Market Fairness and Transparency: Examining Consumer Perceptions in Gig Economy Marketplaces

By

Andrew Chong

A dissertation submitted in partial satisfaction of the
requirements for the degree of
Doctor of Philosophy

in

Information Science

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Coye Cheshire, Chair
Professor Paul Duguid
Professor Peter Matthews
Professor Niloufar Salehi

Summer 2025

Abstract

Market Fairness and Transparency: Examining Consumer Perceptions in Gig Economy Marketplaces

By

Andrew Chong

Doctor of Philosophy in Information Science

University of California, Berkeley

Professor Coye Cheshire, Chair

Today consumers interact with markets in a wide variety of ways that are mediated by technology. We perform a wide variety of everyday activities - such as booking short trips, buying food delivery, and shopping for groceries - through marketplaces managed by large, for-profit technology companies. Consumers negotiate not only with other economic actors, but the presence of a large technology company, when performing such ordinary and mundane tasks. These markets connect different groups of economic actors, where for-profit companies decide marketplace architecture, information and the availability of choices.

Economic sociologist Koray Caliskan (2007) describes the prevalence of markets on our everyday lives: "A mysterious certainty dominates our lives in late capitalist modernity: the price. Not a single day passes without learning, making, and taking it. Yet despite prices' widespread presence around us, we do not know much about them" (p. 241). Hayek (1945) proposed that the "marvel" of markets and the price mechanism was its relative invisibility, that allowed the decentralized coordination of a wide series of actors without explicit control.

But today's technology-mediated marketplaces have assertively departed from this notion of markets as free-acting, intangible institutions, instead becoming managed environments that are to an extent visible and tangible as technical artifacts. These technology-mediated marketplaces have become in some ways more visible to consumers in the form of front-facing apps, as well as their association with the organizations that govern them, primarily by for-profit technology companies. In so doing, longstanding assumptions about how markets should function are put under scrutiny, forcing a re-engagement with basic assumptions of how fair markets should operate by users, citizens and regulators alike. This dissertation examines how such technological mediation has affected how consumers think about and use markets, particularly around issues of fairness.

I first examine consumer perceptions of fairness in two qualitative studies investigating marketplace practices which, particularly in their inception, have undergone a wide degree of scrutiny and controversy: 1) tipping in third-party food delivery and 2) surge pricing in ridesharing. I explore how consumers perceive fairness in engaging in these economic practices when using technology-mediated marketplaces. In 2019, DoorDash faced significant pushback

following a *The New York Times* report that drivers did not always receive all tips from customers, highlighting a gap between how consumers perceived the marketplace to function vs. its implementation in practice (Newman, 2019a). Similarly, Uber has faced a great deal of media scrutiny over its implementation of surge pricing since its introduction in 2011, with Uber first requiring users to accept an additional screen of higher surge prices, but subsequently concealing numeric multipliers to consumers, though they still operate in the background.

In the final project of this dissertation, I conduct an experiment to ask: How do transparency measures provided to consumers influence their use and willingness to pay for rideshare services? I conduct a vignette experiment to gauge whether consumers are more inclined to accept higher prices when they are set by a state transportation agency as opposed to a for-profit technology company. I additionally vary information provided to consumers of the percentage of fares they pay that go to drivers, to determine if they show a higher willingness to use ridesharing marketplaces if they perceive more income going directly to drivers.

Across these projects, I seek to push the boundaries of how we may think about the design of technology-mediated marketplaces and the institutions that govern them. In making decisions on marketplace design and architecture, technology companies often argue that these decisions are based on increasing efficiency or improving social welfare, despite having a clear financial incentive to prioritize profit. The chosen implementations of tipping and surge pricing by companies like DoorDash and Uber have attracted controversy through the years, but have to some extent abated. Technology companies have also learnt from public outcry or pushback, either by revising their policies, or choosing to obscure their processes, as Uber now does in not showing surge multipliers to consumers at all.

Describing a concept from the field of the history of technology, Jackson et al. (2014) describe a "process of 'stabilization' or 'closure' through which emergent technological artifacts and practices take on their more settled and durable forms" (p. 592). I argue that such a process is currently taking place in the design of technology-mediated marketplaces, where policies that may have attracted controversy initially have been engineered or reframed to avoid social censure or pushback.

Ultimately, the current instantiation of how technology-mediated markets are utilized in our society is not inevitable. Consumer perceptions of not only how markets function, but how technology-mediated markets function, and how these interact with one another, will be integral to the extent and success of their future use. This dissertation undertakes to better understand the full implications of technological mediation on how everyday consumers perceive and use markets, and how the fairness perceptions of consumers can ultimately affect the ability to use technology-mediated markets effectively in society.

I find that the technological mediation of markets has important implications on how consumers view fairness in markets. When consumers interact with markets in gig economy services, they often focus on their relationship with the company, viewing their interactions with individual gig workers or the market at large through the lens of their beliefs and expectations of technology companies. Around surge pricing specifically, I also find that increasing visibility and transparency about market processes can have an opposing effect, raising more questions for

consumers on how market prices are set, thus giving companies an incentive to obscure market processes.

In a blinded, randomized experiment, I also find that participants were both willing to pay significantly more, as well as use ridesharing services more frequently, when they are provided with information that 90% of fares go to drivers. This result suggests that there may be significant social costs associated with control of for-profit technology companies over ridesharing marketplaces, since ridesharing companies have little incentive to increase share of fares to drivers or provide fare distribution information. In my conclusion, I discuss these results in the context of the current antitrust and regulatory environment in the U.S. around technology-mediated marketplaces, and the need to explore alternative institutional arrangements to ensure and maximize the beneficial use of markets for society.

Table of Contents

Chapter 1: Introduction: Markets in the Digital Age

Markets exert so pervasive and ubiquitous an effect on our daily lives that we often take them for granted - as a fish does water. The growth of online marketplaces in areas like the gig economy and e-commerce has drawn renewed attention towards the function markets perform and how they interact with issues of fairness as we participate in them. Consumers increasingly find themselves participating in online marketplaces where for-profit companies set the terms of economic interaction. I refer to these as *technology-mediated market*s (TMMs): codified environments where third-party companies structure recurrent exchange between multiple buyers and sellers. In these highly managed environments, consumer norms, beliefs, and expectations about how markets should function can conflict with how they are designed in practice. Two tussles, around the implementation of tipping in third-party food delivery by DoorDash and surge pricing in ridesharing by Uber, show how conflicts can emerge when markets and market processes become codified and managed by for-profit companies.

The reality of these highly managed marketplaces is a stark contrast to the traditional dichotomy of organizing production through markets or hierarchies, first articulated by Coase (1937) and popularized by Williamson (1973). Extending Coase's (1937) argument of why large firms exist, Williamson's dichotomy presents firms as facing a choice of managing production through internal, hierarchical coordination, where managers supervise workers explicitly, or through transacting through external, decentralized markets. Williamson argues that when costs of transacting through a market are prohibitive, firms choose to conduct operations in-house, such as managing supply chains, shipping and customer support, helping explain the growth of conglomerates and large corporations. Yet today's technology-mediated markets straddle both these categories. Technology companies managing large marketplaces continue to grow, not by strict hierarchical management, but by managing decision-making environments that connect its customers, users, and other stakeholders.

This extension of control through the mediation of markets has been of concern to regulators, leading to reactions ranging from the introduction of the Digital Markets Act in the European Union in 2020, to the rise of what antitrust scholar Herbert Hovenkamp (2019) describes as the "neo-Brandeisian" movement in U.S. antitrust, commonly associated with former FTC Chair Lina Khan. Debates on whether platform control over marketplaces requires revisions to existing antitrust policy have been wide-ranging, covering issues such as the use of predatory pricing to gain market share, unfair preferences towards a marketplace firm's own products vs. other suppliers, as well as asymmetries of information that marketplace companies possess over its users (Hovenkamp, 2019; Khan, 2017; Shapiro, 2018). Khan (2017) in particular argues that the consumer welfare standard in U.S. antitrust needs to be revised to take into account new forms of power and anticompetitive conduct that large technology companies may employ to prevent efficient competition in markets.

Against this backdrop, my interest is more specific. My interest is in the psychology and perceptions of fairness of the everyday consumer. As consumers, we interact with the "market" at large on a daily basis, as Caliskan (2007) describes, to some extent as a fictive force, with commonplace social tropes such as "It's just demand and supply" or "It's what the market will

bear." As we increasingly interact with markets, not as an abstract force, but as technical artifacts managed by large for-profit technology companies, how does this change how we perceive markets and market processes? This dissertation explores and argues that such technological mediation complicates moral decision-making for consumers, affecting how they view markets, with long-term implications for the future use of technology-mediated markets in society.

Markets as a social technology

When we purchase an item from a store, or a service from a company, we often do not have much information on the underlying supply chain and steps used to produce it. This was viewed as a key benefit by Hayek (1945), who saw the information reduction performed by markets—to a single price—as a "marvel": one that effectively saved on computation and simplified the decision for the consumer, as: "Do I want to purchase this good or service for this price?"

On the flip side, the necessary information reduction that occurs when a good or service is produced can be problematic. Consumers do not know the conditions under which a good or service is produced. One category of what is missed out are characterized as externalities, both positive and negative, that are not captured by market price. We see many examples in poor working conditions, poor trade practice, a high carbon footprint, or pollution and other environmental costs (Arrow, 1970; Libecap, 2013).

The use of markets themselves has its own checkered and complicated history, not least in part due to their inherent association with market capitalism. Importantly, in this dissertation, I draw a distinction between the use of markets in narrower scopes to allocate goods among competing needs, such as in ridesharing or for a specific good, versus market capitalism at large, which can be understood as a broader system of socio-economic organization characterized by the private ownership of capital and driven by the profit motive. It is the latter that has been both championed by free market proponents and libertarians, and critiqued and sometimes characterized as global neoliberalism (Harvey, 2007).

This distinction between markets as what may be described as a procedural tool, vs. capitalism as a system of socio-economic organization, is fundamental, but can be overlooked in ongoing debates over the right use of markets. Both Schumpeter (1942/2013) and Rawls (2001) point to the fact that this narrower use of markets can serve an effective and welfare-enhancing purpose even in strictly socialist economies, where the state owns the means of production. As Rawls puts it, there is "no essential tie between the use of free markets and private ownership of the instruments of production" (p. 239, 2001). Indeed, the appeal of early liberalism was that a "rational" alternative for organizing economic production and enhancing social welfare could be found, modeled with simple mathematical equations that could prove that overall welfare could be increased if free exchange was allowed between individuals (Smith, 1776; Ricardo, 1819, Marshall; 1890).

The idea that social and economic relations could be "rationalized" was deeply appealing as a counterweight to the control of authoritarian or monarchial governments, and provided an international model of cooperation against the violence and volatility of conflicts between nation-states (Hayek, 1944, 1960; Keynes, 1944; Mill, 1859; A. Smith, 1776). Critiques of neoliberalism would argue that the ideological attractiveness and mathematical elegance of such

a “toy” or “island” economy, often taught in undergraduate economic classes today with the example of coconuts and widgets produced (Samuelson, 1947), caused proponents to extend it too far, with its own repercussions on global inequality and a destabilizing effect on socio-economic relations (Harvey, 2007; Polanyi, 1944).

The idea of markets as a social technology or tool, separate from its association with capitalism as a broader system of socio-economic organization, is hence well-established. One aspect that is often missing in the ongoing debates is the need to separate markets as a narrow social technology distinct from its association with global capitalism and the dominance of large technology companies in regulating its functions. In this dissertation, I am curious about how ordinary consumers perceive markets as a social technology in itself, though also attentive to how they may associate it with larger issues of inequality and capitalism at large.

Fairness in markets

Perceptions of fairness have always been integral to how we use markets, though their integration into economic models is more recent. Kahneman et al. (1986) criticize the notion of a strictly utility maximizing “homo economicus” or “economic man,” showing in a series of carefully designed scenarios that everyday consumers had widely differing perceptions of fairness for market processes that are typically modeled equivalently in economic theory. They point to how fairness perceptions differ significantly depending on their context - for example, participants are far more accepting of price increases due to reduced supply and increased costs, as opposed to higher demand. Similarly, decreases in wages are viewed unfavorably when due to increased unemployment (and supply of available workers), but judged acceptable if the company is making a loss. These values that consumers have in interacting with markets are not just theoretical but have real market consequences. Kahneman et al.’s work help explain the phenomenon of “sticky wages,” a widely observed phenomenon dating back to Keynes (Haley, 1990), where firms are reluctant to lower wages and instead choose to fire workers, leading to higher unemployment and limiting the efficacy of monetary policy.

Technological mediation adds an additional layer of complexity with how consumers perceive markets. Consumers have to contend not only with how they feel about the market and market processes itself, but also with the fact that these processes are controlled and managed by a for-profit third-party entity. As market interactions are managed digitally by technology companies, and market information and processes are themselves constructed and managed by firms, their implications on how consumers view and seek to use markets are unclear. Across industries dominated by economies of scale and network effects such as e-commerce, ridesharing and online delivery, consumers increasingly rely on technology companies to tell them what the market is, what market choices they can make, and what price they should pay.

Market design in TMMS

While the institutional context around TMMs is in flux, remarkably few constraints or regulatory mechanisms around TMMs operated by large technology companies exist, especially when compared to financial markets which have a far larger set of laws, rules and regulatory agencies to govern their operation. Suggestions by scholars to regulate marketplace services as public utilities (Khan, 2017) can seem far removed from the current regulatory climate. Meanwhile, technology companies like Uber have funded research (Cohen et al., 2016) to show how their

services deliver significant surpluses and efficiencies to different stakeholders, helping affirm and secure the role of technology companies in deciding market design and market processes.

This dissertation takes the stance that the current instantiation of technology-mediated markets is not inevitable. The most widespread TMMs function with pronounced information asymmetries between users and marketplace operators, with technology companies controlling much of the information and making unilateral decisions on how to design and operate marketplace environments. This has parallels to the history of the internet, where some have argued that the original ethos of the internet or cyberspace as a free, egalitarian space, has been displaced by the dominance of large technology companies who utilize online platforms and collected data as a means of control (Morozov, 2012; T. Wu, 2011; Zuboff, 2023). Gillespie (2010) draws attention to how the use of the term "platform" by social content companies, such as Youtube, can be used discursively to assert a sense of neutrality and obscure design choices that advance the companies' own interests.

Company experimentation

In 2011, Uber introduced the practice of surge pricing, which raised prices for riders in times where demand from riders exceeded the supply of drivers. Uber was criticized for price-gouging in the media, with prices costing up to 8.25 times as much during a snowstorm (Golding, 2013). Then Uber CEO Travis Kalanick sought to deflect criticism towards the company - arguing that surge pricing was a natural market process. He argued: "[Uber is] not setting the price. The market is setting the price. … We have algorithms to determine what that market is" (Wohlsen, 2013). Nevertheless, Uber has sought to minimize attention to surge pricing through the years. While consumers were formerly presented with an additional screen with the surge multiplier prominently displayed (etc. Prices are "7.75x" the normal rate), consumers today are only notified that "Fares are higher due to increased demand" (Figure 1.1). For Uber, it appeared that drawing attention to surge pricing had the effect of drawing undue attention to Uber's own role in managing market processes.

In 2019, DoorDash faced a similar conflict between user expectations and how their marketplace operated in practice. DoorDash faced sharp criticism following reports that tips consumers set in-app did not go entirely to drivers. DoorDash's "guaranteed minimum" policy at the time provided a top-up to drivers when drivers received a below-average tip for a delivery, but also reduced base pay to drivers when consumers tipped higher than the average. DoorDash argued that this policy was designed to provide greater wage stability for drivers, but users felt that DoorDash was using tips to subsidize its own payments to drivers. DoorDash subsequently revised its policy so that tips now go entirely to drivers.

The experience of codification for 1) surge pricing in ridesharing and 2) tipping in third-party food delivery respectively drew attention to previously less visible market processes. Raising prices during times of high demand and tipping are everyday practices, but their implementation in TMMs drew increased attention to these practices and the role TMMs companies play in managing market processes. These events also illustrate how users can carry over norms and expectations about how markets should function as they participate in technology-mediated marketplaces. Do consumers perceive fairness differently in TMMs, and why might they do so?

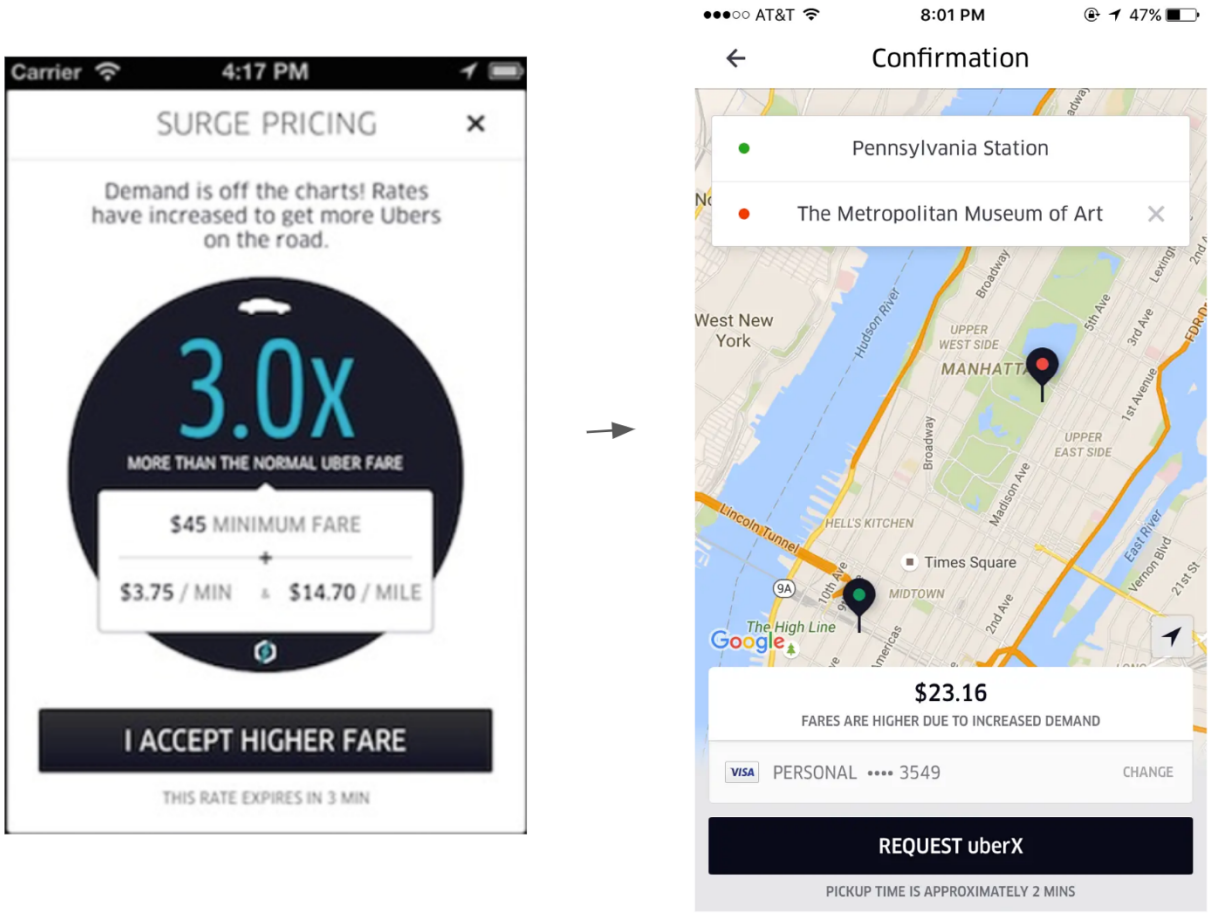

Figure 1.1. Evolution of Uber surge pricing interfaces (circa 2013 to present)

This dissertation examines how consumers view economic practices such as surge pricing and tipping when they occur in technology-mediated marketplaces. I explore how consumers perceive and interpret fairness when participating in TMMs, and what aspects of TMMs influence how consumers think about fairness. I adopt a mixed-methods approach. I conducted 2 qualitative studies examining consumer perceptions of fairness around these 2 economic practices: 1) tipping in third-party food delivery and 2) surge pricing in ridesharing. In addition, I conducted an online survey experiment to examine how providing different information to consumers about: 1) who sets surge prices and 2) how fares are distributed between drivers and ridesharing companies, influences their willingness to pay and how they perceive fairness.

The structure of the dissertation proceeds as follows. In Chapter 2, I lay out the contextual history and related literature for the projects in this dissertation. In Chapter 3 and 4 respectively, I discuss qualitative projects examining tipping in third-party food delivery and surge pricing in ridesharing respectively. In Chapter 5, I discuss the survey experiment. Finally, in Chapter 6, I provide a synthesis of findings across these three studies, and discuss them in the context of the current antitrust and regulatory environment in the United States. I argue for the need to explore

alternative institutional arrangements to dominance by incumbent technology companies over marketplace services to maximize the beneficial use of markets in society.

Chapter 2. Literature Review

Examining Marketplace Participants as Users

The operation of markets has classically been discussed in the abstract, from Smith's (1776) characterization of the market as an "invisible hand" to Hayek's (1945) consideration of markets as a decentralized mechanism for processing information. This notion of markets as a free-ranging, naturalistic process resulting in spontaneous order has been complicated by successive waves of scholarship across multiple disciplines. Scholars have pointed to the complex set of institutions required for markets to function, which North (1991) broadly defines as consisting of both "informal constraints (sanctions, taboos, customs, traditions and codes of conduct), and formal rules (constitutions, laws, property rights)" (p. 97). This work has emphasized how markets are socially-contingent and constructed environments, depending on a complex interplay of norms, beliefs and laws to function (Lampinen & Brown, 2017; Roth, 2018).

In the 1990s, economists were recruited for the first time to design and manage large-scale marketplaces, in areas such as the design of labor marketplaces for residencies for American doctors, and the design of FCC radio spectrum auctions. This work was integral in the burgeoning discipline of market design, which greatly expanded with the growth of the Internet, with economists employed to help manage large-scale online markets such as eBay and Google AdWords in the 1990s and 2000s. Roth (2002) reflects on this history, noting that "[a]s marketplaces proliferate on the web, a great deal of market design is going to be done by computer programmers" (p. 1343).

