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Floating and Camping: Spatial Inequality and Strategies of Delivery Riders

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Abstract. This study takes delivery riders as the research object to explore the structural spatial inequality faced by delivery riders in urban spaces. Through semi-structured interviews with 11 riders in Beijing, the author analyzes the spatial exclusion and discipline encountered by delivery riders from three dimensions: physical space, social space, and virtual space. Specifically, the spatial exclusion faced by riders in physical space includes explicit spatial restrictions and implicit forced "transgression"; in social space, they suffer from "symbolic violence", which leads to the temporariness and informality of resting spaces, as well as restrictions on living spaces, ultimately resulting in fragmented lives and highly closed social networks; in virtual space, platforms deepen the power inequality between riders and multiple parties through their own power mechanisms. Meanwhile, riders have developed subjective spatial strategies in their spatial practices. By responding to, utilizing, and recreating spaces within "gap spaces", they have achieved negotiation and resistance amid spatial discipline. From the perspective of spatial justice, this paper reveals the mechanism of the reproduction of spatial inequality for delivery riders under the platform economy, and suggests reducing spatial inequality through inclusive urban spatial governance to promote urban spatial equity.

Keywords: Delivery riders, Spatial Inequality, Spatial Exclusion, Symbolic Violence, Social Integration

1. Introduction

In recent years, driven by both high market demand and high labor demand, the food delivery industry based on instant delivery platforms has become a typical representative of new forms of employment. As of 2024, the number of delivery riders in China has exceeded 10 million, and the number of riders on some platforms has been increasing at an annual rate of 20%. As a profession vastly different from traditional blue-collar work, food delivery riding has attracted a large number of workers due to its more flexible work rhythm and more diverse income sources, thereby exerting a profound impact on the temporal and spatial order of urban life and making delivery riders an indispensable group in urban spaces.

However, this ubiquitous group in cities faces various forms of exclusion, including but not limited to cultural exclusion arising from the lack of a sense of urban belonging and cultural identity, institutional exclusion caused by the household registration system, and "exclusion due to

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alienation" resulting from the definition and restriction of group identity [1]. The author has noticed that the work style of delivery riders is closely related to their spatial situation in cities, and they face a series of spatial exclusions during their work. Riders are not only often excluded from the physical space of the city but also encounter various spatial exclusions in cultural space and virtual space. Such exclusion not only prevents them from obtaining a normal spatial experience in the city but also affects their identity recognition.

The spatial exclusion faced by delivery riders is specifically manifested in restrictions in spaces such as shopping mall entrances, outside commercial areas, office building districts, and residential communities, as well as the lack of comfortable and normal resting spaces or being forced to deviate from regular urban road spaces under the dual pressure of time algorithms and route navigation. All these inequalities indicate that urban space is implementing systematic exclusion against the labor group of delivery riders through explicit or implicit rules. This exclusion is not only reflected in physical space access restrictions but also internalized into a set of social codes, trapping delivery riders in a structural dilemma in the game of urban space.

Therefore, from the perspective of urban space, what forms of spatial inequality are delivery riders facing? What obstacles and threats does spatial exclusion pose to delivery riders in their work? What countermeasures have delivery riders adopted in the face of a series of spatial exclusions? This study aims to explore the spatial inequality faced by delivery riders and attempt to respond to the above questions.

2. Literature review

Benefiting from the rapid development of the platform economy, delivery riders have gradually become typical representatives of new-type workers in cities. However, the marginalized situation of delivery riders in urban spaces has become increasingly prominent [2]. Existing research on delivery riders mainly started in 2017, and most studies so far have focused on the labor rights, algorithmic control, and social integration of delivery riders. Nevertheless, there are still relatively few literatures focusing on the group of delivery riders. This section will attempt to review relevant research from the perspectives of algorithmic and cultural exclusion, and understand the spatial inequality faced by delivery riders from the perspectives of spatial and social exclusion.

