others (Weber 2019b:1305). In traditional bureaucratic organizations, power derives from enterprise rules. Employers have the power to make rules, which, in turn, solidify the dominant power. Where does the power of market-oriented bureaucratic organizations to formulate enterprise rules come from? Weber put forward two opposite types of power domination, specifically, "domination by the interest pattern (especially by monopoly position)" and "domination by authority—command power and obedience obligation" (Weber 2019b: 1305). However, in the era of the platform economy, data, which is the key production factor, are monopolized by platform enterprises, so platform enterprises have the opportunity to establish a rational bureaucratic control system outside the enterprise through monopoly control and to authorize digital technology and third-party institutions to manage workers. Therefore, platform enterprises help the two types of power domination transform from opposition to integration. Visible market

transaction behavior masks the invisible bureaucratic control of platform enterprises over market participants via the monopoly of information and data.

Abbreviations

OCDL	Online car-hailing driver's license
OCTRP	Online car-hailing transportation registration permits
CP	Car manage-service partner
DMP	Driver manage-service partner
KPI	Key performance indicator

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ZL designed the study and conducted research, HY contributed in arranging and analyzing data. All authors read and approved the final manuscript.

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Competing interests
The authors declare they have no competing interests.

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Publisher's Note

Labor order under digital control: research on labor control of take-out platform riders

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Abstract

Following Marx's analysis of technical control, this article studies the labor process of take-out riders from the perspectives of organizational and scientific technology. On the one hand, by redistributing control power, the platform system (software) and consumers replace the platform company (manager) to manage take-out riders. Although the platform company seems to have given up direct control over riders, it downplays the employer's responsibility and transfers labor conflicts to the platform system and consumers. On the other hand, digital control has changed from physical machines and computer equipment to virtual software and data. The platform system makes labor order possible by subtly collecting and analyzing data from riders and using these data analysis results to manage them. Thus, digital control not only weakens riders' willingness to resist and gradually reduces their autonomy but also "invites" them to participate in an implicit process of self-management. The control methods of capital change not only from autocracy to hegemony but also from physical to virtual.

Keywords: Take-out riders, Labor Order, Control power, Digital control

Introduction

The starting point of labor process theory is the uncertainty of the labor force. The greatest challenge for capital after purchasing labor is how to realize 100 percent of the labor force in products or services. As the process is fraught with uncertainty, capitalists must shift control of the labor process from workers to themselves (Braverman 1979). However, capital in the process of labor control will inevitably sow the seeds of workers' resistance. Therefore, the core issue to be answered by the labor process theory is how capital controls labor and how workers resist, that is, how the labor order is possible. "How capital maintains order on the production site is a fundamental issue in the theoretical interpretation of the labor process" (Wang 2011).

Human society has entered the Internet era from the age of industrial production and from the real economy to the virtual platform economy. The "tentacles" of capital are not satisfied with labor control in the field of production but extend to the field of circulation (such as the work of take-out riders, online car-hailing drivers, and couriers), and so labor process theory should also adapt to changes over time. This research starts from the core topic of labor process theory and focuses on how capital controls labor in

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the Internet platform economy. Internet platform workers seem to have much “freedom” and “autonomy” compared with industrial workers. The “Eleme” company pointed out that “work freedom” is important for attracting riders. More than 60% of "hummingbird" riders value free working hours, and nearly 30% of riders agreed that they like the feeling of riding a bike through the city.[1] Researchers have also found that the Internet platform’s labor control is very different from that of traditional employment organizations. “Workers take orders on the platform. You can freely determine working hours, locations, rest and vacations and even determine labor supply and salary levels. Workers have labor autonomy” (Wu and Li 2018).

Therefore, can we think that companies in the platform economy have loosened their grip on labor? If the answer is yes, this is contrary to the starting point of the labor process theory. If the answer is no, why do platform workers seem so “free” and have a fair degree of “autonomy” at work? Moreover, compared to the era of industrial production, the scale of platform employment such as “Eleme” and “Meituan” is unprecedented. The official website of “Eleme” has three million registered riders.[2] “Meituan” announced more than 2.7 million people.[3] Such a large group of take-out riders can shuttle through China’s large and small cities and towns in an orderly manner every day. Starting from the central concern of labor process theory, this article explores the following: What is the reason for orderly labor under the control of the Internet platform?

Technical control in labor process theory

Technical control in classical labor process theory

Marx revealed two types of technology. One is technology as a material artifact, which refers to the relationship between man and nature, and the other is technology as a social form, which refers to the social relationship between people (Grundmann, 1991). The former refers to applying science and technology in the labor process, and the latter refers to the organizational technology that appears in the labor process. In the capitalist mode of production, technology improves production efficiency, and it is also an important means for capital to control labor. Since Marx, the analysis of technological control has been carried out along the two clues of scientific-technology control and organizational-technology control.

Marx pointed out that “the change of the mode of production takes labor as the starting point in the handicraft industry, and the means of labor in the large-scale industry” (Marx 2004). The two changes in the mode of production refer to the innovation of organizational technology and scientific technology, respectively. First, the handicraft industry has improved the way the labor force is organized. On the one hand, the division of labor increased productivity and created “local workers;” on the other hand, the labor hierarchy system divided workers into skilled and unskilled workers. The division of labor and hierarchy jointly promoted the improvement of productivity but at the same time led to the devaluation of the value of the labor force. Subsequently, industrial production revolutionized production technology,

[1] See the "2018 Take-out Riders Group Insights Report" published internally by "Eleme."

[2] Refer to "Hummingbird" Homepage (https: //fengniao. ele. me).

[3] See the homepage of "Meituan Delivery" (https: //peisong. meituan. com).

transferred labor and materials from workers to machines, and replaced manpower with natural forces. Marx analyzed the direct influence of machine applications on workers in *Capital* and pointed out that replacing workers' physical strength with machines eliminated the difference between workers' gender and age. As women and children join the labor force, capital gains more controllable workers; at the same time, under the unemployment crisis, workers' willingness and ability to resist has also been weakened (Marx 2004).

Following Marx's analysis, Harry Braverman (1979) analyzed the scientific management of Frederick Winslow Taylor. In his view, scientific management has nothing to do with science and technology but develops management methods and labor organizations. The goal of scientific management is to transfer the control of the labor process to the managerial department and accurately implement labor control in every step of the operation. Taylor believed that this goal could be achieved in three steps: first, collect and develop knowledge about each labor process; second, concentrate this knowledge in the management department; third, use the monopoly on knowledge to control every step of the labor process (Braverman 1979). In the end, scientific management will lead to the separation and opposition of workers' hands and brains, and workers' craft knowledge and labor control rights will be deprived of, "they (workers) function as cogs and levers"(Braverman 1979: 124).

Immediately afterward, Braverman analyzed the impact of scientific and technological control on workers. Starting from the control method of the machine's operation, he revealed that "it is in the nature of machinery, and a corollary technical development, that the control over the machine needs no longer be vested in its immediate operator" (Braverman 1979: 172). He also took the "numerical control" of the workshop machinery as an example to illustrate how the machine works step by step according to the digital program, thereby reducing the skill requirements of the machine operators. Compared with the fierce resistance caused by the Taylor system, the technological gap between workers and machines is more likely to make workers succumb to the domination of machines.

Richard Edwards also chose to start with analyzing labor-organization techniques in his *Contested Terrain*. "Control system" is the basis of his analysis. He believed that the control system contains three elements: the direction of the work task, evaluation, and discipline of workers (Edwards 1979). In the stage of competitive capitalism, the control system is completely in the hands of the employer alone, and there have been two nonstructural controls: employer control and hierarchical control. After entering the monopoly stage, nonstructural control exists in small and medium-sized enterprises on the fringe of the economy.

In contrast, monopolistic companies at the economy's core have to adopt new control methods due to the failure of hierarchical control and the emergence of many civilians. The "control system" is embedded in the company's technical structure and organizational structure. The former is called "technical control" (Edwards 1979), and the latter is called "bureaucratic control" (Edwards 1979). Although Edwards directly uses the term "technical control," it mainly refers to the aspect of scientific-technology control; that is, the three elements that control workers (mainly blue-collar workers on the production line) are completely under the control of technology.

For instance, when the manager sets the speed of the assembly line, the foreman is no longer needed to guide the workers. With the introduction of "numerical control" equipment and the application of computers in the workshop, "the computer can send instructions (according to its preprogrammed routine) as to what operations or activities workers are to perform, and upon successful completion of the task, the central computer will receive feedback information that will permit it to send out instructions for the next operation. Through central programming, the computer can follow production through its various stages, controlling the flow of work" (Edwards1979: 123).

"Bureaucratic control" represents the innovation of organizational-technology control. Compared with the arbitrariness of employer control and hierarchical control, bureaucratic control completely entrusts the three elements of controlling workers (mainly office clerical employees) to the rules and regulations and provides detailed regulations on job responsibilities, scope, content, and levels. With the structuring of the control system, the willingness of workers to resist has also been eliminated.

Michael Burawoy did not specifically analyze scientific and technological control in *Manufacturing Consent* (2008). In his view, "machine-tool technology, in its principles at least, has remained relatively constant over the past century" (Burawoy 2008: 64). However, Buroway's contribution is to bring workers' subjectivity into the analytical framework of labor process theory. Compared with the autocratic side of science and technology control presented by Marx, Braverman, and Edwards, Burawoy allows us to see the hegemonic side of science and technology control. In the context of the state's legislative intervention in the labor process, workers have regained control of the machine. The "making out game" allows workers to control their own machines instead of being controlled by them, enhancing their autonomy, so "the game is entered into for its relative satisfactions, or what Herbert Marcuse calls repressive satisfaction… The satisfaction of that need reproduces not only "voluntary servitude" (consent) but also greater material wealth" (Burawoy 2008: 89). In terms of organizational-technology control, the internal labor market fosters competitive individualism, which reduces the conflicts between workers and management while exacerbating internal conflicts among workers, and the return of qualifications ensures workers' loyalty to the enterprise. Collective bargaining and grievance procedures established within the company dissipate workers' solidarity and fighting spirit as a class by nurturing them as industrial citizens with rights and obligations rather than as members of the working class.

Under the capitalist mode of production, the management department has committed to decomposing the labor process mastered by the workers and reorganizing it into the labor process mastered by the managers. New production methods and machines provide an excellent opportunity for this decomposition and reorganization. In terms of organizational-technology innovation, the division and collaboration of labor, the separation of concept and execution, bureaucracy, internal labor market, and internal state continue to erode workers' skills and resistance capacity. In terms of iterations of science and technology, the study of the labor process has revealed the influence of machines, automation, and computer technology on the labor process and labor alienation.

In short, in the era of scientific and technological revolution, the management department has the "ambition" to master the entire labor process and control all its factors without exception. However, "how does the scientific-technical revolution transform the

labor process? No such unitary answer may be given. This is because the scientific and managerial attack upon the labor process over the past century embraces all its aspects" (Braverman 1979: 150). With the rise of the fourth industrial revolution represented by artificial intelligence technology (Tian and Liu 2019), technologies such as the Internet and big data have had a disruptive impact on people's work and life (Jia 2016). From the perspective of Marx's technological control, what impact will the new round of technological changes have on the labor process?

Technical control in the Internet platform

Today, whether in China or abroad, the glory of industrial giants has been overshadowed by various Internet platform companies. Chinese "ATM" (Alibaba, Tencent, and Meituan) and American "FLAG" (Facebook, Amazon, LinkedIn, and Google) are currently the hottest Internet platform companies. The earliest Internet platforms originated from search engines and social media platforms. Pettman (2015) pointed out that the key to the profitability of this type of platform lies in the ability to obtain people's attention; that is, the platform has to divert people's attention to the platform because the more attention the platform receives, the more likely it is to make money through advertising. The emergence of Google and Facebook has subversively changed the profit-making model of purely quantitative attention. They monitor and mine the information left by individuals on the Internet and then obtain the ability to push accurately and provide advertising information to users who need it more. From an extensive attention economy to a precise advertising push, "data" plays a key role. "And since prediction and analysis are so crucial to advertisements, every bit of data, no matter how seemingly trivial, has potential value" (Levy 2009: 108). Therefore, platform companies such as Google, Facebook, and Amazon began to store every user's search, every push, and purchase record. Through the inadvertent data left behind, platforms can better control their users.

In *Uberland: How Algorithms Are Rewriting the Rules of Work*, Alex Rosenblat (2019) revealed how Uber uses algorithms to control its drivers. Uber draws on the methods used by platform companies such as Google and Amazon to manage and manipulate consumers, tracking consumer preferences and content clicked on and then providing so-called personalized and customized products to users with similar preferences. It is just that Uber applies the same strategy to labor management. As a data-driven Internet platform company, Uber quantifies the work habits of drivers by recording all the details of the driver's whereabouts—from the vibration of their mobile phones to the ratings of passengers on each trip. Although Uber has repeatedly promoted so-called hands-off management to give drivers full freedom and autonomy, it is implementing a higher level of monitoring because it will record a series of personal data of the driver, including ratings, order acceptance rate, rejection rate, online time, number of trips, and performance in comparison with other drivers. Rosenblat (2019: 187) pointed out that behind all this, "Uber's algorithms give the company vast leverage over how drivers do their work."

Chinese domestic research on labor process control on Internet platforms is becoming increasingly abundant compared with foreign countries. Qingjun (2018) studied online

ride-hailing drivers from a control perspective. They found that the platform's control over the labor process coexisted with workers' autonomy, significantly different from traditional labor process control. This new employment model and the platform labor process result from the platform's three core mechanisms. The work autonomy mechanism, the salary and incentive mechanism, and the star rating mechanism enable ride-hailing drivers to have a subjective experience of active recognition and passive acceptance of the platform and its rules and finally cooperate with the platform. This research avoids the technical perspective and analyzes the capital control means from the perspective of labor subjectivity.

In a study on couriers for the Internet platform, Jiachi Zhuang (2019) found that Courier companies have continued the factory management model, and courier workers must follow standardized and normalized operations in the labor process. At the same time, the courier company has established a rigorous information monitoring system, which records the logistics information and related persons in charge of the computer by scanning the barcodes of the mailed products for tracking and querying by managers and consumers. The continuation of the factory management model can be regarded as a kind of organizational, technical control, and the information monitoring system centered on the product barcode is the embodiment of science and technology control.