Within HCI, the primacy of code in shaping social and economic interaction has been extensively studied, with earlier work focusing on early virtual communities such as Usenet (Donath, 2002) and YouTube (Gillespie, 2010). Donath emphasizes how the information and affordances available for interaction are strictly defined by code, since such virtual environments are "wholly built" - where the "design of the environment" "control[s] their perception of the world" (2002, p. 62).

This dissertation draws from these multiple perspectives. I examine the marketplace participants as *users*, which involve interaction with a set of information and affordances defined by code, but also brings into focus broader beliefs and norms around markets and market processes as relevant to understanding how users interpret and use technology-mediated marketplaces.

The methodological perspective I take in this dissertation is aligned with what Harrison et al. (2007) characterize as a third "phenomenologically-situated" paradigm in HCI research. Harrison et al. describe this paradigm as considering interaction "not as analogous to information processing and transmission but as a form of meaning making in which the artifact and its context are mutually defining and subject to multiple interpretations" (p. 6). They describe this framework for examining interaction as seeking to "support situated action and meaning-making in specific contexts, and the questions that arise revolve around how to complement formalized, computational representations and actions with the rich, complex, and messy situations at hand around them" (p. 6). They summarize the "the three interlocking elements of the phenomenologically situated paradigm are a (1) focus on meaning and meaning creation, (2)

based on human experience, and (3) therefore represented through multiple perspectives, and the relationship amongst those perspectives" (p. 6).

A related literature and perspective is the sensemaking literature within and outside of HCI (Chen et al., 2022; Pirolli & Russell, 2011; Weick, 2008). Weick (2008) characterizes that the "basic idea of sensemaking is that reality is an ongoing accomplishment that emerges from efforts to create order and make retrospective sense of what occurs" (p. 635). As marketplace users participate in technology-mediated marketplaces, they form working beliefs of how TMMs operate that can influence how they interpret issues of fairness in technology-mediated marketplaces. As Martin et al. (2016) qualify in their analysis of Turkers on Amazon Mechanical Turk: "it does not matter whether this reasoning is correct or not, what is important is how the workers understand how the market plays out since such 'understandings' can motivate action" (p. 58). This perspective informs this dissertation as I examine how consumers seek to understand, learn, and form working beliefs - sometimes incorrect ones - of how TMMs function, and act on those beliefs and expectations.

Changing Views of Online Markets

With parallels to the history of the internet, the advent of online markets in the 1990s was often initially viewed with optimism. Online markets were viewed as having the potential to reduce or eliminate transaction costs and reduce information asymmetries. The advent of online marketplaces led to an explosion of work that theorized how online markets could lower transaction costs and mitigate information asymmetries by enhancing market thickness, offering reviews and ratings, as well as providing various guarantees (Mackie-Mason & Varian, Hal R., 1994; Pasquale, 2016).

A traditional concern in the market design literature centers on how market design can be used to overcome information asymmetries between buyers and sellers. Akerlof (1970) provides a classic example of why market failure can result in the used-car market due to information asymmetry between car buyers and sellers, where buyers do not know the quality of cars being sold. Within auction theory, market design is centered on how to design mechanisms and incentives to induce market participants to reveal valuable information about themselves, in particular their willingness to pay. These theories were taken and applied to active auctions, such as in the second-price auction in eBay and the modified VCG auction at use in Google Adwords (Varian, 2009).

More recent scholarship, however, has shifted beyond market design as a way to resolve asymmetries between buyers and sellers, towards an examination of conflicts of interests between the platform and marketplace users as a whole. These range from concerns with digital market manipulation (Calo, 2014), behavioral manipulation based on data collection (Zuboff, 2023), and power and informational asymmetries between platform companies and workers (Schor & Vallas, 2021). More broadly, these concerns extend to concerns that the growth of online platforms reflect a new form of extractive capitalism (Srnicek, 2017; Zuboff, 2023) and require revisions in antitrust and consumer protection laws (Khan, 2017; Pasquale, 2016).

While this ongoing discussion certainly informs this dissertation, I examine technology-mediated marketplaces primarily as *environments* for decision-making, focusing on how markets and market processes are interpreted by consumers. Adapting Hodgon's (2019) definition, I define TMMs as codified environments where third-party companies structure recurrent exchange between multiple buyers and sellers. I focus on this perspective, but discuss explicitly how my findings relate to ongoing debates over online markets in Chapter 6: Synthesis, Implications, & Conclusion. This definition is important as I focus specifically on how companies design marketplaces and represent market information, rather than a wider analysis of platform or surveillance capitalism.

Fairness in Markets

What does it mean for a market to be fair? In political philosophy, the use of markets is discussed in the larger context of how resources and opportunities in society should be allocated. Rawls (1971, 2001) presents his "original position" as an attempt to "set up a fair procedure so that any principles agreed will be just" (p. 118). His "original position" presents a thought experiment where societal decisions for principles of justice are made behind a "veil of ignorance," prior to any of the participants in the thought experiment knowing their personal characteristics and social status. In his deontological attempt to derive just principles for society, Rawls (2001) presents markets as useful devices in society, but emphasizes the need to constrain them "within a framework of political and legal institutions" (p. 43). While Rawls views markets as allocative devices that are likely necessary in some form, for Rawls, they need to be situated within a broader social system that aligns with a Difference Principle: such that "social and economic inequalities are to be arranged … so that they are to the greatest benefit of the least advantaged" (1971, p. 72).

Within game theory, much work has shown how people act on fairness in social and market exchange (Fehr & Schmidt, 2001, 2006; Rabin, 1993), but less has directly examined whether market mechanisms, such as price bidding, are viewed inherently as fair. Nevertheless, particularly where individuals begin with equal endowments, participants have shown a willingness to accept the outcomes, particularly in repeated games (Corrigan & Rousu, 2006; Falk, 2021). These games capture aspects of what we expect from fairer markets—clearly defined and transparent outcomes, uniform rules, and in most cases, the same starting resources for all participants.

The willingness of people to participate in market games such as double auctions and accept their outcomes do not, of course, entail that people view the use of markets as fair allocative mechanisms in real-world contexts. Game participants have no say in the institutional setup and are presented with predefined "rules of the game" in an artificial laboratory setting. Outside of games, the evidence is more mixed. People do not particularly view market allocation methods as fairer than others, particularly since equal endowments, where participants begin with the same set of starting resources, are not viable in a real-world setting (Sondak & Tyler, 2007). Sondak and Tyler (2007) find that other nonmarket mechanisms, such as voting, a lottery, or a process of consensus, were all preferential to market pricing as a mechanism for allocating limited resources such as parking spaces, vacation days, and street policing.

In the choice between markets and other allocation mechanisms, markets may thus not be seen as preferential. Between the choice among different markets, however, that question is more open. Sondak and Tyler (2007) argue that similar principles used to evaluate procedural fairness in the judicial process, such as voice, neutrality of the decision-maker, can also be applied to markets, arguing that how markets are designed and institutionalized can have widely differing effects on how people perceive fairness.

Fairness as "essentially contested" and competing definitions of fairness

This overview of fairness in markets, both as opposed to other allocative mechanisms as well as between different markets, is reflective of how complex discussions of fairness in markets can be. This is even prior to considering the added complexity related to the technological mediation performed by for-profit companies in constructing and operating marketplaces. These debates reflect existing tensions of how and for whom fairness concerns can be incorporated in market design, but also of how fairness operates as an "essentially contested" concept (Gallie, 1956; Mulligan et al., 2019). Gallie (1956) describes such ideas—for example, "Democracy" or "Social Justice"—as "concepts the proper use of which inevitably involves endless disputes about their proper uses on the part of their users" (p. 169).

While this dissertation is primarily centered on how fairness is perceived by consumers *in-situ*, it is informed by a rich multidisciplinary literature around fairness. I summarize these multiple lines of scholarship as they relate to markets in four primary ways below. It should be noted that while these fairness principles can often be in tension, they are not mutually exclusive.

First, *deontological considération*s arise from reasoning a priori from held values or perceived rights, not from end consequences. In contrast, *teleological considerations* are centered on evaluations of the ultimate consequences. Utilitarianism falls under this category, which can be defined as "calculating the total amount of good and bad in the consequences of those actions", where an action is morally right if "the net good - the total amount of good … minus the total amount of bad… [is] greater than the net good for any other available action" (Mulligan et al., 2019, p. 10).

A third approach can be characterized as *procedural fairness*. In such a conception, fairness is concerned with the "process of allocation", as opposed to "evaluations of the fairness or favorability of outcomes of that process" (Sondak & Tyler, 2007, p. 80). Finally, *distributive fairness* centers on the fairness of the distribution of outcomes. Recent scholarship in computer science that focuses on how algorithms can incorporate varying notions of outcome fairness, such as demographic parity, can be viewed as falling under this approach (Dwork et al., 2012; Kleinberg et al., 2025).

While these definitions can appear academic in nature, they surface frequently in ongoing discussions over marketplace policy by technology companies as well as in the media. DoorDash, for example, has argued that its guaranteed minimum policy in 2019 (which provides a top-up for low-tip deliveries but reduces base pay for high-tip deliveries) was designed to provide greater wage stability (or distributive fairness) for drivers. Consumers, however, objected to this policy on deontological grounds, feeling that their tips should go entirely to drivers. Similarly, Uber has frequently argued that surge pricing maximizes the number of

possible rides and hence the overall welfare of drivers and riders (utilitarianism or teleological concerns), but again faced pushback from consumers on deontological grounds that different riders should not be charged differing amounts for a similar ride, regardless of market conditions.

Deontological fairness

*Deontological considération*s arise from reasoning a priori based on held values or perceived rights, as opposed to end consequences. Rawls' (1971) famous thought experiment in *A Theory of Justice* attempts to have individuals construct a set of social principles in society based on first principles, where individuals participating in the experiment do not know their personal characteristics or social status in their deliberation. He reasoned that in such a deontological exercise, people would arrive on a First and Second Principle, which states that each person should have an equal right to basic liberties, and that "social and economic inequalities are to be arranged.. so that they are to the greatest benefit of the least advantaged" (1971, p. 72) respectively. Rawls (1971, 2001) frequently presents markets as useful devices, but is emphatic that markets needed to be embedded within a just society ascribing to these fair principles, and constrained "within a framework of political and legal institutions" (2001, p. 43).

In practical terms, deontological concerns consumers have towards markets relate to held values or perceived rights, notably, that of equal treatment. Research shows that consumers object to most forms of explicit price discrimination, for example, list price discrimination where different prices are shown to different consumers (Poort & Zuiderveen Borgesius, 2019). More acceptable are types of price discrimination that are easier to obscure or rationalize for consumers, such as those based on loyalty programs, quantity discounts, or physical or virtual coupons consumers have to search for (Maxwell & Garbarino, 2010). More broadly, participants can strongly object to being given different market prices or market information. Another deontological consideration is an expectation that tips paid to drivers should go entirely to them, as discussed in the above example.

Teleological fairness

By contrast, *teleological considerations* are centered on evaluations of the ultimate consequences of a marketplace practice or policy. Utilitarianism, a teleological approach, seeks to maximize some definition of "social good." Depending on how the "good" is defined, actual policies may look quite different. While we may object to people receiving different prices, we might view the situation quite differently where, for example, in a ridesharing service, lower-income riders are given lower prices than more well-off riders. Depending on how a definition of "social good" is defined, and for whom, utilitarian marketplace policies can hence vary considerably.

One common metric used is social welfare, defined as the sum of buyer surplus and seller surplus in economics. Buyer surplus is defined as the difference between what buyers (or consumers) are willing to pay and what they actually pay, and similarly, seller surplus is the difference between what sellers are willing to sell their good or service for, and what they actually receive. The use of markets is appealing because, when properly designed, they maximize social welfare and achieve Pareto efficiency—where resources are allocated in a way such that no one can be made better off without making someone else worse off. Effective markets are efficient because they increase production and maximize social welfare by having participants communicate their real willingness to pay (Pareto, 1906/2014). This basic intuition

was formalized mathematically under partial and general equilibrium conditions, or single and multiple markets, by Marshall (1890/2013) and Arrow & Debreu (1954) respectively. Within the market design literature, encouraging the use of well-designed markets are hence seen as increasing social welfare as a whole (Roth, 2018).

Such a conception is closely tied to welfare economics, where utilitarian comparisons are used to evaluate the desirability of various policies. Similarly, utilitarian calculations play a key role in antitrust law and policy, where for instance, courts often rely on economic models to determine whether on net the pro-competitive effects of a policy outweighs its anti-competitive effects.

The relevance of teleological and utilitarian considerations is seen particularly around the practice of price discrimination. First-degree price discrimination involves setting different prices for each individual buyer. In the case of a single monopoly seller, perfect first-degree price discrimination allows the monopolist to produce a socially-efficient level of output, as it allows the monopolist to expand its output to serve all customers willing to pay above its marginal cost. However, the firm is also able to extract all consumer surplus (Varian, 1989). Under such perfect price discrimination, consumers typically see their welfare decrease, though total welfare (of producers and consumers) increases.

By contrast, second-degree price discrimination involves discounts for varying quality or quantity. In quality variations, firms employ *versioning* where slightly different products are offered to consumers for the purpose of price differentiation. UberX, UberXL and UberBlack etc. can be seen as an example. Finally, third-degree price discrimination involves setting different prices to different groups. Armstrong (2006) summarizes examinations of price discrimination in a number of theoretical settings, generally arguing that effects on consumer and total social welfare are largely ambiguous in many cases. Generally, for this reason, scholars caution against categorical prohibitions of first and third-degree price discrimination (De Streel & Jacques, 2019).

Procedural fairness

While not typically discussed in these terms, the use of price to allocate resources in markets can be seen as procedurally fair. With the large caveat of equal endowments, intuitively, if people begin with the same starting resources, and a decision must be made to allocate limited resources, it can seem procedurally fair to allocate the good according to each individuals' preferences as denoted by their maximum willingness to pay.

Procedural fairness is a concept most familiarly applied in the judicial process, but attempts have been made to apply it to markets. Elements of procedural fairness typically stressed include 1) understanding: whether the individual understands how decisions are made, 2) respect: whether the individual feels they are being treated with dignity and respect, 3) neutrality: whether decisions are seen as being made in an unbiased manner and 4) voice: whether the individual feels they have an opportunity to be heard (S. Smith, 2023). Within social psychology and related fields, which examines procedural fairness more broadly in social contexts, Leventhal (1980) proposed an influential framework for evaluating procedural fairness with four criteria: 1) consistency 2) unbiasedness, 3) accuracy and 4) offering opportunities to correct or dispute decisions. In addition, research shows that people can be more likely to accept decisions if they

perceive them to be made from a fair process, regardless of whether the outcome is favorable to themselves (Sondak & Tyler, 2007).

The question of how to apply these principles in market settings, or how ordinary consumers view procedural fairness in markets, is less clear. Sondak and Tyler (2007) argue that the acceptability of markets is "enhanced or diminished by judgments about their procedural justice" (p. 91), suggesting that factors such as neutrality, trust and status recognition may enhance their procedural fairness to users.

Distributive fairness

Finally, *distributive fairness* centers on the fairness of the distribution of outcomes. Distributive fairness is not typically attributed to markets, with a concern that markets where the highest bid wins out will tend to benefit those who are well-off. Sondak and Tyler (2007) discuss how "people tend to oppose the use of markets as allocation procedures when they believe markets produce distributively unfair or immoral outcomes" (p. 79), where "people oppose market allocation when they feel that they do not lead those involved to receive the outcomes that they deserve in relationship to either principles of distributive or outcome fairness" (p. 80). Indeed, while Rawls views markets as allocative devices as likely necessary in some form, he emphasizes that they need to be situated within a broader social system that aligns with a Difference Principle: such that "social and economic inequalities are to be arranged.. so that they are to the greatest benefit of the least advantaged" (1971, p. 72).

The issue of distributive fairness arises in markets again around the issue of price discrimination. Should all buyers receive the same price? As in the teleological/utilitarian case, this question of fairness again depends on how the outcome is defined. If the outcome is simply the price buyers pay, it would appear distributively fair for all buyers to receive the same price. However, we may view price as a way to ensure more equitable outcomes in society, i.e. more well-off consumers should pay higher prices as compared to less well-off consumers. An additional complication is the role of marketplaces in serving both buyers and sellers, where marketplace decisions can benefit one group over another. This is particularly true in the gig economy, where marketplace policies directly affect the distribution of outcomes between consumers and workers. Keeping prices low, for example, in ridesharing might increase the total number of rides and benefit consumers, but also reduce hourly wages for drivers.

Can markets do it all?

At least in theory, markets appear potentially to meet most, if not all, of these four conceptions of fairness discussed. Rawlsian social theory, arising from a process of deontological reasoning, considers markets as useful devices. Economic theory shows that in theory, markets support achieving pareto-optimal outcomes, maximizing the total amount of utilitarian social welfare. Procedurally, if a market's rules are made transparent, such as in a double auction game in a laboratory setting, markets allow participants to communicate and bid based on their own true valuation of an item. Finally, assuming equal endowments, markets can act distributively fair in aligning allocation of goods to people's true wants and preferences. The potential for markets to align across these multiple conceptions make them theoretically attractive, contributing to their appeal as charismatic technologies. It also explains attempts by platform companies to cast the marketplaces they manage as mechanisms for fairness.

Each of these conceptions of fairness, however, can be problematic in a real-world setting. While a Rawlsian, deontological thought experiment might find markets useful or acceptable, people often find that marketplace policies do not reflect their own deontological values, such as equal treatment in the case of price discrimination, where different people are charged different prices. Teleologically, considerations of what "good" is maximized can result in very different marketplace policies. Should ridesharing companies seek to maximize the number of rides? Or some other metric? Procedurally, many technology-mediated marketplaces lack transparency, with marketplace users often being unclear about how marketplaces operate "beneath the hood," such as how surge prices are set or what share of tips go to drivers. And finally, equal endowments is almost never the case in the real-world, raising all sorts of questions of what might a distributively fair marketplace policy might look like. Practically, any company engaged in marketplace management must navigate a complex array of competing fairness concerns.

Technological mediation and implications on market fairness

As markets become technology-mediated and centrally managed by technology companies, many of these issues of fairness have erupted to the forefront. What conceptions of fairness should technology companies use or prioritize, and which groups, if any, should marketplace policies provide fairness towards? As de-facto custodians of social welfare, technology companies frequently position themselves to be pursuing a particular conception of fairness and for a particular group of users. For example, Uber faced criticism for years for not showing destinations to drivers before they make a decision whether to accept a ride, since the ride might take them out of the way or to an area where they were unlikely to pick up rides, effectively lowering their hourly wage (Calo & Rosenblat, 2017).

Uber frequently argued that this policy was to protect riders, since showing the destination to drivers would allow them to cherry-pick which consumers to pick up (Katwala, 2018; Said, 2021). While this is true, not showing destinations to drivers also provided Uber an additional lever of control in its operations, allowing it to satisfy customers with an affordable ride without having to raise prices to attract drivers, who receive penalties if they reject a certain number of rides. The issue of whether to show destinations to drivers is thus a quintessential example of how various conceptions of fairness can come into play, and for which user group.

Uber argued its policy helped promote a deontological conception of equal treatment for riders, but at the cost of distributive fairness concerns between riders and drivers. The decision of whether to show destinations to drivers highlights the central role technology companies have in managing interests between groups of marketplace users through their design of marketplace policies. It also shows how the role of technology companies in managing interests between different user groups can provide some cover for the company towards consumers, workers or regulators, since policies they choose ostensibly on behalf of some user group are likely to benefit themselves as well, or at least, align with their business models.

Fairness in the wild

The wide range of fairness concerns can seem complex and bewildering for anyone seeking to understand how fairness is perceived in technology-mediated marketplaces. In this dissertation, I seek to understand how everyday consumers perceive fairness in technology-mediated

marketplaces, and while informed by these varying conceptions of fairness, I focus on how consumers themselves as marketplace participants think about and discuss fairness "in the wild." This approach has been taken in HCI research particularly in examining technical systems that can intersect with a wide variety of fairness concerns, such as in examinations of how users perceive the Twitter algorithm (Burrell et al., 2019), and how parents view school-matching algorithms (Robertson et al., 2021).

Consumers may not be aware or have varying expectations of how various marketplace practices function. I examine two marketplace practices—that of tipping and of surge pricing, where such varying conceptions can come about. In my qualitative studies (Chapters 3 and 4), I focus primarily on how fairness is perceived, and which conceptions of fairness consumers consider when they interact with technology-mediated marketplaces. In Chapter 5, I focus on how providing consumers with information on ridesharing marketplace practices influences their perceptions of distributive and procedural fairness, and their willingness to utilize these marketplaces.

Chapter 3: Tipping in Technology-Mediated Marketplaces

Tipping as a social and economic practice has been a topic of longstanding interest as it provided ready evidence that people did not always act from a narrow definition of self-interest, and that non-economic factors - such as social norms, altruism and perceptions of fairness - can play an important role in economic decision-making. To understand how technology mediation affects how consumers perceive fairness and interact with technology-mediated markets, tipping is hence a natural activity to study. In this chapter, I discuss findings from a collaborative qualitative study[1] where I interviewed everyday users of third-party food delivery services about how they perceive fairness and make decisions about tipping in third-party food delivery, as compared to how they tip typically when using other services in non-mediated contexts.

Consumer responses to issues of fairness in tipping have been a particular flashpoint in third-party food delivery services, where consumers interact with drivers and restaurants through TMMs. In 2019, DoorDash encountered strong pushback from consumers due to a conflict between consumer expectations and how tipping operated within the service (Newman, 2019b). Under DoorDash's "guaranteed minimum" tipping policy at the time, drivers did not always receive their tips in full. Rather, drivers who received a below-average tip received a top-up from DoorDash, while drivers who received an above-average tip saw their base pay reduced. Following an investigative report by *The New York Times* (Newman, 2019a), consumers reacted strongly against this revelation, despite this policy having already been in effect since 2017 (Newman, 2019b; Siegel, 2019).

