



HAL
open science

Responsible innovation and digital platforms: the case of online food delivery

Cédric Gossart, Cynthia Srnec

► To cite this version:

Cédric Gossart, Cynthia Srnec. Responsible innovation and digital platforms: the case of online food delivery. *Journal of Innovation Economics & Management*, 2024, Responsible Innovation Theoretical Debates and Facts Trends, 43, pp.215-246. 10.3917/jie.pr1.0155 . hal-04372253

HAL Id: hal-04372253

<https://hal.science/hal-04372253v1>

Submitted on 30 Jan 2025

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - ShareAlike 4.0 International License

Responsible innovation and digital platforms: The case of online food delivery

Cédric Gossart, Cynthia Srnec

DANS **JOURNAL OF INNOVATION ECONOMICS & MANAGEMENT** 2023/0 (PRÉPUBLICATION),

PAGES I155 À XXXII

ÉDITIONS **DE BOECK SUPÉRIEUR**

Article disponible en ligne à l'adresse

<https://www.cairn.info/revue-journal-of-innovation-economics-2023-0-page-l155.htm>



CAIRN.INFO
MATIÈRES À RÉFLEXION

Découvrir le sommaire de ce numéro, suivre la revue par email, s'abonner...

Flashez ce QR Code pour accéder à la page de ce numéro sur Cairn.info.



Distribution électronique Cairn.info pour De Boeck Supérieur.

La reproduction ou représentation de cet article, notamment par photocopie, n'est autorisée que dans les limites des conditions générales d'utilisation du site ou, le cas échéant, des conditions générales de la licence souscrite par votre établissement. Toute autre reproduction ou représentation, en tout ou partie, sous quelque forme et de quelque manière que ce soit, est interdite sauf accord préalable et écrit de l'éditeur, en dehors des cas prévus par la législation en vigueur en France. Il est précisé que son stockage dans une base de données est également interdit.

Responsible Innovation and Digital Platforms: The Case of Online Food Delivery¹

Cédric GOSSART

*CY Cergy Paris Université, CNRS, THEMA
Université Paris-Saclay, Univ Évry, IMT-BS, LITEM
91025, Évry-Courcouronnes, France
cedric.gossart@imt-bs.eu*

Cynthia SRNEC

*CY Cergy Paris Université, CNRS, THEMA
Université Paris-Saclay, Univ Évry, IMT-BS, LITEM
91025, Évry-Courcouronnes, France
csrnc@cyu.fr*

ABSTRACT

Online Food Delivery (OFD) has evolved with the fast diffusion of digital platforms. But these innovations have thrived at the expense of riders delivering food orders. Riders' risks increase because of irresponsible behaviours in the OFD ecosystem. We seek to identify sources of irresponsibility in OFD ecosystems, which adopted OFD innovations (mobile apps). We argue that these sources are distributed across actors and span across innovation adoption phases. We construct a grid to identify these sources at each adoption phase, and apply it using data collected in France during the Covid pandemic, when riders' risks soared. Our first result enables us to fill an important gap in the literature, by providing a grid to analyse sources of irresponsibility in an OFD ecosystem. Our second result identifies these sources in the French

1. *Acknowledgments:* We would like to thank the anonymous reviewers for their constructive comments. This article is the result of the project "Platform workers: Challenges and opportunities in the field of social protection" (ALTER) conducted by the Fondation d'entreprise MGEN pour la Santé Publique (FESP-MGEN), in collaboration with the Laboratoire en Innovation, Technologies, Économie et Management (LITEM, EA 7363). We would like to thank Morgane Le Guern (FESP-MGEN) for her contribution to the quantitative analyses. Cynthia Srnc would like to thank the ETIS laboratory (UMR 8051) for its support.

OFD ecosystem, and enables us to provide an improved grid and to formulate managerial recommendations.

KEYWORDS: Responsible Innovation, Online Food Delivery, Innovation Adoption, Riders, Irresponsibility

JEL CODES: M14, O39

In the past decade, there has been a growing concern for the impacts of digital platforms on labour markets (Bureau International du Travail, 2019; Srnec, 2016). Digital labour causes injustice and precariousness for many workers (Abdelnour, Méda, 2019). It has been studied from various perspectives such as algorithmic management, working conditions or activism (Fuchs, Sandoval, 2014). Practices of food consumption have recently evolved to incorporate digital actors, which expanded fast in the past few years especially during and after the Covid-19 pandemic (Paché, 2020a). Scholars highlighted riders' unfair working conditions, especially during this pandemic. Indeed, most riders are self-contractors and many do not earn minimum wage or have appropriate social protection (Gossart, Srnec, 2022; Huang, 2022; Schreyer, 2021). They are part of emerging Online Food Delivery (OFD) ecosystems, which comprise other actors such as platform operators, investors, consumers, or restaurants. A digital platform can be defined as “*a set of stable components that supports variety and evolvability in a system by constraining the linkages among the other components*” (Baldwin, Woodard, 2009, p. 19). There are different types of platform-mediated labour, we are interested in gig work (location-based) carried out through apps (app-work) (Duggan *et al.*, 2020), notably because such app-work generates a lot of work-related vulnerabilities.

In this paper, we focus on OFD platforms delivering meals to individuals in France, where in 2022 the online food delivery market represented 2.3 bn €. ² If some OFD platforms are cooperatives (*e.g.* CoopCycle) most are capitalistic (*e.g.* Uber Eats, Deliveroo). These incumbents claim to have reinvented home food delivery and labour relations, and promise freedom and flexibility to riders (Rème-Harnay, 2020). But there is a big gap between their claims and practices (Criddle, Murgia, 2023), and OFD platforms' responsibility discourses have been considered fairwashing (Howson *et al.*, 2020).

Riders are vulnerable actors in the OFD ecosystem. Once registered with a platform, they pick up from restaurants orders placed by customers through the app, mostly using bicycles. This exposes them to various types of risks (health, socioeconomic). For example, riders using two-wheeled vehicles are

2. Statista (2022), Revenue of the Online Food Delivery Market in France from 2017 to 2026.

particularly vulnerable to collisions, who is responsible for their vulnerability? With Wareham *et al.* (2014, p. 1212), we argue that it is not only capitalistic platforms but that responsibility is “*distributed across more than one entity*”.

In this paper, we claim that riders’ risks signal irresponsibilities in an OFD ecosystem and focus on identifying the sources of distributed irresponsibility. To do so, we focus on the adoption of OFD innovations (apps) on the French market, and follow Damanpour and Schneider (2006) according to whom innovation adoption consists in three phases (initiation, adoption decision, implementation) and three dimensions of innovation adoption factors (contextual factors, characteristics of individuals, organisations, characteristics of the innovation itself). Although there is no shortage of research studying responsible innovations, there is a gap in the literature regarding the sources of irresponsibility generated by the adoption of digital innovations (Zhu *et al.*, 2023).

This paper aims to fill this gap by answering the following question: *what are the sources of irresponsibility in an OFD ecosystem?* To answer it, we first construct a literature-based grid enabling us to bring out possible sources of irresponsibility in an OFD ecosystem. Second, we use this grid to identify actual sources of irresponsibility in the French OFD ecosystem, using data collected during a research project funded by a large non-profit organisation.

The contributions of this paper are both theoretical and empirical: (1) a grid to bring out possible sources of irresponsibility in an OFD platform ecosystem; (2) an application of this grid to the French OFD ecosystem. This paper is structured as follows: after this introduction (section 1), we present the literature on innovation and responsibility that leads to the construction of the grid and formulate the research question (section 2). We then introduce our method and data (section 3), followed by our results that consist in the application of the grid to the French OFD ecosystem (section 4). Finally, we provide a discussion ending with an improved grid (section 5) and conclude on avenues for future research (section 6).

Literature Review

Innovation and Responsibility

There is an abundant literature on “responsible innovation” (RI), which implies “*taking care of the future through collective stewardship of science and innovation in the present*” (Stilgoe *et al.*, 2013, p. 1571). Georget *et al.* (2023) recall the distinction between an academic stream, responsible innovation,

and an institutional stream (European Commission), responsible research and innovation. In early innovation stages (prior to adoption), RI requires anticipating impacts, being aware of its limits, including a variety of stakeholders and responding to their concerns (*ibid.*). When RI practices are not in place, risks facing actors increase and sources of irresponsibility arise. For Stahl (2023, p. 5), “the ecosystems perspective (...) allows the recognition of the complexity of the network of existing responsibilities”. OFD ecosystems are complex, and sources of irresponsibility distributed across actors. Indeed, “it is the often complex and coupled systems of science and innovation that create what Ulrich Beck (2000) calls ‘organised irresponsibility’” (Stilgoe *et al.*, 2013, p. 1569).

With OFD apps, platforms’ choices “shape the application and use of its tools, resources, and services” (Stahl *et al.*, 2021, p. 186) and can generate irresponsibilities. Despite their impacts on society, few studies focus on RI and digital platforms, although RI is a growing research field addressing innovation in information and communication technology, which encompasses digital platforms (Zhu *et al.*, 2023). Authors have for example used RI criteria “to show how RI solutions can be fostered through digital platforms to address grand challenges” (Ahuja *et al.*, 2023).

