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Are Ride-Sharing Platforms Good for Indian Drivers? An Investigation of Taxi and Auto-Rickshaw Drivers in Delhi

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Abstract. It has been several years since ride-sharing platforms such as Ola and Uber have entered the Indian market. As a type of matching service, mainstream economic theory predicts that they will bring economic efficiencies to hired transportation. In this study, we investigate the impact of ride-sharing on drivers of taxi cabs and auto-rickshaws in New Delhi through a mixed-methods study involving 60 drivers. We find mixed outcomes for drivers with little clear evidence of overall benefit. We saw no statistically significant impact of ride-sharing on drivers' average revenue per day, though the data is suggestive of income gains of 7-18% which seem likely to be due to longer hours driven. In contrast to the corporate marketing where driver autonomy and flexibility are oft-cited perks, our participants tended to report less autonomy and control with ride-sharing. And, we find evidence that drivers face greater uncertainty with respect to their income as ride-sharing companies offer intermittent promotional incentives. Our findings are consistent with technological amplification theory. Through ride-sharing platforms, unequal power dynamics between large corporations and low-wage workers are amplified: ride-sharing companies wrest control from drivers while providing little in return.

Keywords: ICT, Sharing Economy, Gig Economy, ride-aggregator platforms, auto-rickshaws, India, Delhi.

1 Introduction

Ride-sharing – that part of the so-called “sharing economy” [24, 26] that matches drivers with riders for personal ground transportation through smartphone apps – is now a worldwide phenomenon. In high-income countries, ride-sharing companies such as Lyft and Uber are widely hailed for providing transport services that are convenient, low-cost, widely available, quick to pick up, and good for drivers [9, 10, 23]. On the other hand, critics point out that the platforms bypass local transport regulations, compete with public transportation, and underpay their drivers [9, 18, 23].

In India, the two major ride-sharing companies are Ola, an Indian company, and Uber, the U.S. multinational company. Personal, hired, ground transportation in urban

India is a different phenomenon compared with much of the developed world. There are vehicle classes other than four-wheeled automobiles, whether it is auto-rickshaws, bicycle rickshaws, or even human-pulled rickshaws. The services are extremely inexpensive, and rides are plentiful and easy to hail [19].

In this paper, we report on a study that focuses on the impact of ride-sharing on drivers of hired transport in India in terms of revenue and driver perceptions. We used a mixed-methods study of 60 drivers in New Delhi, split evenly among three groups: taxi (automobile) drivers who used ride-sharing apps, auto-rickshaw drivers who used ride-sharing apps, and auto-rickshaw drivers who did *not* use ride-sharing apps.

Overall, we find that the impact of ride-sharing on Indian drivers is mixed, with no clear evidence of net benefit. We find no statistically significant impact on drivers' average revenue per day, and even a suggestive (i.e., not statistically significant) 7-18% increase in mean revenue is likely due to drivers working more hours. Qualitatively, we find that many Indian drivers feel pressured into ride-sharing so as not to be "left behind," but there are complaints about a resulting loss of autonomy. Among drivers, ride-sharing appears to exacerbate existing inequalities, with a few high-performing drivers benefiting from the rewards offered by ride-sharing companies while relatively older, smartphone-less drivers who do not own their own vehicles struggle either to participate in ride-sharing or to maintain their levels of income. These findings build on the small literature on ride-sharing in the developing world.

We situate our findings in a critique of capitalism, mediated by technology's amplifying effect [28]. Contrary to claims that the sharing economy represents a departure from capitalism's pathologies that elevates workers by providing new opportunities through individual entrepreneurship, what we suggest is that ride-sharing in urban India is an extreme form of capitalism in which the unequal power dynamics between corporations and workers are amplified, with workers likely losing out as tech titans clash overhead. Thus, while our findings differ in the details, they extend some of the existing criticism of the sharing economy [9, 18, 23].

2 Related Work

2.1 Ride-Sharing and Its Impact on Labor

There is a considerable literature about ride-sharing in developed-world contexts. Some research focuses on the benefit to rider-consumers that includes lower costs compared to local taxi cabs, at least for routine rides [7], as well as shorter wait times and ease of use [8]. Indeed, riders in many cities express delight about ride-sharing, with accompanying complaints about over-priced and outdated taxi services [8]. Riders are even willing to pay the premium when ride-sharing platforms implement "surge pricing" – raising the price of rides during moments of driver scarcity [7].