This backlash led DoorDash to alter their policy so that all tips went directly to drivers, with DoorDash acknowledging that their attempt to reallocate tips had made consumers "feel like their tips did not matter" (Newman, 2019b). Based on DoorDash's statement, it appeared that the re-allocation of tips went against basic consumer expectations about the function and significance of a tip as a reciprocal reward for good service. The incident reflects how gaps can emerge between consumer expectations of how marketplaces should operate, and how practices like tipping are implemented in practice. The strength of consumer pushback also raises interesting questions of why and how fairness issues may be of particular concern in TMMs, as consumers assess their obligations to other economic actors when participating in TMMs.

In this study, we ask the following research questions to understand whether consumers perceive fairness in tipping differently in TMMs, and why they might do so.

RQ1: How do consumers describe what is or is not fair when tipping in third-party food delivery, compared to tipping in non-TMM environments?
RQ2: What role do TMM companies play for consumers in determining what is or is not fair when tipping in third-party food delivery?

[1] See Chong el al. (2024) for a published account of this project in collaboration with Ji Su Yoo and Coye Cheshire.

Our data analysis produced three themes around fairness in tipping. Two of which will be familiar to people who tip: 1) tipping to provide a living wage for workers, and 2) tipping to reciprocate their work and effort of individual workers. A third was to some extent more surprising—a variety of views participants expressed around 3) the fairness of how TMM companies were distributing payments between different stakeholders in the ecosystem. Across three themes, participants discussed their decision-making process which often overtly took into consideration the role of TMM companies. Participants also contrasted their experiences and perceptions of fairness when tipping in TMMs as compared to non-TMM contexts.

Based on these findings, I discuss specific aspects of TMMs that influence how consumers perceive fairness in TMMs. First, we find that codification of tipping before service inclined participants to view the tip as a general obligation to support the living wage of drivers, rather than as a way to reciprocate the costs and effort of individual drivers. Second, participants were overtly aware that their tipping decisions were occurring in an environment operated by a for-profit company, actively incorporating their perceptions and attitudes towards TMM companies in their decisions of how much to tip. Third, consumers also had difficulty assessing the cause of late or incorrect orders, sometimes punishing drivers (with lower tips) for factors outside of their control.

Finally, in this chapter, I also discuss how specifically marketplace aspects of TMMs have salience around fairness for consumers, which have implications on how TMM companies choose to frame and represent marketplace processes.

Literature Review

The practice of tipping was seen as providing ready evidence that people do not always act strictly out of a narrow definition of self-interest, and that non-economic factors —such as the prevalence of social norms, altruism, and perceptions of fairness—can often play an important role in determining economic action. Granovetter (1985) alludes to how tipping in restaurants was evidence of "generalized morality" in an anecdotal observation that people tended to still tip in locations they would not visit again. Kahneman et al. (1986) find no significant differences in self-reported tips for restaurants participants visit frequently, as opposed to one they did not expect to visit again—a result which has been replicated in other studies (Azar, 2010).

The literature on tipping in economics and economic sociology is fairly extensive. Summarizing this research, Azar (2007) explains that people tip to keep in line with social norms, to demonstrate gratitude, to show an awareness that service workers rely on tips, and to avoid negative feelings such as embarrassment and guilt from under-tipping. He discusses how consumers seek to maximize positive feelings by engaging in either altruism or reciprocity, thereby minimizing negative feelings such as social disapproval or a sense of acting unfairly. Research also indicates that interpersonal connection between servers and customers, such as personal introductions by name (Garrity & Degelman, 1990) and perceptions of friendliness (Conlin et al., 2003; Rogelberg et al., 1999) can increase customers' propensity to tip (Azar, 2007).

Around the gig economy, scholars have suggested a decline in tipping norms, particularly in the ridesharing industry, though evidence for this remains mixed. Research investigating how social tipping norms and practices may be changing in contemporary gig economy services such as Uber and DoorDash is more limited. Utilizing a survey vignette experiment, Duhaime and Woessner (2019) find that participants assigned to a gig worker scenario tipped less on average than traditional employees for an identical delivery task. Drawing from open-ended survey responses, they suggest that consumers tip gig workers less due to perceptions of greater worker autonomy. In a review of how digital technologies are affecting tipping across different industries, Warren and Hanson (2023) argue that reasons for different tipping norms in the gig economy can be complex, ranging from the design of the tipping interaction to the service context. Furthermore, they suggest the need for more qualitative work to understand how and why consumers may tip differently when using gig economy services compared to other environments.

Methods

Recruitment

We recruited interviewees at a public university in the United States that maintains a large pool of over 10,000 pre-screened students, employees, alumni, and personnel who are or were affiliated with this university. Using purposeful sampling (Creswell & Creswell, 2018), we interviewed individuals who used third-party food delivery services in the US in 2020.

All participants were at least 18 years of age, physically located in the US, and indicated they could be interviewed in English. We obtained roughly equal numbers of participants (see Table 3.1) who identified as female (12) and male (13), across four different age groups (18-24, 25-34, 35-44, 45 and older). Out of the 25 participants, 5 participants reported that they grew up partially outside of the United States. Most participants (22) resided in California in 2020.

Participants indicated that they used a range of services offered in the US (e.g., DoorDash, UberEats, Grubhub, Instacart, Chowbus, and Caviar). An approximately equal number of participants stated that they usually access third-party food delivery services by smartphone or personal computer. A majority of participants in our study estimated that they used third-party delivery food services about 1-2 times a month, consistent with a 2019 survey of food delivery usage among American adults (US Foods, 2019). Finally, several participants described higher use of third-party food delivery services in 2020 due to the COVID-19 pandemic.

Table 3.1: Participant characteristics

	Sex	Age	State	Freq*	Services used
P1	Male	45-54	California	1-2	DoorDash, Grubhub, Uber Eats
P2	Male	55-64	California	1-2	DoorDash, Uber Eats
P3	Female	55-64	California	1-2	DoorDash, Grubhub
P4	Female	45-54	California	1-2	DoorDash, Grubhub, Postmates
P5	Male	35-44	California	<1	DoorDash, Grubhub
P6	Female	35-44	California	<1	DoorDash
P7	Male	35-44	California	9 or more	DoorDash, Grubhub, Uber Eats
P8	Male	35-44	California	1-2	DoorDash, Uber Eats
P9	Female	35-44	Georgia	1-2	DoorDash, Grubhub
P10	Female	35-44	Arizona	<1	DoorDash, Postmates, Caviar
P11	Male	18-24	California	<1	Grubhub, Uber Eats
P12	Male	25-34	California	1-2	DoorDash, Uber Eats
P13	Male	18-24	California	3-4	DoorDash, Grubhub, Uber Eats, Caviar
P14	Male	25-34	California	1-2	DoorDash
P15	Female	18-24	California	<1	Uber Eats
P16	Female	25-34	California	5-8	DoorDash, Grubhub, Uber Eats, Postmates
P17	Female	18-24	California	<1	DoorDash
P18	Female	18-24	California	1-2	DoorDash, Grubhub, Uber Eats, Postmates
P19	Female	45-54	California	1-2	DoorDash
P20	Female	25-34	California	1-2	DoorDash, Uber Eats
P21	Male	25-34	Florida	<1	Uber Eats
P22	Male	25-34	California	3-4	Grubhub, Uber Eats, Postmates
P23	Male	18-24	California	<1	DoorDash, Grubhub, Uber Eats
P24	Male	45-54	California	<1	DoorDash, Grubhub, Uber Eats
P25	Female	25-34	California	<1	DoorDash, Chowbus

* Frequency per month

Interview Procedure

I conducted interviews in English using the Zoom videoconferencing platform between December 2020 and February 2021. I transcribed two interviews verbatim and the remaining interviews were transcribed through a professional transcription service. Each interview lasted between 53 and 95 minutes, with most interviews lasting longer than an hour. Participants also filled out a short demographic survey using an online form before the interview. Participants were paid a $25 Amazon gift card for their time.

We designed a semi-structured interview instrument to elicit participant attitudes, beliefs, and behavior related to tipping. Our aim was to get at participants' perceptions about fairness, tipping, and third-party food delivery services. We first asked participants to describe their last few third-party food delivery service orders and to explain their thought process behind their tipping decisions. Participants were asked to discuss any similarities and differences between how they tipped in third-party food delivery service compared to other services, thereby drawing out participant's perceptions, motivations, and reflections on their own tipping rationales.

Participants were also asked how they believed tipping operated in third-party food delivery, such as how recommended tips are set and how drivers are compensated from tips, as a way to initiate discussion about TMMs and to investigate the role that TMMs may play in assessments of fairness in tipping. Finally, I presented participants with hypothetical scenarios varying how drivers were compensated from tips to encourage participants to contemplate what is or is not a fair tip. Throughout the interview session and in response to participant responses, I was careful to follow up on any views participants brought up that were related to fairness.

Data Analysis

All three authors were involved in the data analysis. Since our interview protocol aimed at surfacing consumer perceptions of fairness and tipping in TMMs, we began our analysis with a process of structural coding (Saldaña, 2016) that aligned with these topics. Two authors, including the author who served as the interviewer, identified and excerpted participant responses related to attitudes, motivations, beliefs, and practices around fairness in tipping for all 25 interviews. We also paid special attention to participants' opinions about TMM companies.

The same two authors then independently conducted a first cycle of initial and in-vivo coding (Saldaña, 2016) to identify a broad range of attributes related to fairness and tipping, adding any emergent codes from the interview transcriptions, and discussing the codes to reach agreement. There were 396 codes; example codes include "transparency of how driver paid," "tipping as reward," and "sufficient wages." In our second analysis cycle, all three authors examined the initial and in-vivo coding and emergent codes. We conducted multiple iterations of pattern coding that resulted in 54 codes such as "distribution of costs," "allocation of responsibility," and "opaque company practices." Finally, these codes coalesced into the major themes that we describe in our findings, including "transparency," "reciprocity," and "wage equity," among others. All authors compared the major themes across all 25 interviews, revisiting the transcripts continuously until there was agreement among authors.

Findings

In this study, we sought to understand how consumers perceive fairness differently where tipping occurs in technology-mediated marketplaces, in contrast to how they tip in non-mediated contexts. Our data analysis produced three themes around fairness in tipping: 1) Fairness as Supporting a Living Wage, 2) Fairness as Reciprocity, and 3) Fairness in Distribution of Payments. I discuss these themes below, paying attention to how participants compared their experiences of tipping in TMMs as opposed to non-TMM contexts, as well as how participants discussed TMM companies in their thought process.

Fairness as Supporting a Living Wage

Our analysis of how participants perceived wage fairness in third-party food delivery services compared to non-TMM environments yielded several key findings. First, many participants expressed difficulty determining how much to tip to support a living wage in TMMs due to an absence of existing norms, with some expressing concerns over a perceived lack of transparency in how tips affected driver compensation. P14 articulated how he felt unsure about whether he should rely on tips recommended by TMM companies, feeling the "rules" to be "vague" in third-party food delivery.

> I mean, I always felt uncomfortable, you know, I always wanna play by the rules, but then when kind of the rules are vague… I just want to pay and get what I'm supposed to get and not have to play a game. (P14)

Some participants also related concerns with a perceived lack of transparency in how tips affected driver compensation in TMMs. P5 felt that higher recommended tips by TMM

companies could be used as a way to shift the burden of paying drivers a living wage onto consumers. P5 explained: "[Y]ou can also create a strange situation where, you know, businesses are raking in more profits … than they should be, and not paying their staff properly and then the general public has to pick up the slack." He expressed annoyance at a perceived need for consumers to "police" TMM companies and their compensation practices. P5 emphasized how he felt that as a consumer, he should not be responsible for ensuring drivers are "being paid properly" given he was "just buying some food."

> I also feel like, how much needs to be offloaded onto people? … Why do I have to make sure the driver's being paid properly? I mean, come on, I'm just buying some food. So I kind of feel like, yes, repeatedly pushing these things, decisions, and it's my responsibility to make sure the guy's getting paid properly… I like the idea of more information, transparency, but I'd just like it to be just more ethically straight up, [where] the consumer doesn't have to police it themselves. (P5)

P20 expressed similar frustration with the potential use of higher recommended tips by TMM companies to subsidize wages to drivers, but felt an inability to push back against specific company policies. She ultimately saw such practices as the cost of convenience for the consumer.

> It's just funny, like … all these pricing tactics, you know exactly what the companies are doing, and yeah, as a consumer, you have no choice, right? If you want to use a service, you have to pay for it … Yeah it's frustrating and it's annoying, but it's the cost of using these products for the convenience factor. (P20)

A second major issue we found was lower opportunities for interaction (e.g., seeing or talking with drivers) in third-party food delivery, which shaped how participants related to drivers and their sense of obligation to support their living wage through tips. Participants told us how greater interaction in other services sometimes led them to consider workers' situations and their wages more carefully. For example, P20 described how interacting with drivers in another TMM service, ridesharing, led her to sometimes tip more as a way of supplementing low pay.

> When I used to take Ubers, sometimes you would talk to the drivers and they would tell you certain things. But with [food delivery], there's no interaction… [With rideshare drivers,] they can tell you how much they're making, which is not a lot of money, or how hard it is, and it makes you feel bad. (P20)

Participants discussed how, by comparison, food delivery inherently involved minimal interaction between consumers and workers. Importantly, participants pointed to specific TMM policies that they felt made the service feel even more impersonal. P3 contrasted her experiences before and after no-contact policies had been instituted due to the COVID-19 pandemic. She recounted her more frequent interactions with drivers before the pandemic: "I actually used to chat quite a bit with the drivers before because I'd sit out on the front porch and wait for them to appear with the food and then, you know, chit-chat with them a little bit before they headed off." She added how she sometimes would tip them more if she felt they "were having a bad day." She

highlighted how this more personal aspect to tipping had been eliminated due to no-contact policies.

> [I]t's very different because that aspect of tipping has been removed by the pandemic. We don't have that personal interaction or … perception of someone else's situation … You know, some days you could tell if they were having a bad day. You know, it's just on the facial expressions. Um, and so by having the contactless delivery, I don't actually ever see that. (P3)

Similarly, P10 described how the option to tip before knowing anything about the driver, as well as reduced opportunities for interaction due to no-contact policies, caused her to feel "no connection" to drivers:

> You have your option to tip before you're told your driver's name, you don't know anything about your driver, and especially during COVID, you don't even see your driver most of the time. I live in an apartment building, so like my driver has just texted me and said, "Oh, I left your order on the front desk like you said," so then I go get the order, but I don't see the driver, I don't know what kind of car they drive. I, you know, I don't see them driving up or anything like that. I have no connection to them. (P10)

Finally, we found that some participants felt a lower obligation to support third-party food delivery drivers due to their association with TMMs rather than with specific restaurants. Discussing how he felt about tipping restaurants as opposed to third-party food delivery drivers, P22 describes feeling a greater obligation to support the "livelihood" of restaurant owners due to more sustained and personal interactions with them. By contrast, P22 described how though he "[felt] sorry for [drivers]," he tended to see them as "part of this machine which are these large institutions." He expressed what he felt as the interchangeable nature of his interactions with drivers, where he felt TMM companies "are always going to find a driver."

> Well, the thing is … Uber and Grubhub … are always going to find a driver. These restaurants, you know, they're owned by actual people. You know, you actually talk to some of these people, and they put their livelihood [sic] and stuff … Yeah, with the drivers, there's just less connection with the person. Even though I do feel sorry for them because they have to work at such companies, it's just … they're part of this machine which are these large institutions. (P22)

Fairness as Reciprocity

A second core theme that emerged is how participants discussed tipping as a normative means of reciprocating the costs and efforts of individual service workers. P2 described how he viewed tipping generally as a way to "show appreciation for … work done," a perception that many participants shared. He explained:

> So tipping is about service, right … so if you have a really good waiter who's attentive … theoretically you tip more. And … you have that interaction throughout the service where

> you can make judgments and see how things work. That's, you know, how you tip your bartender, or your waiter or waitress … right? Because you have that interaction where you see how they perform. (P2)

Similarly, P18, who was in her early twenties, related that she used to view tipping as "an obligation" where "you just tipped everyone." As she got older, she tended to vary her tips because she felt that "people who make the extra effort and go the extra mile to make sure that your service went well … deserve to get paid a little more."

As participants discussed how they tipped in third-party food delivery services vs. other services, we found several distinct aspects of TMM design that influenced how participants perceived and acted on reciprocity in third-party food delivery, compared to non-TMM environments. First, many participants found it significant that the decision to tip was presented to consumers before delivery, i.e., before the service was completed. This was true for all major food delivery services in the United States at the time (DoorDash, Grubhub and Uber Eats), which were also the services most frequently used by our participants. Consumers contrasted this to their experiences using many other services, such as in-restaurant dining or hairdressing, where the tipping decision usually comes after the service. P3 saw tipping before service as an act of faith for consumers, rather than a way for them to reciprocate the costs and efforts of drivers.

> … it's completely illogical and… you definitely are doing it on faith that the people who are doing it are going to, you know, perform their tasks to the best of their abilities and not like spit in your food. [laughs] (P3)

P15 explained how paying before delivery predisposed her to view the tip as something fixed, rather than a variable amount based on quality of service, such as when tipping for sit-down service at a restaurant.

> I think probably because the payment part happens before you get your food, so I just kind of do it then … and it's not influenced by my experience, whereas at like a restaurant I'm paying after I'm being served and I have my experience at the restaurant. So I'm more inclined to [tip the same amount using third-party food delivery services], I guess my tips are more variable otherwise. (P15)

Despite expressing frustration or finding it unusual to set a tip before delivery, most participants did choose to set the tip when first prompted, with only a few choosing to set the tip to zero and adjusting it after delivery or tipping in cash. Participants explained that they felt it was inconvenient or troublesome to change the tip after delivery, with some participants being unsure whether it was possible to adjust the tip after service at all. For participants who did change the tip after delivery, they related that they only bothered to do so after what they regarded as exceptionally good or bad service.

Second, participants' responses revealed how TMM companies can limit marketplace information provided to consumers, making it difficult for them to make assessments of an appropriate reciprocal tip. For example, while a few participants discussed sporadic attempts to compensate drivers for extended wait time at restaurants, most consumers did not actively

incorporate this into their tipping decisions. This was because driver wait time was not provided to users. In order to calculate driver wait times, users would have had to notice the driver's restaurant arrival time and independently calculate wait time based on the driver's departure. Instead, consumers explained that they relied primarily on information directly provided by TMM companies, such as expected arrival time and distance of consumers to restaurants, to gauge driver costs and effort.

Participants related incidents that showed that they had difficulty determining the cause of a late or incorrect order based on limited information provided by third-party food delivery services, thus blurring the responsibility for poor service quality among drivers, restaurants and the TMM company. P22 recounted an incident where he tipped a driver poorly due to an incorrect order. He explained how he felt there "needs to be some kind of consequence," describing how at the time he did not see the restaurant and driver as "different entities."

> Well, it's more… It's just like anger at that point. Yeah, it's not really thinking. I guess if I were to really think about it, it's like the driver has nothing to do with it. Usually I associate the driver with the restaurant… but they're two different entities. But, uh, yeah, I guess I really never thought about, you know, them not being connected. (P22)

P11 described a similar conflation of responsibility between the TMM company and driver which led him to tip the driver less.

> It wasn't the driver's fault but the app's fault I think. … It was giving me some sort of time estimate, but it kept going up and up and up and I thought that he was still far away and it was like 10 minutes in the future. So I thought he wasn't here but it turned out he had been here. … [T]hen I got there … and my order was slightly screwed up and I was just already really frustrated and I felt bad for him but also a little mad. … It was obviously more of the app's fault than the driver's fault but I was just kind of having a rough day. (P11)

Interestingly, P2 described initially attempting to determine an appropriate reciprocal tip, but ultimately giving up due to the difficulty of gauging responsibility between restaurants, drivers, and the TMM company. P2 explained: "I used to ask if it was late, you know … what was the cause of the delay?" He would then sometimes tip the driver more if he felt they were not at fault and where the driver had been inconvenienced, such as when the delay was due to a long wait time at the restaurant. P2 explained:

> I used to ask if it was late, you know … what was the cause of the delay? But now I just don't even bother asking. … [I]t just got to the point where, you know, any rationale would be [given], you know, [whether] it's traffic … so I think I just thought like, there's no correlation between those two. (P2)

Due to this difficulty, P2 eventually chose to just set the tip at the start and just "tip everybody the same."

Finally, participants' responses also reflected how mediation performed by TMM food delivery services can facilitate avoidance of drivers and a lack of reciprocity when social interaction might be undesirable for consumers. P25 relayed how she would often deliberately avoid calls from drivers so as not to leave her apartment, leaving drivers to wait for an exiting car to open the gate into her apartment complex. She described subsequent attempts to avoid or reduce interaction with drivers after such incidents: "I don't meet them. I just say [through the app] like, 'Leave the food at my door.'" When asked if she adjusted her tip up due to their difficulties in getting to her apartment, she described such inconvenience as part and parcel of the work of drivers. Ultimately, she did not feel a need to reciprocate any added inconvenience to drivers with higher tips.

> It's part of work, right? … I mean it's like doing any kind of work, you're gonna encounter troubles. And this is part of the routine. Why … I mean there's nothing worth complaining about. It's just part of your work. [laughs] (P25)

Fairness in Distribution of Payments

Our final theme is how participants felt about the fairness of how TMM companies distributed payments, including tips and fees, between drivers, restaurants and the TMM companies. Our analysis yielded several key findings. First, some participants reasoned that high fees and mark-ups paid to TMM companies translated to a lower necessity to tip drivers. P11 explained:

> So, I think in the beginning I saw, like, double fees, like almost twice as much, and I was not incentivized to tip. My thought process was, they're already getting paid by Uber Eats. Why am I paying them more when they're already making money on this service? (P11)

Similarly, P1 felt strongly that since he was already paying a mark-up in menu prices, he should not need to tip drivers as much. This led him to tip less in third-party food delivery than when ordering delivery directly from a restaurant. He explained his view: "The Uber driver, regardless if I tip him or not, is going to get paid. Their base is going to be a lot more than the mom and pop pizza driver. They're already getting more because of the markup in the price of the food."