Regarding how algorithms reshape the labor process of delivery riders and deepen their marginalized situation through spatial constraints, existing studies have pointed out that platforms rely on algorithms to establish a monitoring mechanism for riders. By compressing delivery time and then using order assignment rules to deprive riders of the autonomy to choose orders, the work pressure on riders is increased [3]. However, some studies have pointed out that the relationship between delivery riders and platforms is not a simple domination-subordination relationship. In fact, riders have developed three "subjective time strategies" of "rebellion", "adaptation", and "value-added" [4]. These strategies reflect that riders have regained a certain degree of control over their own work rhythm through micro-level confrontation and interaction with platform mechanisms.

As for the issue of cultural exclusion of delivery riders, some scholars based on the perspective of social constructionism have proposed that the public image of young riders presents contradictory characteristics of "hardworking-dangerous" and "free-restricted". In the social gaze where media reports and public perception often depict riders as "urban marginalized people" or "tragic heroes", delivery riders often find it difficult to obtain real social respect [5]. This marginalized state makes riders over-focused by intellectuals and the public, forced to become symbols for projecting social problems, and their subjectivity is thus weakened [6], leading to more serious cultural exclusion.

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From the spatial perspective, only a few studies have revealed the spatial inequality suffered by delivery riders in cities, mainly revealing the segregation in living, working, and social spaces, and how these spatial segregations hinder riders' integration into urban society. Studies on living spaces have pointed out that delivery riders are often pushed to the edge of the city, facing limited housing conditions and great economic pressure [7]; studies on social spaces have found that riders' social spaces are limited to the scope of "station-delivery" and excluded from broader social spaces [8]; studies on working spaces have found that riders often break through the "spatial threshold" in the "rush work game". However, this spatial breakthrough has intensified conflicts between riders and other urban groups due to the frequent traffic violations committed by riders [9]. It is worth noting that some scholars from the perspective of spatial justice have pointed out that this inequality in living, working, and social spaces reflects the imbalance in the supply of public resources between riders and other urban residents, deepening the spatial exclusion faced by riders [10]. To sum up, such spatial inequalities have actually placed riders in a "floating state" in the city [11]. The segregation in their living, working, and social spaces not only limits their accumulation of social capital but also strengthens their identity as "marginalized people" [12].

Some scholars have placed the occupational dilemmas of delivery riders in the social structure from the perspective of social exclusion to study the occupational dilemmas of delivery riders and their solutions [13]. Other scholars have used the perspectives of platform time discipline and spatial production to reveal the mechanism of capital's time discipline on gig workers and the resulting "labor order", as well as the maintenance of workers' dependence on the platform through the production of "labor space", "regulation space", and "communication space", providing a framework for "time discipline" [14]. However, the author has noticed that existing studies have not directly focused on the inequality issue of delivery riders from the spatial perspective, making it difficult to systematically explain the spatial inequality of delivery riders.

Based on spatial sociology and labor control theory [15], this study first analyzes the inequality encountered by delivery riders in different urban spaces from the perspective of spatial production. Secondly, it uses the concept of "symbolic violence" proposed by Bourdieu [16] to explain the implicit exclusion suffered by delivery riders in resting, living, and social spaces. Thirdly, relevant studies have shown that the platform economy has established a new labor control model through algorithmic and data-based management, enabling workers to be deeply disciplined even in virtual space. This paper attempts to combine the above theories to analyze the marginalized situation of delivery riders in urban spaces and further explain the subjective strategies they have developed.

3. Research methods

This study selected delivery riders from three core food delivery areas in Beijing, namely Wangjing, Jiuxianqiao, and Laiguangying, as interview subjects. Semi-structured interviews were conducted with 11 delivery riders, covering riders of different delivery modes (Lepao, dedicated delivery, crowdsourced delivery, etc.), different working years, and different age groups to ensure sample diversity. The author mainly conducted face-to-face interviews at order-waiting gathering points (around business districts, under shade trees, shopping mall rest areas, etc.), investigating from six spatial inequality dimensions: living space, platform space, working space, social space, access restrictions, and resting space, and flexibly adjusted the interview time according to the work rhythm of the interviewees. Sensitive information such as the personal information of all interviewees and the platform companies they belong to was anonymized, numbered from Rider A to Rider J. Finally, the author conducted verbatim transcription and thematic coding based on the interview materials and analyzed the interview content.

