

# EPIC2019

## Ethnographic Praxis in Industry Conference Proceedings

### Getting Us There

#### Ride-Hailing Systems from the Drivers' Perspectives

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*Now that they are beyond the initial start-up phase, it is time to take a critical look at ride-hailing systems such as Uber and Lyft. This ethnographic case study investigates these systems from the drivers' perspectives and also addresses the ethnographic techniques and general approach that we used. Without a protocol, budget or equipment, we interviewed approximately 150 Uber, Lyft, and Taxi drivers in 23 US cities over 2 years during paid rides. Our loosely structured interview approach allowed us to collect information from drivers regarding the entire gamut of their jobs. This included how and why drivers work, their choice of work hours, rider pickups, driving, vehicle ownership and maintenance, rider behavior, perceptions of safety / danger, navigation, general likes and dislikes of the system, and financial matters related to their business. Our findings cover a wide range of issues, some bearing on poorly designed or missing functionality in the driver's mobile apps, but also spanning social, emotional, financial, and behavioral issues that impact the drivers. These issues directly relate to decision making, worker autonomy, and human agency.*

#### INTRODUCTION: LOOKING BENEATH THE SURFACE

This case study focuses on ride-hailing systems (also known as *e-hail*, *ride-sourcing* or *transportation network companies*; see Shaheen & Cohen, 2018) from the drivers' perspectives. In addition, we start with a discussion of our general research approach, which we consider equally important to the findings.

Ethnographic techniques allow us to see more than what is on the surface, more than what we normally "pass by" in any particular setting. So many of us take advantage of these transportation services each day yet it is easy to miss what's really going on with the humans who are serving us. The ethnographic techniques help reveal the motives of actions of various players, for example the intentions of workers, surfacing not just the "how" of work but the "why" of work. These instruments of ethnographic research give us the means to learn how things are going in a particular environment, perhaps discovering gaps in the design of a range of systems, software applications, and even detect the rough edges in business models—old or new. This type of research can help us peer into situations and settings—learning about the unmet needs and wants of humans, their work struggles and what they love about their work. These techniques can even begin to surface bellwether indicators of systems that are in trouble.

In this paper we present a case study of the use of ethnographic techniques to investigate disruptive and evolving business innovations in mobile app-based ride-hailing systems from the drivers' perspectives. One unique feature of this case is our method of study, described below in detail. In brief, we conducted this study in a rather expeditionary manner, with no budget, while we were working on other projects.

## EXPEDITIONARY ETHNOGRAPHIC INQUIRY: A HABIT OF UNCONFINED DISCOVERY

In this atypical project, we had no client, no project plan, and no budget. This study was not even planned prior to its start, though we did become more intentional about our study as the project unfolded and as we learned more about the topic. We began the research informally, motivated purely by personal and professional curiosity and the desire to connect with the people who were providing our transportation, typically while on business travel for unrelated project work. To be clear, we are not employees of a ride-hailing company tasked to evaluate our company's services. We were not paid as consultants to investigate these transportation services. This work was not academic in nature (e.g., we had no grant funding, no pressure to publish, no team of graduate students analyzing data, etc.).

The vision for this project came from conversations (phone, email) between the two of us (the authors), about various topics related to our work in user research and system development. Since graduate school we both have adopted a habit of thinking about work, the design of workplaces and tools, and human workers, summarized as "always learning through observation and conversation." We both travel often for work and now frequently make use of ride-hailing services—a rather abrupt switch from rental cars in past business travel. So, it was natural that this topic of the ride-hailing services and the drivers surfaced in an exchange in which we compared our observations and decided to pursue the study more intentionally while on business travel with our “day jobs.”

We were not paid for this study. We did not seek approval of an IRB, though we took precautions to safeguard the identities of our drivers and their personally identifiable information. We did not, for example, record audio or video of our conversations.

One central point about our approach which we would like to draw out explicitly is the “spirit of discovery” that fueled the present investigation. We chose to undertake discovery about one domain of human work as we went about our other work. This “always discovering” habit of mind, we believe, can be quite useful to ethnographers. For instance, it can enliven one’s day, turning the hum-drum task of moving about a city into opportunities for professional discovery, as one seeks answers to questions about what is going on under the surface of ordinary events.