Other work considers the impact on drivers. One prominent study compared the gross hourly earnings of Uber drivers with those of taxis and chauffeurs across six U.S. cities, and suggested that Uber drivers earn more per hour [10]. They found that on average, Uber driver-partners earned \$19.19 per hour compared to a \$16.90 for their counterparts and the authors conclude, "Unless their after-tax costs are more than \$6

per hour, the net hourly earnings of Uber’s driver-partners typically exceed the average hourly wage of employed taxi drivers and chauffeurs.”

The same study found that, again in the United States, Uber drivers differ as a group from their taxi-driving counterparts [10]. Among UberX drivers, 19.1% are between 18 and 29 years old, but only 8.5% of taxi drivers are; 21.8% of UberX drivers are between 50 and 64, while 36.6% of taxi drivers. Moreover, “Nearly half of Uber’s driver-partners (48%) have a college degree or higher, considerably higher than the corresponding percentage for taxi drivers and chauffeurs (18%).” Uber drivers also often have another job apart from driving, and use driving as a complement to their wage, compared to their taxi-driving counterparts who tend to be drivers full time. Finally, many Uber drivers appear to engage in driving as a temporary option. After a year of driving for Uber, almost half of the drivers quit.

Scholars have also noted that drivers are lured to the platform with promises of high wages for short hours of driving, but Uber intermittently reduces fare rates unilaterally [21]. Another issue is the myth of flexibility that has gradually faded away as the drivers face constant pressure from the platform to drive longer hours, at particular times, and in specific neighborhoods, or rating systems forcing drivers to bear the burden of customer service. Some scholars argue that the algorithms at the center of Uber’s system consolidates power fully in the hands of the platform [21]. Unlike a human manager, Uber’s system is relentless and uncompromising in its monitoring of drivers’ performance and behavior.

A common criticism of the sharing economy overall is that it leads to “casualization of the workforce, informalisation of the formal economy and the so-called ‘demutualisation of risk’ in modern labour markets” [9]. Ride-sharing companies gain all of the benefits of wage work without the responsibilities through “disguised employment relationships.” Indeed, drivers are responsible for their own vehicle maintenance, insurance, and other costs and have neither overtime pay nor sick leave [10, 21]. Critics of ride-sharing tend to agree that the “uberisation of society” exaggerates the problems of capitalism [18, 28]. Moreover, the use of algorithms erodes job quality in the platform economy. The bargaining power of the worker is truncated when operating through a digital tool. The constant monitoring through the process, and rate given when completing the task creates an unfair imbalance [32].

2.2 Ride-Sharing in India

The two major ride-sharing companies in India are Ola and Uber [2, 30, 3130]. Ola was founded by an Indian entrepreneur who began with a ride-sharing service for cabs in 2010 and then expanded to auto-rickshaws in 2014, the ubiquitous, covered, three-wheeled vehicles that are common throughout South Asia. Uber, of course, is the U.S.-based multinational [30], entered the market in 2013 and launched the auto-rickshaw option two years later. One scholar, pointing out that ride-sharing is an organization of informal work, suggests that in contexts like India where the informal economy is prevalent, ride-sharing’s impact is muted; it is not as disruptive as it is elsewhere [25]. Indeed, “92% of these drivers were driving to earn an income before joining a platform

economy company. Only 8% shifted to these companies from different professions” [25].

Another study of drivers in Bengaluru emphasizes how ride-sharing changes the way that drivers operate, often in undesirable ways [12]. “Without Ola, drivers locate passengers by sight, negotiate whether to take them then set off towards their destination... Ola changes the dynamics as drivers must first accept the passenger’s request then physically locate them, and do not negotiate with the customer.” Customers, however, often cancel, causing drivers to burn fuel without compensation. “Some drivers prefer their regular [i.e., pre-ride-sharing] taxi dispatch systems because they enable seeing and choosing freely between incoming requests,” a choice they lose with ride-sharing platforms. Unhappiness with ride-sharing has prompted Indian drivers to strike [31].

Research also highlights the inequalities among drivers that ride-sharing may aggravate. Generally, the drivers using the application are more literate, for example [12]. Such findings are consistent with the literature on the digital divide in developing countries [4, 20, 29], which finds that digitally mediated activities tend to highlight existing inequalities in economic status, social standing, or education.

The research in this paper builds on the above literature through a preliminary attempt to capture the financial impact of ride-sharing on drivers in India, as well as to tease out some of the key differences that Indian drivers experience compared with their developed-world counterparts.