We now present a literature review on OFD innovations and responsibility, structured around the three innovation adoption phases of Damanpour and Schneider (2006). Table 1 provides details about the phases. Adoption factors are explained in relation to the context of each phase (1), to individual (2.1) and organisational (2.2) actors, and to the characteristics of the innovation (3). In the text, we also highlight the types of riders’ risks (health, socioeconomic) generated by each source of irresponsibility (*cf.* Table 2). Details about OFD actors are provided in section “Methods and Data”.

Table 1 - Innovation adoption phases in an OFD ecosystem

	Preadoption (A)	Adoption (B)	Postadoption (C)
Definition	The innovation (the app) is designed	The period of the decision to deploy the innovation on the local market	The deployment of the innovation in the local market
Example	Uber Eats: took place in California(2014)	Uber Eats: 2016 in France	Uber Eats clients, riders and restaurant owners start interacting through the app

Preadoption Phase (A)

(A1) Contextual Factors

The OFD market is highly competitive and “*platform providers face time pressures to launch platforms on the market*” (de Reuver et al., 2020, p. 259). Therefore, labour protection systems cannot anticipate platforms’ impacts when apps are designed. Besides, “*many digital labour platforms –and especially the bigger ones– have taken root in parts of the economy that have always been remarkably resistant to effective labour regulation*” (De Stefano et al., 2022, p. 17). Also, “*the language used by platforms to describe their relationship with the workers is carefully picked up to displace their responsibility: talking about ‘disconnection’ instead of officially dismissing a worker; or calling the workers ‘partners’, to avoid legal obligations*” (Popan, Anaya-Boig, 2022, p. 36). The context in which OFD innovations are developed facilitates platforms’ irresponsibility and exposes riders to health and socioeconomic risks.

(A2.1) Characteristics of Individuals

Investors of capitalistic platforms value return on investment and inject capital if they can extract monopoly rents. They require platforms to be “*not just monopolies in the market, but owners of the market*” (Sadowski, 2022, p. 36), hence the need to move in fast. Platforms’ top managers “*affect innovation adoption because they (...) control resources and influence major decisions, especially strategic decisions*” (Damanpour, Schneider, 2006, p. 220). They may not support innovations anticipating negative impacts, since “*most firms involved in this space have a capitalist character, with business models and labour-use strategies dominated by imperatives of surplus labour extraction*” (Campbell, 2022, p. 115). Finally, biases of app developers can harm riders: “*Research shows that algorithms are reproducing racial, class, and other biases outside the workplace*” (Vallas, Schor, 2020, p. 286). These sources of irresponsibility generate socioeconomic risks for riders.

(A2.2) Characteristics of Organisations

In preadoption, platform organisations are the main actors. Incumbents are capitalistic firms prioritising “*human-centred design*”, “*increasingly seen and applied to achieve short-term gains for businesses and investors*” (Borthwick et al., 2022, p. 2). As opposed to “*life-centred design*” (Borthwick et al., 2022), it can generate irresponsible innovations that increase health and socioeconomic risks for riders.

(A3) Characteristics of the Innovation

We know little about the values and practices of platform designers (Vallas, Schor, 2020), whose biases can “systematically and unfairly discriminate against certain individuals or groups of individuals in favor of others” (Friedman, Nissenbaum, 1996, p. 332). Algorithmic management “restricts the autonomous agency of labour” (Heiland, 2022, p. 77), and generates stress, as it “tracks, disciplines, and sets expectations for workers without human supervision or recourse, often potentially to the detriment of workers’ social protection” (Duggan et al., 2020, p. 120). “Individuals’ actions are thus framed in a personalised way” (Béjean et al., 2022, p. 9), for example “most platforms utilise customer ratings of workers via anonymous systems as a means of performance evaluation” (Duggan et al., 2020, p. 126), which lack transparency and can be biased (Hanrahan et al., 2018).

Platform designers focus on “service performance” (Simoni, Winkenbach, 2023), for example to solve a “food delivery route planning problem” (Wang et al., 2021). Hence algorithm biases can escape ethical screening, especially since “the software industry has adopted agile and scrum development methods, based on the notion of trying out minimum viable products quickly and testing while on the market” (de Reuver et al., 2020, p. 259). The risk designers address deals with service performance variation to reduce late deliveries (Chen et al., 2022), without anticipating risks for riders (Zheng et al., 2023). Moreover, apps cause riders “a high level of distraction” (Christie, Ward, 2023), which can generate accidents. It appears that “the risk of operation is shifted from the employer to the worker” (Kaine, Josserand, 2019, p. 485). The practices of platform designers are possible sources of irresponsibility in an OFD ecosystem and generate health and socioeconomic risks for riders.

Adoption Decision Phase (B)

(B1) Contextual Factors

The regulatory context is much discussed in the literature (Dirringer, 2018; Montel, 2018). In early phases of OFD innovations, there has been a lot of unsuccessful self-regulation that has required government intervention to protect workers (Gossart, 2021). The financial context in which the adoption decision is made also matters: if a company wants to go public and raise funds on financial markets, it needs to conquer new markets in record time. To so, it uses agile methods and engages in price wars to minimise costs, including

human resources ones. For example, in the case of Uber “it was not yet making a profit when it went public. The price of car journeys had been set below their real price in order to drive competitors out of business” (Mitchell, 2020, p. 79). These context-related irresponsibilities increase socioeconomic risks for riders.

(B2.1) Characteristics of Individuals

When Uber Eats arrived in France (2016), the market was very competitive. Top managers decided to hook riders with a 2.50€ fee per ride, and to take “*advantage of the bicycle and its versatile role for both work and play*” (Popan, Anaya-Boig, 2022). They also attracted clients with a promise of delivery in less than 10 minutes, and in 2018, once in a position of power, changed the ride fee and made it proportional to delivery distance, which impoverished mechanical bicycle riders. At the time Thibaud Simphal (Uber Eats France CEO) declared “*We strongly believe in the principle of competition*” (Ronfaut, 2016). Short term profit maximisation can thus be a source of irresponsibility, which increases riders’ socioeconomic risks.

(B2.2) Characteristics of organisations

According to Viossat (2021, p. 78), the French OFD ecosystem is “*dominated by very aggressive American players who escape the control of nation states and follow a strategy of fait accompli*”. Deliveroo and Uber Eats can be seen as “*institutional chameleons*” (Vallas, Schor, 2020), who only change their irresponsible practices under strong external pressures. Their strategies increase both health and socioeconomic risks for riders.

(B3) Characteristics of the innovation

All innovations go hand in hand with a diffusion plan and business model, and concerning OFD apps: “*The keys to their business model were investment in advertising, the visibility of their physical premises, the flexibility of their workers, and constant innovation*” (Alvarez-Palau et al., 2022, p. 2). But workers’ flexibility can increase economic vulnerability because of unstable wages and a lack of social and health protections. Following the death of a rider, a union declared that “*The task-based payment system favoured by platforms to create competition between workers is increasing work rates and putting delivery drivers at risk*” (Adde, 2023, p. 1). Incumbents’ business models focusing on economic value extraction can generate irresponsibility and increase riders’ health and socioeconomic risks.

Postadoption Phase (C)

(C1) Contextual Factors

Once OFD apps diffuse on a market, their fit to the local context is put to test through a *fait accompli* strategy that does not anticipate societal impacts (Gossart, 2021). Incumbent platforms test their innovations' fit as they diffuse on the market, instead of anticipating their effects (Stilgoe *et al.*, 2013). This triggers legal battles, Deliveroo was for example sentenced to pay 10 million euros to French authorities for undeclared workers (Le Monde, 2022). Not anticipating innovations' effects on riders is a source of irresponsibility in an OFD ecosystem, which increases riders' health and socioeconomic risks.

(C2.1) Characteristics of Individuals

Regarding gig workers and OFD platforms, the literature addresses issues of work-life balance (Warren, 2021), job performance and career success (Crayne, Brawley, 2023), barriers to access assistance (Ravenelle *et al.*, 2021), or alleged flexibility and independence (Robinson, 2022). As for consumers, most OFD literature analyses their perception of the service (Melián-González, 2022). It also stresses to a lack of care for riders, since "*the gig economy is associated with a decline in tipping norms*" (Duhaime, Woessner, 2019, p. 237). Besides, customer ratings "*expose platform workers to algorithmic discrimination by gender, ethnicity and race*" (Vallas, Schor, 2020, p. 286). They also produce data used to run the platform and control workers, who "*contribute, unremunerated, to the stock of intangible capital of the platform*" (Duggan *et al.*, 2020, p. 119). Consumer practices can be sources of irresponsibility and increase riders' socioeconomic risks.

(C2.2) Characteristics of Organisations

With OFD, restaurants found a way to increase their income but not without risks. For example, authors found that in Berlin "*it became apparent that it was not only the riders who were in trouble, but also many restaurants that had relied on Deliveroo*" (Altenried, 2021, p. 6). Besides, OFD apps there is "*additional strain put on kitchen staff*" (Ecker, Strüver, 2022, p. 7), which impacts riders through late deliveries and aggressive behaviour. Indeed, "*preparing food for on-demand delivery interferes with existing work routines to varying degrees depending on the type of restaurant*" (*ibid.*). Also, "*the contract that currently prevails in the industry ignores the negative interaction between channels and gives both the platform and the restaurant incentive to set their price too low*" (Feldman *et al.*, 2023, p. 812). Not anticipating these effects can be a source of irresponsibility that increases riders' health and socioeconomic risks.