Second, this habit helps to keep us attentive and our skills of observation sharp; it can also generate solid design and methodological ideas along the way, perhaps useful for other projects and in other settings. Finally, this attentive spirit can greatly “humanize” one’s day, allowing the engaged observer / interviewer to see “humans” operating in various settings, rather than simply passing by “organisms” or “instruments” serving us in various capacities. Without this spirit of attentiveness and study, people can become, sadly, just background noise. The “always discovering” spirit can thus counter such dehumanizing tendencies.

### OUR SUBJECT: UBER & LYFT IN ADOLESCENCE

Just as we measure the life of a dog in *dog years*, we consider mobile app-based ride-hailing companies—most notably Uber (launched in 2011) and Lyft (launched in 2012)—to be in their adolescence in *start-up years*. They are not the cute little infants and trendy toddlers they once were. It is that time where many are taking a good, hard look at them (acne and

all) and asking *where are they going*, and *what will they be when they grow up*? Although much has been written about the disruption of the traditional taxi industry by these ride-hailing systems, little is known regarding how these new mobility options affect the drivers, especially with respect to more substantial matters such as decision making, autonomy, and human agency.

The technology of these systems has made possible new ways to acquire transport services, but these innovations have correspondingly removed both the rider and driver from the decision and action loop for many aspects of the ride experience. Ride-hailing applications use complex routing and pairing algorithms to assign riders to drivers, weighing traffic patterns, vehicle size, seating requirements, and other preferences to satisfy a request initiated by a rider. Moreover, given the longer-term goal of transitioning to driverless vehicles in these systems (Newman, 2014), little attention seems to have been paid to drivers' perspectives (Angrist et al., 2017). To address this information gap, we examined the effects of these mobile app-based ride-hailing systems on the drivers, conducting observations and contextual interviews with drivers of Uber, Lyft, and taxi services.

In broader context, ride-hailing innovations, such as Uber and Lyft, are the fruits of a much larger disruptive development in the area of personal mobility underway in our society. For instance, in the last 20 years we have seen several mobility-related innovations, giving people new options to get around, including not just Uber and Lyft, but also short-term car rental (e.g., Zip Car), peer-to-peer car sharing (Shaheen, et al. 2009), bike sharing, e-scooters, and so forth. Options for personal mobility are on the rise.

We were interested in learning how ride-hailing innovations have affected the humans in the setting, not just the rider who benefits from these new choices, but more so, the drivers. Do drivers have a full and accurate view of the self-owned business, of their varied expenses? How hard is it for these drivers to get this view of their business? More broadly, what “ripples” or indicators were noticeable about these relatively new systems? Ripples can point to insights, and insights can point to design improvements. Aside from increasing consumer choice (and lowering the cost of rides), what are some of the unanticipated consequences of these innovations on both the rider and the driver? Finally, is the current state of ride-hailing options sustainable, or are there refinements needed in software and the supporting business models?

## **METHODS: SITTING UP FRONT**

What started out as casual observation in the field ended up as a three-fold, triangulating approach including:

- Informal, semi-structured, in-car interviews
- Post-hoc literature review
- Mining of rich and varied on-line discussion groups of drivers from Uber, Lyft and taxi services.

## **Minimally Invasive, In-Car Interviews**

After two years we had conducted more than 150 loosely structured, contextual interviews / observations while riding with Lyft, Uber and taxi drivers during paid rides in 23 US cities. The sample included approximately 70 Uber drivers, 50 Lyft drivers, 50 taxicab drivers, and 4 private car services drivers. Note that many of these drivers work for more than one company.

We generally would request to sit in the front passenger's seat whenever we rode in a ride-sharing vehicle in order to encourage exchange, minimize social distance, and build rapport with the driver. Out of respect for tradition, we typically did not request a front seat in taxi cabs except when traveling with a group, the size of which necessitated the use of the front seat.

As noted above, we did not record our conversations with the drivers so as to minimize disruption and restraint associated with the knowledge of being recorded. The nature of the topics did not call for the after-the-fact granularity which audio and video recordings provide. Generally, we did not even record notes on paper during rides. As a result, we were able to adopt a minimally invasive approach that allowed us to gather deep insights. We were open and honest about our intentions and expressed genuine interest in the drivers. As a result, drivers generally rewarded us with authentic opinions and rich insights.