3 Methodology

3.1 Data Collection

We conducted 60 interviews in New Delhi, India, between January and June 2019, each consisting of a questionnaire with questions related to demographics and business as well as a semi-structured portion with open-ended questions. Interviews were conducted with three types of drivers:

- Auto-rickshaw drivers who used Ola or Uber (Abbreviation: RU; 20 interviews)
- Auto-rickshaw drivers who did not use Ola or Uber (Abbreviation: RN; 20 interviews)
- Taxi cab drivers who used Ola or Uber (Abbreviation: TU; 20 interviews)

All interviews were conducted verbally by the first author during hailed (and paid) rides. Interviews were conducted in Hindi through paid interpreters on all rides.

The questionnaire portion asked about their demographic profile as well as the details of the costs and revenues of their driving-related work. The semi-structured portion asked about their perceptions of their job, ride-sharing platforms, and their economic situation in general.

Rides were hailed from well-known ground-transportation hubs in South Delhi (e.g., Hauz Khas Metro Station, Nehru Place), Central Delhi (e.g., Connaught Place, Central Secretariat) and Old Delhi (e.g., Jama Masjid, Red Fort). Ride-sharing apps were used to recruit participants for the 40 participants on ride-sharing platforms. Regular on-the-

spot hailing of rides was used to recruit the other 20 participants. Rides were requested for common destinations, as well, so as to allow a series of interviews to be conducted in a single day.

Rides were requested for destinations typically 4-6 kilometers away. On Delhi's crowded streets, this allowed for recruiting of the participant, obtaining informed consent, and an interview that lasted about 15 minutes. Drivers were generally very open to being interviewed in this way and tended to be succinct and to-the-point. Interviews quickly came to an end when the destination was reached. In addition to the payment for the ride, we paid tips of 30% of the cost of the ride as a token of our gratitude. Audio recordings were not practical due to engine and traffic noise, so notes were taken by hand as the interviews occurred.

Beyond interviews with drivers, we also met with two Ola Mobility Institute employees who conveyed the specifics of Ola's outreach and interaction with drivers. These interviews provided clarification about some of the drivers' claims about their interaction with Ola (e.g., the specific nature of promotional deals), and also provided a view into the ride-sharing companies' perspectives.

3.2 Data Analysis

Our research involved mixed methods with both quantitative and qualitative data analysis.

All of the demographic and business data were entered into a spreadsheet and cleaned. Though most drivers responded to all of our questionnaire questions, they sometimes varied in the specifics of their responses. In a few cases, we used averages from other drivers to infer specific figures – for example, some drivers reported renting their vehicles; even where we did not have their rental rates, we used average figures based on other respondents. Throughout this paper, we report ARPD as net revenue for the driver in the local currency, the Indian Rupee (Rs). (At the time of the interviews, Rs. 70 was equal to US\$1.) Once cleaned, the data was analyzed to determine summary statistics and correlations. For the latter, several regressions were run, using a subset of the following independent variables: age, education, length of time as a driver, use of a ride-sharing app, length of time using an app, number of hours driven per day, type of vehicle, and vehicle ownership. ARPD was cast as the primary dependent variable, but we also tried regressions with vehicle ownership as the primary dependent variable. Both dependent variables, incidentally, were highlighted by drivers as how they assessed their own performance or success. Vehicle acquisition can have long-term benefits for the drivers, separate from ARPD.

For qualitative findings, participants are referred to throughout by codes: RUX for rickshaw drivers who are ride-sharing app users; RNx for non-user rickshaw drivers; TUX for taxi drivers (all of whom were app users).

3.3 Limitations

Though we made an attempt to capture a diverse set of Delhi-area drivers, our sample sizes are not large, and the samples were biased in a number of ways: Geographically, of course, our results do not necessarily hold beyond Delhi. Even within Delhi, there

may be selection biases due to where the rides were hailed (generally, in high-traffic areas). All interviews were conducted during the day, and drivers taking early morning or late evening shifts were not represented. However, because our ride-hailing methodology was effectively random, we believe our findings have validity within those times and places.

We also acknowledge potential problems with language and culture. Though we – both authors – have lived in large Indian cities, speak some Hindi, and are personally familiar with rickshaws, taxis, and other forms of urban transportation, there are likely nuances of expression that we may have missed.

4 Findings

4.1 Business Basics

Auto-rickshaws have traditionally operated by taking passengers who hail them on the streets. With the advent of ride-sharing platforms, this situation has changed for some drivers in the last few years, but almost all drivers reported a willingness to pick up passengers on the spot. This scenario, however, is somewhat rarer for cab drivers who have over the last 10-15 years, become accustomed to booking rides through private companies and mobile-phone calls.