(C3) Characteristics of the Innovation

In the postadoption innovation phase, the literature suggests that platform governance can “help gig workers craft their platform work” (Chen *et al.*, 2023, p. 2), and that “organisation-level factors could be modified to prevent risky riding behaviour” (Nguyen-Phuoc *et al.*, 2023, p. 1). More importantly, platforms should be “achieving responsible innovation through a collaboration among stakeholders” (Liu *et al.*, 2020, p. 5), which corresponds to the inclusion RI criterion of Stilgoe *et al.* (2013). Not doing so increases riders’ health risks, for example when the algorithm is not designed to integrate real-life traffic risks faced by riders. In Anglo-Saxon incumbent firms, values and assumptions embedded in the first two innovation phases are specific to their socioeconomic and legal contexts. For example, designers assumed that the app was only going to be used by freelancers, so the small fees allocated to riders was not a problem. But it could eventually lead to pay platform workers under minimum wage: “In the United States, illegality is a feature of the ‘sharing economy’, not a bug” (Scholz, 2017, p. 232). Also, designers did not build a transparent system to calculate fees, which increased riders’ economic vulnerability (Abdelnour, Méda, 2019). The app remains a black box “understood by workers in terms of its inputs and outputs, without having a clue about its internal operations” (Cant, 2020, p. 83). Both health and socioeconomic risks arise for riders from these irresponsibilities.

A Grid to Analyse Irresponsibilities in OFD Ecosystems

Having identified the sources of irresponsibility in an OFD ecosystem, we propose the grid presented in Table 2 to address our research question:

What are the Sources of Irresponsibility in an OFD Ecosystem?

The grid also enables cross-referencing each irresponsibility source with a specific risk (health -H, socioeconomic -SE) faced by riders, as identified in the literature review.

In this paper, we seek to identify the irresponsibilities of OFD actors and focus on platform riders, which are invisible victims of platformisation (Paché, 2020b). These irresponsibilities arise when risks faced by riders increase (Aguilera *et al.*, 2018). Those risks relate to the nature of riders’ activity (riding in the city, carrying out orders, interacting with different actors) and to the conditions imposed by platforms through algorithms (Griesbach *et al.*, 2019). Besides *health risks* (illness, accidents...), the condition of being a self-contractor also involves *socioeconomic risks* such as job-insecurity (no long-term contracts), financial insecurity (daily earnings are not guaranteed), and isolation (not belonging to a company, being excluded from a formal

fellow community) (Qiao *et al.*, 2023). Despite caring public discourses, platforms lack care for actors at risk in their ecosystem (Gossart, Srnec, 2022; Srnec, Gossart, 2022).

Table 2 – Grid to identify sources of irresponsibility in OFD ecosystems and riders’ risks

Innovation phases Adoption factors	Preadoption (A)	Adoption (B)	Postadoption (C)
(1) Contextual factors	A1. (H, SE)	B1. (SE)	C1. (H, SE)
(2) Characteristics of: ... individuals (2.1)	A2.1. (SE)	B2.1. (SE)	C2.1. (SE)
... organisations (2.2)	A2.2. (H, SE)	B2.2. (H, SE)	C2.2. (H, SE)
(3) Characteristics of the innovation	A3. (H, SE)	B3. (H, SE)	C3. (H, SE)

Method and Data

Procedure of the Research

To answer our research question, we began with a literature review to identify sources of irresponsibility in an OFD ecosystem, which enabled us to produce an analytical grid (*cf.* Table 2). We then applied this grid using data about the French OFD ecosystem (*cf.* Table 3) following a procedure of analysis presented in an ad hoc section.

The French OFD Ecosystem

The market of OFD is growing (Kässi, Lehdonvirta, 2018) including in France, which attracts foreign firms. Incumbents are French subsidiaries of two Anglo-Saxon firms: Uber Eats has the largest number of users in the country (68%), followed by the British Deliveroo (42%) and the Dutch JUST EAT (30%),³ far ahead of the French startup Frichti (4%).⁴ The two leaders also had the highest number of app downloads in 2021 (5.4 M for Uber Eats, 3.1 M for Deliveroo).⁵ These platforms use app-workers (riders) carrying out a type of gig work boosted by the Covid 19 pandemic (Kalbus *et al.*, 2023; Reynolds, Kincaid, 2023), including in emerging countries like China (Wang *et al.*, 2022).

3. Statista (2022), Online Food Delivery Bookings by Brand in France in 2022.

4. Statista (2022), Total funding amount of food delivery startups headquartered in France as of May 2022.

5. Statista (2022), Number of downloads of leading food delivery and takeout apps in France in 2022.

In app-work, “*service-providing intermediary digital platform organisations (...) utilise workers to perform tasks locally (...) for customers who pay for these services, with the organisation retaining a percentage of the exchange*” (Duggan *et al.*, 2020, p. 118). In this case, “*work is to be completed locally at a specific location and time, by an assigned worker who is managed and subjected to minimum performance standards by a single intermediary digital platform*” (*ibid.*). The authors list four main parties involved in app-work: customers, workers, platform, and suppliers (p. 119).

Based on our empirical knowledge of the sector and the literature (Abdelnour, Méda, 2019; Aguilera *et al.*, 2018; Rème-Harnay, 2020), in Figure 1 we synthesize the French OFD ecosystem of actants (actors, organizations, resources) following the perspective of Latour (2007). Riders are a key element of the system, since they provide the final service (delivering food, for example) but also create data that adds value to the platform (information about the city’s traffic, speed, location, waiting time at the restaurant and at the customer’s place) (Basukie *et al.*, 2020). The large rectangle in the middle corresponds to an OFD platform, in which we highlighted two individual actors: IT and Marketing/management staff (top managers). Then come the three main actors interacting through the platform: two individual ones (consumers, riders) and one organisation (restaurants). The physical relationship between riders (*cf.* the arrows, explained in the legend), clients and restaurants is mediated by the app (Timko, van Melik, 2021). Actors and organizations on the margins of the circle can influence the functioning of the ecosystem in direct or indirect ways (Vercher-Chaptal *et al.*, 2021), but here we focus on the consequences of platforms’ decisions for riders’ well-being.

Data

We applied our grid on the French OFD ecosystem through four data collection phases. The cities of Paris, Lyon and Toulouse were chosen because of their size and the presence of social movements and unions defending riders, notably by organising events during which we could approach riders.

When our data was not rich enough to test the grid, since our questionnaire and interviews focused on the post-adoption phase, in the pre-adoption and adoption phases we sought secondary data to stimulate discussion (public reports, press articles...). Translation of verbatim from interviews carried out in French is ours.

Figure 1 - Representation of the French OFD ecosystem

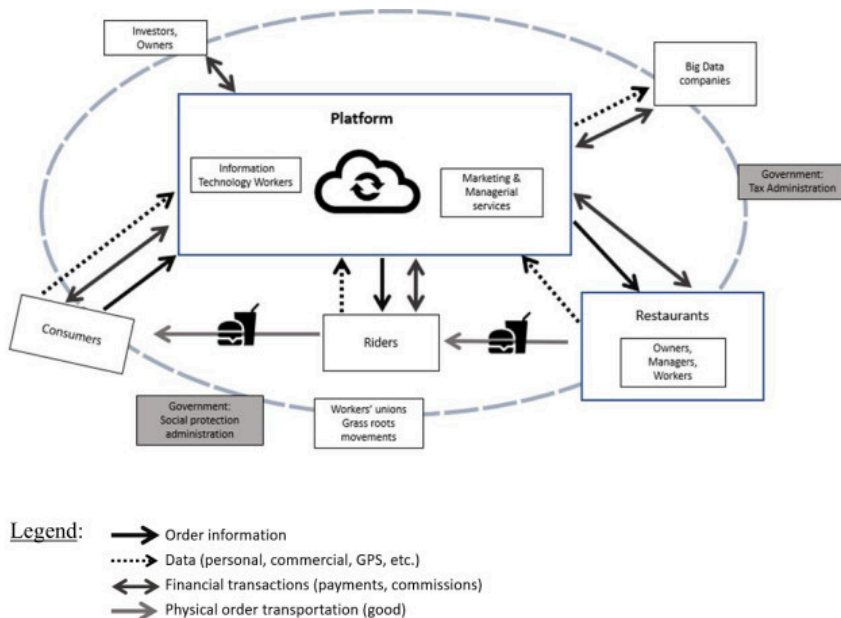


Table 3 - Data collection phases

Phase	Type of method	Data source	Data type	Objective
1. Exploratory	Ethnographic (qualitative, cf. Appendix 1)	Social media and field observations	First-hand data on riders and their representatives (online and on site)	Design questionnaire, define interview protocol, feedback
2. Questionnaire	Online questionnaire (quantitative, cf. Appendix 2)	Riders' anonymous responses	236 responses (incl. 17 former riders) to 27 questions in Qualtrics	Analyse the risks faced by riders, highlight factors causing them
3. Interviews	Interviews (qualitative, cf. Appendices 3, 4)	Social media and riders' meetings, riders' public demonstrations in 3 cities (Paris, Lyon, Toulouse)	18 semi-structured + 2 non-structured interviews + participant/non-participant observations	Interview different profiles (French citizens, migrants, trade unionists, students, older workers...)
4. Grey literature, press	Desk research	Internet	Original documents, newspapers, official records, social media publications	Enrich data sources

Procedure of Analysis

In this section, we explain how we obtained our results. Concerning our first result, the construction of the grid, we surveyed the literature on innovation and responsibility and structured it per innovation adoption phase and factor (*cf.* Table 2). In Business Source Complete, we used the following search terms: “food delivery platforms”, “gig work”, “Online Food Delivery”, and “On-Demand Food Delivery”. The search was then narrowed down selecting papers related to the social responsibilities of OFD platforms and snowballed using references from relevant papers.