Xiangnan Feng and Jing Zhan's (2019) study on take-out platform riders found that take-out platforms mastered the information source and riders' data and realized real-time dynamic control based on riders' characteristics in the specific labor process. At the same time, the application of AI technology represented by intelligent voice assistants led to the "de-skill" of riders. Ping Sun (2019) also researched take-out riders and pointed out that labor under algorithmic logic has temporal, emotional, and gamification characteristics, and she argues that through the labor practice of the "inverse algorithm," riders realize the reconciliation and confrontation of "human logic" and "algorithmic logic." The two studies explored the scientific and technological control of the Internet platform from the perspectives of artificial intelligence and algorithms.

On the whole, international researchers have pointed out the role of big data and algorithms in the scientific and technological control of the Internet platform. The algorithm is similar to Braverman and Edwards's "numerical control" in the 1980s. The final analysis still involves how data are used in management and therefore constitutes a theoretical continuity. Chinese researchers' emphasis on artificial intelligence, big data, and algorithms has skipped concrete analysis of how technology "permeates into the control of workers' production activities" (Wang 2011) and how artificial intelligence, big data, and algorithms are applied to the labor-management of the Internet platform. Regarding the organizational-technology control of the Internet platform, international and Chinese researchers have reached a consensus in many aspects. For example, it is believed that consumers "perform one of the roles of middle managers because they are responsible for evaluating worker performance" (Rosenblat 2019: 187). However, there is still a lack of theoretical analysis and summary of the above phenomenon.

"Returning to the secret of production, exposing the hidden labor process and production scene to the researchers, is the meaning of labor research" (Wen and Zhou 2007: 29). Following this traditional method of labor process research, the author of this

article joined a team of take-out riders in Zhongguancun, Beijing.[4] From the beginning of March 2018 to mid-August 2018, the author was a team rider,[5] experiencing the rider's labor process first, integrating into the rider's daily work and life while accumulating field data from observations, interviews, and logs. This long-term "immersion" helps the author observe the changing process of the technology control of the take-out food delivery platform company. At the same time, the technical blog regularly published by the technical team of the take-out platform company has also become an important resource for the author to understand the technological world behind the rider. The rider team I joined is one of the first to appear in Beijing and is fairly representative. In the words of the team leader, "Our team can be regarded as the nation's number one take-out team in terms of orders. If we say that the Beijing take-out team is the best nationwide, then our team is the best in Beijing."

Under normal circumstances, team riders have to accept the management of their station (set up by the labor service company/agent), but management is gradually limited to the attendance of the morning meeting and manual order adjustment during the peak period. Therefore, like crowdsourced riders, take-out platform companies hand over the management of team riders (including system dispatch, rider matching, delivery pricing, route planning, customer evaluation, performance rewards, and punishments) to the platform system. The platform system mentioned here refers to the distribution software or application developed by the food take-out platform company responsible for its operation and maintenance. Different users are divided into client ends (consumers), merchant ends (merchants), and delivery ends (take-out riders, station). The platform system undertakes most rider management tasks. Therefore, the key to studying the labor order of the platform is to understand the management of take-out riders by the platform system.

Organizational-technology control: redistribution of control power

The take-out rider's labor process revolves around the platform system from registration to exit. After installing and registering take-out platform software via mobile phones, take-out riders can receive orders through the platform system. Due to differences in rider types, riders receive orders in different ways. Crowdsourced riders need to grab orders on the platform system. In general, experienced crowdsourced riders can determine at a glance the most "cost-effective" order based on weight, distance, price, and other factors of the order and then decisively grab the order. Team riders do not need to grab orders because they do not have the right to pick orders. After being assigned by the platform system, the team rider must accept the delivery task from the platform

[4] The names of people, places, and teams that appear in the article are anonymized.

[5] There have been three modes of employment between take-out riders and take-out platform companies, namely, platform-employed, outsourced, and crowdsourced. Platform-employed riders who have signed labor contracts with take-out platform companies and enjoy the salary and benefits regulated by law, but for cost reasons, the platform companies have gradually outsourced distribution services to third-party labor companies (also known as agent stations), and the platform companies themselves are only responsible for the operation and maintenance of the platform system. The outsourced riders, also known as team riders, work in the name of the platform company, but are recruited and managed by the agent station and do not have a labor relationship with the platform company. Crowdsourced riders are not employed by any unit. They only need to log in to the platform and register an account to grab orders and deliver them. This is a very important social supplement to the take-out delivery platform.

system. However, different types of take-out riders work roughly the same after receiving orders.

(1) Rider's labor process

In terms of time, the rider's labor process is divided into three stages, namely, arriving at the store, picking up the take-out meal, and delivering it; in terms of space, the rider's labor process involves three geographic coordinates, namely, the locations of the order-taker, the merchant shop, and the client. After the rider receives the order, the first step is to find the corresponding merchant/restaurant according to its location, the second step is to pick up the take-out from the front desk or the kitchen of the merchant, and the last step is to deliver the order to the client's location. In this process, the rider needs feedback to the platform system through his mobile phone every time he completes a step. The platform system judges whether the feedback is true according to the GPS location of the rider's mobile phone and the delivery time. Under normal circumstances, the straight-line distance between the rider's GPS location and the location of the merchant or the client cannot exceed 500 m, and the interval between the rider's pickup and delivery should not be less than 5 min. If the platform system determines that the feedback is not true, the rider cannot proceed to the next step.

In addition to supervising the labor process of take-out riders in terms of time and space, the platform system will also provide specific guidance in different distribution links. For example, in the link between receiving an order to it arriving at the store, the rider can check the regional distribution of order demand through the order heatmap displayed on the platform system and then wait for orders or grab orders in areas with high order demand so that the chance of receiving orders is higher. For another example, in the link of picking up a take-out meal at the store, the rider can check the estimated time of an ordered take-out being ready for pickup through the platform system. When there are multiple orders to take, the rider can reasonably plan the sequence of pick-ups according to the expected ready-to-pickup time of the orders. For another example, in the pickup and delivery link, the rider delivers the meal following the meal delivery route and sequence planned by the platform system, which can improve the accuracy and timeliness of the delivery.

While the rider delivers, consumers are also involved. The platform system transmits feedback from the rider to the consumer, such as arriving at the store, take-out picked-up, and on delivery. Consumers can view the rider's trajectory on the take-out platform application in real-time. The platform system presents the rider's whereabouts to consumers through a dynamic map from the moment the rider takes the order. Therefore, whether the rider has delayed or detoured behavior in the delivery process, consumers can know it by checking the dynamic map. The platform system increases the control and predictability of meal delivery by giving consumers this kind of "God's Vision" that overlooks the overall situation. This vision adds considerable invisible pressure to take-out riders because the rider always knows that one or more pairs of eyes are watching. The result is that the rider's flexibility in delivering meals is greatly compromised. The team rider Lao Mei gave an example:

It stands to reason that I should send it to Zhengfang Building first and then go to the Engineering School of Y University. However, the time of the order from the engineering school is tight. If the order to the Zhengfang Building is to be delivered first, the order to the Engineering School will surely be overtime when I arrive there. What do you think I should do? I think there is enough time for the order to the Zhengfang Building, so I went to the Engineering School first, which means I'd deliver the far-away order first and then the close-by order. Who would have thought that when I had just arrived at the Engineering School, the client from the Zhengfang Building called me and asked me why I passed by. I said I went to the engineering school first because it would be overtime and kept telling her that I was going to the Zhengfang Building immediately. However, she did not sound too happy, and she said that it was because she saw me coming on her mobile phone that she kindly went downstairs in advance to save my time. I did not think about it, but I went to another place first, so I was so embarrassed to let her wait for a while.

After the delivery is over, according to the rider's performance in the delivery process and standards such as whether the order is overtime or spilled, the platform system will also ask consumers to evaluate the rider's delivery service, ranging from "very poor" to "average" to "Awesome."

Finally, the platform system will reward or punish riders based on the evaluation given by consumers. There are two forms of rewards and punishments: virtual points or "bee value" and real bonuses. The former is related to the rider's "level."[6] The latter directly relates to the rider's income. Normally, every time the rider completes a delivery, he will obtain a "bee value." Two more "bee values" will be added if it is well received. However, if the delivery is overtime, four "bee values" of the rider will be deducted; if a complaint is received, the deduction of "bee value" will be more. The platform system evaluates the rider's level according to the rider's "bee value"; the more "bee values," the higher the level of the rider. Compared with low-level riders, high-level riders have the privilege of first obtaining orders from the platform system, and each order has more commissions. Taking the delivery team where the author works as an example, the delivery commission for each order for the bronze rider, the lowest-level rider, is 8 *yuan*, and the delivery commission for each order for the king rider, the highest-level rider, is 8.5 *yuan*. In addition, if the rider gets a good review, he will be directly rewarded by the platform system of 1 to 2 *yuan*; if he gets a bad review, he will be fined 10 to 20 *yuan*; if he complains, the penalty amount is higher, generally more than 200 *yuan*.

(2) The redistribution of control

In his book *Contested Terrain*, Edwards analyzes corporate labor organizations in the stage of competitive capitalism and monopoly capitalism. Starting with the "system of control," he proposes that the control system consists of three elements: direct, evaluate, and discipline workers (Edwards 1979). According to Edwards, "Control" is "defined as

[6] Take the take-out platform company where the author worked for example, the rider's levels from low to high are bronze, silver, gold, platinum, diamonds, and kings, and under each level four smaller levels are graded, such as bronze 1, 2, 3 and 4. Along with the rider's accumulation of more and more "bee values," rider's level is also getting higher and higher, but poor evaluation, complaints, absences, and other reasons will continue to cause "bee values" deducted, and therefore rider's grade is constantly changing.

the ability of capitalists and/or managers to obtain desired work behavior from workers" (Edwards 1979: 18). Therefore, the three elements of the control system represent three kinds of control power. In competitive capitalism, most enterprises started from small workshops, and employers also grew up from skilled workers. Because the scale of enterprises is small, employers can supervise all links of production and direct specific production operations, and the control system is completely in the hand of the employer. Edwards referred to this control as "entrepreneurial control" (Edwards 1979). With the expansion of enterprise-scale, a vertical management system has emerged, and each layer controls the next layer. Edwards calls this control "hierarchical control." For workers, the foreman is their superior and controls the system so that "the foremen's great power was largely unsupervised, leading to arbitrariness and favoritism" (Edwards 1979: 63). To suppress the fierce resistance caused by arbitrary personal management, the control system is embedded in the enterprise's technical and organizational structure in the stage of monopoly capitalism. In other words, the control elements are now mastered by a structured technical system and organizational system. As "technical control" and "hierarchical control" make the control system structured and institutionalized, workers' willingness to confront employers has been largely dispelled. For example, after the introduction of assembly-line production, "the conflict (between workers and bosses) was mediated by the production technology itself. Workers had to oppose the pace of the line, not the (direct) tyranny of their bosses" (Edwards 1979: 118).

Looking at the labor process of take-out riders from this perspective, this article finds that the three elements of the control system have undergone redistribution. In the rider's labor process, the platform system is responsible for directing the rider's work, the consumer is responsible for evaluating the rider's work, and the platform system completes the final reward and punishment or disciplinary work for the rider. The result of the above seemingly simple redistribution is directly related to the emergence of the platform system. The platform system can allocate orders to riders in a short time, calculate the estimated delivery time, plan the delivery route to guide the rider's delivery, and provide various technical assistance during the rider's delivery process (such as order heatmap and estimated ready-to-takeout time), thereby improving the overall distribution efficiency. Behind efficiency, improvement is the support of strong computing power because matching the rider, calculating the delivery time, evaluating the performance of the rider (including the number of orders, positive and negative reviews and complaints, attendance rate, accumulated mileage, average speed, and customer satisfaction), and rewarding and punishing riders based on performance are all inseparable from the computation of the platform system. Taking route planning as an example, during the peak period for take-out delivery, the platform system can plan a delivery route for the rider within 0.55 ms.[7] In addition, consumer evaluation of riders is also dependent on the platform system.

On the one hand, the platform system has detailed records of each time node of the entire process. Consumers know when they will receive the food when they place an order and see the specific links of the entire food delivery process from the platform

[7] See "Meituan Take-out: The Road to Logistics Technology Exploration," *2019, Network Economy Service Platform,* (https://news.qichacha.com/postnews-643f925549c86be5fOfec29b2bb8ab4.html).

system. This enhances the predictability of rider delivery and provides consumers with a reference basis for evaluation. On the other hand, because consumers can view the rider's location in real-time through the platform system's dynamic map, they can also monitor the rider's whereabouts. If the rider times out or takes a detour, the consumer can intervene in the delivery process by reminding orders and making phone calls. In summary, the platform system has improved the overall distribution efficiency, made the labor process accurate to a calculable degree, and achieved a high degree of labor control and accurate prediction. Because of this, the platform system undertakes most rider management tasks and makes it possible to redistribute control powers.

(3) Shift of labor–capital conflict and weakening of the labor–capital relationship

After the control power was redistributed, the objects of labor conflicts were first transferred. Since the platform system is responsible for dispatching orders, directing, rewarding, and punishing riders, even if the platform system is not a tangible entity, in the eyes of the rider, it is not virtual and ruthless mobile phone software but a real and affectionate "manager." When there is no order, the take-out rider will keep begging the platform system to send more orders in his heart. Additionally, because the platform system acts as a "manager," the rider will vent his dissatisfaction at work to the platform system, and because the "manager" is invisible, riders often express their dissatisfaction through verbal catharsis. Riders in my WeChat group of take-out delivery teams often complain about the platform system like a real manager.

Zhao Xiaohai: order, order, order, why didn't you send me an order?
Li Huahe: How should I say about this system? It separately dispatches order; in one afternoon, it gives me four independent orders to place A, which means I have been "tricked" to ride eight times back and forth.
Mei Zhenmin: I rode until 10 o'clock in the evening yesterday. After 9 o'clock, I said that I could get off work, but suddenly I got an order. I said I was idling all afternoon, then I should go home, and it gave me an order. It was almost 10 o'clock after delivery. However, I must deliver it.

On the other hand, because consumers are responsible for evaluating the work of riders when consumers give negative reviews or complaints, riders will also vent their dissatisfaction to consumers. In the take-out team where the author works, if a rider receives a negative review or complaint, in addition to deducting the bonus, he will also be required to re-participate in offline training with newcomers.[8] No rider is willing to participate in the half-day offline training because there will be no income during this period. When explaining why he would participate in offline training with a group of

[8] Offline training usually occurs in the off-season of meal delivery. Offline training is a punishment in the eyes of a rider, because participating in the training will occupy one's delivery time. However, in the author's opinion, offline training is also a means of regulating the supply and demand of the rider market, because during the off-season, the demand for riders is small, and the team has a large number of riders. The method of making them participate in offline training in batches can play a role in regulating market supply and demand. In the off-season of March and April, riders are likely to be "invited" to participate in offline training because of two negative reviews a week, and in the peak season of June and July, few people have heard of people participating in offline training.

newcomers, rider Wu expressed his dissatisfaction with consumers who gave him negative reviews.

