

Digital platforms and the changing nature of physical work: Insights from ride-hailing



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ABSTRACT

The rise of digital platforms has enabled new forms of work, but the nature of these new forms, particularly the role of the digital platform in shaping work relations, is not well understood. This study explores how the presence of the digital platform manifests itself in workers' perceptions of their work in the context of ride-hailing. We draw on the literature on work relations and theorize how the dimensions of work relations manifest themselves in work done for a digital platform. We employ the Gioia method to analyze 39 interviews conducted with Uber and Lyft drivers, and we identify six key mechanisms of platform-enabled work, namely self-employment, time management, income, information control, pricing, and rating. Our results illustrate that from workers' perspective, flexibility in work relationships is a key positive element of platform-enabled work. The stark power disparity between workers and the platform is, in turn, a major source of discontent among workers. As a result, we put forward two key dimensions of work relations in the context of platform-enabled work: digital temporality and algorithmic administrativity. The study furthers understanding of the implications from the platform economy and sharing economy on work relations.

1. Introduction

Digital platforms such as Amazon MTurk, Uber, and AirBnB have enabled the emergence of various new forms of work (Colbert, Yee, & George, 2016; Gandini, 2019; Howcroft & Bergvall-Kåreborn, 2019; Kuhn & Maleki, 2017). In the context of platform-enabled work, we define a digital platform as the digital infrastructure, rules, and processes that enable resource exchange between external producers and consumers (cf. de Reuver, Sørensen, & Basole, 2018; Howcroft & Bergvall-Kåreborn, 2019).

An increasing number of people globally obtain their primary or supplementary income from platform-enabled work. For example, the number of rides completed with Uber increased from five billion to ten billion between June 2017 and June 2018^{1, 2}. This increase was made possible by advances in information technology (IT) that have reduced transaction costs, thereby increasing the relative competitiveness of the market-based approach to organizing work compared to traditional organizational hierarchies (Parker, Van Alstyne, & Choudary, 2016; cf. Williamson, 1980).

From workers' perspective, digital platforms provide a means of employment and a source of income for many people who would otherwise be unable to participate in the job market. Simultaneously, the working conditions and sustainability of work that digital platforms enable have become a controversial issue (Malhotra & Van Alstyne, 2014; Van Doorn, 2017). For example, while ride-hailing services such as Uber and Lyft offer income for a large number of drivers, many drivers struggle to reach even a minimum income from such work. In sum, digital platforms carry profound economic and social implications as they challenge traditional business models (Cramer & Krueger, 2016; Parker et al., 2016; de Reuver et al., 2018) and the common structure of the “employer–employee” relation (Aloisi, 2016; Colbert et al., 2016).

One of the dilemmas arising from platform-based work structures is whether digital-platform workers should be classified as employees or self-employed (Cherry, 2016; Todoli-Signes, 2017; Schor & Fitzmaurice, 2015), as exemplified by the legal disputes on the status of drivers for drive-hailing services. Due to the increase of independent contracting, self-employment, part-time, temporary, and remote work, different forms of nonstandard work have become important research areas for

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¹ <https://www.uber.com/newsroom/10-billion/>

² <http://www.businessofapps.com/data/uber-statistics/>

scholars who study work and employment relations (Ashford, George, & Batt, 2007; Kalleberg, 2000). However, despite the emerging scholarly interest in the work done for digital platforms (Gandini, 2019; Howcroft & Bergvall-Kåreborn, 2019; Kuhn & Maleki, 2017), there is nascent understanding of the nature of work relations in the context of digital platforms (Cappelli & Keller, 2013; Forman, King, & Lyytinen, 2014). In particular, the role of the digital platform in shaping the nature of platform-enabled work is not well understood.

Against this contextual and theoretical backdrop, we explore *how the presence of the digital platform manifests itself in workers' perceptions of their work in the context of ride-hailing*. We conducted 39 semi-structured interviews of drivers who work for Uber and Lyft in Boston. We subsequently analyzed the data using the Gioia method (Gioia, Corley, & Hamilton, 2013) and identified six key mechanisms of platform-based work, namely self-employment, time control, income, control, pricing, and rating. We further show that from workers' perspective, the flexibility characterizing the work arrangement is a key positive element of platform-enabled work, whereas the power disparity between workers and the platform is a major source of discontent. As a result, by drawing on the concept of work relations (e.g., Pfeffer & Baron, 1988; Edwards & Rothbard, 2000; Kalleberg, 2000; Abbott, 2006), we reconceptualize the dimensions of work relations to capture the nature of platform-based work. We name these dimensions *digital temporality* and *algorithmic administrativity*.

Our study extends nascent research on the nature of work relations in digital platforms (cf. Baiyere & Salmela, 2015; Hamari, Sjöklint, & Ukkonen, 2015; Sutherland & Jarrahi, 2018; Van Doorn, 2017). Specifically, we advance research on the dark side of digital-platform-enabled work (Gandini, 2019; Malhotra & Van Alstyne, 2014) by elaborating on the positive and negative elements that drivers associate with their work for ride-hailing platforms and subsequently theorizing on the resulting changes in the work relations. In doing so, this paper contributes to the IS literature on the dualities, i.e., mutually connected positive and negative aspects of information technology (IT) (Turel & Serenko, 2012; Mäntymäki & Islam, 2016; Islam, Mäntymäki, & Benbasat, 2019; Baiyere, Islam, & Mäntymäki, 2019) in the context of digital work intermediaries. Our findings can help governmental decision-makers and authorities better understand the societal implications of platform-enabled work. Furthermore, our study holds relevance for organizations considering how to utilize elements of the platform and sharing economies in their business operations.