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4. Dilemmas under spatial marginalization: spatial exclusion, discipline, and forced deviance

4.1. Exclusion and transgression in urban physical space

The daily work practice of delivery riders actually reveals a kind of "physical space exclusion". In urban physical spaces such as commercial areas, residential communities, and office buildings, they often encounter restrictions on entering specific spaces or are forced to act in accordance with specific paths. This institutional spatial control limits the movement paths of riders and actually forms a kind of spatial exclusion of physical space against riders. Therefore, such exclusion is not only reflected in the rule restrictions of building management systems but also reflects the implicit discipline of modern urban space on specific groups.

The survey found that the spatial exclusion faced by the group of delivery riders mainly comes from public spaces such as office buildings and residential communities. A small number of residential communities only allow riders to enter on foot. "Generally, riding bikes is not allowed in residential communities; we have to walk in" (Rider C), "Approximately 2/3 of the communities allow bike entry, and 1/3 do not" (Rider H). "Office buildings do not allow entry; most of them have food delivery lockers downstairs" (Rider D). In addition, hospitals, schools, and government work units also do not allow delivery riders to enter. "For example, food deliveries to public security departments are generally placed at the door, as well as those to hospitals and schools" (Rider I), "Schools do not allow entry, and hospitals do not either" (Rider J). Moreover, in the practice of residential communities, entering on foot prolongs the delivery time, increases the labor intensity of riders, and may also lead to "overtime" penalties from the platform. "During the morning peak when it's the busiest time, it's very troublesome that we are not allowed to ride bikes into the community" (Rider H). These "invisible obstacles" not only increase the physical consumption of riders but also expose them to the dual pressure of overtime deductions and customer reminders. It should be noted that unlike property owners and employees who have the right to dominate the space, riders' right to use the community space is temporary and managed. They must obtain permission, abide by rules, and even accept monitoring. "If the property management rules say you can't enter, you definitely can't" (Rider F); "Residents can ride electric bikes in and out every day, but we (riders) have to walk in" (Rider C). This unequal spatial rights structure implies the social hierarchy and power relations hidden in urban operation.

It should be added that on the basis of restricting riders' right of entry, although most office buildings do not allow riders to enter the building, their management has alleviated conflicts and inconveniences in the delivery process to a certain extent by setting up facilities such as food delivery lockers, realizing the orderly handover of the delivery process and reducing the time cost of riders. "If they really don't allow entry, we are actually willing to take orders from there because we don't need to go upstairs; we just need to call the customer in advance to let them come down or place the food in the locker" (Rider A); "The fact that the building says no entry is actually a good thing for us" (Rider A). However, we still need to note that this arrangement is still based on the restriction of riders' "right of entry", which essentially reveals the reality that riders are functionalized and marginalized in urban space as "service providers".

In addition to the explicit exclusion of delivery riders by specific spaces such as residential communities and office buildings, riders also face a more implicit form of spatial exclusion during the delivery process. That is, under the pressure of platform order assignment and delivery efficiency, riders are often forced to commit a series of "deviant" behaviors on the road, including retrograde driving, running red lights, and occupying non-motorized lanes. In this case, the road space reshaped by platform algorithms and efficiency regulations has caused implicit differentiation

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between riders and other urban residents in terms of the right to use road space and freedom of movement. Therefore, "deviance" is the product of riders under multiple spatial constraints and discipline - the explicit exclusion of architectural space limits the movement scope of riders, while in road space, the rigid requirements of the platform force riders to deviate from the conventional road space. This spatial inequality arising from spatial practice on the road is both implicit and daily, making it more difficult for external observers to perceive, but it profoundly affects the riders' spatial experience and mode of action.