> *Students of Y University are really bad, and how shameful to be known as proud children of heaven. Two days ago, I delivered milk tea to a female student at Y University. The lid of the milk tea was not tightly closed. When I arrived at Y University, I found that the milk tea was splashing out of the cup a little bit, just a little bit. I told the girl that the milk tea shop did not close the lid tightly when packing, and I was slightly responsible. So I told her that I would compensate her with some money. The female student picked up the cup and looked at it, and said impatiently, "Forget it, it is okay," then turned around and went back. As a result, when I went back, the site called me and said that a customer had just given a negative review to me. I thought I sent only one order in the afternoon, so the girl from Y University certainly gave the negative review.*

Although consumers always have reasons for negative reviews or complaints, riders still want to understand them. In their opinion, what consumers see on their mobile phones is only their movement on the map as a light dot, but they describe the food delivery process as "a life of nine deaths." Since the order must be delivered within the specified time, it is common for them to ride in reverse, run red lights, and speed up. In addition, they also have to suffer from the difficulties of security personnel along the way, watch out for traffic police penalties, and sometimes need to pay for customers' phone bills (such as when customers cannot receive calls due to stopped mobile service), buy cigarettes, and throw garbage. The wage earned by risking their lives and hard work is likely to be in vain because of consumers' negative reviews or complaints.

Therefore, it is not difficult to understand why a respectful rider will record dissatisfaction and resentment on consumers after learning that he has received a negative review or complaint. Because riders always know the evaluation results given by consumers after delivery, they cannot express their dissatisfaction in person. Consumers seem to have the "absolute power" of supervision and evaluation, but unknowingly, as the "manager" role played by the platform system, they have become "scapegoats" for labor conflicts. Ironically, when consumers and riders complained to each other, the food delivery platform company became the "mediator" of the conflict between them because consumers would complain to the company about the rider through the platform system, and riders could only appeal to the company through the platform system.

Another result of the redistribution of control power is the increased difficulty of determining the labor–capital relationship. From the current legal system, the platform employment model does not completely conform to the category of "employment," nor does it fully conform to the category of "independent contract workers" (Wang et al. 2018). In 2015, the California Federal District Court ruled that the relationship between Uber and online car-hailing drivers constituted an employment relationship mainly because the employer is "controlling details of the job" (Wang Tianyu 2016). Therefore, the key to determining an employment relationship is whether the platform company has control over the labor process or acquired the subordination of the rider's labor to the platform's capital (Chang 2016). However, since the platform system and consumers have undertaken the main supervision tasks, the reallocation of control power has

Table 1 Data collection of the platform system in the rider delivery process

Rider delivery	Take orders, park near the merchant/business, arrive at the pickup point, complete the pickup, get on the ride, arrive near the customer, complete the delivery
Motion state	Cycling, walking, parking, walking, cycling, parking/walking
Basic technology	GPS trajectory mining, Wi-Fi and Bluetooth geofencing technology, Mobile phone sensor motion recognition
Data collection	GPS Trajectory data, Wi-Fi and Bluetooth data, rider behavior data, order data

Source: The Practice of Machine Learning in Meituan's Distribution System: Using Technology to Restore the Real World, 2019

(https://tech.meituan.com/2018/12/13/machine-learning-in-distribution-practice.html)

increased the difficulty of determining the employment relationship. Even from the perspective of "work details," it is difficult to see the platform company in the rider's labor process. Therefore, the rider must be disappointed when encountering a work injury and needing to find an employer to come forward. Rider Shen Jun experienced a similar story while working on platform S. He showed the author a 20 cm long scar on the inner side of his calf and said:

> *When I was delivering food on platform S, I was hit by a car on the road once. However, the car owner is insured and is willing to compensate. The insurance company asked me to provide proof of income to calculate the missed work cost. I went to the platform S office in Beijing and asked them to give me an income certificate, but they just refused to give me one, saying that it had nothing to do with them. At that time, I had an income of approximately 10,000 yuan a month. I spent three months in the hospital. I was able to get many missed work payments according to this standard. In the end, platform S didn't give me a certificate. Finally, the insurance company gave me the minimum wage standard in Beijing as my missed work payment. To be honest, after that time, my heart was cold. These companies will not care about us at all.*

If we say, "on construction sites, the relationship between fellow workers and friends exists between workers and bosses, between workers and workers, and between workers and managers. This relationship is like a veil of affection, covering the labor-employment relationship" (Pan Yi et al. 2011: 118). Then, the reallocation of control power in the Internet platform industry makes it easier for platform companies to eliminate labor relations and employer responsibilities.

Scientific-technology control: digital control

(1) Parallel data collection

The platform system is responsible for guidance, rewards, and punishments in the delivery process and continuously collects data through the rider's smartphone and the installed application (as shown in Table 1). When the rider is on delivery outdoors, the platform system tracks the rider's movement through the GPS in the rider's smartphone. When the rider enters a room to pick up or deliver the meal, due to the poor indoor GPS signal, the platform system will continue to track the rider through the smartphone's

Wi-Fi (wireless network) and Bluetooth signals, and according to the information transmitted by the smartphone as a sensor, the rider's behavior in the room is monitored, and the "every move" of the rider in the room is grasped. Therefore, in addition to the rider's movement, the platform system can also identify the rider's motion state, including walking, riding, running, climbing stairs, and taking escalators or elevators. It can also record historical data generated by the rider, including the time of arrival at the business, the length of stay in the business, the customer's address and floor, the time to notify the customer to go downstairs to pick up the meal, and the time to wait for the customer to pick up the meal. Moreover, as more smart devices, namely smart voice headsets, smart helmets, and indoor positioning base stations, are activated, the rider data will also be more accurate and comprehensive.

In fact, in addition to riders, all terminals that install take-out platform software are the source of data collected by the platform system. Therefore, the platform system collects data from merchants and consumers while collecting rider data, such as merchant addresses (including location and floor), meal preparation time, the weight of the order, price, volume, packaging speed at the front desk, and order situation(squeezed or not). Moreover, it collects information such as consumer address information (including whether there is a janitor, building unit number, floor, and apartment number), taste preference, order time, waiting time, tolerance to overtime, and proportion of giving positive reviews, negative reviews, and even complaints in the past.

The data of the platform system have a wide range of sources, and the collection process is very secretive. Platform systems often complete data collection through the smartphone application without the knowledge of riders, consumers, and businesses. Although the application will have privacy protection tips before using it, no one wants to spend time and patience reading the long-form privacy policy, and if you do not agree, you will not be able to use the take-out platform application normally. For example, when a rider or a consumer installs the take-out platform application for the first time, a notification window will pop up on the phone interface, asking the user to agree to share their location information; otherwise, the application will be unavailable. Although the third option between agreeing and disagreeing, the option of sharing location information only when using platform software, has gradually become popular after the platform application is promoted, the moment a rider or a consumer opens the take-out platform application. He or she has inevitably become the object of platform system data collection. There is also evidence that even if the user deletes the platform application on the phone, the platform system may continue to collect user data.[9]

(2) Technical means upgraded: digital control

The purpose of the platform system to collect data is to serve the platform management. After the rider receives the order, the estimated delivery time will be displayed in the order information, such as 35 min, which means that the rider has to deliver the

[9] On April 23, 2017, the "New York Times" published an in-depth report titled "Uber's C.E.O. Plays with Fire." The report pointed out that Apple's engineers discovered that even if users delete Uber's apps on their Apple phones, Uber is still collecting user information. (see https://sspai.com/post/38938).

meal to the consumer within 35 min.[10] This time is the result of calculation by the platform system based on many characteristic dimensions and historical data. For example, the rider's age and height are very important characteristic dimensions as the model calculates the rider's corresponding step length and speed. Regarding consumers' tolerance limits for overtime, the platform system can calculate the consumer's sensitivity to overtime delivery based on the historical records of negative reviews and complaints due to overtime.

Regarding a merchant, the floor of the restaurant, the meal-preparation speed, and the squeezed package of the order will affect the final delivery time of the rider. In addition, the time, road section, and real-time weather conditions in the business district will also affect the delivery. As these characteristic dimensions and historical data are put into the model, when an order with the same delivery scenario appears, the platform system through self-learning can predict the time required (such as 35 min) for the rider to deliver with a certain degree of confidence (such as 95%). It is foreseeable that as the characteristic dimensions and historical data become more comprehensive and refined, the platform system will also calculate a more accurate estimated delivery time.

However, while collecting data, the platform system is also subtly disciplining riders. In calculating the estimated delivery time, the platform system analyzes all the collected data to manage the rider's labor time. In addition, the delivery route planned by the platform system based on the collected road information (such as the number of traffic lights, time, and road congestion) spatially limits the rider's labor process. Because consumers can see the rider's trajectory data through their mobile phones, they can call to urge the rider when they find that the rider is detouring or deviating from their position. When the rider reports to the platform system that the order is delivered, if the straight line distance between the feedback location and the customer's address is greater than 500 m or the rider takes less than 5 min from picking up the order to delivery, the platform system will determine that the rider is "fraudulent." In short, data have become the main basis for the platform system to manage riders, and the "digital control" behind the platform system has begun to emerge.

Compared with the "numerical control" in industrial automation production described by Braverman and Edwards (Braverman 1979; Edwards 1979), the "digital control" of the platform system—that is, the management of riders using data—shows the following differences. First, the "numerical control" in automated production is to make the machine work per the existing digital program, so the object of its control is the machine; the object of the "digital control" of the platform system is people (i.e., riders), not machines. Second, the intermediary of "numerical control," numerical value, has no special meaning in automated production. In contrast, in the context of big data and artificial intelligence, data have analytical value beyond itself, and the platform system uses them in management such as matching riders, estimating time, planning routes, supervising delivery time and space, and evaluating performance.

[10] The actual situation is much more complicated. Riders often deliver several orders at the same time. The delivery time overlaps and the routes are different. The riders have to deliver the food within the specified time of each order. The estimated delivery time given by the platform system must therefore take into account the delivery of multiple orders. Therefore, the data, algorithms and models involved in calculating the estimated delivery time of the platform system are more complicated.

Third, the program used for "numerical control" in automated production is only composed of digital codes. However, the data used by the platform system for "digital control" are ubiquitous, including not only online and offline data but also data about riders, consumers, merchants, time, road sections, and weather conditions, and have become the data basis for maintaining the platform's labor order. Finally, the "numerical control" in automated production is public, but the process of "digital control" of the platform system is secret because collecting data and using data results are secret. The biggest feature of "digital control" is secretly collecting and analyzing data and using it for management, making it intelligent and invisible. Moreover, it is precise because the platform system calculates delivery time, delivery price, and delivery route based on intangible data, algorithms, and models under the banner of technology neutrality, which does not cause riders to question the quantitative control of the platform system. In contrast, riders also regard this quantitative control (that is, estimated time, navigation of the route) as a means of urging and assisting them in completing the delivery task and obtaining the delivery commission.

(3) Rider autonomy under "digital control"

The author saw in the WeChat group of the take-out delivery team:

Li Wei: @Everyone pays attention, the system is upgraded, and you must arrive at the business/restaurant on time in order to report!
Zhao Xiaohai: What do you mean?
Mei Zhenming: What does it mean to arrive at the business/restaurant on time?
Li Wei: Just look at the report for yourself, and you will know.
Qiu Wei: Well then, the order cannot be pended!

The "report" in the rider's words refers to the fact that when delivery work is delayed due to slow meal preparation in the restaurant, the rider can extend the delivery time by "reporting." "Pending orders" is a strategy that the rider "invented" in the process of delivering take-out over the years to deliver more orders. In principle, the rider should go to the restaurant to pick up the take-out immediately after taking the order. However, before the rider sends feedback to the platform system to "confirm the pickup," if the platform system receives a new order from the same destination, it will send it to the same rider. Whether there will be such an order depends entirely on luck, so the rider tries his luck by "pending an order," that is, by delaying feedback to the platform system about "confirming the meal." "Pending orders" is a strategy of delaying the delivery time in exchange for more orders. However, when the rider wants to "pend an order" but does not want to delay the delivery time because of the "pending order," making up for the time loss caused by the "pending order" becomes the most important issue for the rider.

Correspondingly, the way to extend the delivery time is to "report," but "reporting" needs to meet three prerequisites: first, the rider is near the restaurant; second, the rider has been in the restaurant for more than 5 min; third, the restaurant did not get take-out ready at the expected time. For experienced riders, it is easy to meet the prerequisites for "reporting." First, the straight-line distance between the rider's

Table 2 Before and after changes of conditions for riders to "report"

March 2018	June 2018
Conditions for riders to "report"	Conditions for riders to "report"
1. Nearby the restaurant 2. More than 5 min in the restaurant 3. Till 11:36, take-out not ready	1. Arriving before 18:35 2. Nearby the restaurant 3. More than 5 min in the restaurant 4. Till 18 .40 take-out not ready
The default distance of arriving at the restaurant is 500 m	The default distance of arriving at the restaurant is 100 m

order-waiting place and most restaurants is within 500 m (the requirement of "restaurant neighborhood" is that the straight-line distance is within 500 m). Second, since it is within 500 m, the rider can stay in his original place and click "Confirm Arrival" to the restaurant, satisfying the requirement of more than 5 min in the restaurant while "pending the order" at the same time. Finally, in the hectic, even if the restaurant has already got the take-out ready, the rider can still claim that the restaurant has not been ready for take-out within the expected time, or the ordered take-out cannot be found. In the end, the rider can extend the delivery time of the previous order by "reporting" the previous order, which falsely claims that the restaurant is slow to get ready for the take-out rather than a delay caused by his own "pending order."

This "bug" in "reporting" shows that the platform system is not perfect in management, and it is also why platform companies continue to "patch" and upgrade platform systems. Moreover, the "bugs" in platform system management are usually not detected by the platform system but by the "contributions" of riders. Extending the delivery time of the "pending order" through "reporting" is a manifestation of the labor autonomy of the rider. The rider has discovered the "bug" in existing management rules and used it as a window to maximize benefits.

However, during the rider's labor, the platform system continuously collects delivery data from riders. When an increasing number of riders start to use "reporting" to "pend orders," not only will the amount of "reporting" data increase significantly, but riders also cause a significant increase in timeouts, negative reviews, and complaints due to too many "pending orders." This kind of abnormal data will eventually lead the platform system to detect its own "bugs." The result is that the system "bugs" are patched, and the platform system is optimized. The optimization of the platform system, in turn, strengthens digital control as riders' autonomy space is further eroded.