The article proceeds as follows. The next section describes the theoretical background of the research. The third section covers empirical research, followed by the study's findings in the fourth section. In the fifth section, we discuss the study's implications and limitations and offer ideas for future research.

2. Work relationship in digital platform-enabled work

Working for ride-hailing platforms is a subset of platform-enabled work that the prior literature has placed under umbrella terms such as “gig economy” (Gandini, 2019) and “crowdwork” (Howcroft & Bergvall-Kåreborn, 2019). According to Gandini (2019), p. 1040 the term gig economy denotes “the establishment of a capital–labor relationship between a worker and a digital platform, that mediates workers' supply and consumer or professional demand for the completion of a small task or ‘gig’ and operates at once as a market intermediary”. Crowdwork in turn “functions as a marketplace for the mediation of both physical as well as digital services and tasks” (Howcroft & Bergvall-Kåreborn, 2019, p. 23). For the persons doing the work, the digital platform is the primary contact point that replaces interactions with an employer or employer representative. The omnipresence of the digital platform alongside the physical absence of an employer or employer representative arguably plays a focal role in shaping workers' perceptions of their work and affects many aspects of the work relationships in platform-enabled work. As a result, we draw

on the work relationship literature (Ashford et al., 2007; Kalleberg, 2000; Pfeffer & Baron, 1988) to scrutinize the nature of platform-enabled work from workers' perspective.

The genesis of different types of platform-enabled work (Howcroft & Bergvall-Kåreborn, 2019; Kuhn & Maleki, 2017) can be viewed as a part of a larger societal trend of increasing nonstandard work (e.g. Gandini, 2019). The notion of nonstandard work stems from the concept of standard work, in which work is full-time by default, continues indefinitely, and is performed at the employer's physical premises under the employer's direct control (Kalleberg, 2000). Standard work was the norm in many industrialized nations for much of the 20th century and has been the basis on which labor law, collective bargaining, and social security systems were developed (Kalleberg, 2000). Nonstandard work, on the other hand, was conceptualized by Pfeffer and Baron (1988) using three dimensions—temporal, physical, and administrative attachment—that capture the nature of the work relationship between the employee and the employer. According to Pfeffer and Baron (1988), these three work-relationship dimensions differentiate nonstandard workers from standard workers who have fixed work hours and work on indefinite contracts at fixed locations under employers' direct administrative control (cf. Kalleberg, 2000; Ashford et al., 2007). First, limited temporal attachment refers to, for example, temporary and part-time workers whose working hours depart from what is considered full-time employment. Second, limited physical attachment refers to, for example, teleworkers and those who work from home, thus capturing the spatial distance between the employee and employer. Third, limited administrative attachment refers to the extent to which workers are under an organization's direct administrative control. For example, workers who work through intermediaries or as self-employment contractors have limited administrative attachment to the organizations for which they work.

Ashford et al. (2007) built on Pfeffer and Baron (1988) in their study on nonstandard work, concluding that when an employment duration is limited, the organization has limited administrative control over the employee, and/or workers are not physically in proximity to the organization, work is more nonstandard. Polivka and Nardone (1989), in turn, focused on the temporal dimension, defining “contingent work” as any work arrangement that does not contain an explicit or implicit commitment between employee and employer for long-term employment. Extant research has also used these three dimensions to predict the outcomes for different kinds of work relations. These outcomes include the development of shared cognition (Levesque, Wilson, & Wholey, 2001), organizational identification (George & Chattopadhyay, 2005), organizational citizenship behavior (Pearce, 1993), and social relationships at work (Broschak & Davis-Blake, 2006).

The nonstandard work category encompasses various forms of employment relations that have become increasingly prominent in organizing work (Kalleberg, 2000). Such forms (Casey, 1991; Goldthorpe, 1984; Green, Krahn, & Sung, 1993; Kalleberg, 2000) include alternative work arrangements (Polivka, 1996; Sherer, 1996), market-mediated arrangements (Abraham, 1990), nontraditional employment relations (Ferber & Waldfogel, 1998), flexible staffing arrangements (Houseman & Osawa, 1998), flexible working practices (Brewster et al., 1994), atypical employment (Córdova, 1986; De Grip, Hoevenberg, & Willems, 1997), vagrant or peripheral employment (Summers, 1997), vulnerable work (Tregaskis, Brewster, Mayne, & Hegewisch, 1998), precarious employment (Treu, 1992), disposable work (Gordon, 1996), and contingent work (e.g., Polivka & Nardone, 1989). Due to the proliferation of nonstandard employment relations, this research realm has moved toward self-employment, contract-work relationships, part-time work, and remote work, among many other forms (Edwards & Rothbard, 2000).

Some researchers have argued that the growth in nonstandard employment has contributed to workers' increased perceived job insecurity and greater economic inequality (cf. Kalleberg, 2009). However, from employers' vantage point, nonstandard forms of employment

can be advantageous, as temporary employment can allow the employer to screen potential employees before committing to a permanent employment (Engelland & Riphahn, 2005). Furthermore, the literature suggests that temporary workers are considerably more likely to work unpaid overtime than employees in permanent employment (Engelland & Riphahn, 2005). Nonstandard forms of employment may also help employees to gain a more stable position in the labor market. There is evidence that temporary contracts may serve as stepping stones into more attractive employment even with organizations other than the current employer (Booth, Francesconi, & Frank, 2002). However, it is questionable if for example work for ride-hailing platforms can help to improve worker's position in the labor market (Gandini, 2019).