Next to the type of vehicle driven, ownership of a vehicle is a key differentiator among drivers. When the vehicle is owned, the driver is himself (all of our drivers were male) liable for gasoline, maintenance, and insurance costs. However, for drivers who rent their vehicles, maintenance and insurance are paid by the owner. (Gasoline is typically paid for by the driver, regardless, though there appears to be some variation.) The business relationship that drivers have with vehicle owners is diverse: some pay a rental fee on a daily or weekly basis; others pay their owners a percentage of their daily earnings; still others earn a fixed wage per month (more frequent among ride-sharing drivers). Drivers often aspire to own their own vehicles, and as below, it does appear that ownership leads to greater net income.

4.2 Quantitative findings

Table 1. Table of the main qualitative findings.

| Criteria/Groups | RN | RU | TU |
|------------------------------------------|--------|--------|---------|
| Percentage of vehicle-owners | 47% | 71% | 55% |
| Percentage of non- owners | 53% | 29% | 45% |
| ARPD (whole group in Rs.) | 587.93 | 737.88 | 1405.75 |
| ARPD of vehicle owners (in Rs.) | 750.86 | 798.48 | 1516.22 |
| ARPD of non-owners (in Rs.) | 425.00 | 620.00 | 1231.19 |
| Average age in years | 40.48 | 35.10 | 31.85 |
| Average grade completed | 8.50 | 10.54 | 9.55 |
| Average time being a professional driver | 15.82 | 13.05 | 7.71 |

| | | | |
|--------------------------------------------------------------|-------|-------|-------|
| Average number of hours driven per day | 10.97 | 10.88 | 12.21 |
| Rate of drivers who have tried to use a ride-aggregating app | 11% | - | - |
| Rate of drivers who have tried the other app | - | 65% | 25% |
| Average time using an app in years | - | 2.03 | 2.03 |

Average Revenue Per Day (ARPD). ARPD varies significantly by vehicle type, use of ride-sharing apps, and vehicle ownership. Rickshaw drivers not using ride-sharing apps earned the least, at an average of Rs. 588 a day. App-using rickshaw drivers earned an average of Rs. 743 per day, and cab drivers earned Rs. 1406 on average.

Thus overall, cab drivers earned Rs. 647 more per day than auto drivers ($p < 0.01$). In addition, each additional hour driven per day appears correlated with Rs. 60 more in earnings. ($p = 0.037$). On the other hand, ride-sharing app usage did not have a statistically significant correlation with increased revenue ($p = 0.5$), even though there is a suggestive difference of Rs. 99. If we perform regressions only on ride-sharing app users, driving a cab is positively linked with an increase of Rs. 658.64 ($p = 0.0007$), while every additional hour driven correlates with an increase of Rs. 74 ($p = 0.08$).

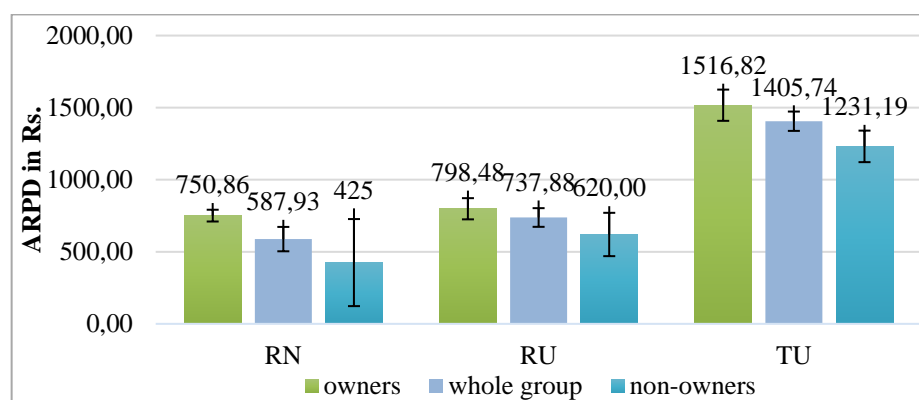


Fig. 1. ARPDs by type of vehicle, vehicle ownership, and app usage. Owners and app-user drivers are likely to earn more than non-owners and non-user drivers. Error bars represent standard errors.

To conclude, while app usage may be correlated with greater revenue, the difference was not statistically significant with our relatively small sample size, suggesting at the least that the variation among drivers due to other variables outweighs use of the app. If our mean differences hold for larger sample sizes, however, ride-sharing app usage may account for an additional 7-18% in net revenue. However, there does seem to be an advantage to being a cab driver over a being a rickshaw driver, and for rickshaw drivers to be vehicle owners, though we caution that these are correlations, not confirmations of causality. Finally, we confirm, unsurprisingly, that across the board, additional hours driven correlates with greater revenue.