As shown in Table 2, the left column lists the conditions to "report" that the author needed to meet when I was a rider in March 2018, and the right column lists the conditions to "report" in June 2018. Compared with the situation in March, the platform system had increased the specific time requirements for arriving at the restaurant by June, as shown in Table 2 "Arriving at the store before 18:35"; the default distance of arriving at the restaurant had also been changed from the previous 500–100 m. In this way, in actual operation, as long as the new "report" conditions are met, the rider can still "report" to extend delivery time because of the restaurant's delayed take-out, but he cannot extend the delivery time of "pending orders" through the "report." If the rider does not arrive at the restaurant at the specified time, he will not be eligible for "reporting"; if

he arrives at the restaurant at the specified time, the rider will not be eligible for the next order due to the time and distance (less than 100 m) from the restaurant. Riders cannot repeat their tricks and fail to postpone or pend feedback to the platform system for "confirming the pickup" and thus lose the possibility of "pending orders."

Conclusion

According to Nick Srnicek's definition, "platforms are digital infrastructures that enable two or more groups to interact" (Srnicek 2018). Platforms are similar to data terminals, connecting different entities participating in market transactions. These subjects include consumers, merchants (front desk and back kitchen), take-out riders, riders' stations, and platform companies in take-out platforms. If we regard the labor order of the take-out platform economy as a network, then the platform system is the core of the network of order. Merchants, consumers, riders, stations, and platform companies are the nodes of the order network, and take-out riders connect the core and the nodes through their delivery behavior, thus forming this network of order. The rise of Internet platform companies largely depends on Internet technology and new organizational management models. Therefore, along with Marx's technical analysis, this article studies the labor process of take-out platforms from the perspectives of organizational technology and scientific technology. It tries to find the answer to why the labor order of the platform economy is possible, and at the same time, respond to new changes of the core issue of the labor process theory, namely, how capital controls labor in the Internet platform economy.

From the perspective of organizational technology, the redistribution of control power is to a certain extent another feature of the labor organization and management model of the Internet platform after subcontracting (such as the "asset-light operating model," see Liang 2017) and assembly line operations (Zhuang 2019; Wu et al. 2018). First, take-out delivery platform companies have outsourced labor to agents in various regions. The take-out team where the author works is a secondary subcontracting station under a certain logistics company in Tianjin. After subcontracting, the take-out delivery platform company is only responsible for operating and maintaining the platform system, positioning itself as a technology service company rather than a take-out delivery company. Therefore, it does not recognize the existence of an employment relationship with the take-out delivery rider. The agent (i.e., the labor dispatch company) also cleverly avoided the employment relationship by signing a labor dispatch contract with the rider instead of a labor contract. Then, in the specific management after the recruitment of riders, the take-out platform company continued the factory management model, that is, the assembly line operation, and continuously dismantled and standardized the labor process.

For example, the rider's delivery was divided into three stages: arriving at the restaurant, picking up the take-out, delivering to the customer, and requesting riders to give feedback to the platform system after completing each work stage. On the other hand, Internet technology is used to redistribute control power. The platform system is responsible for directing and disciplining riders, and consumers are responsible for supervision and evaluation. The redistribution of control power largely stems from the support of data, algorithms, and models behind the platform system. Because the data,

algorithms, and models are invisible, the reallocation of control power further increases the difficulty of determining the employment relationship.

After the control was redistributed, take-out delivery riders assumed the responsibility of maintaining the relationship between the take-out delivery platform and consumers. Therefore, in addition to physical and mental labor, much emotional labor is inevitable, such as making consumers have a good experience and feeling. However, even if a rider paid extra labor or risked his life, he could still not ensure that he would be well received by consumers every time. Sometimes, the consumer's evaluation may not be objective and fair, making the rider feel aggrieved and unfair. Compared with dissatisfaction with the platform system's order dispatching, guidance, and rewards and punishments, riders' dissatisfaction with consumers is often more intense. This has much to do with the pattern after the redistribution of control power.

Compared with the nonstructural control ("Entrepreneurial Control" and "Hierarchical Control") and structural control ("Technical Control" and "Bureaucratic Control") classified by Edwards, the organization and management of the rider's labor process are "semi-structured," which includes both the component of "structural control" from the platform system (technology) and the component of "nonstructural control" from consumers. The supervision and evaluation power enjoyed by consumers are highly subjective. Consumers, as concrete individuals, also allow riders to vent their dissatisfaction with a clearer goal. Therefore, conflicts between riders and consumers are often seen in the news. In short, by redistributing control power, platform companies retreated behind the scenes, seemingly abandoning direct labor management but downplaying employers' responsibilities and transferring labor conflicts to platform systems and consumers.

From the perspective of science and technology, the platform system fully manages the rider's labor process with Internet technologies, especially big data and artificial intelligence. Although consumers are also involved in management, their supervision and evaluation power are also realized through the platform system. The platform system's basis for managing the rider comes from the rider's labor process data. In the delivery process, the platform system continuously collects data from riders, consumers, merchants, and business districts, through smartphones and the platform application. It applies these data to the rider's management, such as delivery pricing, rider matching, time estimation, route planning, whole process monitoring, and quantitative assessment. This article puts forward the concept of "digital control" and distinguishes it from the "numerical control" in industrial production proposed by Braverman and Edwards. Digital control" shows that technological control is transforming from physical machines and computer equipment to virtual software and data, changing from tangible form to intangible form. Continuing Marx, Braverman, Edwards, and Burawoy's research, this article attempts to point out two trends in capital control, namely, the transition from: "hard control" (autocratic control) to "soft control" (hegemonic control) and from "obvious control" (physical control) to "hidden control" (virtual control).

The reason why take-out riders feel "free" at work is not only because they are free in terms of time to go to work and get off work but also, to a large extent, because their management has become invisible. Before the rider delivers, the platform system has calculated the estimated delivery time and planned the delivery route; during the rider's delivery process, the platform system will adjust the time and route

according to the actual delivery situation. The rider must follow the platform system's planned route and meet the estimated delivery time. Therefore, the process control of the rider is transformed into result control.

Suppose the rider does not deliver according to the estimated time and route. In that case, the consumer's supervision (through the platform software "reminder" or calling directly to ask the rider about the reason for being late or deviating from the delivery route) will cause the rider to return to the time and space calculated by the platform system. Other riders who work in the established time and space planning will only use quantitative control (estimated time, route navigation) to supervise and assist themselves in completing delivery tasks and obtaining delivery wages. In this sense, invisible control undoubtedly weakens the rider's willingness to resist.

Although the platform system fully manages riders' labor process, it is not impeccable in management, which is why take-out delivery platform companies continue to upgrade platform applications. The "bugs" in the platform system give riders an "opportunity." Experienced riders can always find "bugs" in the system during years of work. Extending the delivery time by "pending orders" through "reporting" is not only the performance of the rider's work autonomy but also the embodiment of the rider's resistance to the "digital control" of the platform system.

However, as more riders followed this method to utilize platform bugs, "reporting" data and abnormal complaint data attracted the platform system's attention, and in the end, the platform system was upgraded to make "pending orders" impossible. Because riders originally discovered the "bugs" of the platform system, they unknowingly participated in its management. Moreover, it is not difficult to predict that the contest between "digital control" and rider autonomy will always end with a "digital control" win through the continuous upgrade. Therefore, "digital control" is also a process in which the rider's autonomy space is constantly eroded.

Finally, although the data used by the platform system to manage riders are objective, there is an interest orientation behind it. Regardless of how much technology leaps, it essentially serves capital (Zuboff 2015). The blind admiration of technical myths often allows us to relax our vigilance against behind-the-scenes operations. Therefore, we should see that the platform system is not an objective and neutral "manager" behind the "digital control." If it is an open secret that the content of social media and shopping websites will be pushed differently according to the preferences and habits of the audience, then we have reason to believe that Internet platform companies are using the data they collect to maximize their benefits. Just as Cathy O'Neil (2018) warned people to stop blindly following big data in the book *Weapons of Math Destruction*, we must be soberly aware that "Some of these choices were no doubt made with the best intentions. Nevertheless, many of these models encoded human prejudice, misunderstanding, and bias into the software systems that increasingly managed our lives" (O'Neill, 2018: V). As various Internet platforms surround people's daily lives, whether consumers or workers, to avoid becoming a "digital refugee" under the Internet platform, they must see the dark side of data and be wary of the capital manipulation behind technology, and through reflection, criticism, and action, resist the data infringement by platform companies.

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Chen Long designed the study and conducted research, as well as arranging and analyzing data. The author read and approved the final manuscript.

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Competing interests
The author declares that he has no competing interests.

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Publisher's Note

Power resources and workplace collective bargaining: evidence from China

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Abstract

During the strike wave of 2010, S provincial authority began to support trade unions in experimenting with workplace union elections and collective bargaining. Drawing data from union documents and ethnographic research, the variability in workplace collective bargaining in the context of official union reform in Y City in S Province is explained in this article. By comparing multiple enterprise union collective bargaining cases, four models of workplace collective bargaining in practice are identified in the research: moderated mobilization, technical negotiation, collective consultation, and managerial domination. Using the power resources approach to analyze collective bargaining, the author argues that the various practices result from the dynamic interactions between workers' power configuration and employers' perception of disruption. Furthermore, the author argues that the variability in workplace collective bargaining is not a transient phenomenon but a semi-institutionalized middle ground.

Keywords: Collective bargaining, Power resources approach, Trade union reform, China

Introduction

Over the past two decades, scholars have witnessed a rapid expansion of labor relations institutions in China, including a rise in trade union membership, staff and workers' congresses, and collective bargaining (Lee et al. 2016; Liu and Kuruvilla 2017). Notwithstanding the institutional expansion, many primary-level enterprise unions lacked worker representation, and collective bargaining did not involve genuine negotiation between workers and employers (Clarke et al. 2004; Lee 2009). However, the large wave of labor unrest in the late 2000s, in which workers demanded wage hikes and union representation, forced the Chinese state to make an institutional response on the ground. As Clarke and Pringle (2009: 85) pointed out, "the form and extent of independent worker activism, and the response of the state to such activism, are a much more significant determinant of trade union development than is the legal and institutional framework of industrial relations." In the regions where foreign-invested manufacturing was concentrated, local authorities began to support trade unions to experiment with workplace union elections and collective bargaining (Meng and Lu 2013), efforts that were further

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strengthened by the national trade union's campaign for establishing union organizations and collective bargaining in all enterprises.[1]

Scholars of Chinese labor relations have explored whether Chinese unions could approach collective bargaining with genuine worker representation and empowerment, and emerging literature suggests a significant improvement in the foreign-invested automobile industry. Nevertheless, there is little evidence indicating that the improvement in the automobile industry would be expanded to other industries. Official union reform has created various workplace collective bargaining practices, but existing studies have only focused on the most compelling cases. While these studies help us see that Chinese autoworkers can mobilize through the elected enterprise union and workers and staff congress and gain wage increases through collective bargaining, we are still left without an understanding of the overall field of Chinese collective bargaining, given the various practices across different factories and industries. It is doubtful that workers in other industries will follow the autoworkers being incorporated into the Chinese corporatist-style labor relations institutions.

In this article, I explore why there is considerable variation in workplace collective bargaining in the context of official union reform in S Province. By comparing different enterprise union collective bargaining cases in Y City, I identify four models of workplace collective bargaining in practice: moderated mobilization, technical negotiation, collective consultation, and managerial domination. I demonstrate that establishing workplace unions itself does not necessarily lead to effective collective bargaining or advancement of workers' interests, but workers' involvement and action are the key factors in shaping collective bargaining dynamics. By employing the power resource approach to examine workplace collective bargaining, I argue that the various models of workplace collective bargaining mainly result from the dynamic interactions between workers' power configuration and employers' response to potential business disruptions. I further argue that the uneven development of workplace collective bargaining is not a transient phenomenon but a semi-institutionalized middle ground.

Collective bargaining in contemporary China

Unlike collective bargaining in most countries, which is conditioned on the union's organizational autonomy from the state and employers and workers' rights to strike, Chinese official unions were the party's mass organizations under the leadership of the Communist Party of China (CPC) (Lee 1986; Chen 2003, 2009; Clarke and Pringle 2009). Because the transition from a planning economy to a market economy created private and foreign-invested enterprises and because the enterprise union cadres are private-sector employees rather than state officials, enterprise unions ceased to be the agents of the state for distributing social welfare and managing the labor force and instead became dependent on company management. Neither official union federations nor enterprise unions can defend workers' rights and interests by organizing collective actions. Given

[1] 2010 Notification on the Further Promotion of the Rainbow Plan for the Implementation of the Collective Contract System; 2010 "Two Universals"—to establish enterprise union organization and collective bargaining in all enterprises; 2011 Work Plan for Promoting Collective Wage Consultation in 2011–2013; 2014 Work Plan to Further Deepen the Collective Consultation System 2014–2018; 2014 Opinions on Improving the Quality of Collective Consultation and the Effect of Collective Contracts.

this institutional environment, how do the Chinese unions approach collective bargaining? Can collective bargaining improve Chinese workers' labor conditions and material interests on the shop floor?

The "appropriated representation" model represents a pessimistic view of collective bargaining in China. Eli Friedman (2014: 22) adopted the term from Max Weber and reconfigured it to "refer to a situation in which the state unilaterally grants exclusive rights of political representation of an entire class to a particular organization in the absence of substantive or formalistic delegation from membership." Under the conditions of the appropriated representation, rising labor unrest strengthens the political status of official unions in the Chinese state. The official unions could push the government to promote pro-labor legislative reform to maintain industrial stability. Nevertheless, weak, unrepresentative enterprise unions are incapable of enforcing legal rights or negotiating collective contracts on behalf of workers.

Many studies in the 2000s supported the appropriated representation model. Scholars have identified a "quota management strategy" that the national union federation used to create enterprise unions and increase the coverage of collective contracts (Clarke et al. 2004; Lee 2009; Wu and Sun 2014; Qian 2014). Upon receiving the quantitative targets assigned by the national federation, local official unions allied with government departments to invite, if not press, employers to fill out and sign a collective contract template with enterprise unions. In the much-praised sectoral collective bargaining in Zhejiang and Jiangsu Provinces, officials and employers used sectoral collective bargaining to standardize wages and working conditions across the homogeneous sector in town, with a dozen employer-picked worker representatives being consulted in the negotiation process (Pringle 2011; Friedman 2014; Wen and Lin 2015). Therefore, state-initiated collective bargaining was mostly a top-down administrative process involving cooperation between officials and employers, and workers were largely excluded from the process if any negotiation took place.