Studies have shown that the proliferation of IT in recent decades has been shaping and redefining the concept of work (Dillahunt & Malone, 2015), as IT enables new types of work relations (Kalleberg, 2009). More specifically, advances in digital technology, such as the emergence of digital platforms like Uber and Amazon MTurk, which are also referred to as digital labor intermediaries (Peck & Theodore, 2013) or labor platforms (Kuhn & Maleki, 2017), have been changing the structure of work (Howcroft & Bergvall-Kåreborn, 2019; Kuhn & Maleki, 2017). This in turn has significant implications for the conceptualization of work as well as the individual, managerial, and organizational outcomes attributed to work (Gandini, 2019; Kuhn & Maleki, 2017; cf. Ashford et al., 2007; Grant & Parker, 2009).

3. Research approach

3.1. Research context

Our research context is digital ride-hailing platforms, specifically Uber and Lyft. Since driving for ride-hailing platforms represents one of the most common examples of platform-based work. Moreover due to controversies and the associated lawsuits and legislation initiatives related to drivers' legal status (Kuhn & Maleki, 2017), they provide a representative context in which to investigate how workers perceive their work and how work relations manifest themselves in platform-enabled work.

In essence, ride-hailing platforms connect people who need transportation with drivers willing to provide transportation. In doing so, the platforms provide a means to fulfill people's needs for mobility while allowing those with the necessary resources, i.e., time and a car, to earn money by providing those needed resources (Van Alstyne et al., 2016). To this end, the platforms obtain location data from both drivers' and riders' mobile devices, employ feedback mechanisms that allow for both drivers and riders rate each other alongside other parameters in the algorithm that ultimately connects drivers with riders. For both drivers and riders this materializes in the smartphone app that is the user interface.

To start working for these platforms, an aspiring driver need to register him/herself and undergo a background check conducted by the platform (Kuhn & Maleki, 2017). The purpose of the background checks, alongside the insurance coverage provided by the platforms is to reinforce trust that is another key prerequisite for the successful employment of the platform-based business model (Van Alstyne et al., 2016). Furthermore, to achieve the scalability that running a platform-based business model requires (Van Alstyne et al., 2016), ride-hailing platforms utilize cloud computing.

Besides its traditional purpose, to transport people, digital ride-hailing services have gradually been evolving into platforms with flexible capabilities that enable their use cases to be extended in new ways. For instance, the Uber platform into a goods-delivery platform (e.g., food delivery), with the company experimenting with campaigns and business models such as “#UberEATS” and “Uber for Business,” among others. In addition, Uber has “Uber for developers,” enabling third-party developers to extend the digital platform with applications such as Google Maps, HotelTonight, Starbucks, and TripAdvisor

through the Uber Application Programming Interface (API).

3.2. Data collection and analysis

Our empirical data comprise 39 semi-structured interviews with drivers working for Uber and Lyft in Boston. We decided to focus on Boston because of its reportedly high concentration of ride-hailing activity, including a large number of drivers. More broadly, the State of Massachusetts rates among the top 10 in terms of driver populations and ride-hailing traffic in the US (Hall & Krueger, 2015). Since this study's premise concerns work relations, we consider drivers to be the most appropriate respondents for our inquiry. Finally, we chose the semi-structured interview approach, as it provides us with the freedom to adapt interview questions as new knowledge emerges from interviews (Gillham, 2005). Each interview lasted approximately 30 min, and we recorded all the interviews after securing interviewees' permission. The interviews were transcribed to enable further analysis, and we also took notes during the interviews to use in the data analysis.

We employed the Gioia method (Gioia et al., 2013) to guide the analysis of interview data. As pointed out by Gioia et al. (2013), novel insights often can be yielded by carefully investigating how different actors experience events. Gioia et al. (2013) further suggested certain practices that bring qualitative rigor, such as creating a data structure to visualize the analysis process. As is typical of inductive research, our analytical process was iterative and partially overlapped with data collection. Nevertheless, certain phases, as outlined below, in the analytical process can be recognized wherein we iterated and refined inferences of theoretical mechanisms from the empirical material.

We started our analysis with open coding (Strauss & Corbin, 1998). The first stage of the analysis process included reading the interview transcripts and marking certain areas with codes to describe interview content (Miles & Huberman, 1994). We used the research question to guide the first round of coding. We also identified differences and similarities among different segments of empirical data. This practice resembled constant comparisons in grounded theory research (Strauss & Corbin, 1998). Table 1 provides a summary of the codes relevant to the present study and their related content.

During the second stage of the analysis process, we further categorized the first-order codes into more abstract second-order concepts (Charmaz, 1990; Van Maanen, 1979). The second-order concepts were established by systematically combining first-order codes with similar content (cf. Dubois & Gadde, 2002). During the analysis process, we wrote numerous brief notes and memos to document the choices made and to further develop our insights. These notes and memos totaled up to 30 pages. As is typical for an iterative research process, we refined our coding procedures according to our evolving understanding (Strauss & Corbin, 1998). As a result of the second stage of the analysis, we came up with six categories describing the mechanisms of the digital platform and two aggregate themes covering the temporal and administrative dimensions of work relations.