Second, we found participants had divergent views about the fairness of how TMM companies were distributing payments. On one hand, many participants felt that TMM companies were likely to be taking a large share of payments which they felt to be unfair. P23 and P25 referred specifically to the practice of TMM companies charging fees to consumers as well as restaurants, a practice which P25 described as "double-dipping." P23 expressed a similar view:

> Especially during the pandemic, a lot of food delivery services are like, "Oh, you should support your local restaurants by using our food delivery service." … It seems disingenuous to me to charge a service fee while also charging the restaurant. Like you're taking money from every single person in the equation here. (P23)

On the other hand, while some participants did feel that TMM companies took a large share of payments, they did not feel this to be necessarily unfair or disproportionate. P20 felt it difficult to

assess a 'fair' TMM share of payments based on the relative contributions of the TMM company vs. restaurants and drivers, emphasizing what she perceived as its inherent subjectivity.

> [M]y gut feeling is companies are out there to make money, and so I would think [laughs] they put their incentive first—it's for them to make money. I don't know how it's distributed, but they can argue it many different ways that they are the service provided, they provide the platform, they made it so that everything is possible so then they deserve to take the biggest cut. And whatever spare is, it's all relative, right? (P20)

P15 also did not feel that TMM companies were taking a particularly unfair share of payments. She invoked a broader economic argument to explain her lack of concern, feeling that drivers and restaurants would not work with TMM companies if they did not receive "a decent amount."

> I think the platforms obviously wanna make money, so they're probably gonna try to squeeze out as much profit [as] they can, but also they have to pay the drivers and the restaurants a decent amount, because otherwise they're not gonna wanna work with them so much. (P15)

Finally, while many participants expressed frustration at what they felt to be a disproportionate share of payments going to TMM companies, they described different responses to this perceived practice. P1 imputed a lower obligation to tip, feeling that higher tips to third-party food delivery drivers would just end up primarily benefiting the TMM company and its "shareholders." He explained:

> Am I going to give more money to that person? At the pizza joint? Yes. Versus the person with the Uber delivery driver? Yes, I would rather give my money to the person working directly for the restaurant. Because it's the restaurant that's directly benefiting, and that person versus, you know, this corporation, this Uber, DoorDash, Grubhub … I want to help out, you know, mom-and-pop pizza shop. I don't want to help out who the new CEO of Uber is. (P1)

Other participants, like P18 and P23, related a grudging acceptance of the increased share of payments they felt were going to TMM companies. P18 expressed a sense of powerlessness towards this practice, describing how she felt that feeling, as a single consumer, she felt she was "not in [a] position" to change it. P23, who tended to tip at least the preset default, felt that consumers simply had to accept "paying more" if they wanted to make sure restaurants and drivers were being compensated fairly. He explained:

> There's like this giant tech firm in the middle now… and so just having one more player, it means that the cost goes up. So the only way to bring the final cost in line with what people expect is by taking money from drivers and restaurants. So I think people just need to get used to paying more. (P23)

Discussion

This project set out to understand how consumers perceive fairness in TMMs differently from non-mediated contexts. Our analysis reveals how consumers think about fairness in tipping under three themes, and how different aspects of technological mediation interacted with how they viewed fairness. Below, I discuss specific aspects of TMMs that influenced how they view fairness in tipping. Finally, I discuss how specifically marketplace aspects of TMMs have salience around fairness for consumers, and their implications on how TMM companies choose to frame and represent marketplace processes.

Codification and the Changing Social Meaning of Tipping

As with any codified system, some set of rules *must* be made to facilitate interaction (Gillespie, 2010; Lessig, 1999). We find that choices in how TMM companies choose to codify tipping fundamentally changed the social meaning consumers attached to tipping. Participants describe how the option to tip prior to delivery predisposed them to view it as a general obligation, rather than as a way to reciprocate the work and effort of individual workers when tipping after delivery is complete.

Gig economy researchers in HCI and adjacent fields note that over time, the sharing economy has shifted away from attempts to facilitate social exchange, altruism and reciprocity, to a more transactional model based on convenience and efficiency (Ravenelle, 2019; Schor & Vallas, 2021). Our findings align with this body of work and provide insight into how the design of TMMs can hasten this shift. TMMs that prioritize convenience and efficiency for consumers by codifying tipping early in the ordering process break the assumptions of reciprocity—with important repercussions for how consumers determine what is or is not a fair tip for workers.

Decisions by TMM companies to codify an efficient experience can come at the cost of more reciprocal, nuanced social interactions that allow consumers to make informed, fair tipping choices. Since tipping within a given society is largely dependent on norms (Azar, 2007), these subtle codification processes can effectively eliminate the ability for individuals to apply their own cultural norms of fairness in food delivery and related TMMs. As TMM companies codify tipping into streamlined ordering processes, they may prevent avenues for reciprocity and force consumers to continue to modify (or even lose) their existing cultural norms of fair tipping.

Consumer Perceptions of TMM Companies as For-Profit, Third-Party Mediators

Many participants in our study expressed an overt awareness that their tipping actions were occurring in an environment visible to and managed by a for-profit TMM company, whose interests might not necessarily align with consumers and drivers. Underlying opacity in how tips affected workers and TMM companies caused participants to make varying and sometimes opposing interpretations of how much to tip. For example, P1 chose to tip third-party food delivery drivers less than drivers who were directly employed by restaurants because he believed a higher tip would just end up benefiting TMM corporations. Others, such as P18 and P23, always chose to tip the preset default (or more) due to expectations that drivers were likely to be vulnerable to exploitation by TMM companies.

Our analysis highlights how tipping in TMMs is no longer primarily a dyadic interaction between the consumer and the food delivery worker, but becomes subsumed under a broader association between consumers and the TMM companies. Participants incorporated their views of TMM companies and how the underlying marketplace operated to how they should tip workers, with some viewing their primary interaction being with the TMM company, and not the worker.

Changes in these perceptions have real consequences for workers, but its net effects are unclear. If consumers, such as P1 did, view a lowered obligation to tip workers in TMMs, workers could see lower tips. On the other hand, workers could see higher average tips if consumers perceive a higher obligation to tip in TMMs, as P18 and P23 describe. At the same time, such perceptions of a higher obligation can also be used as a way for TMM companies to subsidize its own payments to drivers, as reflected in DoorDash's decision to reduce base pay to workers who received higher tips under its "guaranteed minimum policy," which faced sharp criticism in 2019 (Newman, 2019b).

Assessing Accountability in Managed Complex Systems

We find misattributions in assessing accountability can occur when consumers interact with TMMs. In our study, both P11 and P22 recounted how they previously penalized drivers for late or incorrect orders service with lower tips, which on extended reflection, they reasoned may not actually be the responsibility of the driver but instead be due to the restaurant or the TMM company. P22 describes how he sought to express his dissatisfaction with the service as a whole by giving the driver a lower tip as he felt "there needs to be some kind of consequence," where the tip was the most readily available affordance to express their feedback.

In seeking to provide a frictionless service to consumers, TMM companies have an incentive to conceal the complex sequence of actions required to facilitate a food delivery. Reasons for delays are not typically communicated to consumers, such as cancellations from prior assigned drivers, restaurant ordering systems that only start orders when drivers arrive to pick them up, or delays in food preparation at restaurants (Keeble et al., 2020; Richardson, 2020; Tuco et al., 2021). As TMMs continue to connect a wider range of economic actors, from workers to property owners, such misattributions are to some extent endemic to these systems. For example, in industries ranging from e-commerce to vacation rentals, there are current legal conflicts where individuals do not know who to hold accountable for defective products or property damage (Lieber, 2014; Riley 2020).

In HCI and adjacent fields, discussions of accountability and attribution of blame in complex managed systems frequently arise (Boeva et al., 2023; Charisi et al., 2017; Elish, 2019). Prior studies show how responsibility for an adverse outcome can be attributed between users and designers of the technical system as well as non-human actors (Charisi et al., 2017; Elish, 2019). Elish (2019) provides a cautionary example within the context of automated vehicles, describing "moral crumple zones" where drivers can often bear the brunt of automated system failures. For example, when an accident occurs in an automated vehicle with a human driver in the seat, Elish argues we should not necessarily look to the driver as the culpable party, but to the entire

technological system that allows such accidents to occur. Our study shows how similar difficulties in assessing accountability can occur in TMMs, due to the complex coordination required between different parties. TMM companies have incentives to provide limited information to consumers to prioritize efficiency, which can result in individual drivers having to bear the costs of any system failures in the form of lower tips.

Perceptions of Markets and Market Processes

Analysis of many digital systems in HCI have focused on how the visibility of human labor can be diminished through automation and abstraction (Boeva et al., 2023; Gray & Suri, 2019), concepts which are certainly salient in our study. But TMMs combine both features of technological mediation as well as of marketplaces. In this section, I discuss how specifically marketplace aspects of TMMs have salience around fairness for consumers, which have implications on how TMM companies choose to frame and represent marketplace processes.

Interaction in a TMM is not tied solely to the degree of abstraction inherent in interacting with any information system, but the role of the service as a marketplace coordinating multiple economic actors. While designers of any technical system must decide what information to surface to users and what to keep hidden, the provision of a marketplace itself has implications for users. These implications center not only around how the marketplace is designed to afford different social interactions, but also how users perceive markets and market processes, central to the topic of this dissertation. I discuss both these aspects below.

Designing markets for social interactions

Economic and social exchange on marketplaces can be a messy process. For a social practice like tipping, users may find it difficult to navigate the social norms and relationships inherent in determining how much to tip. Indeed, some participants discussed disliking the practice of tipping in general, which was exacerbated in TMMs in third-party food delivery by the difficulty of determining the cause of late/incorrect orders and lack of clarity of how tips are distributed.

While some participants expressed frustration on having to tip prior to delivery, there is some indication that a pre-service tip set prior to delivery might be more convenient. Most participants, even while expressing frustration on having to tip before delivery, eventually opted to do so, with many selecting the preset default and few changing the tip after. Tellingly, in 2017 then Uber CEO Kalanick was reported in internal discussions to oppose introducing tipping in another closely related service, ridesharing, altogether due to concerns that it would add “friction” and create a sense of guilt for consumers who did not tip (Fitzsimmons, 2017).

In other words, TMM companies do not have a clear incentive to design marketplaces to afford close or reciprocal social interactions. For TMM companies, the provision of a seamless service - a service you don’t need to think about - can be advantageous for users of on-demand services looking for convenience. This has implications for consumers and how they relate to workers. For example, participants in our study did not express a concern with retaliation from drivers on subsequent orders due to low tips, as they felt they were unlikely to meet the same driver again.

How users interact with a TMM also goes beyond the kind of social interactions the marketplace affords. When users interact with a TMM, they also interact with a "market" at large. As such, their perceptions and use of the service is not only shaped by the degree and type of social interactivity afforded by the marketplace, but their general perceptions of markets and market processes. In our study, participants incorporated these perceptions in different ways.

This notion of a "market" at large is at play in how participants discussed how they felt about tipping and fairness in relation to drivers. P22, for example, described how he felt "Uber and Grubhub … are always going to find another driver," in explaining why he tended to view drivers as "part of this machine which are these large institutions." While several participants suggested that TMM companies might be taking a large share of payments by using tips to subsidize wages and by charging multiple fees to both consumers and restaurants, they also felt it difficult to judge, on a macro-level, whether this share was disproportionate or 'unfair.' Other participants, like P15, invoked a similarly broad economic argument that drivers could leave if they were not paid enough.

As service workers become embedded in large-scale TMMs, consumers may feel a reduced sense of connection, and tend to see service workers as mechanical parts of broad economic processes or, as P5 put it, part of "these large institutions." The choice of whether to emphasize or de-emphasize these market representations, particularly as they relate to workers, is an additional dimension of design for TMM companies, which I discuss in the next section.

The market as a service?

Worker autonomy is frequently discussed in debates over benefits for workers as well as in research examining tipping norms in the gig economy. Duhaime and Woessner (2019) argue that consumers perceive gig workers as having greater autonomy, and therefore feel less obligated to tip them. In a vignette experiment, they find that consumers tip workers more when they perceive the workers to be employees, rather than as general gig workers doing a task at a set price. They argue that the "marketization and gigification of tasks increasingly enables both managers and customers to view workers as another means of production, rather than fellow human beings" (p. 243).

To some extent, technology companies are shifting towards a more "curated" model of marketplace interaction to simplify transactions for consumers and reduce transaction costs. TaskRabbit, for example, notably reconfigured its business model in 2014 from facilitating repeated interactions between consumers and workers, towards one where the TMM performed more matching and consumers had less control over who they hired (Jain, 2023) .

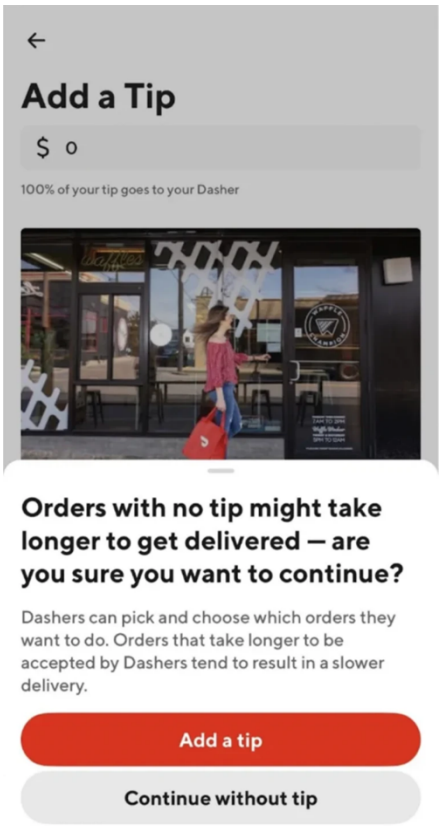

Figure 3.1. DoorDash tipping interface (circa 2023)

At the same time, TMM companies continue to experiment with the benefits of representing themselves as providing a marketplace service, in coordinating interactions between economic actors. Recently, for example, DoorDash provides an in-app notification to consumers that attaching no tip prior to delivery can lead to their delivery taking longer, essentially devolving responsibility from assuring timely delivery and representing it as a market process. Recalling Williamson's (1973) dichotomy between coordination through internal hierarchical management vs. the operation of markets, DoorDash's actions hence reflect an interesting example of how TMM companies can straddle both categories. Our study suggests how specifically *marketplace* aspects when interacting with these environments are of salience around fairness for consumers, which may be utilized by technology companies for their own benefit, as DoorDash sought to do by reminding consumers to tip adequately to ensure prompt delivery.

Technology-mediated marketplaces continue to grow and disrupt new industries, ranging from care work to home cleaning. Interactions between consumers and workers, or consumers and small businesses, are hence increasingly subsumed under their interaction with a technology-mediated marketplace as a whole. Our findings highlight how the moral calculus that consumers perform can become more complicated, a calculus which has to take into account both their views of markets as well as of technology companies.

In a historical study of worker-consumer alliances, Frank (2003) provides an insightful example of how globalization, by placing greater distance between consumers and workers, fundamentally altered the nature and success of consumer-worker alliances. Frank discusses how the shift of production across national borders reduced the ability of consumers and workers to build solidarity, in contrast to when workers and consumers were familiar to one another and interacted within the same geography. Through the specific example of tipping in third-party food delivery, a different form of distancing between consumers and workers may be unfolding. The consequences of how TMMs are shaping consumer-worker relations are unclear, and we should be cautious about drawing overly broad implications. Our study, however, suggests that the role of gig economy services as marketplaces has salience around fairness to consumers, emphasizing the importance of examining how TMM companies choose to represent and frame market processes to consumers.

Conclusion

In speaking with and considering how consumers think about fairness in tipping closely, this study shows how an everyday social practice, that of tipping, becomes interpreted differently by consumers when it occurs within a technology-mediated marketplace. A key result is how social norms usually associated with tipping after delivery are altered, with participants tended to view tipping as an obligation to provide a living wage, rather than a way to reciprocate the efforts of individual workers.

A second key result is how tipping as a primarily dyadic exchange between delivery worker and driver can become subsumed by the relationship between the consumer and TMM companies, with differing participants inferring a lower or higher obligation to tip depending on their specific beliefs. Consumers make both ethical and economic assessments differently, taking into account their views and perceptions of TMM companies as well as their beliefs about how tipping in the marketplace operated.

Finally, we argue that examining TMMs as digital systems requires examining how consumers perceive the role of markets, which have salience around how they perceive fairness when interacting with other economic actors. We find that some participants tended to view their interactions with individual drivers as interactions with a broader marketplace as a whole. TMM companies continue to experiment with such representations, sometimes unsuccessfully—as Uber sought to do initially in its representation of surge multipliers as reflecting a larger market process of demand and supply. I explore this in the next chapter where I examine how consumers perceive changing prices due to supply and demand in TMMs, through the example of surge pricing in ridesharing.

Chapter 4: Surge Pricing in Technology-Mediated Marketplaces

The adjustment of price to supply and demand is a cardinal rule in economics, one which Hayek (1945) referred to as a "marvel." Price contains information, which collapses the complex sequence of events and supply chains prior to the production of a service or good into a single number. Markets are hence seen as allowing efficient coordination of a vast number of sellers, buyers, consumers, producers—all acting towards their own self-interests.

This free action of price is hence seen as integral to the potential efficiency of markets. Kahneman et al. (1986), in a series of famous vignette experiments, show that everyday perceptions of fairness vastly differed for the public or average consumer, with fairness perceptions acting as a "constraint" on markets. Similarly, Roth (2018) describes the role of fairness perceptions and human values in the design of markets. Both economists are careful to affirm that such behavior is not "irrational," but rather as reflecting fundamental human norms and values which markets should take into account.

As consumers frequently interact with marketplaces that are technology-mediated and managed by for-profit companies, they encounter market processes in unfamiliar environments, one that interacts with both their perceptions of general, underlying market processes, as well as their perceptions of technology companies. Similar to the previous chapter with tipping, this project explores how consumers perceive and interpret the practice of surge pricing in technology-mediated marketplaces. In particular, I am interested in how the technological mediation and operation of marketplaces by for-profit companies affect how consumers perceive prices and the practice of surge pricing.

To answer these questions, I conducted qualitative interviews with 21 users of ridesharing services to understand how consumers perceive price and wage changes in everyday scenarios, drawn from Kahneman et al.'s (1986) paper, as well as an instrument designed to elicit their views of prices and price changes in ridesharing specifically. I also use a series of ridesharing interfaces as probes to understand how consumers perceive ridesharing applications and features.

Together, I seek to answer these following research questions:

1. How do consumers perceive fairness around changes in prices in response to demand and supply?
2. How do consumers view the role of surge pricing by ridesharing companies?
3. How do consumers respond to management of markets and market processes by ridesharing companies?

The Practice of Surge Pricing in Ridesharing

Uber introduced the practice of surge pricing in 2011(*Pricing*, 2025), which raised prices for riders when the demand from riders exceeded the supply of drivers. The app initially presented riders with a separate screen that they would have to accept, informing riders that "Demand is off the charts! Rates have increased to get more drivers on the road." Strong pushback and criticism by riders, as well as coverage by the media (Wohlsen, 2013), led Uber to remove this additional screen. Uber shortly retained a numeric multiplier provided to riders, but subsequently removed that as well, with only "Fares are higher due to increase demand" in the description.

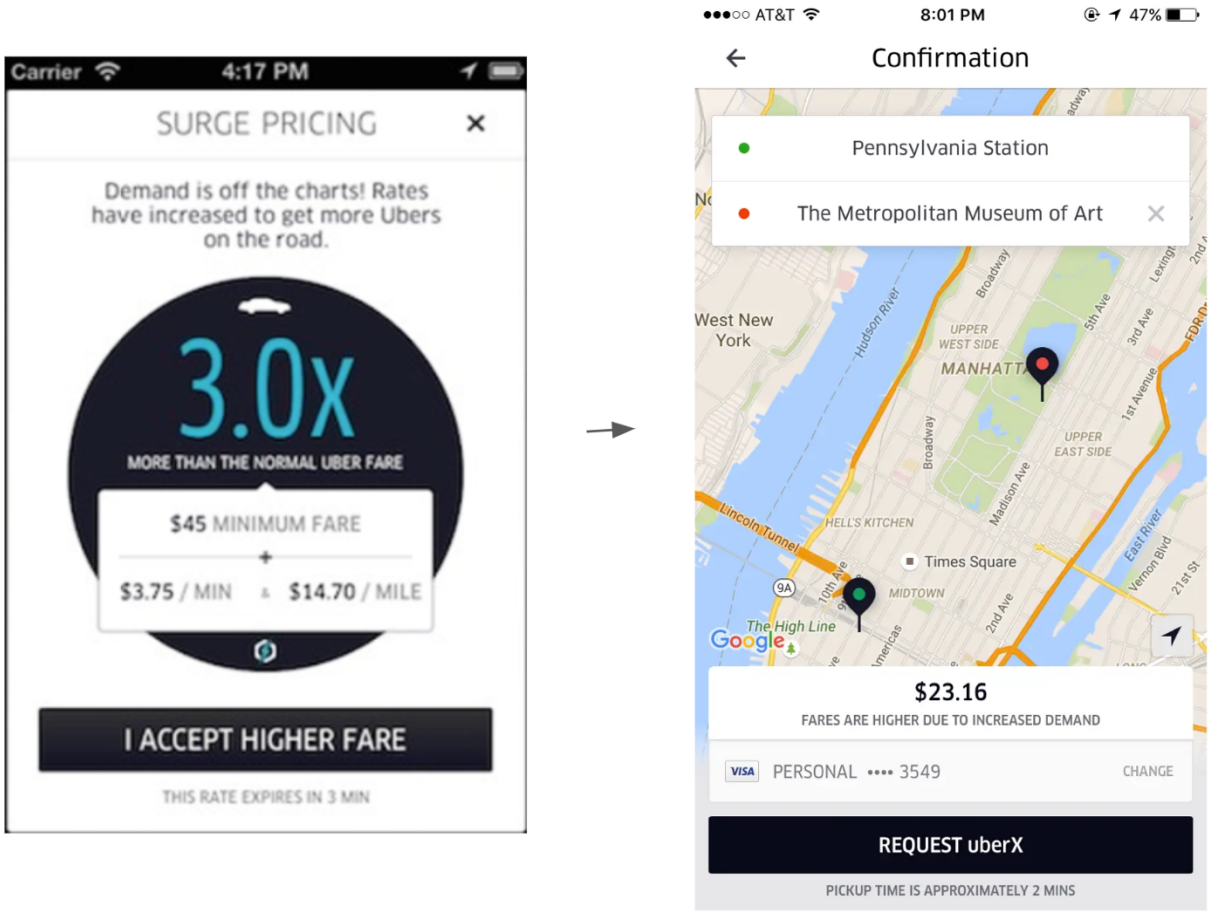

Figure 4.1. Evolution of Uber surge pricing interfaces (circa 2013 to present)

Literature Review

Price Adjustments and Price Discrimination in the Digital Economy

The adjustment of price to demand and supply is a basic function of markets, and seen as a way to maximize buyer and seller welfare and achieve Pareto efficiency, an outcome where no one's welfare can be increased without reducing welfare for someone else. These models rely on a

single price provided to both buyers and sellers. Kahneman et al. (1986) show that how price adjustments are framed can lead to widely different perceptions of fairness. Two main concepts he reveals are that price increases due to a decrease in supply are not well-accepted, and that price increases due to an increase in costs are found more acceptable. Kahneman et al. (1986) also introduce a concept of a "reference transaction," a status quo which people use to compare changes in price and can significantly influence their perceptions of fairness.