Concerning our second result, the application of the grid to France, we collected data in four phases (*cf.* Table 3). We first started with an exploratory phase during which we carried out ethnographic research on social media, collecting qualitative first-hand data of riders and their representatives to design our survey and define our interview protocol (phase 1). Then in phase 2 we applied an anonymous online questionnaire to delivery riders using Qualtrics, including open text coded with NVivo. The questionnaire aimed to identify health and socioeconomic risks faced by riders, so the questions asked relied on prior reading in the literature, the press and a Facebook group of French riders (*cf.* Appendix 5). Phase 3 consisted in interviews and observations (interviewees were recruited at the end of the online survey and through opportunistic sampling combined with a snowball strategy). A thematic analysis of interview transcripts and answers to open survey questions was conducted, following a line-by-line method of coding carried out manually through NVivo (*cf.* coding book in Appendix 4). We then used the themes to select verbatims to apply the grid to our case. Data collection stopped when thematic saturation was achieved (Saunders *et al.*, 2018). Phase 4 consisted in desk-based research using original documents extracted from the Europresse database, newspapers and official records, as well as social media publications. We used a set of French keywords (riders, pandemic, accident, social protection...) and searched French social media using the accounts of activists, trade unions and riders (*e.g.* on Twitter: #riders, #UberEats...). We also collected articles cited in reports or mentioned in official documents and academic works.

Results

Having identified possible sources of irresponsibility in an OFD ecosystem, we now use our data to test the grid in France.

Preadoption Phase (A)

(A1) Contextual Factors

Our grid enables us to stress that incumbents' apps were designed in foreign countries having specific contexts, in order to be used anywhere in the same way. In the design phase, there was no concern for local institutional specificities such as the ones associated to the welfare state, despite platforms' caring discourses.⁶ In turn, our data suggest that the French legal system was not fit to deal with the arrival of platforms making use of grey areas in local labour laws: 32% of the riders that answered our questionnaire were not covered by Social security. Competitive pressures combined with a lack of protection increased health risks: *"There are accidents almost every day. (...) we should be paid more than minimum wage, because it's a job that's not easy, that's quite psychological, a lot of stress"* (Rider, 3-year experience, age group 3, 2021 interview).

(A2.1) Characteristics of Individuals

Our data did not enable us to study investors and top managers. But the consequences of their decisions have led authors to suggest that the responsibility to care for riders has been externalised on riders themselves, who *"must anticipate for every aspect of the job and take responsibility for any outcomes"* (Timko, van Melik, 2021, p. 513). This also applies to the French market.

(A2.2) Characteristics of Organisations

OFD incumbents are capitalistic platforms prioritising return on investment (ROI), which leads to design apps that put riders at greater risks. For example, *"by not paying for social protection for their employees, platforms [enjoyed] a competitive advantage over traditional production organisations that could be considered unfair"* (Montel, 2018, p. 22). Incumbents' strategy is a source of irresponsibility.

(A3) Characteristics of the Innovation

Our data did not enable us to study how platforms were designed, but do provide evidence of a lack of concern for riders' safety. It suggests practices of "irresponsibility-by-design", which impose huge stress on riders: *"we were being spied on more and more (...) you had to say where you were on the GPS (...). For the first few months sometimes I'd wake up in the middle of the night, I'd*

6. See e.g. <https://corporate.deliveroo.co.uk/about-us/sustainability>.

think I was hearing my [platform] ringtone” (Ex rider, 2-year experience, Age group 2, 2021 interview).

Moreover, in early innovation stages there were no means to factor riders’ opinions into the platform. Deliveroo did create a forum open to volunteer riders (who received a stipend) so that they share their ideas and experiences “*to improve the experience of riders all over France*”.⁷ But this was a mere ad-on implemented after the innovation adoption decision. An elected representative was very critical of the forum, which suggests that the app’s “*unfairness-by-design*” is a source of irresponsibility: “*it’s strictly pointless (...). They don’t give a damn about [us]*” (Rider, 3-year experience, age group 3, 2021 interview).

The lack of transparency of the app is also a source of irresponsibility, since it stresses riders who cannot understand how their income is calculated: “*there are too many uncertainties. Rain, for example, brings in orders, that’s classic; match days, important football matches, Valentine’s Day, that sort of thing*” (Ex rider, 3.5-year experience, age group 3, 2021 interview).

Adoption Decision Phase (B)

(B1) Contextual Factors

On the public policy side, witnessing platforms’ fast development, in 2015 the *Inspection Générale des affaires sociales* started analysing their impacts on labour and social protection (Amar, Viossat, 2018). But it was only in 2020 that a report to the Prime minister suggested to “*generalise the use by platform workers of a third party to employ them*” (Frouin, 2020, p. 4). When they decided to put their app on the French market, Uber Eats and Deliveroo knew that riders were not as protected as employees and took advantage of it. In France, “*the social responsibility of digital platforms was introduced by the law of 8 August 2016*” (Dirringer, 2018, p. 42), which put pressure on platforms. Shortly after, “*Uber and Deliveroo, for example, have started to develop social insurance for their platform workers*” (Amar, Viossat, 2018, p. 69). Therefore, a possible source of irresponsibility is that when making the adoption decision for the French market, platforms launched their innovations without anticipating their effects on riders. Their *fait accompli* strategies enabled them to maximise profit by making use of social protection loopholes.

(B2.1) Characteristics of Individuals

The literature suggests that strategies used by incumbents’ top managers when making the adoption decision are potential sources of irresponsibility,

7. See <https://deliverooforum.com/fr-fr>.

since they can increase riders' risks. We found evidence of that increase in France. For example, managers involved in the third Deliveroo Forum in 2021 claimed that they always sought to benefit riders by giving them new deliveries,⁸ whereas our data suggest that such schemes impacted riders negatively. Riders took very heavy deliveries while neither weight limits existed per order nor weight bonus:

“Sometimes they really exaggerate, they give us (...) a rucksack that weighs 20 kilos, 30 kilos, sometimes it's really enormous.

Q - Isn't there an extra charge for heavy stuff?

No, nothing at all, it's a serious abuse, because these are volumes that should be transported by cargo bike” (Ex full time rider, age group 3, 2.5-year experience, 2021 interview).

Incumbents' top managers also decided not to offer equipment when they put the app on the French market:

“They didn't provide us with the equipment, the bikes (...). That happened after a year, they started to provide equipment, big bags, but at the beginning it was really haphazard. I had to buy equipment to work with (...)” (Rider, age group 3, 3-year experience, 2021 interview).

(B2.2) Characteristics of Organisations

We found evidence that platforms exploited regulatory loopholes. For example, some offered a small “rain bonus”, but one rider complained he never got it. In his opinion, platforms showcase this bonus to “*push people out en masse so that they provide the service, because the more couriers, the faster the service will go. [A rider] provides the service and then they try to escape the bonus*” (Rider, 2-year experience, age group 2, 2021 interview). Another example shows that riders can be appointed “captains” and asked to lay off other riders, which can generate stress: “*When we became captains, they were no longer in charge of recruitment, we were, (...) they even gave us the responsibility of firing people too (...) after 6-8 months, I started cracking*” (Ex rider, 2-year experience, age group 2, 2021 interview). Profit-maximising strategies also generate health risks by triggering tensions: “*they fostered competition between us, which was really weird, using statistics, it was horrible, the pressure (...). So at the beginning we had a bit of friendly relationships and then very quickly things got a bit heated, and groups formed*” (Ex rider, 2-year experience, age group 2, 2021 interview).

8. See <https://deliverooforum.com/fr-fr/news/compte-rendu-du-forum-deliveroo-doctobre-2021>.

interview). Profit-maximising strategies externalising costs on riders without anticipating risks are sources of irresponsibility.

(B3) Characteristics of the Innovation

Governed by algorithmic management, riders cannot request more transparency about their earnings. Flexibility is part of incumbents' business model and is a source of irresponsibility that increases riders' health and socio-economic risks. A rider told us: *"We should have the right to express our opinion about this algorithm, the right to transparency, so that when it rains, the price per kilometre simply increases instead of adding a bonus of 1.50€ per order, which is sometimes not respected"* (Rider, 3-year experience, age group 2, 2021 interview). The source of irresponsibility lies in the business model of Uber Eats and Deliveroo, whose fees are paid per order delivered in time.

Postadoption Phase (C)

(C1) Contextual factors

Following years of *laissez-faire*, French public authorities started caring for riders (Gossart, 2021). For example, they imposed a social dialogue with the law of 21 April 2021 (*ibid.*), which led to the election of platform and riders' representatives. On 20 April 2023, the latter agreed on a 11,75€ minimum hourly wage (20% of riders were earning less than that) (Daboval, 2023). As evidenced by data obtained from our questionnaire, many riders were not covered by Social security (32%). And among riders that used to be inactive, only 46% knew that they were covered by it, which suggests that many of the remaining 54% may not have had a legal working status in France. A lack of generalised protection harms the most vulnerable riders: only 46% of formerly unemployed riders were covered by Social security, compared to 90% of formerly active ones. Economically vulnerable riders can also take more risks to maintain earnings: *"I didn't realise I had a fracture, so I continued to work. There are many delivery drivers (...) who keep working with fractures because they cannot afford to stop, or because they do not have the social security cover to be able to stop and get treatment"* (Rider, age group 3, 3-year experience, 2021 interview). Our data also suggest that the social protection of vulnerable riders is transferred to their families, when they have one (Gossart, Srnc, 2022). 147 riders responded to our question concerning supplementary health insurance via a mutual, only 60% had one and 88 explained how they could access it: mainly through a family member (33% of them). Besides, law suits taken up by riders against platforms with the support of riders' movements (Aizicovici, Songne, 2019) suggest that incumbents do not address riders'

risks. The application of our grid to the French OFD ecosystem reveals a lack of public and private social protection for riders, which is a source of irresponsibility that increases riders' health and socioeconomic risks.