In actual delivery, the "navigation" system, as an indirect form of discipline on riders' movements in the city, can provide riders with accurate and safe delivery routes. However, some riders do not trust the navigation or refuse to follow the navigation route under delivery pressure. The author found that some riders believe that the route provided by the navigation is not the fastest, and some riders point out that the navigation data is not accurate enough to fully reflect the actual road conditions. "Sometimes the navigation route is rather roundabout" (Rider C). But the more major contradiction is that "navigation" only considers the standardization and safety of the route and does not provide routes for retrograde driving or running red lights. However, many riders admitted that they are still forced to take deviant behaviors such as retrograde driving and running red lights under the influence of time pressure, delivery efficiency requirements, and road space settings. "Especially during the lunch peak, there are many people and vehicles, and we riders have to carry a lot of orders - at least 6 or 7 orders at a time. Can you make it without running red lights? You will definitely be overtime" (Rider H), "If I don't drive retrogradely, I have to go around to the other side and then come back, which wastes time, so I will drive retrogradely" (Rider B). Even a considerable number of riders clearly stated that such deviant behaviors are almost "necessary" in their work. "There are some places where you have to go the opposite way" (Rider A), "Running red lights is definitely a must. The station manager even said personally, 'You can drive retrogradely and run red lights; otherwise, you can't finish the delivery'" (Rider E). More seriously, one interviewee clearly pointed out the life danger associated with this forced "transgression". "Accidents happen every day; it seems that a rider was directly hit and killed this morning" (Rider E). These remarks not only imply the universality of forced "transgression" of riders in road space but also constitute the most vivid example of the spatial inequality they encounter in their work practice.

In other words, the retrograde driving and running red lights of riders during work are actually the inevitable result of platform discipline, behind which is a structural spatial dilemma jointly shaped by urban space restrictions and platform discipline. Just as the spatial restrictions of office buildings and residential communities constitute an explicit, physical spatial exclusion, the forced "transgression" of delivery riders on the road also points to the implicit inequality in urban space. Thus, the work practice of riders has become a concrete manifestation of the spatial inequality they face.

4.2. Symbolic violence and life fragmentation in social space

Space is a manifestation of social relations, which includes institutional, cultural, and symbolic constructions [17]. Therefore, different from the exclusion in physical space, delivery riders also face a kind of non-direct but continuously functioning discipline in their daily work. Distinct from the exclusion in physical space, the "symbolic violence" encountered by delivery riders in social space, through the solidification of identity symbols, social relations, and living patterns, constitutes the continuous exploitation of riders' daily lives and invisibly deepens the fragmentation between them and mainstream urban life [18].

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The fact that delivery riders cannot separate themselves from their labor identity during rest time constitutes the most intuitive symbolic violence in riders' lives. During the intervals of daily delivery, the resting spaces of delivery riders are not fixed. "We don't have a fixed place to rest" (Rider C). Riders often rely on some temporary and informal resting spaces, including roadside shade, store entrances, shopping mall corridors, or corners of restaurants. "(I) usually rest under the shade of trees" (Rider C), "Generally, when there are no orders and the weather is good and not too hot, I will rest near shopping malls or some stores, or even in the delivery vehicle" (Rider I). These places often show obvious informality and randomness, and most of them are "gap spaces" that riders find conveniently during work, rather than the "rest spaces" for urban residents. But even in these spaces, the professional identity of delivery riders can never be hidden. Uniform work clothes, food delivery boxes, and the possible order assignments from the platform at any time keep them in a state of "temporary rest" [19]. Therefore, rest itself, which is incorporated into the work logic, no longer becomes non-working time separated from labor. The professional identity of delivery riders that cannot be hidden also makes it impossible for them to enter public leisure spaces as ordinary citizens, but only to occupy the marginal corners of public spaces under the symbolic shackles of "delivery riders".

The "life fragmentation" faced by riders occurs in their spatial practice in residential spaces. The choice of residential places by most riders is actually strongly shaped by work factors. "(It takes) at most ten minutes to ride here from where I live" (Rider A). Another decisive factor is the rent price. In order to minimize living costs, riders often choose to share a house or live in dormitories. "There are many rental houses in Caochangdi, usually small single rooms" (Rider D). Therefore, this fragmented life practice of riders precisely stems from the highly overlapping state of their living and working spaces. On the one hand, the daily life of delivery riders is limited to the vicinity of the work business district, forming a residential geography centered on work; on the other hand, under the penetration of the work-oriented and cost-compromised living logic, the residential space that should provide rest, recovery, and private life actually lacks a sense of daily life and becomes ambiguous and vague, thus contributing to the structural fragmentation of delivery riders' lives.