One basic assumption, that a single price is provided to buyers and sellers, becomes complicated in the digital economy. Consumers access prices not through browsing a list price in a physical store, which is the same for all customers, but through individualized apps and web browsers. The ability to price-discriminate, or offer different prices to different customers, has greatly increased. In the digital economy, in apps and websites that require logins, prices can differ greatly. Calo describes this as a characteristic of the "mediated consumer" (Calo, 2014).

Unsophisticated attempts at price discrimination can spell disaster for a company. In 2000, Amazon issued a public apology when it was reported that different prices was being offered to different customers using browser cookies, with then CEO Jeff Bezos issuing a statement declaring "We've never tested and we will never test prices based on customer demographics" (Weiss, 2000). Companies have learned from their past mistakes. Across platforms like ridesharing and e-commerce, we see the proliferation of methods to price discriminate that are more difficult to detect, such as targeted coupons, product versioning, and loyalty programs.

Custodians of Social Welfare

Uber has often argued that its interests align well with maximizing social welfare. This is supported by some research. A variety of research has investigated how Uber's policies and practices are socially beneficial, some using real data from Uber as a partial component of their analysis. Castillo (2018), using a spatial equilibrium model with trip data in the Houston area, finds that surge pricing increases rider surplus by 3.57% of gross avenue, while driver surplus and platform profits decreased by 0.98% and 0.5% respectively—suggesting that surge pricing acts to *decrease* Uber's profits. It is important to note that these estimates are against a simulated counterfactual where Uber does not employ surge pricing, and its results assume a fixed commission of 24-28% taken by Uber.

Uber has often claimed that keeping prices competitive is most advantageous for Uber, arguing that maximizing consumer welfare is both socially optimal as well as privately profitable for Uber, and that overall social welfare aligns well with Uber's own interests (Wohlsen, 2013). In another paper employing a theoretical model, Castillo et al. (2017) argue that surge pricing solves the "wild goose chase"—improving efficiency and increase overall social welfare (rider and driver surplus) by reducing wait time for drivers. More broadly, in a paper that had financial support from Uber, Cohen et al. (2016) estimate that UberX generated about $2.9 billion in consumer surplus in 4 U.S. cities included in their analysis.

These results collectively suggest that Uber's practices, particularly around surge pricing, are predicated on making its service and marketplace more efficient, with consumers particularly benefitting from lower wait times and lower prices. Significantly, however, Uber's practices,

including the share of fares taken and prices displayed to riders, are not static and can change throughout time.

In 2014, Uber introduced an upfront price, which effectively decoupled what drivers get paid from what consumers pay (*Pricing*, 2025). This meant the market was split into two. Traditionally, with only one price, surplus is distributed between the buyer and seller. By decoupling the fare for riders and wages received by drivers, Uber can adjust prices to the demand and supply for both markets, thereby reducing driver and rider surplus and maximizing profit. Uber argued that providing an upfront price was beneficial for riders by reducing uncertainty over what their fare would cost.

Methods

Recruitment

I recruited interviewees through Prolific. Participants were at least 18 years of age, physically located in the US, and used ridesharing services in the past 12 months. Participants filled out a pre-screening survey with demographic characteristics, frequency of rideshare usage, and political affiliation. I then contacted participants to schedule interviews, selecting participants to achieve variation over gender, age, frequency of rideshare usage, and political affiliation.

Participants were well-distributed across the United States, including both major cities (12), suburban (7) and rural (3) areas. The sample were broadly represented across gender, age, race, income, education level and political affiliation. Ten participants identified as female, 10 as male, and one as non-conforming/non-binary. Participants ranged in age from 22 to 56 years old. Three participants were aged 18-24, five were 25-34, eight were 35-44, and five were aged 45 or older." Fourteen participants identified as white, two of whom also identified as American Indian or Alaskan Native, five identified as black, and two as Asian. Participants reported a range of educational backgrounds: four had a high school diploma or less, five had some college or an associate degree, seven held a bachelor’s degree, and five had completed a postgraduate or professional degree. Nine participants reported a household income in 2023 of less than $60,000, four between $60,000 to $99,999 range, four between $100,000 and $149,999, and four above $150,000. A third identified as Republicans, a third as Democrats, and the others as Independents or something else.

Table 4.1: Participant characteristics

	Gender	Age	State	Freq per month	Services used	Political Affiliation
P1	Woman	35–44	Texas	9 or more	Uber, Lyft	Independent
P2	Woman	35–44	Vermont	<1	Uber, Lyft	Democrat
P3	Man	25–34	Oklahoma	<1	Uber, Lyft	Democrat
P4	NC/NB[1]	18–24	Washington	<1	Uber, Lyft	Democrat
P5	Man	35–44	California	5–8	Lyft	Independent
P6	Man	25–34	California	5–8	Uber, Lyft	Democrat
P7	Woman	25–34	Texas	1–2	Uber, Lyft	Independent
P8	Man	45+	Idaho	1–2	Uber, Lyft	Democrat
P9	Man	18–24	Connecticut	1–2	Uber, Lyft	Independent
P10	Woman	25–34	California	5–8	Uber, Lyft	Democrat
P11	Woman	35–44	Washington	3–4	Uber, Lyft	Independent
P12	Man	35–44	California	9 or more	Uber, Lyft	Republican
P13	Woman	45+	Texas	1–2	Uber	Democrat
P14	Woman	45+	Oregon	1–2	Lyft	Something else
P15	Woman	35–44	Illinois	1–2	Uber, Lyft	Independent
P16	Man	35–44	California	3–4	Uber, Lyft	Republican
P17	Woman	35–44	Florida	9 or more	Uber, Lyft	Republican
P18	Man	45+	Florida	9 or more	Uber, Lyft	Republican
P19	Man	45+	Iowa	1–2	Uber, Lyft	Republican
P20	Man	35–44	Pennsylvania	3–4	Uber, Lyft	Republican
P21	Woman	18–24	Maryland	1–2	Uber, Lyft	Republican

[1] NC/NB = Non-conforming/Non-binary

Interview Procedure

I conducted interviews in English using the Zoom videoconferencing platform between December 2024 and February 2025. All 21 interviews were transcribed through a professional transcription service. Interviews lasted between 53 and 95 minutes, with most interviews lasting longer than an hour. Participants also filled out a short demographic survey using an online form before the interview. Participants were paid a $25 Amazon gift card for their time.

I designed an interview instrument divided into 3 modules. The first module involved showing participants three scenarios from Kahneman et al. (1986) describing different contexts for changes in price and wages, to elicit participant thoughts about processes of supply and demand in general. In the second module, I asked participants about how they used ridesharing services, including their past experiences with surge pricing as well as how they perceived surge pricing to work. The final module involved showing participants various interface probes, including ones that mapped closely to Uber's interfaces across time, as well as speculative interfaces with new features to elicit participant perceptions of other marketplace designs. I include these scenarios and findings across the different modules in my Findings where appropriate to contextualize my results for the reader.

Data Analysis

Using interpretative qualitative coding, I conducted the data analysis in an iterative process. I first applied initial coding to the data, where I used short phrases as codes on a line-by-line basis. Some example codes include “surge price an attempt at price gouging” and “cares about own price most.” I then applied focused coding by identifying common themes to form higher-level codes. Examples of second-level codes include “seeing numeric multiplier discourages ordering ride” and “price differences attributed to dynamic pricing.” I paid attention to 1) how participants might view market processes differently in ridesharing marketplaces and 2) how participants perceived marketplace features and information in ridesharing apps.

Findings

Consumer Views of Market Processes

In the first module, I presented participants with scenarios drawn from Kahneman et al. (1986). I selected these scenarios to elicit how participants felt about adjustments of price to demand and supply for goods and wages. I asked participants to discuss how they felt about these price adjustments to provide a baseline for how consumers felt about markets and market prices more generally against their views of markets in technology-mediated marketplaces.

> **Scenario 1:**
> A hardware store has been selling snow shovels for $15. The morning after a large snowstorm, the store raises the price to $20.
>
> **Scenario 2:**
> A small shop has one employee who has worked in the shop for six months and earns $18 per hour. Business continues to be satisfactory, but a factory in the area has closed and unemployment has increased. Other small shops have now hired reliable workers at $14 an hour to perform jobs similar to those done by the shop employee. The owner of the shop reduces the employee's wage to $14.
>
> **Scenario 3:**
> A company is making a small profit. It is located in a community experiencing a recession with substantial unemployment but no inflation. There are many workers anxious to work at the company. The company decides to decrease wages and salaries 7% this year.

Overall, I find that participants had mixed reactions to price changes in response to supply and demand. Participants responded better when price changes were due to increased costs or financial hardship from an employer. Participants also felt that it was unfair to set wages according to external factors beyond their control, rather than the quality of their own work. Participants also differentiated between price changes for goods vs. labor, feeling that employees should not be treated as “expendable” (P4) and see their wages change in response to market conditions.

i. Mixed reactions to market-based price changes

Participant views of the general role of markets were mixed. Several participants expressed that raising the price of a snow shovel during a snowstorm in Scenario 1 was reasonable, with many feeling it as par for the course due to limited supply and increased demand, or as P14 puts it, "supply and demand." Other participants felt strongly that this was unfair, with many referring to the term "price gouging," particularly as many felt a snow shovel to be an essential good or necessity in a snowstorm. P15 described: "As a consumer, no, I don't find it to be fair at all. I find it to be price gouging. They're preying on other people's weaknesses and their necessity for something."

Many participants expressed ambivalence about such a price increase. For example, P7 felt the practice was broadly acceptable, though she was not "happy about it."

> Yeah. I am not the biggest fan of it, but that's how the economy works based on demand. Prices do go up. So it's the norm. So while I might not be super happy about it, it is acceptable, and that's how the world works. So I wouldn't protest or go against it. (P7)

P11 expressed a similar view, expressing that even though she did feel it to be "price gouging" to an extent, she still felt it was acceptable.

> If there is a big demand for them and they don't have enough… I think it is probably acceptable. I don't think I'm happy about it. I don't think it's very nice of them, but I do think just as far as supply and demand, it's probably acceptable. (P11)

P20 expressed his view more strongly, feeling that price adjustments due to demand and supply served an important function:

> Well, I think it's fair. I believe in capitalism and supply and demand is kind of the basis of that. Yeah, it kind sucks if you're short on cash, but it's totally their right to do it and I understand why. (P20)

ii. Price changes due to financial hardship more acceptable than excess supply

In line with Kahneman et al.'s (1986) results, participants felt that wage changes due to lower profits or financial difficulties were far more acceptable than in response to an increase in the supply of workers. P6 felt a wage decrease would be more acceptable if the employer could not afford maintaining the same wages.

> I think if there was a downturn in business and my employer was losing money and couldn't afford to keep paying me 18 an hour, then I could kind of understand pay cuts or having benefits slashed because that makes more sense. But I guess in this case, if business is still fine, revenues are seemingly okay, it seems like it's just a matter of being able to pay less and make more money because of it. (P6)

P5 expressed a similar view but also felt that wage changes in response to "supply and demand" was par for the course, particularly in a recession.

> Yeah, I mean, in a recession, yeah, it's completely acceptable. That's a supply and demand thing, too. I don't know. But yeah, this is just completely acceptable. I mean, I know it sucks, but it's like they're making a small profit, there's a recession. There's a lot of substantial reasons as to why they're doing what they're doing. It's not ethically irresponsible or anything. (P5)

Participants pointed out that wages due to external factors out of an employee's control felt particularly unfair. P10 described how an employer reducing wages not due to the employee's own "quality of work," but instead to "reflect the wages of other people" felt unfair, particularly if the employer was not facing financial hardship.

> It feels unfair because the wage reduction is not due to the quality of work being reduced by the employee, it's just because of or to benefit the small business directly, it's mainly just to reflect the wages of other people. (P10)

P19 expressed a similar view, emphasizing how the wages of other employees should not affect the wages a worker is paid.

> Yeah, this is unfair. If the worker has been paid $18 per hour, and you're changing the pay just because of other employees? I mean, this is what he's made. If he moved to a different role and he accepted that hey, this role is going to pay less, he or she, that's fine. But if they didn't change anything, then they should not take a lower pay. It's unfair. It's not right. (P19)

iii. Price changes for labor are perceived differently from goods

Participants also described how they perceived the adjustment of price for goods and labor (in the form of wages) differently. Participants felt that reducing wages due to increased supply was disrespectful to workers, emphasizing that relationships between employers and employees extend beyond a market relation. Several participants felt that such an adjustment was an affront to the dignity of workers. Adjustment of price for labor was hence treated differently by participants. P4 expressed this view strongly, feeling that a business that adjusted wages due to increased supply was "not trustworthy or reliable."

> I think it is both morally and ethically wrong. Morally, it is a terrible thing to do to another person to treat them as if they're almost expendable, that their wage that they need to live can be taken away from them at any time. And ethically, it's a bad business practice. It shows that as a business, you don't care about your employees, that you are only going to treat them as well as you're required to by the other competition in the area… It shows that you're not a trustworthy business, or I guess employer, it shows that you're not trustworthy or reliable. If that happened to me, I'd quit immediately. I would not take that. (P4)

Surge Pricing by Ridesharing Companies

In the second module of the instrument, I asked participants about how they understood surge pricing to work, whether they saw a role for surge pricing and their feelings towards it, and specific incidents where they observed surge pricing. In my analysis, I compared their views of surge pricing in ridesharing services to their perceptions of the adjustment of price to demand and supply generally.

Three aspects stood out in terms of how participants discussed adjustments in price to demand and supply generally as compared to ridesharing specifically. First, participants continued to draw the distinction between "necessary" and optional goods, seeing surge pricing as more acceptable for rides that might be seen as luxuries. Second, many participants characterized surge pricing as serving a useful function in ridesharing specifically by managing demand and supply as well as traffic, more so than in other industries such as fast food. Third, many participants also felt that surge prices reflected actual market conditions reasonably accurately, though other participants felt that ridesharing companies might be using high demand to justify higher prices to consumers.

i. The role of agency in acceptability of surge pricing: luxuries vs. necessities

The theme of agency continued to be important in ridesharing. Similar to their views of price adjustments generally, participants emphasized that they were more accepting of surge pricing in contexts where riders had a choice, either from other transportation options or if they were voluntarily attending a concert or large sports event. P3 discussed how consumer awareness that prices would be higher made surge pricing more acceptable.

> So I guess when I think about busy events like a sporting event or something like that, when people go to those events, I think they go in with the realization or the thought in their mind that there may be significant demand for getting back home if they have to take an Uber, if they have to take a Lyft. And I think that when they go to those events, surge pricing is okay because the thought is probably already in their mind that there's going to be high demand for Uber. (P3)

P5 contrasted the voluntary aspect of taking rideshares at a sporting event to a rainstorm or blizzard, where riders did not voluntarily choose to be in the situation, and where factors affecting their need were external and out of their direct control.

> I mean, well, why should it be? There's no good reason that it should be. It's like after a sports event, that's a hedonist event. It's something that people are willing to pay more to enjoy themselves. They're spending up to get this kind of luxury, whatever accommodation. Whereas a rainstorm, it's just a necessity. It's a part of blizzard whatever. There should be discounts in those moments. On sports events, you would expect it to be … I don't think anyone at a sports event would expect a Lyft to be cheap. They'd be like, 'It'll be expensive, but it's worth it because we got to get out of here.' (P5)

ii. Prices as a way to regulate demand and supply in ridesharing

Participants discussed their views of surge pricing in ridesharing, comparing it to their general views of adjustments in price to demand and supply. Many participants did not view surge pricing negatively in ridesharing, while some expressed ambivalence. Similar to how they viewed adjustments of price to demand and supply generally, some participants saw surge pricing as serving a useful function, but explained how they did not like it as consumers personally. P7 described:

> I dislike it as a customer, obviously… So I think when it does increase, we still deem it acceptable, and we'll typically still use the service… I don't know if I can say it's good or bad. I think it's in the middle. It's okay. Yeah. I see why they do it. As a consumer, it's not ideal. (P7)

One difference in ridesharing from general contexts is that some participants saw surge pricing as serving a function in avoiding rides from becoming "backed up" and managing traffic.

> I like it. I think it's good because it makes it so everything doesn't get backed up. If you need it right now, you could just pay the extra fee and go out. (P9)

This meant that participants were more understanding of price increases in ridesharing, as compared to the increase in price of goods generally. For example, P9 discussed how he objected to the practice of surge pricing in fast food because "food can't get backed up." Similarly, P6 points to the role of surge pricing in not just managing the demand for rides, but for managing traffic.

> I think with a large sporting event, you've got a lot of people calling for rides. It's not like a life or death situation if you have to wait a bit longer. So in my mind, it's fine to implement surge pricing because you might get people who are like, 'Okay, well maybe I'll hang around a bit, maybe go somewhere that to eat and then I'll call a ride.' I think in situations like that, like a sporting event, it manages the amount of people leaving the stadium or the general area. That also helps manage traffic in the area too, so you don't have all these drivers trying to come in and go out, and it just blocks everything up. (P6)

iii. Prices as an accurate representation of the market in ridesharing

Many participants accepted surge prices as accurately reflecting the demand and supply for drivers. Some participants, however, described instances where they felt that surge prices did not reflect a lack of supply of drivers, but was instead an excuse to charge riders higher prices.

P16 described how he felt surge prices did not reflect actual demand and supply, but because ridesharing companies know they were able to charge more at the time.

> Yeah. That they don't always do surge pricing because they don't have enough drivers. They often just do the surge pricing just because it's specific time or they know at this time, people will pay more than at other times. Like I said, late at night. All the time after 10:00 or 11:00, there's always surge pricing, especially on weekends. And it's like, well, no, there's a ton of cars out there driving right now. I can see in the map that there's a ton

> of cars, but they're charging me more just because of the time because they know, oh, people pay more at this time. (P16)

P16 felt that the average consumer likely accepted surge prices as adjusting to demand and supply, but for him, simply reflected when ridesharing companies know they can charge riders more.

> Yeah. The average consumer using an app, I'm just going to say probably just assumes that it's just the supply and demand, and that's why the prices go up and down when that's not that. The app just knows when to charge people and that they can charge people more and people are willing to pay it. The consumer doesn't understand what's actually happening, that it's just price gouging. (P16)

P21 felt that surge prices did not arise from demand and supply, but was rather a "set price" given to riders. She felt that in a "free market," riders would be able to compare prices and price to be determined accordingly, which was not the case in ridesharing for her.

> I think in a free market, you would expect that if there was some kind of way for them to market the surge pricing as like, "Oh, you can compare prices and find the best price for your budget." That would be great, except for it's never less than you would expect. So the prices are always higher. And so, that's not really applicable because you're not able to shop around. It's like the market-set price or higher during a search. Does that make sense? (P21)

Management of Markets by Ridesharing Companies

Finally, throughout the interview, I paid attention to how consumers made sense of marketplace features and design aspects, as well as how they viewed their management by ridesharing companies. In this section, I first discuss participant perceptions of various marketplace surge pricing features. I next discuss perceptions and attitudes participants had towards technology companies, state regulators and unions, as well as drivers.

A. Perceptions of surge pricing features and design

i. Visibility of multipliers

I presented participants with an interface corresponding to Uber's representation of marketplace multipliers after 2016, which gives no numeric multiplier. I then presented participants with Uber's representation of multipliers between 2015-2016, where a numeric multiplier was briefly visible. Participants were told to imagine seeing this interface in a ridesharing app and respond to them accordingly, and were not informed that the interfaces corresponded to Uber's interfaces at different times. Each interface was presented on a separate slide and participants were asked to respond to them individually.

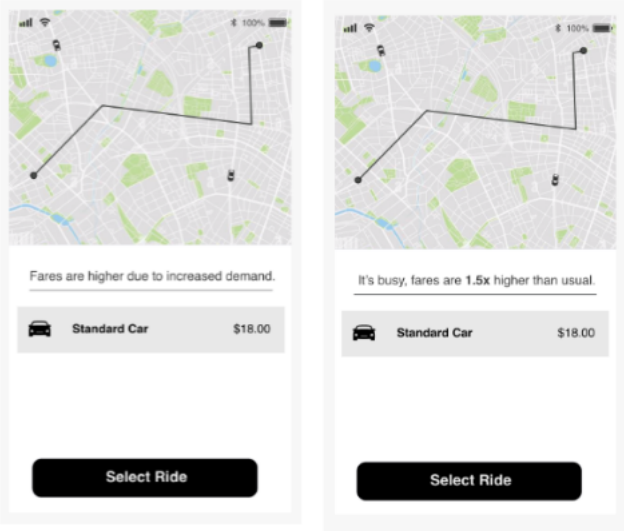

Figure 4.2. Interfaces with and without numeric multipliers

Participants described how having the numeric multiplier was useful as it gave them a sense of how much higher prices were than normal. P11 described how seeing the multiplier helped her decide whether to order a ride based on much higher the demand for rides was than normal, essentially providing a numeric anchor she could compare current prices to.