(C2.1) Characteristics of Individuals

Concerning riders, in our sample most people were working full-time (> 20 h./week) and delivering food using a bicycle (66%). For most of them, monthly income was lower than minimum wage (1220 € in 2020), and 56% were earning less than that despite working more than 21 h./week, excluding the hours waiting for orders, which suggests that delivery fees are too low to make a living. Only 15% of full-time riders were earning more than 2000 €/month. Many riders are full-timers rather than part-timers and could be considered employees. But most riders are not satisfied with their income, especially formerly unemployed ones who tend to work longer hours than others. The main source of irresponsibility evidenced by our grid lies in incumbents' business model, designed by top managers under the pressure of investors, that generates working poor.

(C2.2) Characteristics of Organisations

The main source of irresponsibility here concerns the lack of equipment (Interview n°3). A discourse *vs* practice gap is another source of irresponsibility. For example, during the Covid pandemic platforms enforced a "no contact protocol" that was poorly enforced: *"The restaurant owner is the one who is supposed to set up a click and collect system, where we are supposed to be one meter away from each other. That never happens"* (Rider, age group 2, 6-month experience, 2021 interview). A second illustration of this gap relates to complementary insurances platforms can offer. When asked if he reported his illnesses or accidents to the platform, a rider responded: *"No, I didn't, there's no point (...) the complementary insurance contracts taken by the platforms are (...) extremely low-cost"* (Rider, age group 3, 3-year experience, 2021 interview). Restaurants are also sources of irresponsibility: *"you know from experience that a particular restaurant has a policy of making the rider wait (...). A novice rider doesn't have enough experience to know which restaurants are acceptable and which are not, and an experienced one knows he needs a blacklist"* (Rider, age group 3, 3-year experience, 2021 interview).

(C3) Characteristics of the Innovation

Irresponsibilities also arise when the app is being used. We found evidence that platforms sanctioned riders not respecting delivery routes defined by their algorithm, because they preferred safer (albeit longer) routes. Platforms'

closed governance is another source of irresponsibility, since it generates a lot of stress at all hierarchical levels and increases riders' health risks:

“someone calls me (...) and they say ‘you’ve been in the same place for 5 minutes, what are you doing?’. (...) ‘I’m replacing my wheel: I’ve got a 10-minute break then I’ll resume my delivery’, and in the meantime they’ve called me again 3-4 times (...) so the pressure is on. I’ve had an accident too, it was horrible, they don’t give a damn about the traffic: they put the estimate on the GPS, if it says 15 minutes, you have to do 15 minutes, 17 max” (Ex Rider, 2-year experience, age group 2, 2021 interview).

Discussion

This paper makes two contributions to the literature: a grid to analyse sources of irresponsibility in an OFD ecosystem; and the application of that grid in France. We focus on the adoption of a specific type of digital innovations (OFD platforms' apps), and take that irresponsibilities arise when risks facing platform riders increase.

The first benefit of the grid is to enable the identification of irresponsibilities in an OFD ecosystem. In particular, it has enabled us to bring out six key elements in relation to the literature on innovation and responsibility. First, when the latter tend to focus on responsible innovation criteria, dynamics and methods (Stilgoe *et al.*, 2013; Ahuja *et al.*, 2023; Zhu *et al.*, 2023), this paper analyses sources of irresponsibility caused by innovations. Second, when the literature stresses the role of policies (Ribeiro *et al.*, 2017) and organisational practices (Koops, 2015; von Schomberg, 2019), our approach encompasses the whole innovation ecosystem. Third, irresponsibility is also distributed across innovation adoption phases, whereas the literature focuses on preadoption (Pacífico Silva *et al.*, 2018; Timmermans, 2019). Fourth, if scholars identified various innovation adoption factors (Damanpour, Schneider, 2006), sources of irresponsibility associated to these factors have not been examined. Fifth, the literature analyses risks faced by OFD riders (Zheng *et al.*, 2023; Kaine, Josseland, 2019), but does not relate them to innovation adoption phases and factors. Sixth, responsibility and innovation have seldom been discussed in the case of digital platforms and OFD apps (Zhu *et al.*, 2023).

The second benefit of the grid is its application to the French OFD ecosystem. We found value in distinguishing different innovation adoption phases, notably to identify upstream sources of irresponsibility and formulate

managerial recommendations. For example, riders' risk could be reduced by anticipating algorithms' negative impacts at the design phase.

In the preadoption phase, the literature suggests that the lack of adaptation of the legal context to a fast-evolving sector, notably regarding social protection, can be a source of irresponsibility. Our grid enables us to confirm that source of "institutional irresponsibilities" in France. For example, our results reveal significant differences between professional statuses, since riders who used to be unemployed were more likely to have an accident or fall ill, possibly for working longer hours. We could not find evidence of irresponsibilities caused by individuals, but we did in the case of incumbent organisations and innovations, for which "carelessness-by-design" is a common practice (focus on ROI, little concern for riders' safety and opinion, lack of transparency...).

In the adoption decision phase, the literature points out numerous unsuccessful self-regulations by incumbents, as well as pressures exerted by the financial context. In the French case, our evidence confirms the source of irresponsibility at national public level because the lack of generalised social protection harms riders. In such a context, as "institutional chameleons", incumbents exploit loopholes in labour law to maximise profits (Abdelnour, Bernard, 2018). But our results also point a major source of irresponsibility with "careless strategizing" (no anticipation of the risks for riders of the decision to adopt the app on the French market). Our findings confirm that workers' flexibility is part of incumbents' business model, which focuses on short-term profit and exploits inequalities to reduce prices and rely "*on the availability of an abundance of cheap labor and a permissive regulatory environment*" (Scholz, 2017, p. 44). For example, "*Uber Eats fosters discount competition by offering all kinds of discounts such as the 'buy 1 get 1 free' scheme*", which creates unfair competition (Coudurier, 2021). If these careless strategies originate from the headquarters abroad, French top managers, with their knowledge of the local context, could have required a modification, but their values may not have compelled them to do so. Such strategizing leads to transfer the management of health and socioeconomic risks to riders themselves or to public authorities. To overcome that source of irresponsibility, new business models could be adopted such as sufficiency ones (Bocken, Short, 2016), as in the case of cooperative platforms (e.g. CoopCycle). This would help "*reducing job demands of riders to prevent job strain and increase road safety compliance*" (Nguyen-Phuoc et al., 2022, p. 552).

In the postadoption phase, the grid did not enable us to shed light on values embedded in apps. Also, it did not cover the aspect of riders' physical protection. But it did enable us to highlight "institutional irresponsibilities" caused by the lack of social protection for workers, not compensated by

proper insurances offered by incumbents. Others sources of irresponsibility that our grid enabled us to identify rest with OFD customers, restaurants, top managers designing and implementing strategies generating claims *vs* practices gap and enforcing closed platform governance. At the level of consumers, sources of irresponsibility are concentrated in postadoption. For all these actors, a lack of anticipation of the consequences of consumption preferences on riders leads to irresponsibility, stressing that the first RI criterion of Stilgoe *et al.* (2013) is essential to promote responsible innovation ecosystems.

But the application of our grid has also stressed limitations and possibilities of improvement. Indeed, the difficulty to account for contextual factors (1) or designers' values (3) questions the relevance of using adoption factors in the grid. Instead, an improved grid (*cf.* Table 4) could replace these factors with the type of risks generated in each phase by some key actors, including nonhuman ones such as algorithms. Using our results, for each riders' risk (§) exemplified in Table 4, a source of irresponsibility (#) can be highlighted and used to formulate recommendations.

Table 4 - Improved grid to identify sources of irresponsibility in OFD ecosystems according to the risks of each phase of innovation

Innovation phase Risk type	Preadoption (A)	Adoption (B)	Postadoption (C)
(1) Health	§ Lack of social protection: # No concern for local welfare policies	§ Stress due to pay-by-delivery fee: # Business model	§ Traffic accidents: # Lack of protective gear
(2) Socioeconomic	§ Platforms save money on social protection that is lacking: # Prioritise ROI	§ No weight bonus on heavy deliveries: # Prioritise short term profits	§ Little earnings despite full time job: # Business model

Conclusion

This paper has made both theoretical and empirical contributions. Our theoretical contribution takes the form of a grid to identify sources of irresponsibility in an OFD ecosystem. Our empirical contribution, the application of that grid to the French OFD ecosystem, has enabled us to formulate managerial recommendations. They are addressed to policy makers seeking to address irresponsibilities in OFD ecosystems, and to actors of these ecosystems who can use the grid to reflect upon their behaviour in the face of highlighted risks.