State corporatist representation is another framework for investigating Chinese trade union politics (Chan 1993, 2008; Unger and Chan 1995; Chen 2003; Wen and Lin 2015; Liu and Kuruvilla 2017). Philippe Schmitter (1974: 93) defined corporatism "as a system of interest representation in which the constituent units are organized into a limited number of singular, compulsory, noncompetitive, hierarchically ordered and functionally differentiated categories, recognized or licensed (if not created) by the state and granted a deliberate representational monopoly within their respective categories in exchange for observing certain controls on their selection of leaders and articulation of demands and supports." Chinese trade union politics manifest state corporatist representation as the state created the centralized, hierarchical official union system and forged its organizational dependency on state power. Nonetheless, except for the urban workers before market reform, Chinese trade unions were unable to incorporate workers into the corporatist representation for conflict resolution or economic (re)distribution.

However, the strike wave of 2010 changed the landscape of Chinese labor politics, initiating a state corporatist approach to governing labor unrest. As workers struck to demand higher wages and union representation, the Chinese government recognized the necessity of resolving labor conflicts by allowing workers to elect shop floor representatives and negotiate wages and benefits with employers (Meng and Lu 2013; Chan

and Hui 2014). Recent studies find that elections have created union representativeness and autonomy from management. The reformed enterprise unions are capable of mobilizing workers to bargain with employers based on established procedures. Workers can veto the negotiated contract or even take collective action through the elected workers and staff congress, and when enterprise unions cannot reach an agreement with management, official unions mediate the stalemate (Cao and Meng 2017; Pringle and Meng 2018; Luo and Yang 2020; Deng 2016, 2020).

Notwithstanding, it is doubtful that the recent collective bargaining reform will fully establish a corporatist representation for Chinese labor. The practice and quality of collective bargaining vary considerably across factories and industries. The most studied cases of workplace collective bargaining concentrate on the foreign-invested, capital-intensive sectors where (semi)skilled workers are militant and employers comply with the regulations. Collective bargaining in labor-intensive sectors, to which scholars have paid little attention, presents different dynamics. In some enterprises, elected union cadres rely on professional status and expertise to negotiate with management, while worker participation is limited in electing representatives, collecting information, and revising and approving collective contracts. In other enterprises, enterprise unions consult with management to set up wages and benefits and then obtain formal approval from a controlled workers and staff congress. Still in others, if there is any negotiation, management dominates enterprise unions in setting wages, and workers are excluded from participation. What explains the variability in workplace collective bargaining practice in China? Is this variability a temporary development in a transition to state corporatist labor relations or an institutional arrangement that is neither state corporatist representation nor appropriated representation?

Explain the variability in workplace collective bargaining: a power resources approach

The power resources approach (PRA) has recently emerged as a research heuristic for studying trade union renewal in globalization (Schmalz et al. 2018). In a nutshell, the PRA stipulates that although globalization has weakened organized labor, workers could still draw power from their job and labor market locations (structural power), unions and collective organizations (associational power), the established state regulations (institutional power), and public morality and communication (societal power) to pressure employers to make a concession. While focusing on Chinese state actions cannot explain the diverse collective bargaining practices and workplace outcomes, the PRA can help us understand the variability by analyzing the dynamic interactions between state reform, worker power, and employers' response. To apply the PRA to analyze collective bargaining cases in Y City, we must first place the PRA concepts within China's context.

Structural power refers to the disruptive power stemming from workers' location in the labor process and skill supply in the labor market. The former is workplace bargaining power; the latter is labor market bargaining power (Wright 2000; Silver 2003; Webster 2015). Since the S provincial labor market has been tight since the late 2000s, it is mainly workers' workplace bargaining power that varies across enterprises and sectors. Because Chinese unions are not allowed to organize workers to disrupt production, Chinese workers' structural power is manifested in spontaneous wildcat strikes. According

to past observations and research, Chinese workers' workplace bargaining power has been the most crucial source for institutionalizing genuine collective bargaining. As a senior union official in Y City summarized, "all the cases of effective collective bargaining in Y City result from wildcat strikes."[2]

Regardless of the strength of workers' structural power, the actual exercise of structural power makes the most difference through employers' perception, giving rise to different attitudes among employers toward collective bargaining in China. Employers who experienced strikes are likely to accept union elections and establish procedural rules of collective bargaining, and then the strength of workers' structural power affects the dynamics and outcomes of collective bargaining. Strong workplace bargaining power is often associated with a stable, (semi)skilled workforce in capital-intensive industries, while weak workplace bargaining power is usually associated with a high-turnover, low-skilled workforce in labor-intensive industries. In enterprises where strikes occur, enterprise unions are likely to pressure employers in wage negotiations with the threat of possible wildcat strikes if workers hold strong workplace bargaining power (Cao and Meng 2017; Luo and Yang 2020; Deng 2016, 2020), but enterprise unions are more likely to coopt workers if workers' workplace bargaining power is weak (Meng and Cao 2017; Froissart et al. 2019). Many employers who have not confronted strikes are unwilling to accept genuine wage bargaining.

Associational power arises from "the various forms of power that result from the formation of collective organization of workers" (such as trade unions and political parties), which can be divided into three levels: workplace, industry, and society (Wright 2000: 962–63). Chinese workers' associational power can emerge at the workplace level but not at the industry or national level, as official union federations (including industrial unions) are state organizations. Nevertheless, because most enterprise unions were created by officials and employers, they did not embody workers' associational power. However, in the 2010s, the enterprise union reform in S Province created an opportunity to build worker representation and organizational capacity, aiming to generate associational power for collective bargaining.[3] The reform has created a variety of union autonomy and representativeness, resulting in different levels of worker participation in collective bargaining: in some enterprises, all workers are mobilized for participation; in other enterprises, only worker representatives are allowed to participate; while in other enterprises, only union cadres are involved, or in the worst scenario, the management dominates the enterprise union.

Institutional power derives from the state-legislated labor relations institutions and laws secured through historical labor struggles (Schmalz et al. 2018: 121). In China, the labor relations institutions and laws cannot automatically create institutional power because introducing those institutions and laws is a top-down bureaucratic process led by the state rather than the product of compromise between capital and labor. Chinese labor relations institutions and laws only begin to generate institutional power when

[2] A conversation with a senior union leader in Y City, April 2014.

[3] After a wave of strikes in 2010, S provincial officials began to support electing enterprise union cadres and worker representatives in strike factories. In 2012, the Y City Federation of Trade Unions began to campaign for implementing democratic elections in enterprise unions. In 2014, the S Provincial Federation of Trade Unions made enterprise union election an official policy in the province.

Table 1 Worker power and the variability in workplace collective bargaining in China

Labor power	Collective bargaining			
	Moderated mobilization	Technical negotiation	Collective consultation	Managerial domination
Structural power	S	–	–	–
Perception of disruption*	S	S	–	–
Association power	S	S	S	–
Institutional power	S	S	S	S
Exemplar	YT Union	RH Union	FX Union	WM Union

"S" means "strong," and "–" means "weak." Strong or weak only represents an ideal situation in theoretical analysis

*Employers' perception of disruption can be seen as an actual exercise of workers' structural power (regardless of the strength of the structural power), which is often realized in the form of wildcat strikes in China. Even though workers' structural power is very weak in one case, as long as they exercise structural power by going on a wildcat strike, employers can still develop a strong perception of business disruption

CPC leaders advocate for law and policy enforcement. Collective bargaining has existed in Chinese labor law (1994), trade union law (2001), and collective contract regulations (2004), but until the late 2000s, when CPC leaders and the national union federation mobilized local governments to set up enterprise unions and collective bargaining, and particularly in S Province, when the provincial party leader ordered to address labor disputes by union reform and collective bargaining, did workers begin to receive institutional support to elect enterprise union cadres and representatives and initiate collective bargaining with employers. However, institutional power alone cannot lead to genuine collective bargaining. As I will show later, if workers only hold institutional power, employers may superficially comply with state regulations without offering a substantial compromise to workers.

Societal power refers to the latitude for action arising from a coalition with other social actors or leading public opinion to support trade union demands (Schmalz et al. 2018: 122–23). Societal power hardly applies to Chinese trade unions because the state strictly controls the horizontal coalition and publicity work of trade unions, and so Chinese unions are constrained to network with social actors to defend labor rights. Because the union's publicity work must be kept in line with the party's discourse, there is no point in expecting Chinese unions to have the discursive power to lead public opinion debate. Hence, I do not consider the effect of societal power on the variability in workplace collective bargaining in China.

Most existing labor studies using the PRA examined how one or two sources of labor power influence the collective labor struggle outcome (Fichter 2018; Hinz 2018; Spooner 2018). By employing the PRA to analyze workplace collective bargaining in the Chinese context, this research contributes to the theory of the PRA by showing how the interplay between the different sources of labor power dictates the dynamic process and outcome of workplace collective bargaining. Using the PRA to examine 17 cases collected in the fieldwork, I identify four models that emerged from the empirical comparison (see Table 1): moderated mobilization, technical negotiation, collective consultation, and managerial domination. The column content represents the variant of workplace collective bargaining. The row content is the sources of labor power and employers' perception of structural power, except for the bottom row, which provides exemplary cases that I will discuss in the next section.

I do not claim that the four variants that emerged in this research represent the totality of the variability in workplace collective bargaining in China. Grounded in empirical findings in Y City, my purpose is to use the PRA to understand the institutional means, dynamics, and outcomes of workplace collective bargaining, as well as how Chinese cases could broaden the application and understanding of the theory of PRA. There could be other variants of collective bargaining resulting from different interactions of forces or alternative explanatory factors other than labor power and employers' response.

Data and research method

Data are drawn from documents and ethnographic research in Y City between 2014 and 2017. At the end of 2013, I joined a research team at a Chinese public university to study the trends in Chinese worker organizing. One part of the project was to study the changing role of trade unions in worker organizing. In Y City, China's leading special economic zone, the concentration of foreign capital and migrant labor produced perhaps the most contentious labor conflicts in the world, and the Y City Federation of Trade Unions (Y City Union) has been proactive in reforming enterprise unions and collective bargaining to maintain industrial stability. Through a few rounds of communication between the union and the research team, the Y City Union provided me with access to its daily administration, reform projects, documents and journals.

I collected 17 promotional cases of workplace collective bargaining from the union's work documents, research reports, and internal references and recorded interviews with enterprise union cadres and workers. I compared the processes of unionization and collective bargaining among those cases for which sufficient details were available, and four models of workplace collective bargaining emerged. Then, I select the YT Union, the RH Union, the FX Union, and the WM Union as exemplars to demonstrate the four variants or models. The other 13 cases of workplace collective bargaining are provided in Table 2 in the Discussion section.

To collect enough details and verify the documented cases, I also conducted an independent investigation of the four selected enterprise unions. I talked to the enterprise union leaders and workers in the four companies and local officials when I attended the meetings, training workshops, and inspection tours organized by the Y City Union. The data collected through extended conversations with the enterprise union leaders, workers, and officials enriched my understanding of those cases and made me confident in drawing the analytical conclusions based on the comparison.

Four models of workplace collective bargaining

Moderated mobilization: the case of YT Union

The first model of workplace collective bargaining is "moderated mobilization" (Luo and Yang 2020). In this model, state officials support enterprise unions to achieve organizational autonomy from management through shop floor elections and mobilize worker participation in collective bargaining through an elected workers and staff congress. Workers can meaningfully participate in the bargaining process, as they can make demands for negotiation, veto the union-negotiated collective contract if unsatisfied, and even take collective action to press employers for concessions.

Nevertheless, workers' meaningful participation is granted under three conditions: (1) labor strike experience forces employers and officials to recognize worker representation and collective bargaining rights on the shop floor; (2) a relatively stable, (semi)skilled workforce holds strong workplace bargaining power in a capital-intensive sector; and (3) collective strike experience fosters workers' collective identity and inspires them to use strong workplace power to bargain for their interests, which makes potential business disruption a constant threat to employers.

Thus, even though Chinese enterprise unions of this kind are constrained by the lack of genuine representation (as many managers may be elected to union leadership) and the right to organize strikes, the presence of state support (institutional power), legitimate enterprise union organization (associational power), workers' strong on-job bargaining power (structural power), and employers' perception of disruption leads to a moderated mobilization model of collective bargaining. Most scholarship on the recent development of Chinese collective bargaining has recognized the moderated mobilization model (Cao and Meng 2017; Pringle and Meng 2018; Luo and Yang 2020; Deng 2020).

The YT Union collective bargaining exemplifies moderated mobilization. YT is a joint venture between Y City Port Company and a Hong Kong firm. The investor controls the company, which has more than 2000 employees. On April 7, 2007, approximately 800 crane operators went on strike, disrupting the largest seaport in South China. The workers initially demanded a decade's worth of unpaid half-hours—a substantial amount of compensation. When officials arrived at the scene, the workers' demands shifted to include a pay raise and union representation. Officials and YT managers refused, arguing that the crane operators' income was already higher than the average monthly income in Y City (2,926 yuan in 2006) and considerably above the local minimum wage of 700 yuan per month. However, workers complained that their wages had been stagnant for a decade as the company's profits kept rising, arguing that the company should share its earnings with the employees.

Soon, the S provincial party authority sent a message to demand that the Hong Kong investor negotiate with the workers. The local government's withdrawal from the state-capital alliance forced the Hong Kong tycoon to negotiate with the strikers. Then, the Y City party authority let the Y City Union take the lead in mediating the strike, helping the workers set up an enterprise union, and establishing collective bargaining. After seven negotiating sessions, the company and workers agreed to a 3% wage increase, a 500 yuan monthly allowance, and a company-paid contribution to a housing fund (totaling 13% of monthly income) as an alternative to the half-hour back pay. In total, the employer paid approximately 40 million yuan for the settlement.

At the same time, the Y City Union and YT workers and staff took two and a half months to elect the first YT Union Committee, as there was a disagreement between the workers and the Y City Union on nominations. Many workers treated managers, supervisors, and team leaders as unqualified for the "rank-and-file" union leadership. However, union officials finally persuaded workers to elect a union committee including both workers and managers, with the latter sitting in the union chair position. One practical reason workers accepted this arrangement was that managerial staff have access to company information and good negotiation skills. After successful unionization, the YT

union and management agreed to hold an annual collective bargaining session every November beginning in 2008.