The topics discussed were never formalized into a script, interview guide, or question list, and were largely determined by the natural flow of conversation, less choreographed and more extemporaneous. Topics spanned the gamut of the driver's jobs (both as drivers and in other trades and professions for those who also worked other jobs). Discussions often covered how and why drivers work; their choice of work hours; details about the procedure for passenger pickups (and choice allowed), driving tasks, issues related to vehicle ownership and maintenance, rider behavior (and drama) as seen from the driver's perspective, navigation tools and tasks, likes and dislikes regarding the drivers' app and the entire ecosystem, and financial matters related to their business.

## **Post-hoc Literature Review**

Due to the ad hoc nature of this project, we did not conduct a formal literature review before diving into our research. Instead, as the project began to take shape, we came across news and journal articles initially more by happenstance than from intentional search. Although this is not our typical approach to research, we were surprised to find a refreshing freedom in starting our data collection with a blank slate and then later reading the findings and ideas of other researchers.

We were also a bit surprised by how little published research we found on the behavioral and attitudinal aspects of the ride-hailing innovations of Uber and Lyft from the driver's perspective (e.g., hours worked, motivation, allegiance, app ease of use, sense of autonomy, etc.). This is not the case with respect to research centered on the economics and pricing strategies of these ride-hailing companies (summarized briefly below). Yet, there is a rich and growing set of thought-pieces and news articles about the impact of these innovations on drivers' behaviors and attitudes in various news channels and also within on-line discussion groups.

With respect to the economics of ride-hailing services, Salnikov, et al. (2015) compared fare pricing between taxis and UberX in New York City and found that taxis generally provided slightly less expensive fares. In a similar vein, Chen, et al. (2015) studied the surge-pricing algorithm used by Uber with a particular focus on transparency (to riders) and the effects of this algorithm on demand for rides. They caution that the current black-box approach to pricing may have unintended behavioral effects and could even lead to manipulation, pointing to anecdotal evidence that some Uber drivers—by exploiting differences between surge areas—have attempted to induce demand surges, artificially decreasing the supply of available cars for hire.

Lastly, on the theme of economics, Cramer and Krueger (2016) studied the capacity utilization rates between taxis and UberX drivers. They found UberX drivers had significantly higher rates of utilization (“higher share of miles with a passenger”) compared to taxi drivers. They attributed the difference to several factors, including Uber’s flexible labor supply, Uber’s driver-rider matching algorithms (including surge pricing), and some taxi regulations which effectively dampen utilization rates for taxis in aggregate.

Rounding out our literature review, we broadened our search for relevant literature beyond Uber- and Lyft-specific research in order to better understand several behavioral-related factors, such as safety, fatigue, and the health of paid-drivers. We also reviewed briefly the future of personal mobility, which will eventually include autonomous and semi-autonomous riding (“driverless cars”); these innovations will bring with them a great demand for substantial study by ethnographers.

The safety of taxi drivers has received, not surprisingly, considerable study over the years. Briefly, Dalziel and Soames (1997) analyzed a set of fatigue-related factors and accident involvement of taxi drivers over a two-year span. They found a significant negative correlation between total average break time and accident rate. Similarly, Lim and Chia (2015) studied taxi driver fatigue and health status (self-reports of hypertension, diabetes mellitus and high cholesterol). Reports of driver fatigue were found to be more associated with other work-life habits (e.g., poor quality of sleep, the holding of part-time jobs, long driving shifts (>10 hours of day) and the over-use of caffeinated drinks) than it was associated with health status, per se.

Future mobility solutions are already being well researched. Both Saffarian, et al. (2012) and Endsley (2017) examined various human factors aspects of autonomous and semi-autonomous driving systems (not specifically related to ride-hailing situations), including the importance of maintaining human situational awareness, out of the loop performance problems, loss of skill, mode errors and trust. Also, with respect to driver autonomy, Eriksson and Stanton (2017) studied transitions between automated driving and human controlled driving. In particular they studied control transition times needed under various driver task loadings.