For the preadoption phase, public policies could target the weakest workers and support alternative platforms such as cooperatives (Sobczak, 2021). As for app designers, they could practise value sensitive design (de Reuver *et al.*, 2020), or even life-centred design that provides “*a more holistic perspective by decentring humans*” (Borthwick *et al.*, 2022, p. 1). For the adoption decision phase, an essential recommendation consists in changing incumbents’ business models focused on economic value extraction. Other platforms chose a different path (Vercher-Chaptal *et al.*, 2021) relying on sufficiency business models (Bocken, Short, 2016). Finally, for the postadoption phase, changes in consumer habits could be supported by “*certification schemes that are able to carefully distinguish between platforms that offer workers a fair deal and those that do not*” (Graham, Woodcock, 2018, p. 249).

Among the limitations to this research, we can point the focus on riders and the fact that we studied only one case study country. We lacked data on actors in early phases, for example regarding values and biases embedded in the technology, in-depth case studies could be carried out on those aspects as Ribeiro and Shapira (2019) did in the case of menthol biotech.

Regarding other future research, sources of irresponsibility could be investigated in other technological ecosystems, in collaboration with ethicists to develop an “*ethics of ecosystems*” (Stahl, 2023, p. 5). The state could play an important role in the regulation of the adoption and impact of innovation on riders’ well-being. Future research should pay attention to ongoing experiences in France (with the adoption of negotiations organised by the Labour Ministry) and the upcoming EU platform workers Directive. Our first and second grids could also be tested in different contexts to evaluate their respective contextual fit, including regarding the latter Directive. Last but not least, riders are not only victims but also actors of change. Riders’ practices to cope with algorithmic management such as community organizing (Timko, van Melik, 2021), adaptation strategies (Tuomi *et al.*, 2022), rebellion (Fernández, Barreiro, 2020; Ferrari, Graham, 2021), and reverse engineering (van Doorn, 2020) should be further investigated.

REFERENCES

- ABDELNOUR, S., MEDA, D. (2019), *Les nouveaux travailleurs des applis*, Paris, PUF.
- ADDE, J.-C. (2023), Accident mortel d’un livreur à vélo : La CGT dénonce les méthodes des plateformes de livraison, *France Info*, April 11, <https://france3-regions.francetvinfo.fr/auvergne-rhone-alpes/rhone/lyon/accident-mortel-d-un-livreur-a-velo-la-cgt-denonce-les-methodes-des-plateformes-de-livraison-2751222.html>.

- AGUILERA, A., DABLANC, L., RALLET, A. (2018), L'envers et l'endroit des plateformes de livraison instantanée. Enquête sur les livreurs micro-entrepreneurs à Paris, *Réseaux*, 212(6), 23-49.
- AHUJA, S., CHAN, Y., KRISHNAMURTHY, R. (2023), Responsible Innovation with Digital Platforms: Cases in India and Canada, *Information Systems Journal*, 33(1), 76-129.
- AIZICOVICI, F., SONGNE, M. (2019), 'Parfois 2 euros pour une course, c'est quoi ça ?' Grève des livreurs de Deliveroo à Paris, *Le Monde*, August 8, https://www.lemonde.fr/economie/article/2019/08/08/greve-au-menu-chez-les-livreurs-de-deliveroo_5497661_3234.html.
- ALTENRIED, M. (2021), Mobile Workers, Contingent Labour: Migration, the Gig Economy and the Multiplication of Labour, *Environment and Planning A: Economy and Space*, 0308518X211054846.
- ALVAREZ-PALAU, E., CALVET-LIÑÁN, L., VIU-ROIG, M., GANDOUZ, M., JUAN, A. (2022), Economic Profitability of Last-mile Food Delivery Services: Lessons from Barcelona, *Research in Transportation Business & Management*, 45, 100659.
- AMAR, N., VIOSSAT, L.-C. (2018), L'impact des plateformes collaboratives sur l'emploi et la protection sociale : quelques perspectives, *Revue française des affaires sociales*, 2, 68-81.
- BALDWIN, C., WOODARD, C. (2009), The Architecture of Platforms: A Unified View, in Gawer, A. (ed.), *Platforms, Markets and Innovation*, Cheltenham, Edward Elgar, 19-44.
- BASUKIE, J., WANG, Y., LI, S. (2020), Big Data Governance and Algorithmic Management in Sharing Economy Platforms: A Case of Ridesharing in Emerging Markets, *Technological Forecasting and Social Change*, 161, 120310.
- BECK, U. (2000), Risk Society Revisited: Theory, Politics and Research, in Adam, B., Beck, U., Van Loon, J. (eds), *The Risk Society and Beyond: Critical Issues for Social Theory*, Routledge, 211-230.
- BEJEAN, M., BENAVENT, C., DE PECHPEYROU, P. (2022), Ouvrir la boîte noire des plateformes : structures, acteurs, opérations, *Innovations*, 69, 5-14.
- BOCKEN, N., SHORT, S. (2016), Towards a Sufficiency-driven Business Model: Experiences and Opportunities, *Environmental Innovation and Societal Transitions*, 18, 41-61.
- BORTHWICK, M., TOMITSCH, M., GAUGHWIN, M. (2022), From Human-centred to Life-centred Design: Considering Environmental and Ethical Concerns in the Design of Interactive Products, *Journal of Responsible Technology*, 10, 100032.
- BUREAU INTERNATIONAL DU TRAVAIL (2019), *Les plateformes de travail numérique et l'avenir du travail : Pour un travail décent dans le monde en ligne*, Rapport à l'OIT, 164p.
- CAMPBELL, I. (2022), Platform Work and Precariousness: Low Earnings and Limited Control of Work, in De Stefano, V., Durri, I., Stylogiannis, C., Wouters, M. (eds), *A Research Agenda for the Gig Economy and Society*, Cheltenham, Edward Elgar, 113-132.
- CANT, C. (2020), *Riding for Deliveroo: Resistance in the New Economy*, Cambridge, Polity Press.

- CHEN, J., LUO, J., HU, W., MA, J. (2023), Fit into Work! From Formalizing Governance of Gig Platform Ecosystems to Help Gig Workers Craft their Platform Work, *Decision Support Systems*, 114016.
- CHEN, J., WANG, L., WANG, S., WANG, X., REN, H. (2022), An Effective Matching Algorithm with Adaptive Tie-Breaking Strategy for Online Food Delivery Problem, *Complex & Intelligent Systems*, 8, 107-128.
- CHRISTIE, N., WARD, H. (2023), Delivering Hot Food on Motorcycles: A Mixed Method Study of the Impact of Business Model on Rider Behaviour and Safety, *Safety Science*, 158, 105991.
- COUDURIER, P. (2021), Algorithmes obscurs, commissions gourmandes : les restaurateurs dépendants des plateformes de livraison, *Marianne*, February 2, <https://www.marianne.net/economie/entreprises/algorithmes-obscurs-commissions-gourmandes-les-restaurateurs-dependants-des-plateformes-de-livraison>.
- CRAYNE, M. P., BRAWLEY NEWLIN, A. M. (2023), Driven to Succeed, or to Leave? The Variable Impact of Self-leadership in Rideshare Gig Work, *The International Journal of Human Resource Management*, 1-23.
- CRIDDLE, C., MURGIA, M. (2023), Big Tech Companies Cut AI Ethics Staff, Raising Safety Concerns, *Financial Times*, March 28, <https://www.ft.com/content/26372287-6fb3-457b-9e9c-f722027f36b3>.
- DABOVAL, A. (2023), French Food Delivery Workers to Get Minimum Wage, *RFI France*, April 21, <https://www.rfi.fr/en/france/20230421-french-food-delivery-workers-to-get-minimum-wage>.
- DAMANPOUR, F., SCHNEIDER, M. (2006), Phases of the Adoption of Innovation in Organizations: Effects of Environment, Organization and Top Managers, *British Journal of Management*, 17, 215-236.
- DE REUVER, M., VAN WYNSBERGHE, A., JANSSEN, M., VAN DE POEL, I. (2020), Digital Platforms and Responsible Innovation: Expanding Value Sensitive Design to Overcome Ontological Uncertainty, *Ethics and Information Technology*, 22, 257-267.
- DE STEFANO, V., DURRI, I., STYLOGIANNIS, C., WOUTERS, M. (2022), Introduction, in De Stefano, V., Durri, I., Stylogiannis, C., Wouters, M. (eds), *A Research Agenda for the Gig Economy and Society*, Cheltenham, Edward Elgar, 1-12.
- DIRRINGER, J. (2018), L'avenir du droit de la protection sociale dans un monde ubérisé, *Revue française des affaires sociales*, 2, 33-50.
- DUGGAN, J., SHERMAN, U., CARBERY, R., MCDONNELL, A. (2020), Algorithmic Management and App-work in the Gig Economy: A Research Agenda for Employment Relations and HRM, *Human Resource Management Journal*, 30(1), 114-132.
- DUHAIME, E., WOESSNER, Z. (2019), Explaining the Decline of Tipping Norms in the Gig Economy, *Journal of Managerial Psychology*, 34(4), 233-245.
- ECKER, Y., STRÜVER, A. (2022), Towards Alternative Platform Futures in Post-pandemic Cities? A Case Study on Platformization and Changing Socio-spatial Relations in On-demand Food Delivery, *Digital Geography and Society*, 3, 100032.
- FELDMAN, P., FRAZELLE, A., SWINNEY, R. (2023), Managing Relationships Between Restaurants and Food Delivery Platforms: Conflict, Contracts, and Coordination, *Management Science*, 69(2), 812-823.