Two major problems emerged in the initial 2 years of collective bargaining. On the one hand, many members of the bargaining team were elected based on aggressiveness in making radical demands during the 2007 strike rather than leadership or the ability to negotiate; on the other hand, except for electing a bargaining team, workers were not engaged in wage negotiation, which made the union's bargaining team rather isolated from members. Management often challenged the YT Union's representativeness in making wage demands, and collective bargaining was quite difficult during the 2 years. In 2008, the YT Union negotiated a 2% wage increase amid the global financial crisis. In 2009, when the port business returned to high profit, the union secured an offer of up to a 4% wage increase, but the YT workers and staff congress vetoed the collective contract.

In 2010, 153 representatives elected a new YT Union Committee, including three managers and 18 workers; Wang, a financial manager, won the chair position. Under the new leadership, the YT Union approached collective bargaining with a relatively participatory strategy. For example, during the bargaining process, the union mobilized workers to collect wage and welfare information across seaport companies, regularly communicated with worker representatives, and published proceedings from the negotiation sessions to maintain workers' collective attention. In addition, Chair Wang purposefully made the workers aware of the ongoing labor unrest in S Province and composed the union's bargaining team of both moderate and aggressive workers.[4] Later, the YT Union Committee also asked workers to propose negotiation items and voted on the top five demands to bring to the collective bargaining table. Such moderated worker mobilization established the union's legitimacy among the workers and put pressure on the management, who gauged workers' opinions and the risk of logistic disruption. From 2010 to 2012, YT workers won 10%, 8%, and 5% wage increases, respectively.

In addition, another strike episode in 2013 is worthy of attention regarding my analytical purpose. That June, when Wang was reelected as the chairman of the YT Union, workers and the management began to negotiate how to implement the city's new policy on the housing fund contribution. According to the policy, the original company-paid contribution to a housing fund (totaling 13% of monthly income), a benefit workers won in the 2007 strike, became a legally mandatory payment shared between workers and employers. Despite the disagreement, the worker representatives voted on a plan after a few rounds of heated debate—the company and workers would equally share a contribution totaling 26% of monthly income to the housing fund. Effective in August, workers experienced a 13% loss of cash income on wage slips at the end of the month, and the outburst of panic and anger led to a wildcat strike on the morning of September 1, initiated by approximately 200 crane operators and then joined by all employees. Workers demanded an across-the-board 2,000 yuan increase in living allowance.

The YT Union represented workers negotiating with the company for three sessions until 2 am. The company offered a 500 yuan allowance increase; the strikers refused to make concessions but lacked consensus in making their demands. On September 2, the

[4] Read Pringle and Meng (2018) for details on the mobilization.

Y City Union came to mediate the strike. The official leader denounced the strike as illegitimate, reminding workers that collective bargaining in November should be their way to advance their demands instead of a wildcat strike. Then, he turned to negotiate with the management for a new package of close to a 30% wage increase and a 5,000 yuan bonus for resuming production. In the official announcement, the union official warned all workers that things would go beyond their control if they did not stop or were they to conduct a wildcat strike again. Workers resumed work at 4 pm.

The dynamics of moderated mobilization

The case of YT Union collective bargaining illustrates how the interactions between structural power, institutional power, associational power, and employer response produce the dynamics of the moderated mobilization model of collective bargaining. In one of the world's busiest seaports, crane operators' skills and on-the-job experience give them strong workplace bargaining power to disrupt global trade logistics. Crane operators' exercise of this structural power, manifested by wildcat strikes, pushed the state to respond to workers' economic demands by recognizing their rights to organize a "rank-and-file" enterprise union and negotiate wages with the management. The state's enforcement of labor relations policies and laws generated effective institutional power that forced the employer to accept the establishment of the YT Union and collective bargaining in the company. Because crane operators' highly valued skills and work experience make it difficult for the company to replace them in a short time, the crane operators' strong workplace bargaining power compelled the management, who perceived workers' structural advantages, to recognize the elected representative organization and make concessions in collective bargaining. The YT Union acquired organizational legitimacy and relative autonomy from the state and company management. Thus, workers seem to have acquired associational power through state law enforcement and their elected YT Union and the workers and staff congress.

The YT crane operators formed a "worker identity" based on occupational skills, strike experience, and active participation in union elections and collective bargaining. The initial wildcat strike in 2007 resulted from their shared grievances of wage stagnation and declining social status; as workers complained, "In the 1990s, the crane operators' income and social status could match them to marry school teachers in Y City, but today, no teachers in Y City would like to marry a crane operator."[5] The crane operators gradually forged a collective identity by participating in representative elections and collective bargaining, such as vetoing the 2009 collecting contract. As a union official observed on the scene, "You can obviously see that the crane operators view themselves differently from other staff and employees in YT." With the formation of workers' collective identity, the crane operators went on strike again in 2013 when the YT Union failed to address their concern about losing the housing fund benefit. Thus, the crane operators' strong structural power may lead to militant workplace unionism.

Notwithstanding, the YT workers' structural and associational power is moderated by the organizational and political constraints imposed by the official Y City Union in

[5] As paraphrased by an official in the legal department of the Y City Union, May 2014.

China's context. The official union did not allow the workers to fully run the YT Union by nominating managers to union leadership positions based on their employee status and arguing for their administrative and communication skills, which workers need. By creating a legitimate manager-led enterprise union, the YT Union became a de facto intermediary between workers and management and between the official union and the company. However, because the crane operators' structural power is too strong and disruptive for the employer and the government, the company and the Y City Union accepted incorporating the workers into interest bargaining. The YT Union was also pressed to have workers participate in union affairs and wage negotiation openly and transparently in order to release pressure from workers and the company. Meanwhile, such "mobilization" made the YT Union more legitimate and powerful in collective bargaining with the company, thus enabling workers to benefit from the associational power embodied in the manager-led YT Union.

However, not all workers' demands, or grievances, could be addressed through the YT Union's moderated mobilization and wage negotiation, and the YT Union may fail to contain workers' disruptive power when workers' grievances become salient or suddenly erupt. As the 2013 strike demonstrated, when the workers and management could not reach a satisfactory solution on the housing fund payment, although a resolution passed in the union-organized ballot, the crane operators still circumvented the YT Union to start a wildcat strike. When enterprise unions fail to contain labor conflicts, the official union or government agencies intervene to mediate and even punish worker militancy if they can no longer control workers, as the Y City Union leader threatened the YT strikers with public security intervention if they continued to strike or were to strike again.

Technical negotiation: the case of the RH Union

The second model of workplace collective bargaining is "technical negotiation." Like the moderated mobilization model, wildcat strikes pushed state officials to support enterprise unions to acquire organizational autonomy from management through shop floor elections and mobilize worker participation in collective bargaining through an elected workers and staff congress. The perception of strike disruption and state pressure also compelled employers to accept the establishment of worker representation and collective bargaining.

Unlike the moderated mobilization model, worker participation in the bargaining process is limited because it only involves the elected representatives in the workers and staff congress and because a manager-led enterprise union controls the workers and staff congress composed of shop floor supervisors, technicians, team leaders, and office staff—a structure of worker representation imitating the structure of company management. During collective bargaining, enterprise union leaders' technical skills, production knowledge, and managerial authority (these union leaders are, in fact, managers) are central to wage negotiation. Worker representatives passively participate in the process, as they can hardly put forward workers' demands, confront their higher-up managers or take collective action. Ordinary workers give little attention to wage negotiation, as they feel no power to influence the union decision and no compulsion to participate, as they would not stay in the factory for long.

The limited worker participation and technocratic domination in enterprise unions result from workers' weak workplace bargaining power in a labor-intensive industry, where a low-skill workforce and high labor turnover weaken workers' structural power. Thus, the presence of state pressure (institutional power), enterprise union legitimacy (associational power), and employers' perception of past strike disruption leads to a technical negotiation model of workplace collective bargaining.

Perhaps, the RH Union collective bargaining best exemplifies the technical negotiation model. RH Industrial Development Lit., founded in 1991, employed approximately 4,000 workers to make printers and optical instruments. In 2013, the RH Union was recognized as one of the ten best Chinese enterprise unions; it was the only recipient that was not a state-owned enterprise union. Thus, the RH Union was recognized as a national model for China's foreign-invested enterprise unions.

In 2007, when RH was called on to form an enterprise union, the company nominated nine managers as candidates for seven union committee member positions, and workers contested the election by electing a non-nominated female workshop manager to chair the new RH Union. The RH Union focused on welfare provision and dispute mediation in the first term. For example, the union regularly organized social events, hobby associations, and sports clubs, distributed holiday gifts, and provided financial aid to workers. The union also regularly arranged public lectures to help workers adjust to urban life, covering mental health, makeup and dressing, dating and marriage, sexual health, and communication skills. When a spontaneous wildcat strike occurred in late 2007 due to workers' anger with the company's new work evaluation scheme, which led to an income decrease, the RH Union mediated the dispute between worker representatives and management and coordinated both sides to accept a revised policy. The strike led the RH Union to hold regular consultative meetings with worker representatives and management to process workers' grievances and the company's concerns.

In 2010, the RH Union Committee organized its second election, in which the company did not interfere. The record of the 2010 election shows that there were 248 representatives, with 190 coming from the shop floor and 58 from administration and research units. Workers and staff in small union groups raised hands to elect their representatives, and primary-level supervisors, technicians, and team leaders made up most worker representatives. The representatives and the election committee nominated 14 union committee candidates. Because all the former union committee members were managers, which did not seem truly representative, the election committee decided that at least four candidates must come from the shop floor. In the nomination process, most representatives nominated their managers, whom they thought of as having high authority, strong managerial skills, and a good reputation. By adopting relatively democratic procedures, the election produced a union committee including seven managers and four shop floor supervisors, imitating the company management structure.

Liang and Gang were elected to be the chair and vice-chair of the RH Union and were also the directors of the department of products and the department of quality assurance, respectively. The RH Union held future union elections the same way, and Liang and Gang stayed in the chair positions until the company moved to a neighboring city in 2020. Using their managerial skills, the two leaders built an efficient union

administration. Under the new leadership, the RH Union drew up a full range of rules, standards, and regulations through the workers and staff congress, such as RH Union membership regulations, worker and staff congress regulations, union committee operation standards, union committee meeting rules, union financial management procedures, union procurement procedures, union sport activity rules, and union financial aid standards. Standardizing and institutionalizing union administration became a salient feature of the RH Union.

The RH Union became a well-functioning welfare workplace union focusing on distributing benefits and mediating workplace disputes, playing a comfortable intermediary role between workers and the company. However, the RH Union was still unable to advance workers' interests by allowing workers to negotiate wages and benefits. The greatest challenge for the new RH Union was collective bargaining. In 2011, the Y City Union, with local party and government support, required the RH Union to sign a collective contract with the company, but the company did not want to negotiate wages with the union, and the RH Union was afraid that they might not obtain a result from the company that could pass the vote in the workers and staff congress.

Coincidently, a wildcat strike gave birth to collective bargaining in the company. On November 3, the molding department, where most employees were skilled workers, went on strike when the company broke an early agreement on raising molding workers' wages. That May, without the RH Union's help, the skilled molding workers had demanded the company increase their wages with a threat of work stoppage, and they negotiated with the company a wage increase that would be effective in October. When the molding workers found the company did not raise their wages upon receiving the wage slips, they planned the strike and let their union representative notify the RH Union on the morning of November 3.

The departmental strike immediately threatened production on the assembly lines by disrupting the supply of molds. The company fired all the strikers the next day, and then the strikers staged a protest in the factory. The RH Union went to mediate the strike, promising that no punishment would apply if they returned to work immediately with no mention of the wage increase. Sixteen protesters returned to work, and 22 received dismissal. Later, when the dismissed workers held a hunger protest in the factory, the RH Union stopped the company from paying compensation for terminating the workers' contracts.[6]

After the strike, the Y City Union officials also met the company management without defending the dismissed workers. The officials pointed at the strike as a warning to management, warning that the company would experience more devastating disruption soon if it continued to reject collective bargaining over wages and benefits—a fate that had befallen several well-known large manufacturers since 2010. Pressured by workers' activism and official warnings, the company and RH Union signed the *RH Wage Collective Negotiation Methods* in December and agreed to begin collective bargaining after the 2012 new year.

[6] Later, the dismissed workers brought the company to court, but the judge ruled that RH had legally terminated their contracts.

The RH workers and staff congress elected a collective bargaining commission including eight worker representatives and ten union committee members, from which five persons formed a negotiation team. Then, the commission was divided into four task groups: the information group collected data on wages, food, rent, child-raising, and education; the communication group reported the negotiation progress to worker representatives and gathered their feedback; the publicity group was responsible for recording the process and developing proceedings from the negotiation; and the negotiation team focused on strategy-making and bargaining. This division of labor has since been institutionalized for collective bargaining at RH.

The RH Union took a technical approach to balance the interests between the company and workers in collective bargaining, emphasizing data analysis and modeling. Gang had led the negotiation with the company since the first collective bargaining in 2012, and he constructed a mathematical model to estimate the rate of increase in wages and benefits. His model included government wage guidelines, industry-level wages, the consumer price index, rent, family size, child-rearing expenses, and other variables. The union refined the model each year, depending on which items were advantageous to the union's demands. For example, in 2012, the union included infant formula prices in the model because many Chinese parents bought expensive foreign brands after a poisonous infant formula scandal exploded in China. In 2013, the information group sampled 146 employee households in migrant neighborhoods and 200 urban apartments in local neighborhoods. The union found that although the rent for urban apartments was higher, the rent in migrant neighborhoods increased at the highest rate in Y City. The commission, therefore, suggested including rent in migrant neighborhoods in the model.

In 2012, the model estimated a 19% raise (350 yuan), but the management proposed an 8% raise, arguing that Japan's earthquake, Thailand's flood, and the European debt crisis dropped the company's profits (RH was operating in those regions). However, because the union's data were prepared in a convincing way that the company did not expect, the company could not resist the evidence that the past wage was set too low to meet workers' rising living costs. After four negotiation sessions, the RH Union and management agreed on a 15% raise (300 yuan) in the collective contract in 2012. The workers and staff congress were also persuaded to approve the contract, although worker representatives initially demanded a 30% raise, a number the RH Union deemed "irrational," "realistic," and "unscientific." In the same way, the RH Union negotiated a 10% raise (200 yuan) in 2013. In addition to wages, the RH Union negotiated other benefits for workers over the years, including a work program for pregnant workers, child education subsidies, rent subsidies, a factory clinic, a company bus, and an annual field trip.