Ownership of the vehicle. The ownership rate was the highest among rickshaw drivers ride-sharing app users at 71% compared to 47% for non-user rickshaw drivers, and 55% for cab drivers. Group averages suggest that ownership rates are linked to education

level, with higher educational levels correlated with higher ownership rates. Whether ownership causes an increase in revenue, or revenue enables ownership is not clear from the data.

When taking all drivers together, both education ($p=0.0033$) and revenue ($p=0.0052$) are statistically significant in explaining the likelihood of vehicle ownership. On the whole, our participant cab drivers were less educated than rickshaw drivers using ride-sharing apps (who tended to have the higher ownership rate). The same trend is visible whether rickshaw, cab drivers or app users were considered on their own.

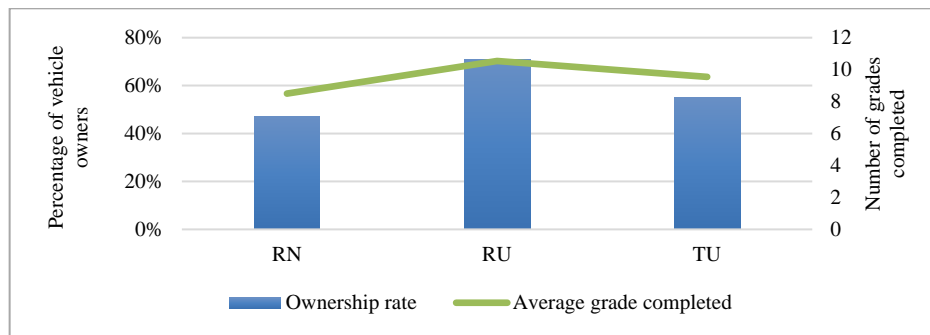


Fig. 2. Rates of vehicle ownership by group plotted alongside level of education. Educational level is likely a direct or indirect cause of vehicle ownership.

To conclude, vehicle ownership does not appear to correlate with app usage, though daily revenue and education do. It seems reasonable to conclude that education directly or indirectly influences ownership (not the contrary). What is unclear is the exact mechanism – it is possible that more educated drivers earn more, making it easier for them to acquire vehicles in the long run; or, it may be that more educated drivers see the value of ownership more clearly, or plan for it better; or, it may be something else. The relationship between income and ownership, however is unclear – our data allows for either greater daily income leading to greater chance of ownership or ownership leading to greater income.

App Usage. Average time of driving with the app was exactly the same for both auto-rickshaw drivers and cab drivers at 2.03 years. First quartile, median and third quartiles are also very similar for both categories: respectively 0.54, 2 and 3 years for rickshaw drivers and 0.56, 2.25 and 3 years for cab drivers.

Volatility of app use among cab drivers is slightly higher because 75% of them have tried both apps, while only 54% of rickshaw drivers report this. 2.03 years of app use on average is quite low compared to the number of years the apps are on the market (since 2013 so, or over 5 years at the time of the interviews). That suggests that our drivers joined recently and the ride-sharing phenomenon is intensifying. Drivers may feel the need to join because they would lose customers otherwise, or because they perceive that ride-sharing apps are advantageous. Of our 20 rickshaw drivers who were not using ride-sharing at the time of the interview, only two had previous experience with Ola or Uber.

Age and Education. On average, rickshaw drivers not using apps are 5.38 years older than their peers using the apps. Similarly, cab drivers using the apps are 3.25 younger than rickshaw drivers using the apps, and thus 8.63 years younger than auto drivers not using them.

A single-variable regression of age against app usage for all drivers together suggests that age influences whether the driver is likely to use an app or not: for every 10 years of age, the likelihood of using a ride-sharing app drops by 15% ($p=0.04$). Rickshaw drivers using the apps are also more educated than drivers not using the apps on average: they completed 8.5 and 10.5 years of formal education, respectively. Cab drivers are not more educated than auto-rickshaw drivers using the app: on average they have completed 9.6 years of education. However, we found no statistically significant link between education and app usage.