During the third stage of the analysis process, we incorporated the work relations perspective (Pfeffer & Baron, 1988) into the analysis and specifically looked at how the dimensions of work relations manifest themselves in the categories identified in the previous stage. This led to the emergence of two theory-guided aggregate themes, namely temporal and administrative, that comprise three second-order categories each.

4. Results

4.1. Temporal dimension of digital-platform enabled work relations

The temporal dimension of the work relation (Pfeffer & Baron, 1988) was manifested in the drivers' narratives describing the flexibility and freedom in determining their working hours. A common theme in drivers' descriptions of the positive sides of working for ride-hailing

Table 1
Coding used on the interview data.

Code	Description	Interview quotes
<i>Being your own boss</i>	Being in control of one's work or self-employed status.	"I'm my own boss basically." "I do whatever I want. I have to be responsible (just for my own), and I have to treat customers great."
<i>Alternative to unemployment</i>	Working for digital platforms provides a means of employment for many people who face challenges finding work or working a "normal" 9-to-5 schedule.	"I used to drive taxis and then drove airport shuttles, and for 12 years, I did package delivery, but they finally laid me off. So, I decided I had been paying into the government for 30 years, [so] I'll get some of the money back, so I was on unemployment for six months, but it's no bargain at all. [It] wasn't enough to pay all the bills and buy food and stuff. And I'm, like, well, I'm gonna get some kind of job."
<i>Work pressure and stress level</i>	Ability to control work pressure and work-related stress levels.	"But, why I like it, why I chose, because I had a job that sucked and was overwhelming, [and I was] always under pressure. Here, I don't have any pressure. Well, I do have pressure, but not as much as if I had my boss all the time on my back."
<i>Work-life balance (e.g., single mothers, sick spouses.)</i>	Ability to work even with challenging life situations and circumstances.	"[As a] single mom, she was so happy that she can be self-employed, take control over her own time, take care of her kids, 'cause they're getting in their teens." [speaking of her friend who is also a driver] "The taxi is more like a job [the person also works as a taxi driver]... this is just... I can do [it] if I want; if I don't want to, I don't have to do it."
<i>Flexibility</i>	Ability to move very fluidly between working and not working.	"It's very flexible. When I feel like I want to work, I'm going to work; when not, I am not, so it's better for me than [a] taxi." "Now I have a part-time job [during] the week...I work Monday through Thursday. So, I do Uber in the morning, 3:30-4 a.m., till like 10. I go to my other job, I get out at 5, and I go home Monday through Thursday. Friday, I do Uber from 4 a.m. till like 1 a.m. Of course, I rest in between."
<i>No working time obligations</i>	Ability to work very few hours, as well as very extensively	"When I was doing [a] delivery [job], I had to get up way too early; 6:30/7 o'clock in the morning, I had to be at work. And now I can go to work at 6 o'clock at night." "Who wants to wake up at five in the morning or six in the morning?" "It's just extra money. Another benefit is they pay you every week." "Driving for Uber is like a hobby. It's a hobby where you get paid."
<i>Extra income</i>	Source of supplementary income.	"[A] new driver gets \$750 for a target, and [a] referrer also gets \$750." "They were so desperate for drivers, they paid a \$750 bonus to get a new driver, but that was after you took 100 rides in a month. The first week, I took 91. So, I almost got the bonus in the first seven days. And they pay the guy that refers you the \$750 also. So, they're actually paying \$1500 to get somebody to hold the steering wheel." "I don't like [that] I can't see where the person is going until I start the trip."
<i>No knowledge of destinations from ride requests</i>	The platforms shield the destinations of ride requests from drivers.	"Sometimes you're taking, like, 10 minutes to pick someone up wherever they are. And then they only go, like, two blocks. So, I did, like, 15 minutes of work, and they're only gonna pay, like, \$5."
<i>Inability to control the mismatch between travel time to a pickup vs. actual trip duration.</i>	Drivers cannot evaluate whether driving to a distant pickup location pays off.	"It's hard to make money on weekdays; the demand is on weekends because [during] weekends, people go out to party. So, on weekends, however, there's a lot of drivers, but at the same time, there's a lot of riders too. But on weekdays, people are working, so there's not too much business. It's kind of hard."
<i>Supply-and-demand volatility</i>	Platforms tailor incentives to encourage drivers to work during certain periods.	"The driver used to make, some drivers used to make up to \$1,000, \$1500 to \$2000 a week then. But now some of them struggle to maybe make even \$500." "Last year, it was very good. The money I was making last year was much more than what I'm doing this year because last year, the rate was high[er]. But this year, they rode down the rates and raised some other expenses. And it kind of sucks." "No matter what, they [Uber] get their own percentage. And if there [are] more people to use Uber, they get more and more percentage. And as a result, the drivers that work, they are working hard, but they are not making enough money."
<i>Reductions in fares</i>	Platforms have lowered fares without consulting the drivers.	"Later on, because a lot of drivers get into it [Uber], then you don't make any more money." "I do [a] full-time job for this year. Even more than full-time, I work my whole day, 75 to 80 hours per week." "I don't like the star-rating system they have because some people, I think they're giving you a four-star, and a four-star for [a] standard person is good. For Uber, it's not good. For Uber, anything below five is bad. People that have 4.6 or 4.4, [it] is because they've gotten a lot of fours."
<i>Influx of new drivers</i>	Driving Uber and Lyft increasingly has become popular, which had led to an increased supply of drivers.	"Drivers are more cautious now [when] they have passengers. If they complain, you can get deactivated." "If you're low on your rates, they'll talk to you. They'll say, 'You need to improve this; you need to improve that,' whatever it is, and if you improve it, you're safe, but if you don't, they just have the ability or the chance to say, 'Bye-bye,' they don't want you."
<i>Excessive work hours due to reduced rates</i>	Maintaining previous income level requires more working hours.	
<i>No control over clients' driver ratings</i>	Excellent customer ratings are really important. All ratings have equal weight.	
<i>Fast elimination due to weak customer ratings</i>	Even small deviations from excellent ratings can lead to a decreased number of rides or not getting rides at all.	