Under the dual effects of "symbolic violence" in resting space and "life fragmentation" in living space, riders eventually engage in a highly closed social model. Their social interactions are thus limited to two highly homogeneous and even overlapping groups: colleagues and fellow townsmen. "Most of my friends here are doing this job" (Rider B), "Most of my friends are in the rider circle" (Rider D). "(My friends) also came from my hometown, and we are roughly the same age" (Rider J). Although riders have frequent interactions with consumers and merchants in daily life, the "symbolic violence" borne by riders makes most of these connections only stay at the transaction level, lacking emotional and other extensions, implying that there is an actual spatial segregation between riders and the broader urban social space.

To sum up, the violence and fragmentation faced by delivery riders in social space are multi-dimensional and intertwined. Delivery riders cannot obtain a real rest space during leisure time, which reflects the "symbolic violence" they suffer; they are also forced to occupy marginal and temporary residential spaces in the city under the coercion of work and income factors, resulting in obvious life fragmentation; finally, in social space, the highly closed social circles of delivery riders further deepen their isolation from mainstream urban life. Shaped by these three types of spatial practices, the daily lives of riders are ultimately positioned as "others" at all times, thus being excluded from equal and normal urban social spaces.

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4.3. Power mechanisms in virtual space

In terms of the work practice of riders, platforms, as managers with technical means, have actually created a set of implicit power mechanisms and disciplinary systems. By virtue of the rating system and order assignment rules, platforms exert direct or indirect control over riders' behaviors, income, time arrangements, and work rhythm, thereby forcing riders to reshape their actions in accordance with the standards and rules set by the platform. To a certain extent, this helps the platform form a high degree of control over the riders' bodies, time, and space, which can be understood as the discipline that riders receive in virtual space (platform space).

This discipline is directly reflected in the platform's control over working hours. Many riders said that they often need to work more than 10 hours a day. "From 10:30 a.m. to about 10 p.m., that's roughly the working time" (Rider C), "In total, it's about 14 hours from when I go out in the morning to when I go back at night" (Rider H). Long working hours significantly compress the riders' freedom to rest, and the resting space is also highly dependent on the order assignment location and delivery scope. The life rhythm of riders is almost completely embedded in the algorithm logic. In addition, the delivery time given by the platform is not fully considered, which further strengthens the discipline on riders' bodies. "Some communities are particularly large, and riding bikes is not allowed inside. It takes us several minutes and hundreds of meters to go back and forth, which delays a lot of time, and other orders are likely to be overtime. I think this is unfair" (Rider I).

In terms of income, work clothes, and task arrangements, the platform also constructs certain spatial inequality in virtual space among riders. First, there are obvious differences in work clothes requirements between crowdsourced riders and dedicated delivery riders. "We (dedicated riders) must have them; we must wear the work clothes and hats, but crowdsourced riders are much more convenient" (Rider H). Second, there is also spatial inequality in virtual space regarding income and task allocation. For different riders, even in the same delivery area, the frequency of order assignment, order type, and unit price may vary among riders with different behaviors. "If the system works well and the rider has a high activity level, the probability of receiving orders is higher" (Rider H), "The faster you deliver, the more orders you will definitely be assigned. To put it bluntly, the station that can adjust this can also manipulate it. If you want absolute fairness, there is no such thing as absolute fairness" (Rider J), "Crowdsourced orders have lower unit prices, so they must be assigned first; they cannot be directly assigned to orders with higher unit prices" (Rider J).

More notably, under the power mechanism of virtual space, the power relationship between riders and merchants also shows inequality. The time for merchants to prepare food is not restricted by the platform or riders, but riders must deliver the food within the time limit required by the platform. In fact, the platform transfers the time pressure and responsibility risks that should be borne by merchants to riders. "(Merchants) should not be punished; what punishment would merchants receive? Only riders are punished" (Rider J).

It is not difficult to see that the power mechanism in virtual space can not only shape the labor behavior of riders but also deepen the structural inequality faced by riders. Because in this virtual space, the working hours, order selection, and even rest rhythm of riders are all highly regulated by the algorithms in virtual space. This also implies that in virtual space, the discipline of the platform on riders not only extends to the daily lives of riders but also affects their work intensity, income level, and right to rest. This actually proves that virtual space is essentially a power field that can deeply control the riders themselves, and through this, it continuously reproduces the spatial inequality faced by riders.