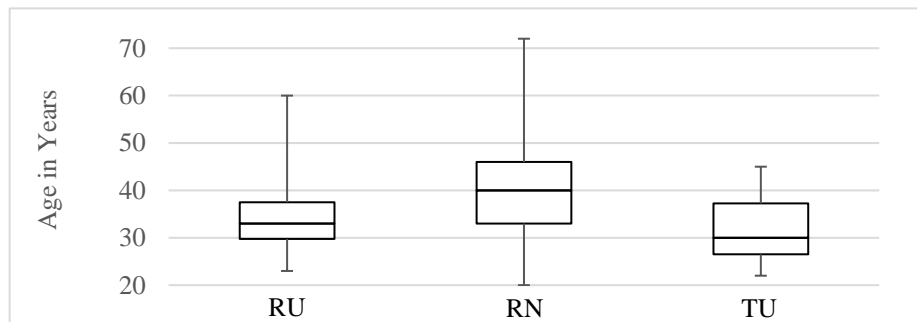


Fig. 3. Boxplots showing the drivers' age scope in years. The age range is wider for RN drivers. TU drivers are consistently younger than RU or RN drivers.

4.3 Qualitative Findings

Overall views on ride-sharing. All of our participants were familiar with both Ola and Uber, regardless of whether they were app users, or whether they used only one of the two ride-sharing platforms.

Many drivers perceived ride-sharing as a new trend that they could not afford to neglect. TU3 said, "Every cab driver came to know about the apps when they entered the market, and I started driving for them because I predicted the market to shift. So, I have used Uber since the beginning." For these cases, it appears that Uber and Ola were not seen as advantages necessarily, but as necessities to begin or to remain in business. Indeed, non-user rickshaw drivers saw themselves to be at a distinct disadvantage: RN4 said, "I am disadvantaged because of Ola and Uber because I get less passengers and thus I earn less". However, it is not clear, especially in light of our quantitative results above, how much these sentiments were based on reality. In fact, some non-user drivers perceived no disadvantage. RN7 said that he did not feel threatened by the apps because "Auto-rickshaws on the apps are not very popular. Indeed, the fares for booking a cab are close to the ones for an auto, so people tend to prefer booking a cab because it is more convenient."

With respect to revenue, reports were mixed. For some, there are clear advantages to ride-sharing, though often, these are based on promotional rewards that do not apply to all drivers. TU18 said, “Uber chose the 100 best drivers in Delhi and I was one of them. I was thus invited in Gurugram for a party, and I was offered an incentive of Rs. 5’700.” A commonly cited reward was one attached to a bonus for making, e.g., 44 rides over 4 days. Such schemes are common for both apps.

Others, however, questioned the financial value of ride-sharing. RU4 said, “I do not see much difference between using the app or not.” RU10 – an app-user – confessed, “The margins are better when I get customers from the street.” And, many have noticed that promotional incentives have decreased in monetary amounts and frequency over time. TU3 said, “I am not very happy with the incentives because they are much lower than before.” TU5, who has 3 years of experience with Uber, was specific about the decline in his average revenue: “My wage used to be higher when I joined the company, at about Rs. 80,000 to 90,000 per month the first year. Then, it decreased to Rs. 60,000 to 70,000 the second year. And, now I am left with Rs. 30,000 to 40,000 per month.” Several drivers began driving based on rumors of high income, and now they felt trapped. TU20 regretted, “I have no real choice if I want to change my job because I only know driving and nothing else.” RU9 said, “I am not happy with the app. The oil prices have increased during the past years, but not the number of customers and incentives are decreasing.”

Between Ola and Uber, the participants expressed relative pros and cons to each, though Uber appeared to be the favorite overall. Ola was said to care better for drivers and to have better incentives. Uber was said to bring more customers and to lead to greater revenue. TU6 said, “The incentives are better with Ola, but there are more rides and more customers through Uber.” RU11 said, “I prefer the way Ola is done, but I would like to switch to Uber because I could get more money. Ola is also easier to use and Uber is very demanding with the everyday selfies that have to be sent to the platform for identity check.” Overall, the majority of our participants (75%) used Uber, which is consistent with anecdotal reports of Uber’s dominance in Delhi.

Among drivers using the apps, only three of our cab-driver participants were not professional drivers before they began; the availability of the ride-sharing apps likely lowered barriers to entry for driving taxis. All of our rickshaw-driving participants, however, were drivers prior to using the ride-sharing apps.

Obstacles to becoming a ride-sharing driver. Some of our participants mentioned problems with technology access, digital literacy, or general education as obstacles to effective use of the ride-sharing platforms. It also emerged that ride-sharing is spread along social networks.

Several participants, mostly non-users of ride-sharing apps, mentioned smartphone ownership as a hard requirement. RN14 said, “Look, I have a very simple phone! I cannot use the apps.” Similarly, RN19 was a previous Ola driver who had lost his smartphone.