## **On-line Discussion Groups**

We monitored and mined a rich and varied set of on-line, open discussion groups for drivers from Uber, Lyft and taxi services. Examples of these groups include:

- Uber: <https://uberpeople.net/>
- Lyft: <https://www.reddit.com/r/lyftdrivers/>
- NYC Taxi: <https://www.yellowcabnyctaxi.com/>

- Ride Guru: <https://ride.guru/>

It is difficult to summarize the richness and depth of the driver information found at these ride-hailing sites; they are, in short, an inexhaustible stream of insights about the behavioral and business dynamics of ride hailing, mostly from a driver’s perspective. For example, there is information on how to handle various situations using the software applications of different ride-hailing companies; there is information on how to deal with various rider problems (rudeness, threats, medical issues that occur during rides, impromptu requests from riders, rider safety, dealing with taxi drivers, etc.). On these sites, drivers also discuss strategies for optimizing fares (and minimizing hassles with riders), and there are various “how to” topics for calculating depreciation, profit, and car maintenance expenses. In short, nearly every subject imaginable, and many in substantial depth with broad contributions from the community of drivers.

Ethnographers interested in ride-hailing will benefit greatly from spending hours in these sites, immersing themselves in the hour-to-hour life of both driver and rider. In contrast to the field interviews we conducted, these sources provide driver input from a different angle, sometimes with greater depth, richness and color. For example, posts to these forums were much more likely to include complaints about specific passenger behaviors that did not come up during in-car discussions with drivers.

## **FINDINGS: DRIVER ED (DRIVERS EDUCATING RESEARCHERS)**

Drivers usually granted our requests to sit in the front seat—generally welcoming the more congenial atmosphere created by a side-by-side seating arrangement. With our minimally intrusive interview techniques, drivers were quite open and honest about their experiences and feelings related to their professional driving and its impact on all aspects of their lives including how and why drivers work, their choice of work hours, rider pickups, driving, vehicle ownership and maintenance, rider behavior, navigation, general likes and dislikes of the system, and financial matters related to their business. Our findings cover a wide range of issues, some bearing on poorly designed or missing functionality in the driver’s mobile apps, but also spanning social, emotional, financial, and behavioral issues.

### **Our Drivers**

Ride sharing drivers are a diverse group. Any stereotype would be misleading. We encountered diversity in almost every dimension imaginable. We rode with retirees with a desire for “something to do” or extra cash, college students driving between classes, immigrants who were driving as their first job in the US, and a former high-ranking university officer who felt shunned by peers after the admissions scandal—just for some examples.

So, what did our drivers have in common?

- The drivers understood that their principal tasks and duties were centered around providing reliable and pleasant transportation to strangers with related duties of

keeping their vehicles in good working condition, clean, and tidy (with varying degrees of pride in their vehicles).

- They all seemed to appreciate the autonomy associated with deciding where (within constraints) and when they could work. They appreciated that they could set their own limits and goals for how much they worked.
- Drivers were aware at a high level of the financial pressures and tradeoffs related to driving (e.g., short-term expenses for gas and oil changes and short-term payout in pay and tips).
- The Lyft and Uber drivers generally did not think of this job as a “career” or a long-term commitment. This differed from some cab drivers who could see driving a cab as a longer-term job.
- A few drivers had started their own personal car services which allowed them to drive for a group of their own clients without a corporation and an app between them and their riders.
- Most younger drivers were generally reliant on their mobile phone / GPS-based maps for navigation. Only older, more experienced drivers (particularly cabbies) who started before GPS systems were prevalent, were adept at navigation without these aids.

Regarding the general outlook on app-based, ride-hailing systems there was a clear divide between those on the inside (i.e., Lyft and Uber drivers) and those outside the system (traditional cab drivers). The traditional cab drivers were predictably resentful of the new app-based ride-hailing systems that were undermining their business. Those who experienced the most loss were those who had invested in the purchase of a cab medallion, the value of which has dramatically fallen since the introduction of app-based ride-hailing systems.

## **Hours Worked**

Some drivers worked full time (i.e., 40 hours per week or more) while more used it as a part-time job or a supplement to another primary job / income. Drivers generally liked the freedom to choose their work hours with some choosing early morning shifts, some choosing late night shift, and many doing “splits” with work during peak activity during the morning commute and then again in the evening with a break midday.

Some drivers admitted that the lack of externally imposed structure on the workday sometimes made it hard to know when to quit. This paired with the company’s incentives to complete a specific number of rides in a day to earn a bonus sometimes resulted in drivers working longer than they had planned. In general, the systems tend to focus drivers on short-term goals, such as financial incentives to perform a certain number of rides within some fixed time period. Some drivers recognize this tradeoff and struggle to gain a longer-term perspective on work life.