> If I can see very specifically what the cost difference is, and if that's rush hour and if I wait a certain amount of time, if I see that it's one and a half times higher, but it's only going to be one time higher, or the same amount if I do it a little bit later, I think it gives me the option of deciding by understanding what the rate difference is, rather than just kind of guessing and thinking, 'Oh, I don't know what it would be if I waited, oh, that looks good enough.' The $18 is a fair rate, but I didn't understand before that that's actually a $6 increase or whatever it would be. (P11)

However, many participants described how seeing the multiplier might discourage them from taking the ride. It also raised questions for them of why prices were higher. P8 described how knowing exactly how much higher prices were than normal would make him "mad."

> No, I wouldn't want to see it. I know you're already saying prices are higher because of busy fares, but to tell me that you're raising it 1.5 times, I wouldn't want to see that. It would probably make me more mad than it would if I just saw that fares are higher in the area without no percentage attached to it. (P8)

Other participants described how seeing the numeric multiplier would not change their rideshare behavior, as they only used rideshare services when they needed them. They described how seeing the multiplier, however, would make them feel like they were being taken advantage of. P5 described how seeing the numeric multiplier would be "an immediate turnoff."

> It's just a visual. Yeah, it's a visual. It's like a cognitive thing. It's just when I see it visually, it's just an immediate turnoff. If I was desperate enough, I might just click it, be

> like, ‘Fuck it.’ But the 1.5 will make me second and triple guess myself, be like, ‘Dude, that's too much. That's too much. I don't know.’ But if I had to see the price, whatever, sometimes you're just forced to do it. I don't know. Something visually just, yeah, it's not good. (P5)

ii. Drawing attention to markets raises greater scrutiny

I also presented participants with an interface corresponding to Uber’s representation of marketplace multipliers before 2015, which required participants to click through a second screen and accept higher prices. This interface gave other information about how fares are calculated, but also did not give an upfront price. As before, participants were not informed that the interface corresponded to Uber’s app. Most participants did not recall seeing this interface before.

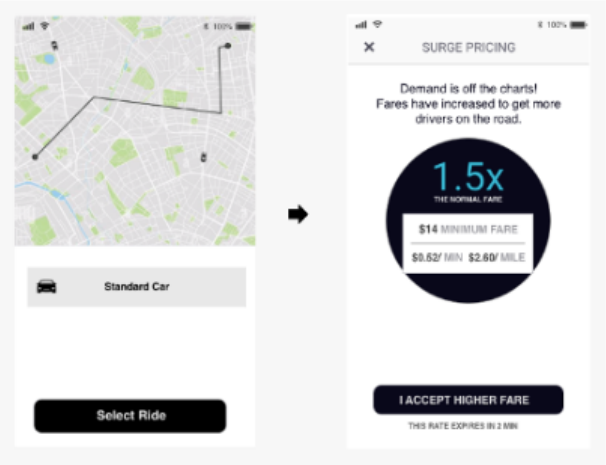

Figure 4.3. Interface with separate screen for accepting surge price

While some participants like the additional information the breakdown provided, participants also described how the additional information raised questions for them about how prices were set. P19 described how the wording of “Demand is off the charts!” raised further questions for him.

> Yeah, I like it. I mean, I don't need the, ‘Oh, demand's off the charts.’ Well, me personally, I'm like, ‘Well, what's demand to them? What do they consider busy?’ I could agree if I'm walking out of a concert or an event, but if I was just walking out of, needing a ride from home, I was like, ‘Well, wait a minute, why does that say demand's off the charts? Because I don't see that.’ (P19)

P20 emphasized how the additional information was not particularly helpful because few people would be able to calculate their fares based on that information.

> It's just too mathematical. I'd rather them just say, ‘Hey, demand is increased, so prices are increased.’ I don't need to see all of this because who's going to take the time? Okay,

> 52 cents a minute. Who's going to say, 'Okay, well, I have to get home, it takes me 16 minutes.' Nobody's going to do all that math so honestly, this is kind of ridiculous. I wouldn't even read it. If I really needed the ride, I'd say, 'Okay, whatever, accept the ride.' I'd rather just see what my fare is going to be than have my hand held and walked through why it is how it is… How many people are going to know exactly how many miles they're going, how long it's going to take? So no, it's not useful to me at all. (P20)

iii. Price differences between consumers are hard to detect

Many participants believed that prices were set similarly for different riders, i.e. there was no price discrimination on the part on ridesharing companies. However, some participants described incidents where they were ordering rides as part of a group, and noticed different prices when rides were called at the same time on different phones. P17 described as being "shocked" at the price difference.

> [W]e were standing at the same spot, so we were still shocked. But who can I explain this to and let anyone know that it is a difference between the users? And it shocked us that, again, that it is like a seven dollar difference because she doesn't use it as much as me. And mine was $85. And that's a big surge when the average ride on a normal non-surge day, it probably would've cost us like $24. (P17)

P7 described noticing a similar price difference, but ascribed it as possibly due to the dynamic nature of pricing changing second to second. She also suggested that built-in discounts could also account for different prices. She described how her friends did not really "question it" as they "forg[o]t about it later."

> And I think one person did have a built-in discount. But for one person, it was just cheaper. I don't know if it changes maybe every second or how that works, but yeah… Yeah. We actually didn't think about it because it's happened before, but I think we never spent the time thinking why. If someone has a discount, then that makes sense, and we don't question it or if they have a gift card or something. But if someone doesn't have those, then, yeah, I don't understand why, but we just don't question it because we forget about it later. (P7)

B. Attitudes towards companies, state regulators, unions and drivers

i. Lack of trust in technology companies

Participants also generally expressed skepticism about various market information and transparency information posed to them in a ridesharing app. Responding to a visual probe that provided information about the number of participants looking for rides, P2 expressed that while he would always "opt for more information," he "want[s] to be able to trust it." He discussed how he might interpret the information about the number of riders ordering a ride as "manufactured panic" in order to get him to order the ride quickly and not compare rates to another ridesharing app.

> So when they're saying there's 10 other passengers requesting rides, I'm like, maybe. But then I look at the little thing and there's only two cars and I'm like, I don't know what's going on here. I'm not sure I trust this. So I guess, in theory, I would say I always opt for more information versus less, but I want to be able to trust it… I feel like they're trying to make me feel more urgency to press select ride because I'm like, 'Oh, I got to do this now. I can't think about it. There's 10 other people who might press yes at the same time. I got to get in line first.' And so I feel like it's almost manufactured panic because it's like I can't ponder this, I can't open up the other app and check because someone's going to get in line in front of me. So I got to select yes now. (P2)

P4 described how he disliked the conversational tone of "Demand is off the charts!" that was previously displayed in Uber's early interface before 2015. He explained that Uber is just an "app" and "utility" to him and should not "try to make conversation with [him]," emphasizing that the app was "not [his] friend" and should just "give [him] the numbers."

> Demand is off the chart. Fares have increased to get more drivers, what are you? You're not fooling anyone, my guy. I say my guy in terms of the person who made this… I think if you're going to show this information, just show it. You don't need any text, you don't need any conversation. It feels like the app is trying to make conversation with me and it's like, you are an app, you are a utility. Do not try to make conversation with me. *I'm not your friend. You are not my friend. I am using you. You are a service. Just give me the numbers* [emphasis added]. (P4)

ii. Who should be setting multipliers

I also presented participants with probes with the multiplier set by different entities, namely the company itself, the state's transportation authority, and by a state driver's union. These were presented individually first and then together. Participants were divided on who they felt should set surge multipliers. While some felt that a driver's union setting prices would more likely guarantee drivers were receiving equitable wages, others expressed skepticism of the additional information provided within the app of who sets multipliers, feeling it was a way for companies to deflect responsibility or "pass[] off all the blame" (P3) to someone else.

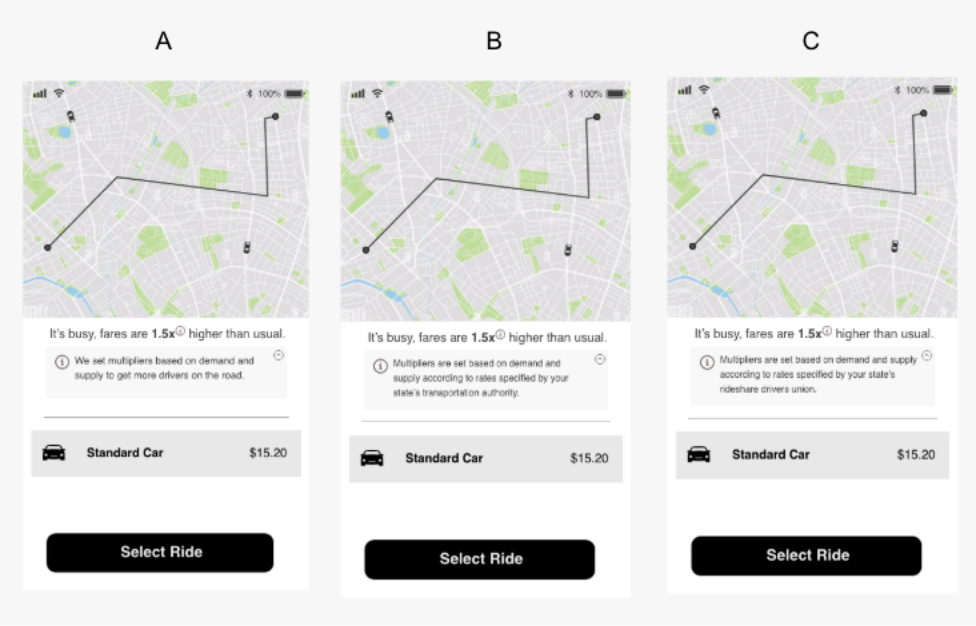

Figure 4.4. Interfaces with different entities setting surge prices

Some felt that the company was best able to set prices based on market demand, while the state or driver's union would be less effective at adapting to the dynamic demand and supply of drivers at a specific time or place.

> Yeah, I think it's more flexible and adapting to the changing demand and supply. I know that B and C are also based on demand and supply, but unions have bylaws and procedures that they develop. It's not like they're developing it, adapting to it minute by minute like A is probably doing with their algorithm. And state regulations, similar stories, it's not like they're … It's probably taking at least weeks or months to pass, so I don't necessarily trust that it's adapting as quickly as A, like an algorithm would. (P10)

Others expressed that they liked the rider's union to set surge prices best, as they felt that was a better guarantee that more of the increase in fares would go to drivers.

> If there's a reason for that based on the union negotiation, then I can assume that the drivers are probably getting compensated well based on the surge, and I wouldn't feel so bad about it, knowing they're hopefully going to get a decent chunk of money out of it. (P6)

P11 also felt that driver's unions setting surge prices was more trustworthy, where the company is not raising prices to "price goug[e] you to just try to make a profit."

> I think so, because that way you know that the driver is getting the money and it's not just that they're price gouging you to just try to make a profit. If a driver's taking more time out of their day to do something, they should be compensated for it. (P11)

While some participants felt that a union setting surge multipliers would mean more equitable wages for drivers, participants also described skepticism with how to interpret information provided in a commercial app about surge multipliers. P3 described how he felt how information either about a driver's union or state regulator setting rates as an attempt to deflect responsibility by the rideshare company. He felt it was an attempt to "pass[] off all the blame or … their rate" to a driver's union or state regulator.

> [I]t does seem like Uber is shifting all of the responsibility onto the state regulators and the regulation rather than just saying fares are higher. It just feels like Uber is taking an issue that maybe they can deal with as a company and passing it off to their customers and saying, 'See, look how bad the state regulators are.' So it just feels … it doesn't make me feel good if I were to see that while I was getting an Uber. (P3)

Some participants did not particularly trust state regulators to help provide equitable wages to drivers either. P1 described:

> I don't have a lot of trust in our state legislators or state regulators? I just don't... There's just a lot of corruption to me that I would just be worried about ethics, and I feel I would trust the unions more to set those fair prices than state regulators. … I'd be worried that the drivers were getting the least benefit [if state regulators were setting surge prices]. (P1)

Similar to Chapter 3's examination of tipping in third-party food delivery, some participants expressed annoyance at having to consider how surge prices are set in their purchase of an everyday service. P8 expressed this strongly, emphasizing: "I just want to know how much I'm paying. I don't care who pays or who sets pricing. It has no effect towards me. … I don't really care."

> No, I wouldn't want to see it. I don't really care what my state sets for rideshares or what the union between the two. … That'd be like me caring about who sets pricing for the stores or who sets pricing for any other service that I request. *I know what I'm asking for. I know what service I'm asking for, and all the others has nothing to do with me. I just want to know how much I'm paying. I don't care who pays or who sets pricing. It has no effect towards me.* [emphasis added] … It's like reading the news story and not caring what the news story said to me. I don't really care. That's the problem between rideshare company and the state or whatever it is. (P8)

iii. Consumer attitudes towards drivers and share of fares going to drivers

Participants showed a mix of attitudes towards drivers and the driver's share of fares during surge pricing. While some participants found surge pricing was acceptable so long as drivers also benefitted from the increase, many participants also described as caring most about the price they paid. P19 was more accepting of price adjusting to "[s]upply and demand" so long as drivers got a cut of the increase in price.

> I understand it. I'm good with it. As long as the person driving or the worker gets also an increase. I mean, if you say that their price, no matter what, they only earn the $4, but the companies now, instead of making 10, they're going to make 20, then it's unfair. But as long as the person doing the job gets a cut of that, then I understand it. Supply and demand. (P19)

P14 expressed a similar view, finding it important that drivers get a fair share of the increase in prices.

> I guess I'm just thinking about it really matters to me whether the drivers are seeing some of this money… Because if it's just the company that is increasing and doubling the prices, tripling the prices, and they are keeping all of that profit for themselves. And the drivers who are actually doing the driving and navigating these super busy streets, and probably if this is a large event, it seems likely that some of the passengers might be more unruly. If they are doing all of that, I sincerely hope that they are seeing that extra money and they're receiving that extra money. (P14)

While some participants expressed concerns over the share of fares going to drivers, many participants discussed how their own price mattered most in ridesharing. P10 described how knowing that drivers got a higher share of fares (90% in the scenario posed to them) would not affect the price he paid or how frequently he used ridesharing services.

> Mainly because just as an individual consumer, the price I pay is the most important factor, so it matters a lot less how that payment is split up between different parties after I make that payment… I don't really see why it would affect my using ridesharing more or less. (P10)

Some participants, however, also described how they felt that surge pricing was unfair to the consumer, but beneficial for drivers, reflecting some tensions between the welfare of riders vs. drivers in how prices are set.

> I really dislike it. I think it should just stay the same and stuff, but I have to give respect to the company that's I guess trying to make it easier for the customer and stuff, so a convenience… I think it's a part that's helpful as far as the driver. The driver gets to make more and they know that they're wanted and needed in the area, so it's beneficial for the driver. But far as the customer, consumer, it's a hard hit too. People are going to pay for what they need and they're going to pay that price if they want to get home or wherever they've got to go. (P17)

Some participants also described how decreases in wages were acceptable in response to demand and supply as drivers were contractors, and free to leave if they did not like the terms. P18 described how such wage adjustments felt fairer in a marketplace model, where drivers were contractors, rather than if they were employees of the company.

> You're going with the recession, or the benefit of having a contract is you have a lot more leeway. … And I've done contract work, and that's just how it works…. When you build a

> house, in great times, you get paid more as a contractor, and when times are tough, and people don't have money, you're going to take less money. That's just business. Now if it were McDonald's, like the example in the beginning where he started off at $18 an hour, and then you want to cut his rate, but he's an employee, that's different. Completely different. Contractors go with the economy. That's what you get paid for. … With a rideshare driver, every single ride is a contract between you and the company. (P18)

Discussion

Market Visibility

Uber has modified its representation of its marketplace through the years, making the surge multiplier less visible throughout time. Over time, Uber first eliminated the additional screen and text for riders to accept higher prices, followed by the elimination of the numeric multiplier, corresponding to the three following interfaces.

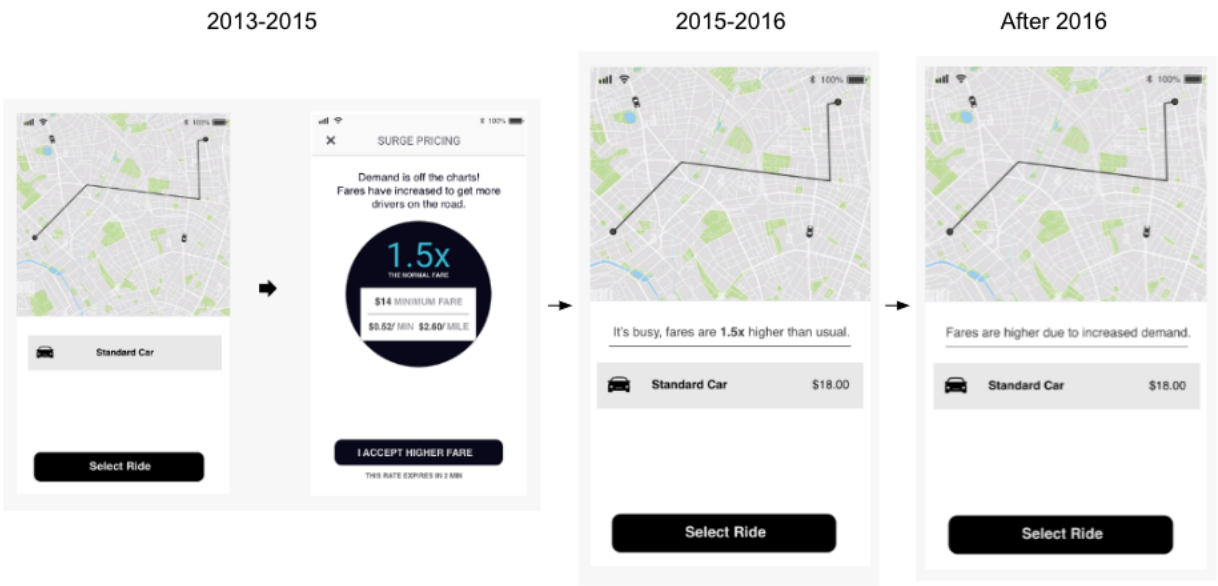

Figure 4.5. Representation of Uber's interface changes over time

My results show how making the market more visible, whether through providing an explanation of high demand in an additional screen, or providing a numeric multiplier, often raised more questions for consumers for how prices are set. For companies that manage marketplaces, my results hence suggest that companies have an incentive to subsume marketplace processes and make them less visible to consumers. In introducing surge pricing in 2011, Uber experimented with market visibility as a way to justify price increases to consumers, but my findings show how this can have the opposite effect. Consumers described questioning how these numbers were set and emphasized how they did not trust the company to begin with, such that they did not trust the additional information provided. We can hence see how Kalanick's comment that "[Uber is] not setting the price. The market is setting the price. … We have algorithms to determine what

that market is" (Wohlsen, 2013) was incongruent with the perceptions of consumers when the market process of price adjusting to demand and supply was made more visible to them.

In terms of the visibility of the numeric multiplier, providing the multiplier in effect provided riders with what Kahneman et al. (1986) described as a "reference transaction," or a baseline for what prices *should* be. Participants liked having access to this multiplier, with some discussing how they would adjust their riding behavior based on prices, riding when prices were lower instead. By removing access to a numeric multiplier as a signal of how much higher prices are than usual, riders are unable to adjust their rideshare behavior to account for driver shortages, as well as their own need for the ride. This is significant in terms of market efficiency, since such adjustments in usage would better manage peak usage and congestion, leading to a more efficient transportation and market system.

In Hayekian terms, when a price arises from the myriad interactions of buyers and sellers in a decentralized market, it contains meaningful information. Buyers and sellers are able to assess relative demand and scarcity across the entire market by examining the price. In TMMs managed by for-profit companies, however, riders and drivers do not derive similar information from price. Consumers do not know the "true" price, only relying on technology companies to tell them what the "true" price is. My findings suggest that consumers find transparency measures such as numeric multipliers useful to assess what the "true" price should be, and adjust their riding behavior accordingly.

Providing the multiplier, however, directly impacts the bottom line for Uber. Participants described how seeing the multiplier would dissuade them from ordering the ride, as it emphasized how much more riders were being charged. Providing the numeric multiplier hence provides a direct example of how company incentives can be in opposition to market efficiency and social welfare. Companies design marketplaces and decide information provided to consumers to increase profits. While social welfare would likely increase if the numeric multiplier were provided, gig economy companies have no incentive to provide this market information.

Difficulty in Detecting Price Discrimination and Plausible Deniability by Companies

I find that most riders did not expect prices to significantly differ between people. Participants only noticed price differences when the same ride was ordered by different members in the same group, and noticed significant price differences on their phones. While a few reacted strongly against these differences, most ascribed it to the nature of dynamic pricing adjusting to the market, or due to loyalty or other discounts users had. Others noticed price differences but did not pay too much attention to it.

This suggests that companies have greater capability to price-discriminate in TMMs, as consumers may simply ascribe price differences to the dynamic nature of the market. While price discrimination is widely practiced by companies, explicit price discrimination is often met with strong consumer pushback, curtailing their use (Poort & Zuiderveen Borgesius, 2019). A high level of price discrimination results in a loss of surplus for both buyers and sellers, which is

exacerbated in the case of ridesharing services due to driver fares being decoupled from what riders pay, effectively creating two separate markets. With the introduction of upfront pricing around 2016, drivers do not make a fixed proportion of what consumers pay, with driver's share of fares ranging from roughly 30%-70% due to variable fees comprised of a "service fee" and "marketplace fee" that ridesharing companies introduced (*Pricing*, 2025).

Beniger (1986/2009) described how administrative and information technologies can serve as a "control technology" across the 1840s to 1920s in the United States. Beniger framed such technologies as a solution to a "crisis of control" brought about by rapid increases in productivity associated with the Industrial Revolution. Similarly, in *The Visible Hand* (1977/1993), Alfred Chandler examines the growing importance of large firms and conglomerates in the United States in the 19th and early 20th centuries. Chandler argues that the role of "managerial capitalism"—characterized by highly hierarchical and centralized management by large firms—has been overlooked in accounts of economic growth, which had typically emphasized the free operation of "the invisible hand" in decentralized markets. While both authors have tended to frame centralized control of information technologies by large companies positively, recent scholarship have argued that such "control technologies" also reflect an expansion of control by large corporations and the private sector, particularly around the growth of the use of platforms and the collection and use of data by large technology companies (Srnicek, 2017; Zuboff, 2023).