To sum up, the author found that riders face three types of complex spatial inequality in physical space, social space, and platform space. In terms of urban physical space, explicit spatial exclusion

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is reflected in riders being restricted from entering certain public spaces, while more implicit spatial exclusion is reflected in riders often having to break the boundaries of normal urban road space and "transgress" into more dangerous physical spaces. In terms of social space, riders' leisure time at work is not accepted by normal public spaces due to "symbolic violence", and outside of work, riders' residential spaces also face profound work orientation and economic compromise, resulting in life fragmentation. These two types of spatial inequality permeate all aspects of riders' lives, ultimately forcing riders to be in a highly closed social space that is highly segregated from the outside world. Finally, in terms of virtual space, the power mechanism created by the platform makes riders face inequality with colleagues, merchants, and customers at the same time. These unequal relationships and the power mechanism exerted by the platform on the riders themselves deeply discipline the daily lives of riders and continuously reproduce the spatial inequality of riders in virtual space.

5. Riders' subjective strategies: spatial practice of camping in gaps

5.1. Spatial response in the gray area

Faced with various spatial inequalities, riders have actually found a field that the author calls "gap spaces" and a set of unique response strategies. This "subjective strategy" (Ren Yunling, 2023) reflects the negotiation and resistance of delivery riders in the face of spatial discipline.

During the peak delivery hours, some riders will take the initiative to avoid orders for residential communities. "During the busy lunch peak, I basically don't take orders for residential communities" (Rider H). Some riders avoid the spatial restriction of "no bike entry" by purchasing small means of transportation such as electric balance bikes. "I bought an electric balance bike myself. Although riding bikes is not allowed in (residential communities), balance bikes are allowed" (Rider H). Some riders also sneak in when the boundaries are vague. "Sometimes when in a hurry, I will sneak into the community when the security guard is not paying attention" (Rider I). These examples show that in the operation mechanism of urban spatial segregation, spatial management is loose and unstable, and there are spaces that can be utilized by grass-roots laborers such as delivery riders. It is in these "gap spaces" that delivery riders seek possibilities and strive for efficiency, dignity, and self-control. Although this micro-level resistance is difficult to fundamentally change the structural inequality of urban space, as a form of micro-power displayed by spatially restricted groups in the face of spatial exclusion, it has participated in the construction of the subjectivity of this group to a certain extent.

At the same time, it should be noted that not all property owners or staff hold an exclusive attitude. Some residential communities take the initiative to provide delivery bikes for riders. "Some communities do not allow bikes to enter, but they provide bikes" (Rider H); "Their community has prepared special bikes for riders, which are placed at the community gate. Although we cannot ride electric bikes in, we can ride these bikes, which saves some time. But such communities are very rare; I have only seen one so far." Some security guards also choose not to stop riders from entering on rainy days or in bad weather. "On rainy days, they should not stop us; we can ride in" (Rider H). This shows that the exclusion in physical space is not completely rigid or technical; it is also affected by specific situations, the individual judgment of managers, and the personal relationship between riders and specific staff.

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5.2. Spatial utilization in the gaps of mechanisms

The delivery practice of riders in residential communities reveals the "gap spaces" in urban space, and the platform mechanism also has "gap spaces" that can be flexibly utilized by riders. Under the high-pressure mechanism of the platform, delivery riders often continuously look for loopholes in the system and construct flexible spatial strategies through mutual assistance and adjustment.

The author found that some riders will accept orders on the way according to their commuting routes, combining their personal commuting trips with delivery tasks. "I work until about 9 o'clock, then log off from Meituan, and then find JD or Fengniao to take orders back home. Because they are crowdsourced platforms, for example, if the platform assigns an order going this way, you can refuse it if you don't want to go; I only take orders going that way (towards home)" (Rider H). This spatial strategy blurs the boundary between work and life, integrating the time cost of commuting into the delivery process. On the one hand, it improves work efficiency; on the other hand, it also allows riders to strive for more autonomy in the gaps of the platform logic.