Both Lyft and Uber now require their drivers to take a six-hour break from driving after the app detects prolonged periods of driving (14 hours with Lyft and 12 hours with Uber). That said, one app does not know when the other has been turned on, so some drivers

occasionally choose to drive longer by switching between apps (see “multi-apping” and app switching discussed below).

## **Driving Locations & Getting Home**

Most drivers appreciated the autonomy and agency provided by the means to work where they pleased. A surprising number of drivers commute long distances into more central metropolitan areas where demand for rides is higher.

Some appreciated the driver app’s indication of areas where drivers were in demand, however savvy drivers indicated that they have learned not to “chase the surge” as the demand has inevitably subsided by the time one transits to a *hotspot*. Instead, these drivers learn from patterns in such information and internally anticipate the increase in demand based on predictable or periodic events such as rush hour traffic, sporting or concert events, and evening dining and social outings.

At the time of this writing, both Lyft and Uber apps provide a feature that allows drivers to indicate a destination and thereby bias the ride assignment algorithm to take drivers in a desired direction. This feature was introduced by one of the major ride-hailing companies, then quickly adopted the other. Many drivers use this feature to head toward home at the end of their work period. One savvy driver would use it to earn some extra money by sharing his car with a rider going his direction en route to his “day job” each weekday.

When this “destination” feature first debuted, some savvy drivers determined that if they set a busy airport as a destination on early weekday mornings, they would be rewarded with riders taking longer, more lucrative rides from the suburbs to the airport for morning flights for business travel. Quickly, the ride-hailing companies responded by adjusting their matching algorithm and pay structure to eliminate this behavior.

Some drivers living near state or city borders where ride-hailing systems are restricted (i.e., New York City) were frustrated when dropping someone off in a location from which they could not pick up another passenger. Similarly, changing local ordinances for “Uber-free zones” around hotels and airports and restrictions on car type (e.g., only hybrid or electric cars) in some areas confused drivers (and passengers) at times and in some cases influenced driver decisions such as choosing to purchase a hybrid over a conventional vehicle.

## **Rider Behavior**

Most drivers had a story to tell about poor rider behavior, but these were harder to draw out during the interviews. The online discussion groups were a richer source for these stories. Trends were somewhat predictable with hurried business travelers making up the majority of morning and evening airport runs and a younger, more boisterous crowd comprising the late-night ridership, especially around bars and restaurants. Drivers in some cities reported that business travelers tended to use Uber more than Lyft and that younger riders were more likely on Lyft. This influenced some drivers’ choice of apps / ride-hailing companies by time of day.



## **Allegiance vs. Multi-Apping**

Among the drivers for the ride-hailing companies, allegiance varied significantly. Some were Uber only drivers and some drove exclusively for Lyft. A driver's preference for one company over the other is affected by many factors. There are the realities and the perceptions of the fairness of the pay structure (e.g., the percentage of a rider's fare that the driver keeps). Some drivers reported that the pay structures were identical between Lyft and Uber, while others reported differences. Some drivers did not believe that the app correctly reported the agreed upon percentage of the fare—feeling cheated by the system. Others disliked company policies or news reports of various activities within the company.

Although allegiance to a single ride-hailing company could be quite strong, most drivers drive for both Lyft and Uber, and in some areas, others ride-hailing companies as well. Many adopted the technique known as multi-apping in which the driver turns on the apps of multiple ride-hailing companies, accepts the first ride that pops up on any of the apps, and then quickly shuts off the other apps. After dropping off the rider, the driver would then turn on the other apps again and repeat the process. An extreme example of multi-apping was seen in Austin, Texas where many drivers worked with all four of the app-based, ride-hailing companies serving the area (Fasten, Lyft, Ride Austin, and Uber).

After multi-apping peaked in popularity in 2018, drivers reported that both Lyft and Uber responded with strengthened incentive / reward / loyalty systems intended to increase their drivers' allegiance. These incentive systems typically entail a bonus structure that is based on completing a certain number of rides within a specified time (e.g., 10 rides in a day or 50 rides in a week). Many have responded to these incentive systems by focusing their efforts on a single ride-hailing company. Those who do a lot of driving can sometimes receive the rewards offered by both companies. Drivers who do this generally find it easier to switch between apps after completing a certain number of rides rather than the more rapid switching of multi-apping. Clearly these incentive systems have influenced driver behavior, but some are not happy about it. Even among those who work to achieve these rewards, some drivers responded negatively to the stronger incentive systems—feeling manipulated by the companies.