To the extent that consumers may accept price differences as due to differences in dynamic pricing, we can see how management of marketplace services opens up a new capacity for companies to price discriminate and extract surplus. Marketplace management can hence extend the power of firms, serving as an additional "control technology." My results suggests that this control technology is most effective when the marketplace is hidden from consumers, as discussed in the previous section.

Tensions between Driver and Rider Welfare

HCI research has often examined how to redesign systems from the perspective of workers, and focused on efforts to increase the visibility of workers and worker labor (Boeva et al., 2023; Gray & Suri, 2019; Zhang et al., 2022). The existing political economy of gig work, however, means that many of these recommendations will not be implemented unless consumers show an interest in supporting workers. The experience of firms that have sought to promote and brand their services as fairer to drivers is not optimistic on this front. Fasten, for example, promoted itself as charging a flat $0.99 service fee to drivers, serving as a true marketplace service (as opposed to an employer). It has, however, since gone out of business. This experience is mirrored in a number of other ridesharing companies that advertised themselves as more equitable to drivers, but have either gone of business or only retain a small market share (Albus, 2025; Lekach, 2018).

While the continuing dominance of incumbent ridesharing companies may be due to substantial network effects from high utilization, as well as the high capital available to these companies, my findings suggest that the failure of more equitable competitors may also be due to a fundamental ambivalence by consumers towards worker rights. Participants were generally unsure of what share of fares go to drivers, which did not factor into their rideshare use

decisions. While some participants felt that it was important that drivers get a fair share of the increase in fares during surge pricing, many participants emphasized that it was their own price that mattered most.

My findings also suggest limitations to integrating transparency information within a commercial app, particularly where it involves other entities such as drivers' unions or state regulators. Participants were divided on whether they wished drivers' unions or state regulators to set surge prices, as opposed ridesharing companies. Participants also expressed skepticism towards information that unions or state regulators were setting prices when provided in a commercial app, feeling it was an attempt by the ridesharing company to deflect responsibility or "pass[] off all the blame" (P3) to someone else.

Conclusion

In this research, I undertook to understand how consumers interpret markets and market processes when they are managed by technology companies. I find that visibility about market processes and price information often raises more questions for consumers on how market prices are set, giving companies an incentive to obscure market processes, which Uber has done over the years in making the surge multiplier less visible. I also find that price differences between riders are difficult to detect, and even when they arise, are often attributed by consumers to dynamic pricing or rider discounts, rather than price discrimination by companies. Finally, I also find a lack of viable alternatives and market institutions for riders, where participants described resistance towards state or unions setting surge multipliers.

Chapter 5: Market Fairness and Consumer Choice

Introduction

In Chapters 3 and 4, I investigated two marketplace practice, tipping and surge pricing, through qualitative interviews. I discussed how the technological mediation of markets by for-profit companies can influence how consumers perceive markets and market fairness. In ridesharing, my qualitative findings in Chapter 4 highlight information asymmetries between consumers and ridesharing companies, with some participants expressing doubts about whether surge prices reflect actual market conditions, as well as concerns over the share of fares that go to drivers.

These concerns map to two conceptions of fairness in examining how consumers perceive fairness in technology-mediated marketplaces. First, consumers may object along the lines of *procedural fairness*, where they may view the process of setting prices to be inherently unfair. Sondak and Tyler (2007) argue that markets should not be viewed as homogenous in terms of fairness, and point to factors such as neutrality of the decision-maker and trustworthiness that differentiate how the procedural fairness of markets may be perceived by its users. Second, consumers may be concerned with the use of markets for *distributive fairness*, which can include the fairness of how outcomes are distributed between consumers, but among others engaged in the economic transaction, such as workers and businesses.

Either of these concerns can cause consumers to choose not to use markets or use markets less frequently. We are familiar with various movements such as the #DeleteUber campaign, which gained momentum due to negative perceptions by the public over a slew of controversies around sexual harassment and sexism at Uber (Isaac, 2017; Leskin, 2019), as well as calls to boycott Amazon in response to harsh working conditions, a lack of employee benefits, and anti-union practices (McFall, 2025). More broadly, consumers may be less willing to use marketplaces operated by these companies due to concerns that these marketplaces may not be operated fairly, whether procedurally or distributively.

In this chapter, I examine whether providing information to consumers around marketplace practices might influence their perceptions of fairness, as well as willingness to use these markets and to pay higher prices. In so doing, I examine whether fairness concerns consumers have with technology-mediated markets cause them to underutilize ridesharing marketplaces, reflecting a larger social cost from the operation of ridesharing marketplaces by technology companies.

1. Will consumers be more willing to use rideshare services or pay higher prices if they are provided information that fares are set by an external regulator?
2. Will consumers be more willing to use rideshare services or pay higher prices if they are provided information that a higher share of fares goes to drivers?

To answer these questions, I conduct a 2x3 factorial experiment where I simulate the use of ridesharing apps by everyday consumers. I vary two main independent variables:

1) Price-Setter: Who sets the surge multiplier
    1. **Company:** The company itself
    2. **External:** An external state regulator
2) Driver Share: What share of the fares goes to drivers
    1. **No info:** No information about share of fares provided
    2. **50:** 50% to the driver, and 50% to the company
    3. **90:** 90% to the driver, and 10% to the company

In the experiment, I also inform participants that the RideShare company in the scenario has 75% of the total market share. While I do not name Uber explicitly, the interfaces are modeled after those in the Uber app, making it likely for participants to relate the interface to Uber.

Overall, I find that the Driver Share independent variable influenced participant perceptions of distributive fairness, as well as their willingness to pay. For financially independent participants as well as participants with household incomes of over 120K, the "90" level also increased their likelihood of using rideshare over public transport compared to the "No info" level, as well as having a larger increase in their willingness to pay. On the other hand, I find that the Price-Setter independent variable had no significant effect on participant perceptions of procedural fairness, as well as 1) their willingness to use rideshare over public transport, or 2) the prices they are willing to pay.

For the Driver Share independent variable, participants in the overall sample were willing to pay 14% more in the "90" level compared to the No info" level (Driver Share IV) after controlling for demographic and rideshare use frequency. Among financially independent participants—who make up roughly half the sample—this difference increases to 33% more, or about $2.60 for an $8 ride. This higher willingness to pay appears localized to participants with high household incomes, with participants with a household income of over $120,000 willing to pay 39% for a ride in the "90" level compared to the "No info" level, but participants in lower income groups not showing an increase. Financially independent participants were also roughly twice as likely to order a rideshare over public transport in the "90" level compared to the "No info" level.

Interestingly, for financially independent participants, I also find that providing information that multipliers are set by the state *and* that 90% of fares goes to drivers results in them willing to pay 33% less. This suggests that state intervention may not necessarily be seen as leading to fairer outcomes by consumers, but can rather be seen as an imposition by consumers, particularly for consumers from lower-income households.

Collectively, these results indicate that consumers are willing to use ridesharing services more frequently as well as pay higher prices if they know that a higher share of the fare is going to drivers. This effect appears to be largely driven by participants with higher household incomes. These results suggest that ridesharing marketplaces might be used more extensively if technology companies take a lower share of fares and provide that information to users, illustrating that there could substantial social costs associated with the management of ridesharing marketplaces by for-profit companies.

The reasons for why providing information about who sets multipliers did not influence participants are interesting to consider, especially in relation to the qualitative results discussed in the prior chapter. One factor may the lack of trust consumers have towards large technology companies. Consumers may not view transparency measures as meaningful unless they include a clear numeric metric for accountability—such as the specific percentage of fares going to drivers. Participants may see additional information without clear metrics as simply an attempt to defray costs or charge higher prices. I discuss this further and relate my experiment results to my qualitative findings in the synthesis and conclusion (Chapter 6) of the dissertation.

Related Literature

Markets and procedural fairness

This gap between the product (and price) delivered from a market, and the process used to generate the product - gives rise to two natural areas of concern. The first centers around concerns over *procedural fairness*.

Procedural fairness is a fundamental concern in legal theory and practice. In this context, procedurally fair legal processes typically incorporate 1) understanding: whether the individual understands how decisions are made, 2) respect: whether the individual feels they are being treated with dignity and respect, 3) neutrality: whether decisions are seen as being made in an unbiased manner and 4) voice: whether the individual feels they have an opportunity to be heard (S. Smith, 2023). Examining procedural fairness more broadly in social contexts, Leventhal (1980) proposes a framework for evaluating procedural fairness with four criteria: 1) consistency 2) unbiasedness, 3) accuracy and 4) offering opportunities to correct or dispute decisions. Research also shows that people are more likely to accept decisions if they perceive the decision-making process to be procedurally fair, regardless of whether the outcome favors themselves (Sondak & Tyler, 2007).

The question of how to apply such principles to marketplaces, or how ordinary consumers view procedural fairness in markets, is less clear. Sondak and Tyler (2007) argue that factors such as neutrality, trust and status recognition can enhance perceptions of the procedural fairness of different marketplaces, and potentially lead to wider acceptance and use of such marketplaces.

Markets and distributive fairness

The second area of concern centers around concerns over *distributive fairness*, or how fair consumers view the distribution of outcomes. Markets are often seen as opposed to distributive fairness, since the highest bid wins out regardless of their need. Sondak and Tyler (2007) discuss how “people tend to oppose the use of markets as allocation procedures when they believe markets produce distributively unfair or immoral outcomes” (p. 79), and where “they feel that they do not lead those involved to receive the outcomes that they deserve in relationship to either principles of distributive or outcome fairness” (p. 80).

For Rawls, markets are useful and help achieve distributively fair outcomes only if constrained “within a framework of political and legal institutions” (2001, p. 43). For Rawls, markets needed to be embedded *within* a society aligned with his First and Second Principles, respectively where each person should have an equal right to basic liberties, and that “social and economic

inequalities are to be arranged … so that they are to the greatest benefit of the least advantaged" (1971, p. 72) respectively. For gig economy marketplaces, issues of distributive fairness are further complicated, since marketplaces serve both gig workers and consumers. Marketplace design decisions can change the distribution of outcomes between workers and consumers. For example, for years, Uber chose not to provide destination information to drivers at the point of choosing whether to accept a ride, arguing providing this information would allow drivers to cherry-pick which consumers to pick up (Katwala, 2018; Said, 2021). Such a policy, however, meant that drivers effectively received lower wages, since a ride might take them out of their way or to an area where they are unlikely to pick up rides. Such a policy essentially prioritized equal treatment across consumers at the cost of distributive fairness *between* the two groups of drivers and consumers.

Procedural and distributive fairness in markets

This contrast between procedural and distributive fairness concerns highlights somewhat subtle differences in how the fairness of markets are perceived. Sondak and Tyler (2007) argue for the importance of separating concerns over procedural fairness from distributive fairness in markets. In an experimental study that asked participants to rate their perceptions of fairness of allocation via a market or one of 8 non-market procedures, Sondak and Tyler (2007) find that "nonmarket procedures are widely viewed as more desirable than markets for making allocation decisions," but that "even markets themselves are judged, in part, by reference to procedural justice criteria" (pp. 90-91).

While some scholars may agree on the allocative fairness potential of markets, this can be predicated on the initial fair distribution of such "social and economic inequalities" that Rawls describes (1971, p. 72). One interpretation of Sondak and Tyler's results is that people may not view markets to be inherently procedurally unfair, but that markets may not be sufficient to correct an initially unfair distribution of resources that exist prior to the market allocation. People may then find non-market procedures more fair or appealing because they believe that market allocations, by themselves, will not correct such widespread social or economic inequalities.

Procedural/distributive fairness in TMMs

How are the concepts of procedural and distributive fairness altered in TMMs?

Around procedural fairness, various scholars have highlighted ways in which TMMs may not be viewed as procedurally fair. Hwang and Elish (2015), for example, investigate how surge zones are represented to Uber drivers, arguing that represented demand for rides often does not match the actual demand for rides in that area. They argue that Uber in effect creates a "mirage of a marketplace," using it as a mechanism for control that places greater risks and costs for drivers, who can drive towards surge areas but find few rides upon arriving. The authors argue that Uber is hence able to shift costs towards drivers and reduce wait time for riders by presenting an ostensibly neutral representation of where there is high demand. More broadly, Calo (2013) discusses how mediation performed by platform companies affords them greater means of "digital market manipulation." What these examples share is illustrating how the procedural fairness of markets can be affected when the market is managed by a for-profit TMM company.

Around distributive fairness, there has been significant research around the concern that TMMs can exacerbate inequalities and result in an unjust distribution of payments between stakeholders. Research documenting the working conditions of gig workers (Ravenelle, 2019), Uber drivers (Calo & Rosenblat, 2017) and crowd workers (Gray & Suri, 2019) highlight asymmetries in information between workers and technology companies which operate marketplaces managing their labor. Broad concern around the role of technology companies in extracting surplus or controlling stakeholders are also playing out in antitrust and the media more broadly (Kaye et al., 2025; Khan, 2017).

Do people act on perceptions of fairness in markets?

More broadly, however, a wave of literature has demonstrated that people often act out of perceptions of fairness, or in particular, when they feel an act to be unfair. This literature is aligned with the behavioral revolution in economics, contradicting the notion of the "homo economicus" or fully maximizing rational actor in economic theory. In a seminal paper, Kahneman et al. (1986) find that people perceive price changes very differently depending on the reasons for them, for example due to a rise in cost as opposed to increased demand. Researchers have also found, in numerous examples among ultimatum, dictator, prisoner's dilemma, public goods games, that people will often punish others for what they see as unfair actions, even at cost to themselves (Fehr & Schmidt, 2001, 2006). Henrich et al. (2001) find sizable differences among 15 small-scale societies in responses to the ultimatum game, suggesting a significant cultural component to how fairness is perceived and how it affects economic actions.

More specifically, there is a host of evidence that show consumers are empirically willing to pay more if they believe the product or service is produced more ethically or with greater fairness. The evidence for this is quite diverse, though few scholars examine how fairness perceptions shape consumer behavior in marketplaces specifically. Many examples are found within the literature around fair trade and ethical consumerism. Pelsmacker et al. (2005), for example, find that consumers were willing to pay 10% more for fair trade as opposed to regular coffee. Sen and Bhattacharya (2001) find more mixed evidence, indicating that depending on the congruence between consumer values and company corporate social responsibility (CSR) initiatives, information about CSR initiatives can decrease consumer intentions to purchase the firm's goods.

Acting on perceptions of fairness in TMMs?

While this fairness research is extensive, few have directly examined the fairness of how markets and market processes are perceived by consumers. Research such as Sondak and Tyler (2007) contrasts market and nonmarket mechanisms, but does not examine how consumers respond to particular configurations of markets - even as they argue that their findings show that consumers do find procedural and distributive fairness to be important *between* different markets, pointing to an area where more research is needed. My results contribute to this literature by examining whether altering two key features - information about who decides market prices, and how payments are distributed, might affect consumer perceptions of procedural and distributive fairness, as well as their willingness to use these markets.

Much research on the gig economy and marketplaces has focused on operational aspects. Castillo et al. (2017) find that surge pricing can actually *reduce* prices for consumers by creating greater

efficiency through reducing wasteful trips for drivers. In a study predicated not on increasing specific operational efficiency, but demonstrating overall benefit of the Uber platform, Cohen et al. (2016) find that UberX generated some $2.9 billion dollars in consumer surplus, suggesting substantial benefits but also potential for more targeted and aggressive pricing for Uber. This project seeks to push this design landscape by considering whether the underlying institutional structure—a variable difficult to test in field settings, and unlikely to be supported by technology companies—affects consumer willingness to use online markets.

A rising tide of research also examines worker rights and worker conditions in the gig economy, and considers how to design technical systems to benefit workers. Zhang et al. (2022) examines how algorithms may be designed to work with and benefit human drivers, while Lee et al. (2015) discusses the impact of algorithms and algorithmic management on drivers. However, an open question is whether consumers themselves will support such systems. As Healy et al. (2020) have persuasively argued, consumers are the lynchpin of the gig economy but are understudied in the gig economy and HCI literature.

Sample

A total of 993 participants were recruited through the Berkeley Xlab between November 3, 2023, and December 3, 2023. Participants needed to be at least 18 years of age and have used ridesharing services using a phone app. Sixty entries were excluded due to missing data, resulting in a final sample of 933 participants.

Seventy percent of participants identified as female, 23% as male, and the remaining as non-binary, other, or who preferred not to answer. Fifty-five percent identified as Asian, 25% as white, 2% as black, and the remaining as mixed-race, other categories or who preferred not to answer. Twelve percent identified as Hispanic, 85% as not Hispanic, and the remainder preferring not to answer.

Sixty-nine percent reported themselves as current full-time students, 30% as not current full-time students, with the remaining preferring not to answer. Forty-nine percent were financially independent, with 51% relying on their parents or guardian for financial support. Participants were also asked to report their household income, with a note that they should include their parents' or guardian's income if they relied on them for financial support. Thirty-one percent reported household incomes of below $60,000, 27% of between $60,000-$120,000, 26% of more than $120,000, and the remainder preferring not to answer.

Methods

Participants were first screened for meeting the study's age and ridesharing eligibility criteria. They were then presented with the following base scenario.

Scenario:
Imagine there is a new commercial ridesharing app **RideShare** that accounts for 75% of all rideshare trips in the United States, and operates nearly all rideshare trips in your area.

One Saturday afternoon at 2pm, you consider using the app to get home after running an errand.

Your two options are:
1) You can order a ride on the app. The entire journey typically takes 20 minutes, including wait time, and costs $8.
2) You can take public transport. The entire journey typically takes 50 minutes, including wait time, and costs $5.

Participants were then asked comprehension questions over the time and price difference between the two options, and the percentage of rides the rideshare company accounts for, to make sure they understood the scenario. Participants who failed the comprehension questions were allowed to change their selections until they got them correct.

Participants were then assigned to one of six conditions, which were produced from varying two independent variables in a 3x2 factorial design. This presented them with the same text before, but with the added visual of a phone screen showing a surge price.

The first variable varied the information text attached to the multiplier with the two following options:

1. **Company:** "Multipliers are set by RideShare based on current demand and supply at your location"
2. **External:** "Multipliers are set by state regulators based on current demand and supply at your location"

The second variable varied information about distribution of payments to drivers with the three following conditions:

1. **No info:** "No information about distribution of fares given."
2. **50: "**Drivers receive 50% of every fare, with 50% going to cover our costs."
3. **90:** "Drivers receive 90% of every fare, with 10% going to cover our costs."

The interaction of these two variables produced the six conditions that participants were randomly assigned to:

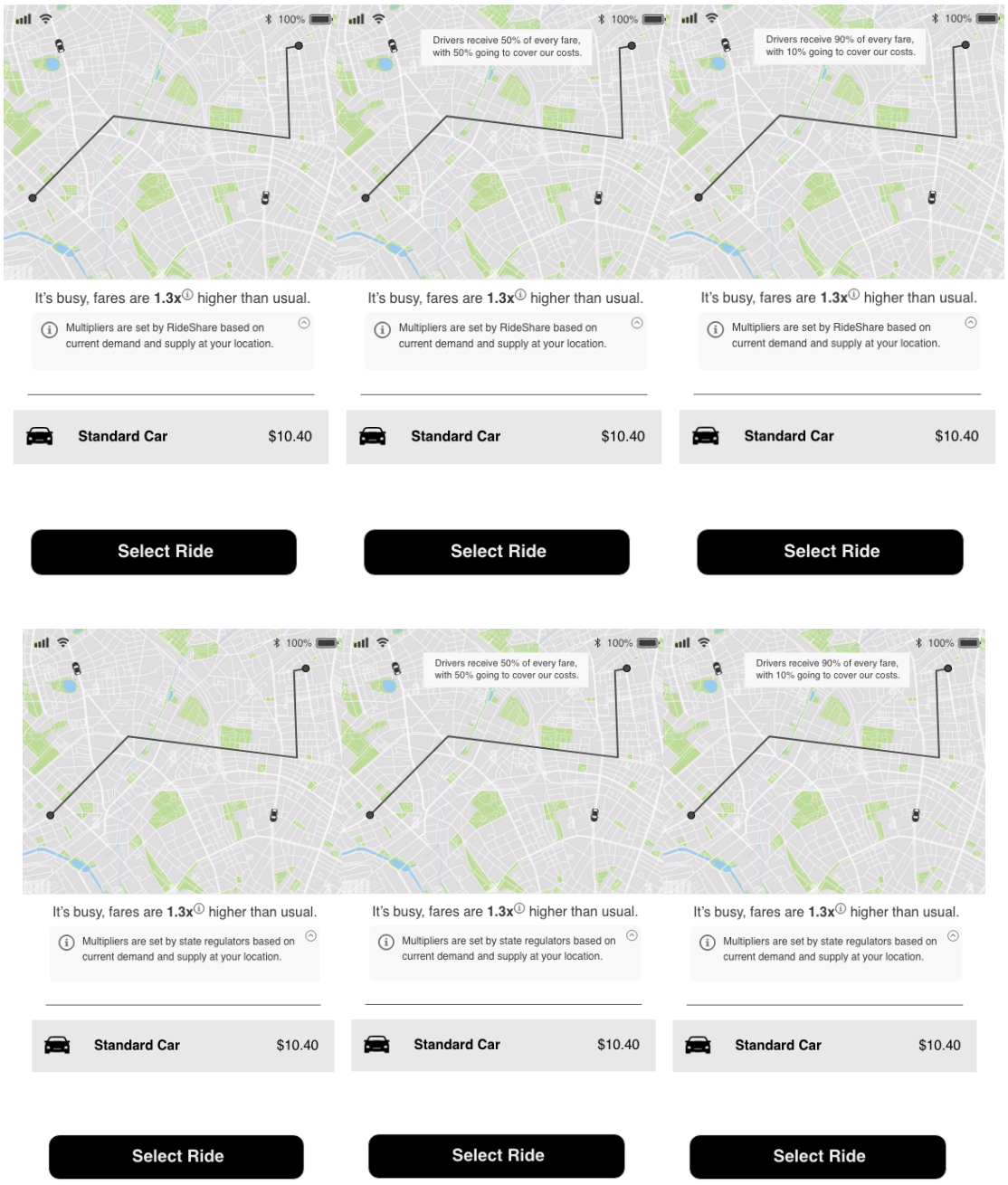

Figure 5.1. Visual interfaces presented to participants across 3x2 conditions

Participants were then asked whether they would take the rideshare trip or choose to take public transport, as well as the highest price they would see in the app and still choose to take the rideshare trip over public transport. Options for prices were presented in dollar amounts with the multiplier in parentheses, etc. "$10.40 (1.0x)."