Some riders also adjust their work intensity by transferring shifts. Riders will hand over their orders to other riders in WeChat groups or other platforms to gain a short break, or exchange orders that are more on the way with other riders. "For example, if I don't want to go out at night and want to sleep at home or go drinking with a few friends to go fishing, I can transfer my shift out, and then I can get off work immediately" (Rider A), "If you don't want to deliver an order, you can sell it in the group" (Rider H). In this process, riders camp in the "gap spaces" of the platform, forming a mutual assistance network to escape the platform mechanism through their social relationships. By exchanging, selling, or transferring orders, they gain a certain degree of flexibility and self-adjustment space amid the platform's high control.

To sum up, the spatial strategy of delivery riders utilizing the gaps in the platform mechanism reveals that even though the platform attempts to control the daily lives of riders in every detail through labor discipline, in reality, there are still "gap spaces" in this control that can be utilized. This spatial strategy, as a micro-level resistance and reconstruction of riders against platform discipline, strives for efficiency, rest, and dignity in highly restricted work.

5.3. Spatial reconstruction in the gaps of interpersonal relationships

At the social level, delivery riders have constructed another kind of "relational space" through their own relationship networks. It not only supplements the current highly atomized and isolated situation of delivery riders but also provides them with spiritual support and practical resources to a certain extent.

Digital social tools are one of the ways for some riders to expand their relational space. In addition to using work-related WeChat groups and QQ groups to share order assignment information or traffic conditions, riders also take the initiative to get to know people of other occupations in the city through social software. "As for friends, I have rider friends and also friends from social software" (Rider I). In this way, through social networks, riders have actually created a unique "communication space" for themselves in virtual space, providing themselves with emotional recognition and spiritual support.

It is worth noting that some riders have also formed emotional bonds with merchants that go beyond work relationships. During the fieldwork, the author noticed that Rider F would receive fruits given by familiar merchants. The author believes that such daily and small interactions show that beyond the cold algorithms and orders, the relationship between riders and merchants has

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become warm and intimate through long-term contact, forming an outlet for riders to resist labor alienation.

To sum up, even though riders face different types and degrees of spatial exclusion and discipline in various spaces, the author believes that riders still develop flexible strategies through various spatial strategies to strive for a "gap space" beyond discipline to flexibly adjust the rhythm of work and life. It is by relying on these "gap spaces" that riders have developed subjective strategies to cope with spatial inequality, improving their life experience, income level, and self-esteem.

6. Conclusion

Taking the spatial inequality faced by delivery riders as the entry point, this study explores the inequality faced by delivery riders in physical space, social space, and virtual space during their work and life, as well as how they realize resistance against spatial inequality through the response, utilization, and reconstruction of "gap spaces".

First, delivery riders are facing explicit and implicit exclusion in urban physical space. Places such as office buildings, residential communities, hospitals, and schools restrict delivery riders from entering these public spaces through spatial management systems, while platform pressure forces them to frequently "transgress" on the road. Second, in social space, the temporariness and marginalization of resting and living spaces further weaken the boundary between riders' work and labor, resulting in life fragmentation. At the same time, in virtual space, platforms also highly control and discipline delivery riders in terms of working hours, work intensity, and labor income through power mechanisms such as order assignment and evaluation systems. These examples collectively point to the structural spatial inequality actually faced by delivery riders in urban space.

The author found that despite facing structural spatial inequality, delivery riders are constantly developing flexible strategies in "gap spaces". First, riders cope with spatial restrictions by avoiding orders for residential communities, using means of transportation, or "sneaking in". Second, mechanisms such as accepting orders on the way during commuting and transferring or exchanging orders also enable riders to break through platform discipline to a limited extent. Through the utilization of "gap spaces", a unique practice of delivery riders in gaps is formed. At the social level, riders have constructed informal life networks through long-term interactions with merchants and their relationships with fellow townsmen and relatives, and have expanded more potential communication spaces through social software. In the practice of these interpersonal relationships, riders have found spiritual comfort and reconstructed their own social space beyond labor.

In conclusion, the actual situation of spatial inequality of delivery riders reflects the reproduction mechanism of urban space driven by institutional power and symbolic violence, and also implies the subjective practice of marginalized groups in the city camping in the gaps. This study not only helps to understand the spatial inequality of delivery riders but also provides clues for reflecting on urban spatial governance - a spatial governance strategy that reduces spatial exclusion in design and recognizes the spatial needs of delivery riders in governance may be an important way to improve urban fairness and inclusiveness.

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