The ride-hailing companies compete for drivers' time and continue to use the incentive systems to attract drivers into driving more for their company. There are additional bonuses and perks available as well, such as for referring new drivers and for receiving consistently high ratings by one's riders. The driver can work to achieve a status symbol (e.g., "Diamond Rating") which appears when the app introduces driver and rider.

In a sense the reward systems offered by these companies in response to the drivers' multi-apping strategy could be viewed by the drivers as a loss of their autonomy in how they perform their work. In other words, their strategies to increase their fares by multi-apping have been thwarted or complicated by these new incentive systems. In some cases, drivers feel manipulated by these inherently extrinsic motivators. The free choice of drivers has been undercut by the companies.

## Car as Office

Occasionally, the front passenger seat was unavailable for us as riders. Some drivers simply prefer the slight increase in distance afforded by having passengers sit in the back seat. In other cases, drivers use their front passenger seat much like a mobile office for personal belongings, snacks, water (for driver and passengers), notes, receipts, phone charging equipment, and food (pizza boxes, etc.). This is the exception, however, since the default ride options for both Lyft and Uber (*UberX*) are meant to accommodate up to four passengers, which, for most sedans requires the use of the front passenger's seat.

Occasionally, when traveling with a group, and use of the front passenger seat was required to accommodate the group, the driver needed to clear off the front passenger seat.

## Business Functions Missing from the Driver Apps

We found that some driver tasks such as rudimentary dispatching and navigation are well supported by the company-provided mobile apps while other aspects of work were either wholly unsupported or poorly supported from the broader context of the drivers. While drivers for these ride-hailing companies are effectively independently operating franchise owners, the franchising companies provide drivers little in the way of tools related to business or financial matters. Here are some examples:

- **Vehicle ownership & maintenance.** While both Lyft and Uber offer options to lease a car from them, neither provides good tools for determining the long-term costs and benefits of owning vs. leasing a vehicle. Most Uber and Lyft drivers interviewed also seemed unaware of or had difficulty quantifying the cost of vehicle operation, maintenance, and depreciation associated with the miles driven, a finding also reported by Wiles and Sweeney (2019).
- **Tracking expenses & deductions.** Drivers also often fail to account for eligible business deductions. A common missed deduction is the mileage accumulated getting to the pickup point and between fares. There are no in-app tools to track and account for such driver expenses.
- **Business finances.** Surprisingly, many drivers do not know the proportional revenue they receive from fares compared to what the company keeps. Changing incentive systems that provide bonuses for achieving a certain number of rides in a given period further cloud the financial aspects of the business. While the app makes it easy to check income from a ride or for a day the lack of expense tracking makes it difficult to calculate profit (income minus expenses).

It is difficult to run a business without a line of sight to these financial issues. Such shortcomings of the app influence drivers in multiple dimensions—socially, behaviorally, financially, and emotionally.

## Looming Threat

Many of our drivers indicated that they had only been driving for the service for a short time (measured in days, weeks, or months) at the time of the ride / interview. This was particularly true at some point when Lyft and Uber were conducting significant (and clearly successful) driver recruitment campaigns. Some drivers, especially those who signed on with a ride-hailing company early on, lamented the increasing number of drivers, sensing that driver supply was outweighing demand for rides at times. That said, the elephant in the room, was the looming threat of competition, not from other drivers, but from driverless vehicles, for which the rate of maturity is anybody's guess.

## Motivation

Drivers reported a wide range of motivational factors affecting their decision to get into driving for ride-hailing companies and for the amount of driving that they do on a daily or weekly basis. Some of the common motives for driving included:

- **Extra income.** Some mentioned saving for a specific short-term goal such as a vacation or school while others looked at it as a longer-term supplement to another, primary source of income. As mentioned above, autonomy and agency provided by the flexibility in work hours, location, and the opportunistic income are seen as great benefits of the job.
- **Primary income.** Fewer app-based system drivers, but more conventional taxi drivers reported driving as a full-time business and primary source of income. Most who were relying on app-based ride-hailing systems as their primary source of income, generally saw it as a temporary solution while they were looking for other employment.
- **Staying active.** Some drivers had retired from other lines of work and indicated a desire to stay active and productive in their retirement years.
- **Recruiting riders.** A few drivers reported having a private car service in addition to driving for one or more ride-hailing systems. Some attempted to recruit regular customers to their private car service business while serving in the capacity of their ride-hailing driver.
- **Fundraising.** One driver reported that 100% of his profits go to funding a charity founded by the driver and some partners.
- **Family business.** Traditional taxi businesses are sometimes family owned. In those cases, drivers are sometimes recruited from among family members. Similarly, Uber and Lyft drivers often cited family members or friends as recruiting them into driving for one or more of these ride-hailing companies.

Note that most drivers reported multiple factors that influenced their decision to both get started with and to continue with their paid driving. As with any job, the decision to take it on is multi-dimensional.

## Technology Limits

While generally the technology that powers the app-based ride-hailing systems is amazingly reliable, drivers and riders both suffer when pushing the limits of the technology. One example of this is the difficulty with driver-passenger meetup—particularly in areas with a weak GPS signal such as in large cities where buildings, tunnels, and underpasses can cause *shadows* in the GPS signal. When the GPS signal fails or becomes inaccurate, drivers and riders typically resort to telephone contact for the final vectoring to the meeting spot. In one instance, the driver’s app automatically triggered the passenger pick-up function based on the proximity of GPS reported location of driver and rider. Twenty minutes later when the driver and rider were finally united, the app already showed 20 minutes on the meter when the rider entered the car. Such automation (in this case intended to help the driver who forgets to tap on the passenger pickup button in the app) sometimes backfires.

## Hailing Customer Support

As with other aspects of the relatively young app-based ride-hailing systems, the customer support functions for both riders and drivers are evolving. At one point during the early stages of our research, there was a billing problem that neither the driver nor rider could resolve through the app’s functions. Multiple attempts to contact the customer support team by phone resulted in the driver-rider pair trying every branch of a complex phone tree while on speaker phone together in the car. In the end, the pair determined that the only way to speak to a human on the customer support staff was to indicate via a phone tree option, that there had been an accident. Even after speaking with a customer support representative who could clearly track the path of our ride on a computer screen, we were instructed to attempt to resolve the issue by writing an email note to the customer support team. It was a frustrating and time-intensive way to resolve a rather simple system error.

This inadequate access to live customer support is not unique to ride-hailing companies. Many technology-based companies—often those which have undergone rapid growth and quick success in the market—offer minimalist customer support systems, choosing to forego the heavy investment in such high-touch support, and instead pointing their customers and their own employees to on-line self-governing communities for answers. These “rough edges” in their overall profile of services, however, can diminish customer satisfaction in the long run and possibly diminish customer loyalty as other competitors and mobility options enter the market.

## Safety

Perceptions of safety rarely came up during our in-car conversations with the drivers. We occasionally probed the subject, but understandably, it is a difficult topic to discuss. The biggest concerns seem to revolve around the perceived threat of the driver to the rider and the rider to the driver. Auto accident injury—while probably much more likely to result in actual harm—seems to be less of a concern than the potential threat of violence between rider and driver. Ride-hailing companies are actively addressing safety, mainly with respect to rider safety. As examples, these companies are increasing their focus on driver background

checks (some are adding what they call "continuous driver background checks"); they are also spending more attention to licensing and photo verification. They have enabled location sharing in their apps, allowing riders to broad-cast or point-cast to others, their current location. Some of these companies are monitoring rides that appear to have unexplained delays, in some cases querying the rider to see if they need help. Lyft and Uber both recently added a feature that allows a call to 911 directly from their apps.

## **DISCUSSION: DRIVER RATINGS**

As mentioned above, we were not in a client-consultant relationship with a ride-hailing company for this project and we were not funded by a grant. So, this publication and the related conference presentation are the first public dissemination of these findings. We hope that this work contributes in some way to the ordered search for better ways to accomplish service (mobility) to others. We also hope that those who are more directly involved in the business of ride-hailing systems will be able to use our findings to increase the agency of their drivers.