platforms was the temporal nature of work that comprises *self-employment*, *the ability to control one's working hours*, and *source of income*. Most of the drivers whom we interviewed emphasized that they particularly appreciate the flexibility to work without constant supervision. This was considered positive and desirable. In particular, drivers who were retired, single parents, or were taking care of family members with severe illnesses provided rich descriptions of how they valued the flexibility associated with driving for Uber and Lyft.

Furthermore, the platforms allow drivers to decide whether to accept or reject ride requests, which was considered an important positive aspect. Some drivers stated that they specifically valued the freedom to be able to stay home to care for a sick family member, rather than be obligated to go to work under a rigid schedule. In light of these experiences, it is not surprising that respondents appreciated the temporal nature of working as a ride-hailing driver.

The category labelled as self-employed status refers to the informants' views that being legally considered self-employed was viewed as an advantage of platform-enabled work. Some of the drivers we interviewed explicitly referred to a lawsuit against Uber that aimed to require the company to treat drivers like employees instead of as independent contractors under labor laws. While acknowledging the benefits that come with such a classification, the drivers we interviewed frowned at the prospect of losing the flexibility associated with being self-employed. Some even viewed the work arrangement enabled by the platform as a means of carrying out part-time work and feared that being classified as employees potentially would render them unable to work for the platforms. For some of the drivers, the value of being self-employed has even motivated them to quit full-time jobs and start driving for Uber and Lyft exclusively. The following interview quote describes these viewpoints:

"The thing I really value in this...[driving Uber] is that I can be my own boss. I'm like the CEO of my own company."

Second, one of the most frequently and clearly highlighted desirable outcomes of platform-based work is related to *time management*, that is, the control that drivers have over when they work. The driver interface, i.e., the smartphone app, has been designed so that workers only need to turn it on when they are available and are interested in working. This temporal flexibility enables workers to adjust their work schedules to fit their personal life activities. Some of the interviewed drivers specifically noted this flexibility for the option to drive at night, while others leveraged the temporal flexibility by driving while their children are at school. Taken together, platform-based work's on/off nature was viewed as enabling different configurations of work and free time. One of the interviewees describes his experiences in the following way:

"[I drive], like, 30 h [or] so [per week], not really full-time. Not really part-time either...I pick whenever I want. It's nice."

The third category of data falling under the temporal dimension of work relations, *source of income*, refers specifically to the flexible income mechanisms that working for the platforms afford. In fact, most of the interviewed drivers stated that they began working for Uber and Lyft because of the income possibilities. In addition to providing a means of employment for many who are otherwise unemployed, working for digital platforms enables people with full-time jobs to generate additional income whenever they choose. One of the respondents used a faucet analogy to describe driving for Uber, stating it is like "turning on the income tap." The respondent mentioned that whenever he needs extra funds, he just schedules a driving plan for Uber in his free time:

"I am a business owner. I have a business that I run during the day, and this is just extra income. I just [do it] at night for a few hours usually. And the reason why I'm doing it is because I have a German shepherd dog, [a] puppy, and I have to send him to a specialty school, one of the best in the world, that is in Massachusetts. And it costs about \$7000 a

month. So I'm trying to just supplement my income specifically for that."

4.2. Administrative dimension of digital-platform enabled work relations

While the temporal dimension of the work relation was predominantly attributed to the positive aspects of working for ride-hailing platforms, the data describing the administrative dimension contained considerably more critical voices. In particular, interviewees heavily criticized how the platforms exercise control and power over the drivers, particularly describing various rich narratives about how the platform exercises superior bargaining power over drivers through *controlling in the information that is provided to the drivers* as well as the *pricing mechanism* and the *rating mechanism*. This administrative control ultimately results from the fact that the platform operators control and use the data produced within the platform. The following respondent further explained the nature of the administrative control:

"They [platforms] have their own policies, and sometimes they change their policies. Like last year, it was very good. The money that I was making last year was much more than what I'm [making] this year because last year, the rate was high, but this year, they rode down the rates, and they raised some other expenses. And it kind of sucks. But it is what it is... No matter what, they get their own percentage. And if there are more people who use Uber, they get more and more percentage."

Lack of information was a major source of complaints attributed to the administrative dimension of work relations. The principal contact point in the work relationship is the mobile application that connects passengers with drivers. The platforms control the app, so drivers have no control of the information that the app provides, or how the data are used.

For many drivers, a more transparent view of certain aspects of work-related information would be valuable in helping them make better decisions regarding their work options. For example, Uber and Lyft have designed their apps such that they withhold passengers' destinations until the driver picks up each passenger. Some respondents stated that having an idea about the direction a passenger is heading would help them decide whether it is where they are heading at a particular time. This is particularly important in cases when they are considering shutting down for the day and would appreciate having the option of driving a passenger to his or her destination on the way home or wherever they are heading after driving. One of the drivers described his frustration in this regard:

"Probably the only thing I don't like is I can't see where the person is going until I start the trip. Sometimes you are taking, like, 10 min to pick someone up. [You] drive 10 min to wherever they are, and then they only go like two blocks. So, I did, like, 15 min of work, and they're only gonna pay, like, \$5."