- FERNÁNDEZ, A., BARREIRO, M. (2020), The Algorithms is not My Boss Anymore: Technological Appropriation and (New) Media Strategies in *Riders x Derechos* and *Mensakas*, *Contracampo – Brazilian Journal of Communication*, 39(1), 65-83.
- FERRARI, F., GRAHAM, M. (2021), Fissures in Algorithmic Power: Platforms, Code, and Contestation, *Cultural Studies*, 35(4-5), 814-832.
- FRIEDMAN, B., NISSENBAUM, H. (1996), Bias in Computer Systems, *ACM Transactions on Information Systems (TOIS)*, 14(3), 330-347.
- FROUIN, J.-Y. (2020), *Réguler les plateformes numériques de travail*, Rapport au Premier Ministre, 156p.
- FUCHS, C., SANDOVAL, M. (2014), Digital Workers of the World Unite! A Framework for Critically Theorising and Analysing Digital Labour, *TripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society*, 12(2), 486-563.
- GEORGET, V., BARLATIER, P.-J., PENIN, J., RAYNA, T. (2023), Les enjeux économiques, politiques et managériaux de l'innovation responsable, *Innovations*, 72, 5-33.
- GOSSART, C. (2021), La tyrannie d'algorithmes ayant pignon sur rue, *Terminal, Technologie de l'information, culture & société*, 130.
- GOSSART, C., SRNEC, C. (2022), Young, Poor and Vulnerable: Delivery Riders in France are Demanding Better Wages and Social Protection, *The Conversation*, <https://theconversation.com/young-poor-and-vulnerable-delivery-riders-in-france-are-demanding-better-wages-and-social-protection-169863>.
- GRAHAM, M., WOODCOCK, J. (2018), Towards a Fairer Platform Economy: Introducing the Fairwork Foundation, *Alternate Routes*, 29, 242-253.
- GRIESBACH, K., REICH, A., ELLIOTT-NEGRI, L., MILKMAN, R. (2019), Algorithmic Control in Platform Food Delivery Work, *Socius*, 5, 2378023119870041.
- HANRAHAN, B., MA, N., YUAN, C. (2018), The Roots of Bias on Uber, *Proceedings of 15th European Conference on Computer-Supported Cooperative Work*, August 28-September 1st, Sheffield.
- HEILAND, H. (2022), Black Box Power: Zones of Uncertainty in Algorithmic Management, in Armano, E., Briziarelli, M., Risi, E. (eds), *Digital Platforms and Algorithmic Subjectivities*, University of Westminster Press, 75-86.
- HOWSON, K., KATTA, S., USTEK-SPILDA, F., GRAHAM, M. (2020), Uber and Deliveroo's 'Charter of Good Work' is Nothing but Fairwashing, *Fairwork Post*, February 3rd, <https://fair.work/en/fw/blog/uber-and-deliveroos-charter-of-good-work-is-nothing-but-fairwashing>.
- HUANG, H. (2022), Riders on the Storm: Amplified Platform Precarity and the Impact of COVID-19 on Online Food-delivery Drivers in China, *Journal of Contemporary China*, 31(135), 351-365.
- KAINE, S., JOSSERAND, E. (2019), The Organisation and Experience of Work in the Gig Economy, *Journal of Industrial Relations*, 61(4), 479-501.
- KALBUS, A., BALLATORE, A., CORNELSEN, L., GREENER, R., CUMMINS, S. (2023), Associations Between Area Deprivation and Changes in the Digital Food Environment During the Covid-19 Pandemic, *Health & Place*, 80, 102976.

- KÄSSI, O., LEHDONVIRTA, V. (2018), Online Labour Index: Measuring the Online Gig Economy for Policy and Research, *Technological Forecasting and Social Change*, 137, 241-248.
- KOOPS, B.-J. (2015), The Concepts, Approaches, and Applications of Responsible Innovation, in Koops, B.-J., Oosterlaken, I., Romijn, H., Swierstra, T., van den Hoven, J. (eds), *Responsible Innovation 2*, Springer, 1-15.
- LATOUR, B. (2007), *Reassembling the Social: An Introduction to Actor-Network-Theory*, Oxford, Oxford University Press.
- LE MONDE (2022), Deliveroo, reconnue coupable de travail dissimulé, condamnée à verser 9,7 millions d'euros à l'Urssaf, September 2, https://www.lemonde.fr/societe/article/2022/09/02/la-plate-forme-deliveroo-reconnue-coupable-de-travail-dissimule-condamnee-a-verser-9-7-millions-d-euros-a-l-urssaf_6140005_3224.html.
- LIU, Z., MA, L., HUANG, T., TANG, H. (2020), Collaborative Governance for Responsible Innovation in the Context of Sharing Economy: Studies on the Shared Bicycle Sector in China, *Journal of Open Innovation: Technology, Market, and Complexity*, 6(2), 35.
- MELIÁN-GONZÁLEZ, S. (2022), Gig Economy Delivery Services Versus Professional Service companies: Consumers' Perceptions of Food-delivery Services, *Technology in Society*, 69, 101969.
- MITCHELL, T. (2020), Uber Eats : comment le capitalisme dévore l'avenir, *Revue du Crieur*, 15, 76-87.
- MONTEL, O. (2018), Économie collaborative et protection sociale : mieux cibler les plateformes au cœur des enjeux, *Revue française des affaires sociales*, (2), 15-31.
- PACHÉ, G. (2020a), Inside Delivery Platforms: The Covid-19 Pandemic and After, *Journal of Supply Chain Management: Research and Practice*, 14(2), 1-9.
- PACHÉ, G. (2020b), Regard de l'expert. Les gig workers des plateformes de livraison, victimes invisibles de la crise du coronavirus, *Revue Management & Innovation*, 20(2), 161-169.
- PACIFICO SILVA, H., LEHOUX, P., MILLER, F., DENIS, J. L. (2018), Introducing Responsible Innovation in Health: A Policy-Oriented Framework, *Health Research Policy and Systems*, 16, 1-13.
- POPAN, C., ANAYA-BOIG, E. (2022), The Precarious Work of Platform Cycle Delivery Workers, in Norcliffe, G., Brogan, U., Cox, P., Gao, B., et al. (eds), *Routledge Companion to Cycling*, Routledge, 33-41.
- QIAO, S., HUANG, G., YEH, A. (2023), Who are the Gig Workers? Evidence from Mapping the Residential Locations of Ride-hailing Drivers by a Big Data Approach, *Cities*, 132, 104112.
- NGUYEN-PHUOC, D. Q., NGUYEN, N. A. N., NGUYEN, M. H., NGUYEN, L. N. T., OVIEDO-TRESPALACIOS, O. (2022), Factors Influencing Road Safety Compliance Among Food Delivery Riders, *Transportation Research Part A: Policy and Practice*, 166, 541-556.
- NGUYEN-PHUOC, D. Q., NGUYEN, L. N. T., SU, D. N., NGUYEN, M. H., OVIEDO-TRESPALACIOS, O. (2023), Deadly Meals: The Influence of Personal and Job Factors on Burnout and Risky Riding Behaviours of Food Delivery Motorcyclists, *Safety Science*, 159, 106007.

- RAVENELLE, A., KOWALSKI, K., JANKO, E. (2021), The Side Hustle Safety Net: Precarious Workers and Gig Work during COVID-19, *Sociological Perspectives*, 64(5), 898-919.
- REME-HARNAY, P. (2020), Comment les plateformes numériques accroissent la dépendance dans les relations de sous-traitance : le cas de la livraison à vélo, *Revue française de socio-économie*, 2(25), 175-198.
- REYNOLDS, J., KINCAID, R. (2023), Gig Work and the Pandemic: Looking for Good Pay from Bad Jobs During the COVID-19 Crisis, *Work and Occupations*, 50(1), 60-96.
- RIBEIRO, B., SMITH, R., MILLAR, K. (2017), A Mobilising Concept? Unpacking Academic Representations of Responsible Research and Innovation, *Science and Engineering Ethics*, 23(1), 81-103.
- RIBEIRO, B., SHAPIRA, P. (2019), Anticipating Governance Challenges in Synthetic Biology: Insights from Biosynthetic Menthol, *Technological Forecasting and Social Change*, 139, 311-320.
- ROBINSON, M. (2022), I've Been a Full-time Lyft Driver since 2017, *Fortune*, August 18, <https://fortune.com/2022/08/17/full-time-lyft-driver-flexibility-choice-act-underpaid-gig-work-pay-workers-rideshare-mike-robinson>.
- RONFAUT, L. (2016), Uber se lance dans la livraison de repas en France, *Le Figaro*, March 30, <https://www.lefigaro.fr/secteur/high-tech/2016/03/30/32001-20160330ARTFIG00054-uber-se-lance-dans-la-livraison-de-repas-en-france.php>.
- SADOWSKI, J. (2022), Lords of the Platform: Rentier Capitalism and the Platform Economy, in Ness, I. (ed.), *Platform Labour and Global Logistics: A Research Companion*, Routledge, 28-38.
- SAUNDERS, B., SIM, J., KINGSTONE, T., BAKER, S., WATERFIELD, J., BARTLAM, B., BURROUGHS, H., JINKS, C. (2018), Saturation in Qualitative Research: Exploring Its Conceptualization and Operationalization, *Quality & Quantity*, 52, 1893-1907.
- SCHOLZ, T. (2017), *Uberworked and Underpaid: How Workers are Disrupting the Digital Economy*, John Wiley & Sons.
- SCHREYER, J. (2021), Algorithmic Work Coordination and Workers' Voice in the Covid-19 Pandemic: The Case of Foodora/Lieferando, *Work Organisation, Labour & Globalisation*, 15, 69-84.
- SIMONI, M., WINKENBACH, M. (2023), Crowdsourced On-demand Food Delivery: An Order Batching and Assignment Algorithm, *Transportation Research Part C: Emerging Technologies*, 149, 104055.
- SOBCZAK, A. (2021), Transformer ou remplacer les plateformes numériques de livraison pour lutter contre les effets négatifs de l'ubérisation ?, *Revue de l'organisation responsable*, 16(3), 51-55.
- SRNEC, C., GOSSART, C. (2022), Precariousness of Digital Platform Workers, 2022 SASE Annual Conference, July 9-11, Amsterdam.
- SRNICEK, N. (2016), *Platform Capitalism*, Cambridge, Polity Press.
- STAHL, B. (2023), Embedding Responsibility in Intelligent Systems: From AI Ethics to Responsible AI Ecosystems, *Scientific Reports*, 13(1), 7586.
- STAHL, B., AKINTOYE, S., BITSCH, L., BRINGEDAL, B., EKE, D., FARISCO, M., GRASENICK, K., GUERRERO, M., KNIGHT, W., LEACH, T., NYHOLM, S.,