Others noted lack of education as a barrier: RN14 suggested that even had he owned a smartphone, “I am not educated enough to use the apps.” Taxi drivers also mentioned this. TU20 said, “I have failed 10th grade,” suggesting it was difficult for him to use

the apps. RU12 said, “I know that the older people are more scared to use the apps because they are not well educated and they prefer driving by themselves.”, a sentiment was shared by RU13: “Rickshaw drivers using the apps are only 10 to 15% of the rickshaw drivers in Delhi because most of them are scared.” Meanwhile, app users affirm that their own education allowed them to take advantage of ride-sharing. RU10 said, “I did not need a training, because I was educated enough to understand the app.”

Some mentioned that vehicle ownership was critical. TU13 said, “Using an app is beneficial when the auto is owned.” TU4 emphasized, “Owning the auto is what makes the real difference for earnings.”, even though ownership was not a hard requirement.

Finally, responses to questions about drivers’ colleagues exhibited a trend where ride-sharing habits tended to cluster within drivers’ social networks. RU11, an Ola user, said, “My friends are also using Ola over Uber because they had a bad experience in the past.” Similarly, non-users of ride-sharing tended to know many other non-users. RN3 said, “I know other drivers, they also do not use the apps.”, and some also told us that some of their family members were also drivers. A few interviewees declared they have taken part in protests organized by the auto-rickshaw union, and RN9 also expressed the peer-pressure he felt in the community: “I do observe the strikes because I do not want to be beaten up by other drivers”.

The pressures of ride-sharing. Though ride-sharing companies often cite benefits for drivers such as independence and flexible work hours, most of our participants expressed dissatisfaction about longer work hours, inability to choose drivers, inconvenience with pick up (relative to on-street hailing).

Several times, drivers told us that they have to drive longer hours to benefit from ride-sharing. TU12 said, “Before, it was more relaxing to work for my own company because I had only 2 to 3 rides a day.” Similarly, in a context of decreasing incentives, TU16 said, “To get the same amount, I used to drive 2 hours less every day.” Some drivers do not join the companies because they consider that they do not drive sufficient number of hours per day. RN18 said, “I cannot drive for long hours because of health problems, so I have never tried the apps for this reason.”

A number of participants mentioned that arranging and finding pick-up locations through ride-sharing apps was less convenient than picking up people hailing rides on the streets. RN9, who had used Ola in the past, said, “I prefer getting customers from the streets because I do not have to spend time to pick them up. The pick-up locations can be hard to find and some drivers go round and round to find a way to get to the location.” But, this feeling was not universally shared. RU13 mentioned the convenience of not having to bargain: “It is easier with the app, because I do not have to bargain, but only wait for customers.”

One of the major issues that a few participants raised was ride cancellations, when the customer cancels at the last minute. RU14 said, “It is not always fair, because we sometimes have to go towards the pick-up point and it is costly, especially if the customer cancels the trip while we are on the way.”

Depending on the ride-sharing app, drivers also have less freedom to decline passengers. RN11 revealed that he did not like Uber’s system because “the driver has to accept all requests, while with Ola, I can just ignore [a ride] because other drivers

around will be sent the notice.” Ride-sharing or not, licensed drivers are not legally allowed to refuse rides for the most part [14], but regulatory enforcement is weak.

Relationship with ride-sharing companies. While most of our participants felt that both apps were generally good companies, some mentioned that they felt poorly treated. TU1 noted pointedly, “I have the feeling that Uber and Ola want to make the passenger happier than the drivers.” RU17 added that “Apps are good for customers, but [the companies] do not always listen to the drivers.” A common frustration was having ride-sharing accounts suspended because of customer complaints. RN13 said, “My Uber account was blocked a few years back because of a customer complaint.”, an experience also shared by RU11. Reactivation typically requires a visit to the corporate office, which can cost drivers a day of work.

Upskilling of the drivers. Many reported being trained by the company representatives on the spot to learn about the different features of the app, and how to use it, “Uber people told me how to use the app, and how to register” told us RU3. It seems that when going online, the drivers have acquired a set of digital skills. Beyond the ride-sharing app itself, drivers become familiar with bank accounts and digital payments, both of which may have other benefits related to financial inclusion, a point that was raised in our interviews with Ola employees.

5 Discussions

Overall, our findings suggest that the value of ride-sharing for drivers is mixed, with little evidence of clear positive value. We find that much the same phenomenon identified with Uber in North America [21] occurs in India, as well, with minor differences.