The second category of data related to the administrative dimension of work relations was related to the pricing mechanism employed by the platforms that often manifests itself in *price reductions*. Drivers cited price reduction as perhaps one of the most undesirable aspects of the platforms' control over the apps. Almost all the interviewees mentioned Uber and Lyft's unilateral price reductions for passengers, which require drivers to work more hours if they want to sustain their income levels. For example, a driver who decided to quit his or her old job based on the comparable potential income from driving may soon realize that their original calculations no longer make ends meet if the company reduces prices for passengers. This means drivers who make a certain amount of income upon joining the platform would only realize after each price-reduction move made by the company that maintaining the same level of income would require allocating more time to driving for the platform. Furthermore, since the platform owners have the right to determine the price of transactions and the allocated share to the driver, the drivers are at the mercy of the platform owner's decisions on

fares at any time. This leads to a “Red Queen’s race” situation in which the drivers work harder to earn the same amount. A respondent who was a taxi driver and was experimenting with Uber with his private car put it this way:

“I tried Uber because back then, you can easily in a weekend make \$300–\$400. They have a surge basically every time.... So it’s quick, and it’s good. But later, because a lot of drivers get into it, then you don’t do that anymore [because] It’s not [worth it] anymore. ... Now it’s up and down; it’s not something you can trust. ... If you wanna make money with UberX, you have to work [a lot]. Let’s say I do 40 h; you have to make 80 h working UberX, [and yet] you make barely [the] same as [a] taxi. It’s too much.”

The third manifestation of the administrative dimension of work relations was the *rating* mechanism. Uber and Lyft’s digital platforms are structured not only to facilitate the work process, but also to serve the purpose of collecting feedback in the form of ratings on each transaction. The platform enables both the driver and passenger to rate each other after a trip. The rating is structured from one to five stars, with five being the best rating possible. The undesirability element of this comes from how ride-hailing platforms use this data. They set a threshold value (reportedly 4.5 for Uber) as the minimum rating that a driver can have before being terminated from working on the platform. Considering that every human (or specifically passenger) rates differently and weighs his or her rating criteria in a variety of ways, drivers have little control over the ratings that passengers give them. The following interview quote illustrates the issue:

“They have this rating thing, some people might misunderstand, so they get [a] low rating a couple of times, and that person buys a new car just to use it for Uber. It never happened to me, but I’ve seen a lot of people that have very new cars, stuck in the middle....If their rating goes down, they might get suspended for a little bit... [Imagine] you deactivate his account, but he has a new car that he has to pay for!”

Most of the interviewed drivers acknowledged that they do not control many terms of their work relationship. In fact, some said the terms seem to be a one-way street, in which one party makes the terms and the other party has the option of agreeing or simply quitting. There is no option to negotiate in the terms’ formulation, making drivers feel vulnerable to the company’s decisions. For example, the insurance used by the platforms may cover only accidents that take place when there is a passenger in the car, which leaves a gap in coverage for the drivers that they may not have prepared for. If they were to get into an uncovered accident, that leaves them responsible for the full cost of the damage or bodily injury.

The three analysis stages and the respective data-structure processes are summarized in Fig. 1.

5. Discussion

5.1. Reconceptualizing the work relations for digital platforms

Our results highlight two dimensions of work relations pertinent to digitally intermediated ride-hailing: temporal and administrative. Compared with Pfeffer and Baron’s (1988) three-dimensional conceptualization (temporal, physical, and administrative), the temporal and administrative dimensions particularly emerged from our data. Furthermore, these two dimensions manifest themselves quite differently than in Pfeffer and Baron’s (1988) conceptualization. Therefore, we reconceptualize the temporal and administrative dimensions of work relations into *digital temporality* and *algorithmic administrativity*. Table 2 summarizes our findings in compare to Pfeffer and Baron (1988).

First, with respect to the temporal dimension, our analysis revealed a number of temporal patterns related to work enabled by digital platforms. Work for digital platforms like Uber and Lyft is seldom the

result of a long-term career-planning process. Our results suggest that the flexibility of Uber and Lyft work allows for adjusting work to fit the driver’s life situation. Thus, while the typical work relationship’s temporal dimension carries the expectation that the relationship will last over extended periods of time, in the case of platform-enabled work, the temporal dimension reflects the amount of time that the worker intends to allocate for the work.

In fact, due to this temporal nature of work, many people try working for the service, but only a subset of workers continue for extended periods of time. Some can work for digital platforms when they are between jobs. For others, working for platforms may provide them with the kind of flexible work schedule and income source that they have been looking for, leading to a long-term work relationship. Therefore, we extend the notion of the temporal dimension of work relation (Pfeffer & Baron, 1988) from a long-term vs. short-term focus to *digital temporality*, highlighting specifically *when* the work takes place and the high degree of fluidity between work and free time. This fluidity stems from the digital platform’s resource-connecting functionalities that enable very fast changes between the on-and-off status of work based on workers’ context and the availability of work.