In fact, however, mathematical modeling might be a game of numbers to generate a moderate percentage of raise that can be justified in front of workers and showcased as a "rational," scientific" negotiation to state officials. Insider company knowledge was important for the RH union committee to cap the wage increase and to negotiate new benefits for workers. The RH union chairs were senior managers who had a good sense of company productivity and annual profit. They gauged a "reasonable" wage increase and used the "scientific" method to set up the rate of wage increase as long as the rate did not go above their "reasonable" estimate. Even then, they still felt pressure from the company and increasingly preferred to negotiate new benefits with the company,

rather than a higher rate of pay raise, because new benefits not only sounded attractive to workers but also saved a considerable amount of the company's cost associated with a pay raise, such as overtime hourly pay and the employer's contribution to a housing fund, pension, and social insurance.[7]

Worker representatives gradually discovered the "secret" of the union's negotiation strategy—a low raise plus more benefits. Beginning in the mid-2010s, the RH Union received more challenges in the worker and staff congress when representatives were asked to vote on the negotiated pay raise and benefits. Sometimes, the RH Union leaders had to employ their managerial authority to suppress the sparked challenges, with statements such as, "If you do not agree with the deal, you talk to the company" or "whoever can negotiate a better deal should go to talk to the company." The challengers and the congress were silenced when receiving these counterchallenges based on the union leaders' managerial positions, but the ballot reflected the increasing dissatisfaction among the worker representatives. While the negotiated collective contract received above 90% approval for a few years, the approval rate subsequently dropped to below 80%.

In 2020, the company closed the factory and relocated the production to a neighboring city, and the RH Union negotiated a compensation package for workers who chose not to move with the factory. The RH Union reported that from 2012 to 2020, workers' basic wages increased by 1,617 yuan through collective bargaining. However, if we take the increase in Y City's minimum wage into account, which increased by 880 yuan during the same period, the real gain from collective bargaining was not impressive, only 737 yuan. A union committee member's and a worker's comments reflected how meaningful collective bargaining was for them. A union committee member said in an interview:

> *"Our wage level was relatively low for workers, and so the raise looked like a lot to outsiders, but it was not very much for workers. [Nevertheless,] we think it was a good result—if an agreement could not be reached (by workers and company), it would be a failure [for the RH Union]."*[8]

Furthermore, a worker representative commented,

> *"Regarding collective bargaining, before, the wage was totally decided by the company. Now, [we] have only a little voice. In the past, wages increased by about 10 yuan a year, sometimes dozens of yuan a year. We heard about collective bargaining in 2010—union members could bargain with the company—but we did not have real bargaining until 2012. About the wage increase, now it has increased a little more than before. For me, I am not satisfied with the company [...]. For labor strikes, there was a strike before. [You won't go on strike] unless you cannot tolerate it anymore or the grievances cannot be addressed."*[9]

[7] For example, the overtime hourly pay is calculated based on workers' base wages, and the employer's contribution to the housing fund, pension, and social insurance is calculated based on workers' payroll income.

[8] Y City Union interview with union committee member Lie in 2013.

[9] Y City Union interview with a group of worker representatives in 2013.

The dynamics of technical negotiation

The case of RH Union collective bargaining exemplifies how a different configuration of labor power and employer perception shapes the formation of a technical negotiation model of collective bargaining. The exercise of workers' structural power, manifested by the molding workers' wildcat strikes, provided the state officials with an opportunity to push the company and the manager-dominated RH Union to institutionalize collective bargaining, as both the employer and RH Union already perceived the possible threat of production disruption. However, the power dynamics on RH's shop floor are different from the moderated mobilization model in the capital-intensive sector composed of a stable, (semi)skilled workforce.

Although dozens of skilled molding workers in RH had strong workplace bargaining power in disrupting the machine assembly, their failure to build solidarity with assembly workers crippled the opportunity to push for a greater representative union and meaningful workers' participation in RH's collective bargaining. Assembly workers in RH were characterized by low skills and high turnover, and they could not form a stable collective or expect to build a long-term career tied to the promotion and wage increases. Moreover, when the molding workers exercised their structural power by organizing a strike, they were disciplined by the manager-dominated RH Union and punished by the company. They were unable to form a stable solidarity network in the company either. Hence, while molding workers' militancy led to an official establishment of collective bargaining, RH workers could not harness the associational power created by the RH Union for their advantage due to their weak structural power.

Without union members' pressure on the company, the RH Union was comfortable playing an intermediary role in balancing labor relations, having no interest in mobilizing workers and forging their collective consciousness. Unlike the YT Union, which was pressed to incorporate worker participation in interest bargaining, the RH Union only included representatives, mostly primary-level supervisory staff, to participate in information collection and go through the procedures, thus legitimizing collective bargaining. Then, the core of RH's collective bargaining was not solidarity-based interest negotiation but manager-dominated technical analysis, insider production knowledge,[10] and managerial authority to obtain approval of the collective contract from the company and worker representatives. The result of collective bargaining was the limited increase in wages and company welfare, a sort of interest balancing between workers and the company, which satisfied the official unions' mission to build "harmonious labor relations." Thus, without strong structural power, a technical negotiation model of collective bargaining developed from the interaction of institutional power, associational power, and employers' perception of threat in a sort of state corporatist institutional setting.

Collective consultation: the case of FX Union

"Collective consultation" is the third variant of workplace collective bargaining, which is also the Chinese official name for collective bargaining. Enterprise unions are supposed to consult with management on employment issues and sign collective contracts on

[10] Not shown in this case. In other cases, belonging to technical negotiation, it is common to see managers as union cadres use their knowledge in company production and productivity to negotiate with the employer for increasing wages and benefits.

behalf of workers without triggering a worker–management confrontation. As a national policy, it was rarely enforced since the national union began to promote collective consultation in 1994.

Similar to the technical negotiation model, state officials formally require employers to establish enterprise unions and collective bargaining. Enterprise unions can build associational power through a relatively democratic election, welfare and service provision, and labor dispute mediation. Unlike the technical negotiation model, because no labor strike ever occurred in the companies, employers do not directly perceive the threat of disruption and do not feel an urgent need to recognize workers' right to collective bargaining. The enterprise unions still lack organizational autonomy from management. With these conditions, collective bargaining becomes a de facto consultation between manager-dominated enterprise unions and company management; workers and their representatives are largely excluded from participating in any matters except complying with their union leadership to pass the drafted collective contract. As a result, with no strike experience and the absence of strong structural power, the combination of institutional and associational power produced a "collective consultation" model of collective bargaining in Chinese state corporatist settings.

As RH's largest competitor in Y City, FX Union collective bargaining may be the best example to demonstrate the collective consultation model compared to the RH Union's technical negotiation model. FX employed approximately 8,000 workers to produce printers and other electronics. The FX Union was formed in 1995. In the mid-2000s, Zhou, a young shop floor supervisor, was elected as the union chairman. Seeing that all his predecessors were senior managers who barely ran the union with the workers' interests in mind, Zhou proposed banning senior managers from running for union elections, which the employer accepted. Since then, the FX Union committee has been composed entirely of elected workshop managers, technicians, supervisors, and team leaders. Zhou also persuaded the company to fund entertainment and social events for workers. During his tenure, Zhou's union work offended some managers, who later blocked his promotion in the company, so he chose to resign and started his own business after his term ended.

In 2010, Yu won the union chair election after Zhou. The FX Union election was similar to the RH Union elections. Workers were grouped based on production divisions, workshops, lines, and teams and elected their representatives in the groups. Then, the representatives elected the union committee members, including a chair and a vice-chair. However, since FX had not experienced any strike demanding wage hikes or union representation before, the union did not achieve organizational autonomy from management, and the company maintained its interest in controlling the union by sponsoring union chair candidates. In an interview, Yu acknowledged that the company played a key role in promoting him as the chair candidate in 2010. While many workers knew Yu well because of his active role in participating in various union activities, he could only mobilize workers' support in his division—approximately one-fourth of the company workforce—and it was the company that used administrative channels to promote him as a strong candidate in workers' daily shop floor meetings. In 2014, when Yu retired from the union leadership role as a newly promoted company manager, a chair candidate

backed by him lost the election because the company chose to support a different candidate to chair the union.

Despite company interference in union elections, like the RH Union, the FX Union did well in providing welfare and mediating labor disputes. The union organized many associations and social events for workers, such as sports teams, dance clubs, music bands, yoga groups, and reading societies. The union normally sent gifts and distributed resort tickets to workers on holidays. Before the Chinese New Year, the union even booked train tickets and arranged buses to take workers to train stations. The FX Union also collected and addressed workers' grievances through an internal online platform. When a worker lodged a complaint online, the union committee member brought the case to the relevant managers. Whether or not it could be resolved, the union would reply to the worker with a result. For example, some workers complained that it was unreasonable to deduct a two-day wage for a one-day absence in the employee handbook, and after the union talked to the human resource manager, the company changed the penalty to a one-day wage.

In 2011, like most enterprise unions in Y City, the FX Union was required to initiate wage collective bargaining with the company. Because the union did not have enough autonomy from the company and because the union committee members did not have high managerial status in the company, the FX Union could not bargain in the way that the RH Union did. As Yu said, "Our negotiation team members are weaker than the RH Union's in terms of information collection, negotiation power, and mobilization capacity. Even though we take the same approach as they do and collect the same quality data, we cannot obtain the same results because our status within the company is different." "We do not dare to do the same. They are one team with two brands (union and management), but we are not."[11] Nevertheless, the union needed to bargain for some gain to enable the workers and staff congress and union officials to approve the collective contract.

The FX Union approached collective bargaining with a consultative strategy. Before kicking off formal collective bargaining, Yu and other union committee members went to consult with each head of department and the general manager about appropriate union demands on wages and benefits. Through informal consultation, the union collected company information and tested negotiable space on the issues that would be discussed in formal negotiation sessions and secured some support from the management. After the preparation, formal collective bargaining began, but there was only one formal negotiation session between the union and management, as both sides immediately agreed upon the wage and benefit adjustment. Since everything was already negotiated, the formal session was a ritual to legalize the agreement. Then, the union called the workers and staff congress meeting to approve the collective contract. There was no worker or worker representative participation in the process except for voting on the collective contract in one meeting.

The first collective contract in 2011 only won a raise of 50 yuan, a "victory" that disappeared when the municipal minimum wage was raised by 13%. Since 2012, the FX Union has planned collective bargaining only after municipal minimum wage adjustments

[11] Interview with Yu, 2014.

and has managed to gain at least an extra 5% raise in addition to the official minimum wage increase. In 2014, when the municipal minimum wage increased from 1,600 to 1808 yuan, the union demanded an extra 5.6% raise, and FX workers' base wage rose to 1910 yuan. During Yu's tenure, the company had no collective labor disputes. Collective bargaining was de facto a consultation process between the union committee and management.

The dynamics of collective consultation

The case of the FX Union collective bargaining demonstrates a collective consultation model resulting from the operation of workers' institutional power and associational power but a lack of structural power and employers' recognition of that structural power. Since the local state enforced the organization of an enterprise union and signing of the collective contract in FX, the official enforcement generated institutional power that pushed FX management to accept unionization and collective bargaining. Then, enterprise union elections placed responsive shop floor managers in union leadership, who then made efforts to improve workers' welfare and working conditions in the company and built some associational power for the FX Union.

However, since there was no wildcat strike in the company's history and because FX's major workforce (like their RH counterpart) had no strong structural power or collective identity due to low skills and high turnover, the company did not perceive a direct threat of production disruption or feel pressure to give up its control over the FX Union and recognize workers' rights to collective bargaining, while the FX Union did not feel it necessary to achieve organizational autonomy from the management. Thus, although the FX Union held formal organizational status and legitimacy among the workers through union elections, welfare distribution, and dispute mediation, it was still more dependent on the company than on its members. It did not engage workers or their representatives in collective bargaining at all. Ultimately, collective bargaining became an internal consultation meeting between the union and the company, and workers and their representatives were excluded from participation.

Managerial domination: the case of WM Union

The fourth model of workplace collective bargaining is "managerial domination." Like the other three models, state officials compelled employers to formally establish enterprise unions and collective bargaining. However, unlike the other three, the institutional power derived from state law enforcement is the only available power source that workers could rely on in collective bargaining. While an enterprise union is created on the shop floor, company management fully controls the union elections and operation, and there are no democratic procedures to produce accountable union leadership. The company-picked enterprise union committee does not serve workers' interests and may not run the union at all. Consequently, the enterprise union cannot foster workers' associational power in the company. Moreover, a docile, low-skilled, high-turnover workforce can neither challenge the management by disrupting production nor pose a potential threat with strong structural power. The enterprise union cannot represent workers, and management dominates the union and collective bargaining.

I find two forms of practices in the managerial domination model of collective bargaining. One form is the widely reported formalistic collective bargaining, in which a company and its picked union leaders fill out a collective contract template that contains little substance but repeats legal clauses, and no bargaining process takes place. The other form is that the company and its picked union leaders are forced to go through a formal collective bargaining process due to high official pressure, but the enterprise union works with management to pass a collective contract that would benefit employers more than workers. In this study, I provide the case of WM Union collective bargaining to illustrate the second form, which has not been well researched.

In 1996, WM set up a Chinese headquarters and opened its first Chinese branch in Y City. While the Y City Union had been persuading WM to set up workplace unions for years, the company had successfully lobbied the city government to avoid creating unions until 2006, when the central party leader instructed the national union to unionize all foreign-invested enterprises. Then, Chinese official unions started by organizing WM workers. Since WM refused to accept unions, the official unions revamped their revolutionary tradition and took a rare bottom-up approach to organizing workers.[12] Soon, WM gave up and allowed official unions to establish branches in company branches and headquarters.

However, when WM began to comply with official unions' requirements, official unions withdrew from grassroots organizing and coordinated with WM management to set up workplace unions. Human resource managers organized union elections in many stores, including nominating candidates and selecting worker representatives to vote for union committee members. There was no ballot in some branches, and the picked representatives raised their hands to vote. As a result, except for a few workplace unions created during the early grassroots organizing campaign, most WM workplace unions were not representative but controlled by the management. Furthermore, the WM workplace unions were independent of each other, and each union reported to the official union federation in the local district or street office. Therefore, the WM Unions had almost no organizational autonomy from management, and they did not have associational power.

In late 2006, the national union federation approved the Y City Union's request to initiate collective bargaining with WM. In November, the Y City Union organized a collective bargaining training session for the WM Headquarters Union constituted by managers. The union officials quickly found that the headquarters union members aligned their interests more with the company than the workers. The headquarters union even prepared a collective contract template without wage specifics but that repeated the basic labor standards. In 2007, the Y City Union turned to WM branches to collect workers' demands and drafted a new collective contract, but the WM Headquarters Union opposed the draft and said they could not agree to it. Back and forth, the negotiations between the Y City Union and WM China made no progress in 2007.