- OGOHO, G., ROSEMAN, A., SALLES, A., TRATTNIG, J., ULNICANE, I. (2021), From Responsible Research and Innovation to Responsibility by Design, *Journal of Responsible Innovation*, 8(2), 175-198.
- STILGOE, J., OWEN, R., MACNAGHTEN, P. (2013), Developing a Framework for Responsible Innovation, *Research Policy*, 42, 1568-1580.
- TIMKO, P., VAN MELIK, R. (2021), Being a Deliveroo Rider: Practices of Platform Labor in Nijmegen and Berlin, *Journal of Contemporary Ethnography*, 50(4), 497-523.
- TIMMERMANS, J. (2019), Responsible Research and Innovation, in Leal Filho, W., Azul, A.M., Brandli, L., Lange Salvia, A., Wall, T. (eds), *Decent Work and Economic Growth*, Springer, 847-858.
- TUOMI, A., JIANU, B., ROELOFSEN, M., ASCENÇÃO, M. (2023), Riding Against the Algorithm: Algorithmic Management in On-Demand Food Delivery, in Ferrer-Rosell, B., Massimo, D., Berezina, K. (eds), *Information and Communication Technologies in Tourism 2023*, Cham, Springer Nature Switzerland, 28-39.
- VALLAS, S., SCHOR, J. (2020), What Do Platforms Do? Understanding the Gig Economy, *Annual Review of Sociology*, 46, 273-294.
- VAN DOORN, N. (2020), At What Price? Labour Politics and Calculative Power Struggles in On-demand Food Delivery, *Work Organisation, Labour & Globalisation*, 14(1), 136-149.
- VERCHER-CHAPTAL, C., ACOSTA ALVARADO, A., AUFRERE, L., BRABET, J., BROCA, S., SMICHOVSKI, B. C., CORIAT, B., COMPAIN, G., EYNAUD, P., MAUREL, L., SRNEC, C., WANNER, P. (2021), There Are Platforms as AlternativeS, Rapport pour la DARES, 193p.
- VISSAT, L.-C. (2021), Mieux réguler Uber et les plateformes d'emploi, *Commentaire*, 173, 75-84.
- VON SCHOMBERG, R. (2019), Why Responsible Innovation?, in von Schomberg, R., Hankins, J. (eds), *International Handbook on Responsible Innovation: A Global Resource*, Edward Elgar, 12-32.
- WANG, X., ZHAO, F., TIAN, X., MIN, S., VON CRAMON-TAUBADEL, S., HUANG, J., FAN, S. (2022), How Online Food Delivery Platforms Contributed to the Resilience of the Urban Food System in China During the Covid-19 Pandemic, *Global Food Security*, 35, 100658.
- WANG, X., WANG, L., WANG, S., CHEN, J., WU, C. (2021), An XGBoost-enhanced Fast Constructive Algorithm for Food Delivery Route Planning Problem, *Computers & Industrial Engineering*, 152, 107029.
- WAREHAM, J., FOX, P., CANO GINER, J. (2014), Technology Ecosystem Governance, *Organization Science*, 25(4), 1195-1215.
- WARREN, T. (2021), Work-life Balance and Gig Work: 'Where Are We Now' and 'Where to Next' with the Work-life Balance Agenda?, *Journal of Industrial Relations*, 63(4), 522-545.
- ZHENG, J., WANG, L., WANG, L., WANG, S., CHEN, J. F., WANG, X. (2023), Solving Stochastic Online Food Delivery Problem via Iterated Greedy Algorithm with Decomposition-Based Strategy, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 53(2), 957-969.

ZHU, Z.-Y., XIE, H.-M., CHEN, L. (2023), ICT Industry Innovation: Knowledge Structure and Research Agenda, *Technological Forecasting and Social Change*, 189, 122361.

Appendix

Appendix 1 – Observation Days

Month, year	Days	City	Details
March, 2020	1	Paris	Field observation
February, 2021	3	Lyon	Field observation
February, 2021	2	Paris	Field observation
April, 2021	2	Paris	Field observation
May, 2021	2	Toulouse	Ethnographic non-direct interviews (2)
May, 2021	1	Lyon	Field observation

Appendix 2 – Details about the Sample of Questionnaire Respondents (Age groups per professional status before platform work, %)

Age group	Student	Unemployed	Worker	TOTAL
(1) 20 or less	25,4	5,4	1,9	12,0
(2) 21 to 30	73,1	62,5	50,0	62,9
(3) 31 to 40	1,5	25,0	34,6	18,9
(4) 41 or more	0,0	7,1	13,5	6,3
Total (%)	100	100	100	100
Number of riders	67	56	52	175

NB: We have 175 riders out of 236 who answered the questionnaire here, since 17 of them were not riders anymore when they answered, and 44 had other occupations. We only mentioned the 3 most important statuses.

Appendix 3 - Details about the Interviews

Interview number	Date	Duration (minutes)	Modality/Location	Number of pages
1	February 2021	25	Telephone	15
2	February 2021	42	Telephone	18
3	February 2021	57	Telephone	27
4	February 2021	50	Face-to-face (Île-de-France)	27
5	February 2021	42	Telephone	27
6	February 2021	83	Face-to-face (Auvergne-Rhône-Alpes)	43
7	February 2021	26	Telephone	13
8	February 2021	35	Telephone	19
9	February 2021	12	Telephone	7
10	February 2021	81	Telephone	39
11	February 2021	39	Telephone	20
12	March 2021	24	Telephone	10
13	March 2021	24	Telephone	13
14	March 2021	45	Telephone	25
15	April 2021	29	Telephone	15
16	April 2021	18	Telephone	9
17	April 2021	47	Telephone	20
18	April 2021	55	Telephone	24

Appendix 4 - Coding Book (translated from French)

1: choice of platform company, hiring	A: money
2: street traffic	B: delivery autonomy
3: rider platform communication	C: motivations
4: competition	D: career professional project
5: weather conditions	E: status
6: working conditions	
7: demand	
8: demand, to have orders	
9: denounce criticize the platform	
10: impacts on people, identity	
11: order management	
12: delivery management	
13: injustice	
14: work material	

15: profession
16: motivations
17: riders movement union
18: mutual health insurance
19: work organisation and communication via app
20: penalising couriers
21: pleasure sport
22: state policy regulation
23: job insecurity
24: welfare and insurance
25: social protection
26: restaurants
27: undocumented migrants
28: healthcare
29: social security
30: socialisation
31: subordination at work
32: support and accompaniment
33: time
34: work, having a job

Appendix 5 - Sample of Questions Asked in the Online Questionnaire (Data Collection Phase 2) (Translated from French)

- What led you to become a rider?
- What is/was your main status in relation to a delivery platform?
- Do you have another professional activity outside a delivery platform?
- What is your job status in relation to this other professional activity?
- Are you currently working with a delivery platform?
- How long have you been in business as a rider?
- How long do you think you will continue to work for delivery platforms?
- If you are not currently working for a delivery platform, how long have you worked for one or more delivery platforms?
- What were the main reasons that led you to leave the business as a rider?
- How many hours are you or were you connected to the delivery platform(s) per week on average?

- How many hours do you spend or have you spent on delivery per week on average?
- Do you work or have you worked for more than one platform at the same time?
- Please specify the total number
- How much do you generally earn per month from your work with platforms?
- Rate your level of satisfaction with your delivery work via digital platforms from 1 to 5.
- What is or was your main means of transport in this activity?
- Do you have access to public health insurance (Social security)?
- In addition to public health insurance (Social security): do you have access to supplementary health insurances (e.g. mutual)?
- Have you had one or more work-related accidents or illnesses in the course of your delivery activity via a platform?
- If so, how did the platform help you during the care and recovery period?
- Do you contribute financially to public pension and unemployment schemes?
- Do you have access to public unemployment benefits (now or recently during your time as a platform worker)?
- Have you ever received any compensation as a platform worker?
- If you would like to leave a comment about your experience as a rider, please do so here.