While ride-sharing may enable a new income opportunity for some taxi drivers, for others, the benefits seem not to outweigh the inconveniences. Ride-sharing apps appear to push Delhi drivers to work harder for less revenue per kilometer, all while distorting a pre-existing market and reducing overall driver autonomy. First, we did not find a statistically significant increase in revenue for drivers who use ride-sharing. Second, ride-sharing introduces a host of controls for app-using drivers, which reduce real and perceived autonomy; for non-user drivers, the ride-sharing increases fears of being left behind. Third, it seems evident that ride-sharing companies are distorting the market for drivers in unpredictable ways, causing some novices to enter a market and experience difficulties as incentives decrease over time.

These findings extend and qualify previous findings about ride-sharing. Compared with developed-world contexts [10, 23], both the financial and non-financial benefits (e.g., ability to choose one’s working hours) to ride-sharing drivers seem muted.

In developed countries, drivers tend to be from the middle-class, with driving often being a supplementary second job; meanwhile, low-income individuals find it difficult to enter the market as ride-sharing drivers [15]. While they share some challenges with their developed-world counterparts [15], they seem better able to engage with the platforms. We suspect this is because the apps have adapted to Indian drivers in the race to

recruit them, but also because of the way labour was organized among drivers prior to the existence of the apps. Our findings in Delhi are also similar to many of the qualitative findings from Bangalore [12]. Our work adds evidence to the suggestion [12] that under ride-sharing, drivers are having to drive more, for little or no increase in revenue.

A key novel contribution of our work is a report on the impact of recruiting promotions and incentives on drivers. Many take up ride-sharing because of the promises of bonuses. However, such promotions are temporary and, at least at the time of our research, declining. We predict that reports of drivers going into debt as a result will begin surfacing. Meanwhile, the duopoly structure of the market in the Indian case is likely to lead to more rate-cuts in the future.

All of our findings are ultimately consistent with an amplification theory of digital technology [21,28]. While technology may enable new activities, benefiting some while harming others, overall, its effect is to amplify underlying human forces. In the case of ride-sharing in India, those human forces are the routine, sometimes pathological forces of global capitalism, as other critiques of the sharing economy have noted [18, 23, 24], but further compounded by the inequalities of the developing world. Among drivers, too, ride-sharing amplifies existing inequalities: Vehicle owners benefit more than non-owners. And, more educated drivers who can afford smartphones are better able to take advantage. Ultimately, the technology that manages ride-sharing is owned by corporations setting the rules unilaterally. This disproportionate share of power echoes and amplifies classical Marxist literature, which highlights the exploitation of workers who own little of the “means of production” [16]. Neo-Marxist theories that incorporate modern digital phenomena are particularly relevant in our case [10, 32]. Our findings suggest that while some drivers benefited from new livelihood opportunities from the apps, most drivers – even those who use the platforms – are not benefiting greatly. If anything, ride-sharing drivers feel pressured to drive longer hours for smaller margins, and non-user drivers begin to feel they are at a disadvantage – all of this is enforced by the technology. Moreover, our participants were conscious that they were at the bottom of the totem pole, with the companies concerned more about customers than drivers. Meanwhile, intense competition between Ola and Uber causes market distortions and collateral damage from powerful entities in conflict is amplified.

There might be a different evolution of the market in the future: First, auto-rickshaw drivers may be able to retain their historical working paradigm, as Uber and Ola remain relatively lightly used among rickshaw drivers. Second, Indian drivers seem to have a measure of community (formal and informal) that might allow them to collectively resist the power of ride-sharing companies. They meet at traffic hotspots, and a vast majority of them have a family member also driving, and friends in the sector; in some cities, there are labour organizers coordinating drivers (including strikes). Whether this collective potential is fully actualized remains to be seen. As result, short of significant policy interventions to protect drivers and their interests, we suspect that over time, benefits to drivers will be shaved down to just the bare minimum to keep enough of them within the fold of ride-sharing companies.

6 Conclusion

This paper presented an exploratory study that sheds light on the effects of ride-sharing on drivers in New Delhi. We find that there are a number of differences in the reported experiences of drivers in India as compared with those in developed countries, with a tendency for ride-sharing's problems to be further exacerbated. For one, the financial benefit of participating in ride-sharing is much less clear in India than in, for example, the United States. We found no statistically significant economic benefit for drivers to participate in ride-sharing, and many reported that they feel less autonomy with ride-sharing, as they feel they must work longer hours and the apps direct almost all of their activity. Overall, ride-sharing appears to exacerbate the potential for low-wage workers to be exploited by large corporations in the developing world.

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