Second, with respect to the administrative dimension, our results show that the firms behind the ride-hailing platforms exercise significant administrative control over drivers. However, instead of management control, organizational hierarchies, and physical proximity—which characterize traditional organizations (Ashford et al., 2007; Pfeffer & Baron, 1988)—ride-hailing platforms rely on complex, invisible algorithms for both drivers and clients that allow them to employ a market mechanism, driver ratings, and online surveillance to exert administrative power over drivers. Through these algorithmic processes and the market mechanism, the platforms increase prices for rides during peak hours, in busy areas, or during bad weather to ensure capacity and capitalize on demand. The market-driven pricing of rides is a means of ensuring that a sufficient number of cars is available when demand rises. However, this also means that drivers’ incomes depend not only on how much they work, but also on the platform’s pricing algorithm. Furthermore, customer ratings are a mechanism designed to ensure service quality and to exercise power over drivers, as customer feedback may even lead to deactivating a driver from the system. As a result, we shift the notion of the administrative dimension (Pfeffer & Baron, 1988) from management and organizational hierarchies to a digital administrative dimension, which highlights the use of the mediating platform’s digital properties to exercise administrative control over workers (cf. Gandini, 2019). Consequently, we refer to this dimension of the work relationship as *algorithmic administrativity*.

Finally, instead of physical proximity to the organization or its physical premises, ride-hailing workers operate in virtual proximity to the organizations behind the platforms. Thus, we suggest that virtual proximity replaces physical proximity in the context of digital platform-enabled work. For example, Uber and Lyft monitor cars’ locations and collect information about routes used and ride durations. Uber also tracks risky driving behaviors, such as speeding, harsh braking, and even using phones while driving. In addition, the Uber app sends drivers reminders to take breaks from driving, messages that prompt drivers to mount their phones on the dashboard, and reports that show how a driver’s behavior compares with that of other drivers in the same city. This is expected not only to contribute to safer driving patterns, but also to help many drivers receive better customer feedback ratings. On the other hand, this type of digital surveillance on drivers’ behavior also enables various forms of privacy intrusions. Taken together, we view the physical dimension of the work relationship (Pfeffer & Baron, 1988) as being essentially embedded in both the temporal and administrative dimensions, with an emphasis on the virtual proximity of the work relationship as facilitated by the digital platform’s omnipresent nature.

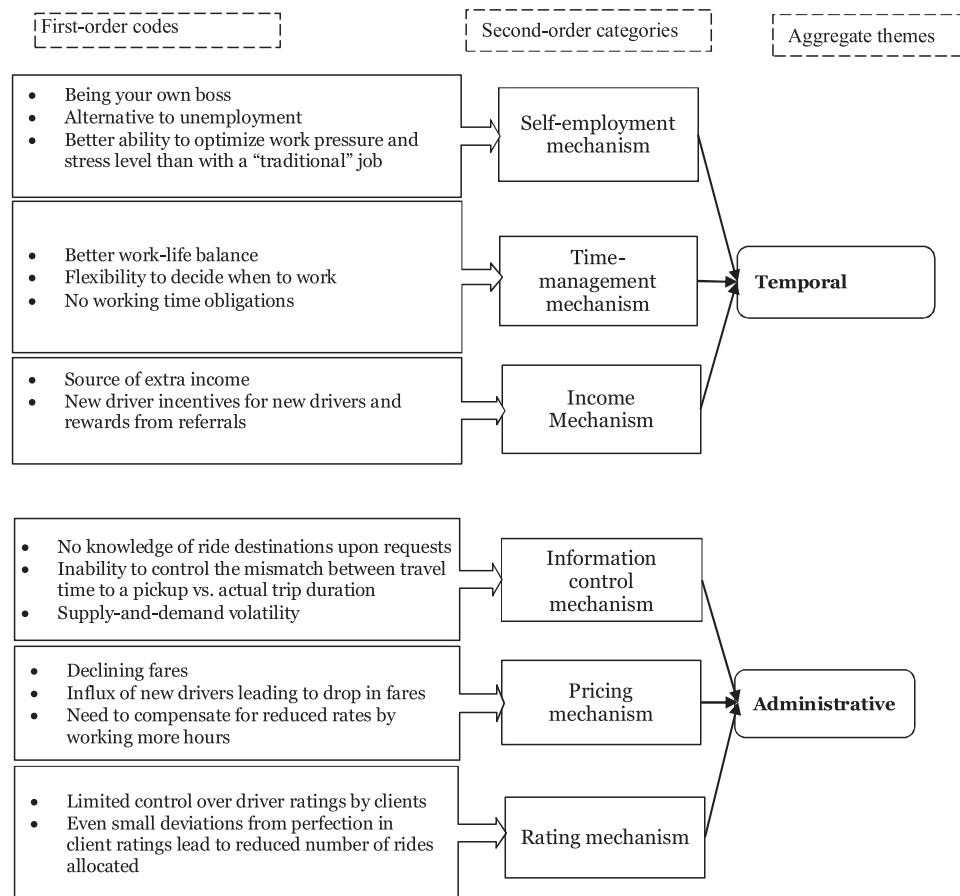


Fig. 1. Themes from data analysis.

5.2. Implications

This study aimed to explore how the presence of the digital platform characterizes work relations in the context of digitally intermediated ride-hailing. In essence, our study provides a workers’ account of the controversies surrounding this type of platform-enabled work. Our findings advance the understanding of the nature of work done for digital platforms (Gandini, 2019; Howcroft & Bergvall-Kåreborn, 2019; Kuhn & Maleki, 2017; Sundararajan, 2014; Leighton, 2016; Todoli-Signes, 2017) by analyzing the mechanisms embedded in the digital ride-hailing platform from the drivers’ vantage point and by providing a fine-grained analysis of work relations in the context of platform-enabled work. Finally, beyond the ride-hailing context, our findings advance the understanding of contributors’ value-creation processes and motivations (Mäntymäki & Riemer, 2016) and the underlying mechanisms that foster contributors’ engagement with activities that they undertake in digital platforms (Pacauskas, Rajala, Westerlund, &

Mäntymäki, 2018).