In 2008, the Y City Union threatened to denounce WM's anti-collective bargaining stance at a press conference, which brought WM's deputy global CEO to lobby the national union leaders in Beijing. After the national union leaders' mediation, WM

[12] Chinese official unions established the first WM workplace union in a southern city in July 2006, taking WM by surprise, and within a few days, three WM workplace unions were established in Y City. In early August, WM announced that the company agreed that Chinese official unions could set up unions in all of its branches.

accepted collective bargaining in China. Soon, the Y City Union guided WM workplace unions to elect representatives. Each branch sent three representatives—one union chair, one worker, and one union committee member (or worker)—to participate in collective bargaining. Among 48 representatives in total, each gave a short speech on why they wanted to be a representative and why they were qualified, and then they voted for ten people to form a negotiation team. The WM-D branch union chair, a worker who participated in the early grassroots organizing campaign, was elected as the chief representative.

Before the negotiation began, a senior national union official flew to Y City to supervise the negotiation, and he persuaded WM to offer a 9% wage increase—1% more than WM had budgeted for wage adjustment. In July, WM signed a collective contract with employee representatives in Y City, with a 9% wage increase plus a 1% performance-based increase—lower than the 13% proposed by workers based on the S provincial wage guideline.

Because the headquarters management often adjusted wages without the intention to negotiate and because most WM unions did not truly represent workers, the WM workers heavily relied on the Y City Union to pressure the company to make concessions. In 2010, when the Y City Union found no progress between union representatives and management, the union officials organized meetings with WM workers, who pressured the company to accept an 8% wage increase in the final negotiation. In 2011, when WM asked representatives to accept a 5.5% wage increase, the Y City Union threatened to hold a press conference to criticize WM's bad faith bargaining, which caused the company to offer a 6.5% raise. In 2013, when WM insisted on a 3% raise and ignored workers' demand for 6%, the Y City Union asked the representatives to notify each branch manager that the workplace union would call for a formal meeting with workers to discuss the wage negotiation on the afternoon of May 2, from 2:30 to 3:30 pm, a threat of work stoppage during holidays that forced WM to accept a 6% raise in the end. In 2014 and 2015, the Y City Union did not intervene in WM collective bargaining, and the wage increase for the 2 years was 5.5% and 4%, respectively, but workers were unsatisfied with the outcome. In 2014, a few worker activists established an independent WM Chinese Workers' Association (WCWA) as an alternative organizational vehicle to build associational power, but they were unsuccessful in building workers' solidarity.

While the Y City Union supervised WM's collective bargaining and helped store representatives gain small wage increases over several years, company management still dominated collective bargaining, and WM workers' income and working conditions did not improve. Management often took away workers' subsidies and benefits while increasing wages. For example, with the WM unions' consent, the company removed the 400 yuan monthly rent subsidy in 2012 collective bargaining despite the widespread opposition from the workers. Additionally, not every worker had received a raise as specified in the collective contract; some workers could not receive a raise due to a "bad performance evaluation."

In addition, working conditions in WM became increasingly precarious. For example, by 2015, WM had reduced the number of workers by half and employed a substantial number of part-time workers; it also required suppliers to employ salespersons to replace WM workers. In 2016, without any consultation with unions or workers, the management announced that WM would switch the regular work hours to a flexible work schedule in which store workers could be on call at irregular hours without

overtime pay. While the WCWA tried to organize workers to resist the new policy, WM prevailed when branch management came to intimidate individual workers one by one and when neither WM Unions nor the Y City Union intervened on behalf of workers.

The dynamics of managerial domination

The case of WM Union's collective bargaining demonstrates a managerial domination model. Although the national federation and Y City Union asserted a salient role in unionizing WM and installing collective bargaining in the company, most WM workers did not achieve union representation or associational power through grassroots organizing or shop floor elections. Their structural power was weak, as they worked in a low-skilled sales sector and were easily replaced by the company, and they had not organized any effective collective action to halt WM's business in Y City. Thus, they were unable to compel the management to respect their rights to union representation and collective bargaining.

In the end, due to the lack of associational power, structural power, and the business disruption caused by the workers' strike, the presence of strong institutional power alone through the national union federation and Y City Union's policy enforcement could produce collective bargaining manipulated by WM management. In many other companies where the officials did not supervise collective bargaining closely, workplace collective bargaining simply comprises a formalistic collective contract template filled out by an employer and his or her handpicked union chair.

Discussion

The above cases represent four typical models of workplace collective bargaining in Y City, which are summarized in Table 2. I also included all 17 cases collected from the Y City Union in the table. Although these companies are from different sectors, it is the patterned configuration of workers' power resources that shapes the variability in

Table 2 Variability in workplace collective bargaining in Y City

Labor power	Enterprise unions			
	YT **AX transport**	**RH** **X precision** **G technology** **C man** **RA tech** **H finance**	**FX** **NV display** **Y zip** **S gate** **BB star**	**WM** **Fox tech** **C footwear** **RD precision**
Structural power	Skilled workforce	Low-skilled workforce with a tiny group of skilled labor	Low-skilled workforce	Low-skilled workforce
Perception of disruption	Wildcat strike	Wildcat strike	No strike	No strike
Association power	Autonomous union elections	Autonomous union elections	Company-influenced union elections	No elections or manipulated elections
Institutional power	Official support	Official support	Official support	Official support
Model variation	Moderated mobilization	Technical negotiation	Collective consultation	Managerial domination

workplace collective bargaining, not industrial characteristics. Similar power dynamics produce the same model even in companies in different sectors. For example, while the YT Union belongs to the logistic service sector, research reveals that moderated mobilization characterizes the auto parts factory collective bargaining in Guangzhou (Luo and Yang 2020; Deng 2020). Although the WM Unions are in the commercial sales sector, the Fox Tech Union, whose collective bargaining is also characterized by managerial domination, is in the manufacturing sector. In another way, different power configurations produce diverse collective bargaining models even though the enterprise unions are in the same industrial sector, as the RH Union and the FX Union have demonstrated in this article.

Based on the comparison, we can see how the interaction between workers' different power resources in Chinese labor relations settings shapes the dynamics of workplace bargaining development on the shop floor. First, workers' associational power is fundamental for any meaningful collective bargaining to take place, and it is created through a certain degree of democratic union elections and responsive enterprise union leadership. A certain degree of democratic elections is the primary condition for generating legitimate worker representation, but it does not guarantee that workers will control the decisions or exercise associational power. In the Chinese union system, responsive, strong enterprise union leadership is often associated with the election of managers into union committees. Like trade union cadres in Western societies, Chinese enterprise union leaders also face the dilemma between their commitment to maintaining the established industrial order with employers and grassroots members' grievances (Hyman 1989[1972]). Unlike Western trade union cadres, Chinese enterprise union leaders as company employees depend on employers for promotions and salaries, and they do not have a union career built into the Chinese official union system.

Consequently, while manager-led enterprise unions in China can mobilize companies' material resources and administer union functions efficiently, the associational power they help build is more restrained from confrontational activities with employers and easily becomes an organizational extension for officials or management to monitor labor relations and control unrest. This construct does not necessarily play to workers' advantage in wage negotiations, and enterprise unions' associational power can be used to tame workers' structural power (Pringle and Meng 2018). Hence, enterprise unions become a contested field where officials, employers, and workers vie to control or use associational power for collective bargaining.

Second, unions' organizational autonomy from company management is critical for workers to benefit from or employ associational power in collective bargaining. Workers' exercise of structural power (such as a strike), not democratic union elections, is most effective for enterprise unions to achieve organizational autonomy. As the FX Union shows, while worker representation was established through elections, the union was still subordinate to management, as the company always sponsored a trusted candidate to compete for the union chair position. For those enterprise unions that have achieved organizational autonomy, workers in those companies had exercised structural power by going on strikes in a more or less disruptive fashion, even though the workers' structural power was weak. Experiencing disruption not only pressed employers to accept autonomous unions but also pressured the manager-led unions to take workers' welfare and

wage negotiation into serious consideration. Although worker participation may still be constrained, the enterprise unions can at least get worker representatives involved and keep wages up with inflation, as the RH Union collective bargaining exemplifies.

Third, meaningful worker participation determines workers' substantial gains in collective bargaining, and strong structural power guarantees meaningful worker participation in the current trade union system. While workers may be loosely organized initially, strike experience inspires skilled workers to realize their strong workplace bargaining power in global production chains and build their confidence to exercise structural power through collective actions. Facing mobilized workers and a high risk of production disruption, manager-led enterprise unions have to engage workers in planning and decision-making related to workers' welfare and wages, and employers are more likely to negotiate with workers in good faith, as demonstrated by collective bargaining in YT and some automotive factories.

My empirical comparison demonstrates that the establishment of workplace union elections itself does not necessarily lead to effective collective bargaining or the advancement of workers' interests, but workers' involvement and action are essential for establishing genuine collective bargaining in China. We have come to see that Chinese workers need to enhance their structural and associational power to improve the quality of workplace collective bargaining, but is this possible in the Chinese union system and in the context of the global decline of organized labor?

As China's industrial transformation and the demographic transition began simultaneously in the mid-2010s, Chinese industrial workers may face a critical juncture of structural power change. In workplaces, local governments and employers have accelerated robotization, digitalization, and artificial intelligence to transform the economy. Whether workers will achieve skills upgrading or be replaced by robots is still under observation. In the labor market, as the population is aging and the young workforce is shrinking quickly, labor shortages have become a severe problem across the manufacturing industry. Hence, Chinese industrial workers may have come to a rare moment when they face a potential power change in workplaces and the labor market.

However, even though workers would achieve greater structural power, the potentially increased structural power may not benefit workers because workers' associational power is severely weakened by the labor dispatch and outsourcing dominating the labor market. In the advanced manufacturing sector, high-skilled workers may prefer to work as independent contractors with individual autonomy. In those factories where low-skilled labor still fills the production line, many workers are now hired and dispatched to workshops by human resource agencies, and they hop jobs between different factories, sometimes even organized by the labor agencies (Liu and Zhu 2020). Neither group of workers is likely to be represented by a workplace union or other labor organization for collective bargaining. If there is a wage negotiation, it is between employers and human resource companies rather than workers. Two consequences may result from the new form of employment relations: (1) workers are more likely to quit jobs than to strike for rights and interests when facing unfair treatment; (2) even when a strike occurs, the strike could hardly lead to the creation of an autonomous enterprise union representing workers.

While my case studies have shown that structural power and the exercise of it are most important to shaping the dynamics of workplace collective bargaining, building associational power or organizing effectively seems to be the most urgent task for Chinese workers to improve working and living conditions as a social class. However, given the official unions' problems of entrenched bureaucratization and the workplace-based organizing principle, it is doubtful that atomized Chinese workers will soon be organized in the labor market dominated by hundreds of thousands of labor dispatch and outsourcing agencies. Although new local union reform is experimenting with organizing workers in residential neighborhoods (Luo and Chan 2020; Wen 2020), thus building associational power beyond the workplace-based organizing principle, no evidence suggests that this new form of labor organizing has played a role in collective bargaining.

Therefore, we may anticipate that the development of collective bargaining in China will stagnate and even decline. For those private and foreign enterprises where worker representation and wage negotiation were not established, workers will be unlikely to push for creating a representative union and collective bargaining in current employment conditions. For those enterprises where union elections and collective bargaining have been institutionalized, the model and outcome of collective bargaining will still be largely shaped by workplace power dynamics if the official unions continue to provide institutional support. Moreover, many foreign-invested enterprises with established unions and collective bargaining have been closing and relocating to new places where unionization may not be legally required. As a result, the variability in workplace collective bargaining will not decrease or converge to the same model in the future. The various models of workplace collective bargaining may not be a transient phenomenon but a semi-institutionalized middle ground in China's context.

Conclusion

In his book on Chinese trade union reform, Friedman (2014) finds that while labor unrest has strengthened the status of Chinese official unions and pushed pro-labor legal and regulatory reforms at the state level, workers can hardly recognize the causal impact of their industrial actions on institutional progress, and they cannot enjoy the gains due to the lack of effective representation in workplaces. Recent scholarship on Chinese collective bargaining has found somewhat effective shop floor mobilization and wage negotiation in the context of trade union reform. However, these studies did not probe the less effective forms and practices, leaving an incomplete understanding of the dynamics of workplace collective bargaining in the country. In this study, I adopt the PRA as a framework to examine the variability in workplace collective bargaining in China's labor relations frontline, Y City, identifying four models of workplace collective bargaining in local institutional settings.

In the "moderated mobilization" model, skilled-worker militancy persistently threatened port logistics, which pushed the state officials to support union elections and wage negotiation, propelled employers to recognize workers' rights, and pressured the YT Union to guarantee workers' meaningful participation in collective decision-making. In the "technical negotiation," past wildcat strikes and state regulatory enforcement pressed the employer to recognize workers' rights to union elections and collective bargaining, leading to the RH Union's organizational autonomy. However,

a high-turnover, low-skilled workforce was unable to appropriate the associational power built by the manager-dominated union leadership, and their participation in collective bargaining was limited to the elected representatives who were inclined to comply with their line managers in union leadership.

Worker participation was further weakened in the "collective consultation" model. Since a high-turnover, low-skilled workforce never challenged the company through wildcat strikes, the FX Union could not achieve organizational autonomy, as the company could still sponsor a union chair candidate, and the union had no pressure to have workers participate in wage negotiation either. Although union elections and collective bargaining were established upon the official request, such a workplace union could only consult with the company on workers' welfare and wages but exclude the input from workers and their representatives. Finally, the "collective consultation" model was degraded to "managerial domination" when WM management controlled the unrepresentative workplace unions, and state support was the only power resource that workers could rely on in collective bargaining.

Based on the findings, I argue that the variability in workplace collective bargaining mainly results from the dynamic interaction between different workers' power resources and employers' responses. Through my discussion of the findings, I further argue that the uneven development of workplace collective bargaining is not a transient phenomenon but a semi-institutionalized middle ground in Y City and the broader Chinese mainland. By employing the PRA to analyze Chinese workplace collective bargaining, I present evidence from China that advances our understanding of the theory of the PRA by advocating for analyzing the dynamic interaction between different workers' power resources and employers' perceptions to explain diverse labor movement outcomes.

Abbreviations

CPC	The Communist Party of China
PRA	Power resources approach

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Declarations

Competing interests
I declare no competing interests in this research.

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