We offer one other idea for innovation and improvement in ride-hailing, and it is related to multi-apping, yet the suggestion could extend well beyond that. Perhaps ride-hailing companies could explore the idea of being more open in their software architecture, providing callable APIs or micro-services to other companies and software providers, encouraging better and easier integration of their services and fare data (pricing, availability and location of cars, etc.); this would allow a "compositing" and contrasting of fares, projected arrival times, etc. among providers within a single app.

This "open ride-hailing market" might help drive down the cost of transportation, allow more choice in bidding for work by the driver, and increase both rider and driver trust in the price algorithms used by various companies. It could also improve the ease of use of ride hailing applications for drivers, minimizing application switching, possibly even improve ride safety by giving drivers a more integrated workplace. This open ride-hailing approach could, of course, be extended to include other options for mobility by providing a more integrated view of all mobility options (e-scooters, bikes, public transport, etc.). RideGuru (<https://ride.guru/>) and Google Transit are examples of attempts to integrate mobility options for riders, but there is a need for greater innovation and deeper integration on this front.

Another high-level finding we found interesting is that many of the recent innovations in transportation / mobility options are blurring the once-sharp line between public and personal transportation systems. Sharing of bikes, chartering private jets, and ride-sharing are examples of this. In the case of the app-based ride-hailing systems of Uber, Lyft, and others, personal vehicles—once purely personal—can now be seen as a component of public transportation.

Furthermore, we hope that our expeditionary, low cost, scrappy, ubiquitous approach to the practice of ethnography will encourage others in our field to adopt a similar mindset allowing us all to discover the good of work—both as observer / researcher and performer (e.g., cabbie, Lyft or Uber driver).

We have pointed out the value of ethnographic tools and how simple and fun it is to learn about a problem while "on the go." We claim crucially that ethnography—while it can

and should be used more formally—is also a “good habit of the mind” that keeps us thinking and always learning.

As these app-based ride-hailing systems mature in the market and evolve toward driverless systems, we will need a deeper understanding of how driver and rider interact—what functions and supporting roles each perform for the other. This deeper understanding will be necessary in order to design systems which fully support the needs of all humans in future mobility systems, including systems which may not include a driver. This methodological approach can be used in other settings undergoing disruption and automation.

### **Coming Up Short**

We are keenly aware of some of the shortcomings of our approach to this research and can already think of things we might do differently next time. Here is a sampling:

- Driver complaints about passenger behaviors that appeared commonly in online forums typically did not come up during in-car interviews. We infer one of the weaknesses of the interview method is that drivers seemed to complain less about passengers when communicating with another passenger in person. Fortunately, the triangulation afforded by the monitoring of on-line forums provided additional insight in this regard.
- Over the course of our study, Lyft and Uber apparently changed or added features in their apps. As a result of the app changes over the course of the two-year sampling period of this study, it was difficult to assess these moving targets. Some findings related to the app discovered early in the study period were irrelevant by time of later observations. For example, when we started these interviews, Lyft made it easier for riders to tip their drivers than Uber did. Subsequently, Uber followed suit by building a tipping function into their rider app, which was easily accessible by the rider.
- Clearly the lack of audio and video recording of interviews made it difficult to capture verbatim comments. While this was a sacrifice, we feel that it was offset by the deeper, more open insights that drivers were willing to share.

We hope that the admission of these shortcomings and the teaching points below will provide food for thought to others who consider using our expeditionary style ethnography.

### **Teaching Points**

The purpose of this section is to list a few points that we pass on to those readers who may want to use this case study as a teaching tool. Consider the following discussion topics and questions as you unpack the case:

- Ask students to consider the expeditionary manner with which we approached this research. Compare it to a more well-planned, well-funded, carefully executed approach.

- Consider the pros and cons of conducting a literature search before embarking on a research project versus diving right into research and reading what others have found later.
- How might results have been different if we had used audio and video recordings, transcripts, and more quantitative analyses (e.g., counting the number / percentage of drivers who brought up a topic or shared a particular viewpoint)?
- How might a team study in more detail, the effects of future automation including the removal of human workers (i.e., driverless systems) on current drivers and passengers?
- What innovative design concepts do the findings from this study elicit?
- We did not enlist as drivers with either Lyft or Uber. How might our findings have differed if we had direct experience in the driver's seat?

We hope these questions spark interesting discussion between students, faculty, and professional peers.

## Epilogue

Though we are reporting here after approximately 150 interviews, we continue our data collection with each ride. We are proud that our rider ratings remain high.

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