As a result, we highlight three specific implications of the study.

First, in our data, the self-employed status of the driver was considered a specific advantage of working for ride-hailing platforms. This is particularly interesting, since the ride-hailing platforms represent platforms where the worker’s relationship with the platform is generally characterized by low autonomy and high dependence on the firm (Kuhn & Maleki, 2017). In fact, drivers’ critical remarks related to the administrative dimension of the work relation essentially relate to the lack of autonomy, dependence on the firms behind the platform, and certain means the firms behind the platforms use to exercise control and power over the workers.

Second, as our analysis shows, ride-hailing platforms exercise control and power by determining prices for the rides in a demand-driven manner and by using clients’ ratings to evaluate drivers, consequently exerting algorithmic administrative control that, for the drivers, materializes via the app (algorithmic administrativity). While these

Table 2
Summary of our findings in compare to Pfeffer and Baron (1988).

Pfeffer and Baron (1988)		Our findings based on ride-hailing platform	
Temporal	Emphasizes on the duration of employment contract (long-term vs. short term). Employer and employee jointly agree on the duration of contract and the schedule of work.	Digital temporality	The nature of work is typically microwork. The driver decides when to work by using the digital platform. Very high volatility in the demand of work. The digital platform allows high degree of fluidity between work and free time. The digital platform enables very fast changes between the on-and-off status of work based on driver’s context and the availability of work Real-time driver surveillance. Use of driver ratings in work allocation. Dynamic pricing mechanism based on demand and supply.
Administrative	Emphasizes the degree of direct management control over employees. Organizational hierarchies as the control mechanism.	Algorithmic administrativity	

manifestations of administrative control and power were a major source of discontent, our informants did not even mention the background checks conducted for new drivers, or code-of-conduct instructions that are also common forms of administrative control among ride-hailing services (De Stefano, 2015; Lee, 2016).

Third, considering the rapid growth of ride-hailing platforms, the mechanisms underlying digital temporality that allow the type of flexibility that can meet drivers' unique conditions and preferences and the high degree of fluidity between work and free time can potentially be viewed as the unique characteristics of these platforms as IT artefacts. Future IS research may build on our findings and operationalize these artefact characteristics in order to test their effects on both positive and negative outcomes of ride-hailing from workers' perspective.

Fourth, our results show that the mechanisms contributing to workers' discontent, such as the rating mechanism and dynamic pricing, are nevertheless instrumental for the platforms' current business models. Hence, this study can be viewed as a starting point for a discussion on the role of the IT artefact characteristics in the parallel manifestation of the positive and negative aspects of platform-enabled work from workers' perspective. As a result, our findings contribute to the IS literature on the dualities of IT (Islam et al., 2019; Mäntymäki & Islam, 2016; Turel & Serenko, 2012) in the context of digital work intermediaries. To this end, our findings elucidate the controversies in the employer-employee relationships resulting from certain characteristics of ride-hailing platforms as IT artefacts.

5.3. Limitations and future research

As with any other study, the results are subjective to several limitations. However, the limitations of the present study simultaneously are avenues for future research. First, we focused on ride-hailing platforms; thus, a natural avenue for future research is to broaden this study's contextual scope to other types of platform-enabled work (Gandini, 2019; Howcroft & Bergvall-Kåreborn, 2019; Kuhn & Maleki, 2017). For example, AirBnB is a dominant digital platform in the travel-accommodation industry and an income source for many people globally.

Second, in this study, we adopted work relations and non-standard work as the theoretical foundations, but it is also possible to investigate ride-hailing work as a business relationship between a micro-size enterprise and a multinational corporation and employ agency theory (Eisenhardt, 1989), transaction-cost theory (Williamson, 1993), or contract theory (Bolton & Dewatripont, 2005), among others, as theoretical lenses to guide the inquiry. For example, future research could specifically examine issues related to security and liability from these theoretical vantage points.

Third, Uber and Lyft have been changing their business models and strategies to adapt to local markets. For example, in some countries like South Africa, passengers have the option to pay in cash. Therefore, the positive and negative outcomes identified in this study by no means are an exhaustive presentation of the complexities and challenges surrounding work done for digital platforms such as Uber and Lyft. Thus, future research could focus on more in-depth inquiries in a particular region or country to provide contextualized insights on the influence of ride sharing on work relations.

Finally, the business model behind intermediary-based digital platforms like Uber and Lyft stems from the platform's control over the transactions and data generated. The data-control mechanism is perhaps a key element of the administrative control that drivers experience. Decentralized technology, such as blockchain (Hughes et al., 2019; Tapscott & Tapscott, 2016), offers a technical foundation for peer-to-peer transactions and may disrupt the current landscape of intermediary-based digital platforms significantly. This may reduce the power disparity between drivers and the platform owner. For example, Arcade City is a peer-to-peer rideshare network and marketplace operated by drivers where clients connect directly with drivers using a

blockchain-based IT architecture³. Thus, future research could investigate to what extent a power disparity could be mitigated through the use of blockchain-based digital platforms.

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³ <https://blog.arcade.city/celebrating-three-years-of-arcade-city-19cb44ee26fd>

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