Subsequently, participants were asked the following questions:

1. How fair or unfair do you find this price change?
2. How acceptable or unacceptable do you find this price change?

3. How fair or unfair do you find this **distribution of fares** between the driver and the ridesharing company?
4. How acceptable or unacceptable do you find **distribution of fares** between the driver and the ridesharing company?
5. How fair or unfair do you find this **process** of setting prices?
6. How acceptable or unacceptable do you find this **process** of setting prices?
7. How transparent do these fares seem to you?

Participants were finally asked a series of demographic questions. The survey was designed to take between 7-12 minutes to complete, with the median completion time being 10 minutes. Participants were paid a $3 Amazon.com electronic gift card for completing the survey.

Hypotheses

Price-Setter Hypotheses:

H1a: Participants report higher perceptions of procedural fairness in the "External" level compared to the "Company" level.

H1b-c: Participant likelihood to choose rideshare over public transport (H1b) and maximum price they are willing to pay (H1c) is higher in the "External" level compared to the "Company" level.

Driver Share Hypotheses:

H2a: Participants report higher perceptions of distributive fairness in the "90" level, compared to the "50" and "No info" levels.

H2b: Participants in the "90" and "50" levels report higher perceptions of transparency than in the "No info" level.

H2c-d: Participant likelihood to choose rideshare over public transport (H2c) and maximum price they are willing to pay (H2d) is higher in the "90" level, compared to the "50" and "No info" levels.

Results

Perceptions of Fairness and Transparency among Participants

This experiment varies 2 independent variables, Price-Setter (External/Company) and Driver Share (No info, 50, 90). I hypothesized that the "External" level would have higher perceptions of procedural fairness than the "Company" condition (H1a), and that the "90" level would lead to higher perceptions of distributive fairness compared to the "50" and "No info" levels (H2a). Running a MANOVA for the seven secondary outcome variables (overall fairness, overall

acceptance, distributive fairness, distributive acceptance, procedural fairness, procedural acceptance, transparency) was statistically significant at the 0.1% level for the overall model.

Table 5.1. MANOVA of perceptions of fairness, acceptability, and transparency

Source	Statistic	Value	df1	df2	F-value	Prob > F
Model	Wilks' Λ	0.505	35.0	3876.7	19.52	0.0000
	Pillai's Trace	0.527	35.0	4625.0	15.58	0.0000
	Lawley-Hotelling	0.916	35.0	4597.0	24.05	0.0000
	Roy's Root	0.841	7.0	925.0	111.15	0.0000
External	Wilks' Λ	0.995	7.0	921.0	0.61	0.7506
	Pillai's Trace	0.005	7.0	921.0	0.61	0.7506
	Lawley-Hotelling	0.005	7.0	921.0	0.61	0.7506
	Roy's Root	0.005	7.0	921.0	0.61	0.7506
Share	Wilks' Λ	0.510	14.0	1842.0	52.67	0.0000
	Pillai's Trace	0.519	14.0	1844.0	46.10	0.0000
	Lawley-Hotelling	0.905	14.0	1840.0	59.47	0.0000
	Roy's Root	0.838	7.0	922.0	110.43	0.0000
External * Share	Wilks' Λ	0.995	14.0	1842.0	0.34	0.9892
	Pillai's Trace	0.005	14.0	1844.0	0.34	0.9892
	Lawley-Hotelling	0.005	14.0	1840.0	0.34	0.9893
	Roy's Root	0.003	7.0	922.0	0.40	0.9040

Coefficients for the dependent variables were estimated using multivariate regression, given that the overall model was significant in MANOVA. The "Driver Share" variable was statistically significant, while neither the "Price-Setter" nor interaction variables was significant, suggesting the "Driver Share" variable was driving the overall significance of the model.

Table 5.2. Multivariate regression results of perceptions following MANOVA

	ofair	oaccept	dfair	daccept	pfair	paccept	transp
External	-0.089	-0.157	-0.084	-0.098	-0.169	-0.163	-0.024
	(-0.58)	(-1.04)	(-0.50)	(-0.58)	(-1.09)	(-1.10)	(-0.13)
50	0.137	0.051	0.118	0.065	-0.080	0.005	0.978***
	(0.89)	(0.33)	(0.70)	(0.39)	(-0.51)	(0.03)	(5.17)
90	0.048	0.179	2.945***	2.704***	0.362*	0.382**	1.182***
	(0.31)	(1.19)	(17.46)	(15.95)	(2.33)	(2.57)	(6.27)
External ∗ 50	0.141	0.131	-0.026	-0.045	0.331	0.273	0.069
	(0.65)	(0.61)	(-0.11)	(-0.18)	(1.49)	(1.29)	(0.26)
External ∗ 90	-0.037	-0.013	-0.116	-0.041	0.094	0.175	0.021
	(-0.17)	(-0.06)	(-0.48)	(-0.17)	(0.42)	(0.83)	(0.08)
Constant	4.298***	4.398***	2.888***	3.155***	4.106***	4.106***	3.081***
	(39.89)	(41.58)	(24.40)	(26.53)	(37.57)	(39.39)	(23.28)

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The External variable, as compared to the Company control, was not statistically significant along all seven perceptions outcome variables.

In line with my desired instrumentation, I find that both the distributive fairness and distributive acceptance outcomes were substantially higher for the 90-10 condition, at 2.9 and 2.7 respectively, out of a 7-point Likert scale, at the 0.1% level of significance. The procedural fairness and procedural acceptance outcomes were also significant (at the 5% and 1% levels respectively), though the effects were much smaller at 0.36 and 0.38.

An additional hypothesis was that the “50” and “90” levels would have higher perceptions of transparency (H2b). This is supported by the ad-hoc tests, where I found a statistically significant effect (at the 0.1% level) for perceptions of transparency. Participants who were provided information about how fares are distributed, whether 50% or 90%, did find the transparency of the fares to be substantially higher, at 0.98 and 1.2 respectively, out of a 7-point Likert.

Important to note is that there were no differences in overall fairness and overall acceptability between the “External” and “Company” conditions, as well as the “No info”, “50” and “90” conditions.

Likelihood of Rideshare Use and Willingness to Pay

The experiment sample was comprised of a large proportion of students (69%), with 51% of the overall sample relying on their parents or guardian for financial support. This likely reduced the power of the experiment, as many participants would have less disposable income or less control over their finances. In the following tables (Table 5.3-5.6), I run the same analysis on the overall sample, for financially independent and non-independent groups, as well as participants with household incomes below $60,000, between $60,000 and $120,000, and above $120,000. Overall, the effects of the experimental independent variables (Price-Setter and Driver Share) are more pronounced in the financially independent and high household income groups (above $120,000).

I hypothesized that the "External" level over the "Company Level" would see a 1) higher likelihood of participants choosing rideshare over public transport (H1b) and 2) higher maximum price they were willing to accept for the rideshare (H1c). In addition, I hypothesized that the "90" level, compared to the "50" and "No info" level, would see a 1) higher likelihood of participants choosing rideshare over public transport (H2c) and 2) higher maximum price they were willing to accept for the rideshare (H2d).

For the overall sample (Table 5.3), I fail to reject the null hypothesis for H1b and H1c. I also fail to reject the null hypothesis for H2c. I reject the null hypothesis at the 10% level of significance for H2d, with participants in the "90" level willing to pay 14% more in the "90" level compared to the "No info" level where demographic and usage frequency controls are included (column 4 of Table 5.3). I also find no significance difference between the "50" level and the "No info" level, which is in line with the H2d hypothesis.

I also find that for the overall sample, participants with higher household incomes were more likely to take rideshare over public transport and pay more for their rides, compared to participants with household incomes of less than $60,000. Financially independent participants were also willing to pay 15% more for their rides.

Table 5.3. Logistic and linear regressions for key outcome variables

	Logistic: Taker		OLS: Multi	
External	1.011	1.001	0.101	0.073
	(0.227)	(0.228)	(0.067)	(0.067)
50	1.035	1.012	0.045	0.015
	(0.234)	(0.236)	(0.072)	(0.071)
90	1.410	1.451	0.136^{+}	0.136^{+}
	(0.318)	(0.337)	(0.076)	(0.073)
External * 50	1.098	1.128	-0.112	-0.068
	(0.351)	(0.370)	(0.104)	(0.104)
External * 90	1.114	1.032	-0.113	-0.125
	(0.359)	(0.338)	(0.107)	(0.103)
Frequency of Use[2]	—	1.192^{+}	—	0.061^{*}
		(0.109)		(0.030)
Gender: Male	—	1.086	—	0.085
		(0.175)		(0.053)
Gender: NB, Other, PNTA	—	0.517^{*}	—	-0.024
		(0.147)		(0.118)
Age (in years)	—	0.967^{+}	—	0.009
		(0.019)		(0.006)
Financially independent	—	1.122	—	0.148^{**}
		(0.201)		(0.054)
Household income: 60–120k	—	1.828^{**}	—	0.308^{***}
		(0.341)		(0.058)
Household income: >120k	—	1.811^{**}	—	0.338^{***}
		(0.352)		(0.061)
Household income: no response	—	1.723^{*}	—	0.253^{***}
		(0.381)		(0.070)
Constant	0.894	0.196	1.261^{***}	0.662^{***}
	(0.141)	(0.090)	(0.046)	(0.138)
N	933	933	933	933
Wald/F-stat	7.150	37.770	1.070	5.640
Prob > stat	0.210	0.000	0.374	0.000
Pseudo/Adj. R^2	0.006	0.032	0.006	0.067

Robust standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[2] Defined as rideshares taken in the past 12 months: 1: Everyday, About once a week, About 2–3 times a week. 2: Almost once every month. 3: About once every 3–6 months, Did not use.

Running the same analysis by financial independence (Table 4 and 5) shows that being assigned to the “90” level over the “50” and “No info” levels resulted in more participants choosing rideshare over public transport (H2c) and willing to pay a higher maximum price (H2d). For financially independent participants, I hence reject the null for both these hypotheses. I still find, however, that being assigned to the “External” level over the “Company” level does not result in a 1) higher likelihood of participants choosing rideshare over public transport (H1b) or 2) higher maximum price they are willing to accept for the rideshare (H1c), failing to reject the null for both these hypotheses.

Table 5.4. Logistic regression: Taking rideshare over public transport by financial independence[1]

	Rely = Y		Rely = N	
External	1.126	1.151	0.909	0.912
	(0.349)	(0.365)	(0.297)	(0.304)
50	1.071	1.162	1.020	0.977
	(0.345)	(0.393)	(0.326)	(0.324)
90	1.047	1.137	2.071*	2.096*
	(0.318)	(0.361)	(0.709)	(0.727)
External * 50	0.681	0.607	1.731	1.881
	(0.310)	(0.284)	(0.788)	(0.888)
External * 90	1.294	1.140	0.884	0.800
	(0.570)	(0.511)	(0.423)	(0.390)
Frequency of Use	—	1.319*	—	1.079
		(0.173)		(0.142)
Gender: Male	—	0.954	—	1.241
		(0.219)		(0.295)
Gender: NB, Other, PNTA	—	0.261**	—	0.996
		(0.116)		(0.392)
Age (in years)	—	1.038	—	1.019
		(0.039)		(0.025)
Household income: 60–120k	—	1.508	—	2.099**
		(0.456)		(0.519)
Household income: >120k	—	1.277	—	3.161***
		(0.377)		(1.009)
Household income: no response	—	1.607	—	1.371
		(0.511)		(0.491)
Constant	0.933	0.208	0.850	0.293
	(0.200)	(0.186)	(0.198)	(0.197)
N	480	480	453	453
Wald χ^2	3.88	21.11	10.24	34.98
Prob > χ^2	0.5665	0.0488	0.0686	0.0005
Pseudo R^2	0.0059	0.0356	0.0167	0.0588

Robust standard errors in parentheses

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[1] Rely on parents for financial support = Y/N

In Table 5.4, after including demographic and usage frequency variables, financially independent participants were 2.1 times as likely, or roughly twice, to pick rideshare over public transport if assigned to the “90” level over the “No info” control. As before in the overall sample, being assigned to the “50” level does not show an increase in probability over the “No info” level. We also see that participants with household incomes between $60,000 and $120,000, as well as above $120,000, were roughly twice and thrice more likely to take rideshare over public transport generally compared to participants with household incomes below $60,000. This is an intuitive result, reflecting that participants with higher household incomes generally would prefer to choose the more expensive rideshare option over public transport.

Table 5.5. Linear regression: Highest multiplier willing to pay by financial independence[1]

	Rely = Y		Rely = N	
External	0.128	0.090	0.069	0.070
	(0.089)	(0.093)	(0.102)	(0.098)
50	0.045	0.027	0.037	0.019
	(0.093)	(0.095)	(0.112)	(0.106)
90	-0.018	-0.013	0.332**	0.326**
	(0.092)	(0.089)	(0.121)	(0.117)
External * 50	-0.168	-0.139	-0.050	-0.017
	(0.145)	(0.150)	(0.151)	(0.147)
External * 90	0.020	0.019	-0.286+	-0.322*
	(0.134)	(0.133)	(0.169)	(0.163)
Frequency of Use[2]	—	0.073+	—	0.047
		(0.041)		(0.044)
Gender: Male	—	0.046	—	0.141+
		(0.076)		(0.075)
Gender: NB, Other, PNTA	—	-0.127	—	0.080
		(0.140)		(0.181)
Age (in years)	—	0.007	—	0.007
		(0.011)		(0.007)
Household income: 60–120k	—	0.232**	—	0.350***
		(0.082)		(0.080)
Household income: >120k	—	0.281**	—	0.371***
		(0.087)		(0.094)
Household income: no response	—	0.212*	—	0.216
		(0.082)		(0.138)
Constant	1.239	0.768**	1.286***	0.806***
	(0.055)	(0.253)	(0.077)	(0.196)
N	480	480	453	453
F-stat	0.93	1.94	1.78	4.97
Prob > F	0.464	0.028	0.115	0.000
R^2	0.009	0.041	0.022	0.102

Robust standard errors in parentheses

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[1] Rely on parents for financial support = Y/N

Table 5.5 shows a similar result as Table 5.4. After including demographic and usage frequency variables, participants were willing to pay 33% if assigned to the "90" level over the "No info" control, which was significant at the 1% level. Being assigned to the "50" level does not show an increase in probability over the "No info" level. We also see that participants with household incomes between $60,000 and $120,000, as well as above $120,000, were willing to pay 35% and 37% more generally compared to participants with household incomes of less than $60,000. Interestingly, when financially independent participants were assigned to both the "External" and "90" levels, they were willing to pay 32% *less*, which was significant at the 5% level. Being informed that surge multipliers were being set by a state regulator had a *negative* effect when combined with information that 90% of their fares to drivers. One potential explanation is that

participants may feel less willing to pay higher prices to benefit drivers if they feel strong-armed by a state authority.

Finally in Table 5.6, I run the same analysis for participants with household incomes below $60,000, between $60,000 and $120,000, as well as above $120,000. There are several interesting results here as well. First, the "90" level only results in participants with household incomes above $120,000 to pay more over the "No info" level, up to 39% more which is significant at the 5% level. This suggest that the desire to pay more to benefit drivers is localized to participants from higher-income households.

Secondly, the negative effect of the combination of being assigned to both the "90" and "External" conditions only occurs for participants with household income of below $60,000, with no effect on the participants in the higher household income brackets. This makes intuitive sense since for participants with lower household income, being informed that prices are set by a state regulator *and* that 90% would go to drivers might feel more coercive.

Table 5.6. Linear Regression: Highest multiplier willing to pay by income groups

	0–60k		60–120k		>120k	
External	0.141	0.124	-0.081	-0.086	0.056	0.077
	(0.117)	(0.125)	(0.131)	(0.128)	(0.133)	(0.135)
50	-0.032	-0.035	-0.041	-0.084	0.165	0.155
	(0.108)	(0.109)	(0.164)	(0.165)	(0.130)	(0.126)
90	0.102	0.123	-0.060	-0.063	0.375*	0.391*
	(0.116)	(0.118)	(0.156)	(0.155)	(0.159)	(0.150)
External * 50	0.040	0.047	-0.046	0.018	-0.041	-0.077
	(0.169)	(0.174)	(0.211)	(0.208)	(0.219)	(0.210)
External * 90	-0.297+	-0.302+	0.029	0.012	0.014	-0.077
	(0.175)	(0.179)	(0.193)	(0.193)	(0.211)	(0.210)
Frequency of Use	—	0.030	—	0.110+	—	0.172**
		(0.044)		(0.059)		(0.064)
Gender: Male	—	0.056	—	0.144	—	0.045
		(0.088)		(0.102)		(0.127)
Gender: NB, Other, PNTA	—	-0.114	—	0.003	—	0.208
		(0.129)		(0.279)		(0.242)
Age (in years)	—	0.002	—	0.002	—	0.025*
		(0.010)		(0.008)		(0.011)
Financially independent	—	0.103	—	0.222*	—	0.055
		(0.081)		(0.095)		(0.129)
Constant	1.102***	0.933***	1.509***	1.140***	1.213***	0.308
	(0.062)	(0.237)	(0.106)	(0.228)	(0.080)	(0.273)
N	290	290	250	250	238	238
F (5, df)	1.09		0.30		3.36	
F (10, df)		0.90		1.59		4.58
Prob > F	0.3676	0.5295	0.9135	0.1096	0.0059	0.0000
R^2	0.0182	0.0302	0.0064	0.0626	0.0468	0.1131
Root MSE	0.6011	0.6027	0.6546	0.6424	0.7258	0.7078

Robust standard errors in parentheses
$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

One additional relevant analysis is the degree to which participants trust technology companies. A lack of trust in a technology company like Uber, whose interface the experiment is modeled after, may result in participants discounting additional information provided within the app. Only 10% of the sample trusted "technology companies to do what is right" most of the time or just about always.

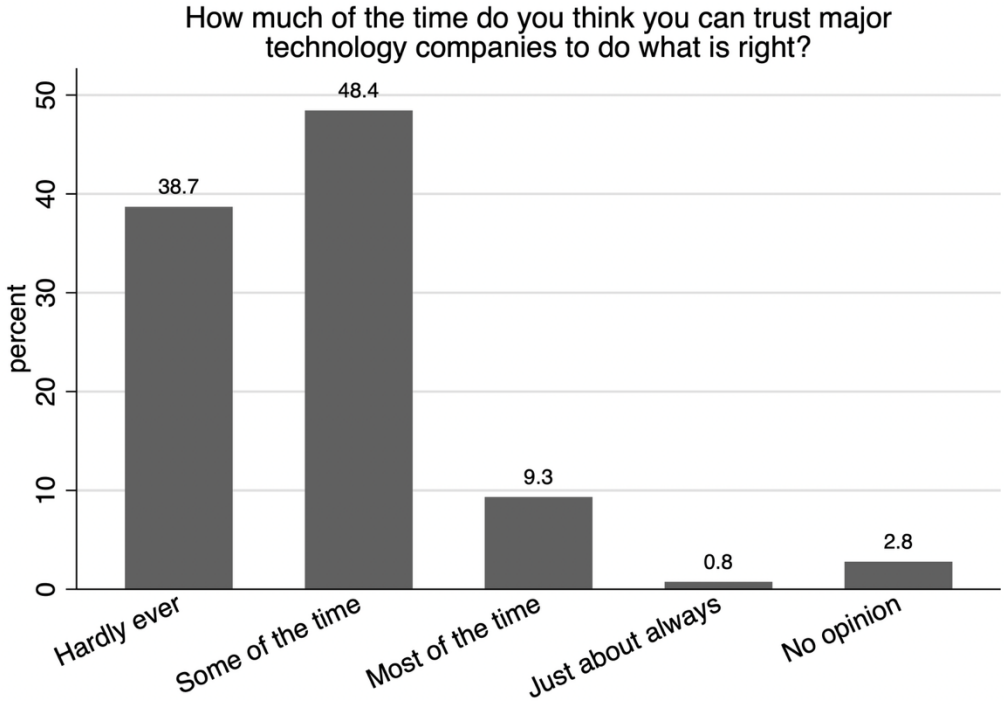

Figure 5.2. Perceptions of trust in technology companies

Discussion

Information about Greater Driver Share Increases Usage and Willingness to Pay

The "Driver Share" intervention provided participants with information that 50% of fares go to drivers, and 90% of fares go to drivers. The control was provided no information on the share of the fare going to drivers. Here, we do see that participants felt the 90% condition to be significantly more distributively fair than the control, but there was no such effect for the 50% condition. Interestingly, participants did feel that both the 50% and 90% condition were more transparent than the control. One difference from the "External" level was that participants were provided with specific numbers—in the form of numeric multipliers—in the "90" and "50" levels.

Participants in the overall sample were willing to pay 14% more in the "90" level compared to the "No info" level (Driver Share IV), after controlling for demographic and rideshare use frequency. Among financially independent participants—who make up roughly half the

sample—this difference increases to 33% more, or about $2.60 for an $8 ride. This higher willingness to pay appears localized to participants with high household incomes, with participants with a household income of over $120,000 willing to pay 39% for a ride in the "90" level compared to the "No info" level, but participants in lower income groups not showing an increase. Financially independent participants were also roughly twice as likely to order a rideshare over public transport in the "90" level compared to the "No info" level.

This result is important in terms of market efficiency. Ridesharing companies have little incentive to distribute a larger share of fares to drivers, or to provide fare distribution information to riders. My results show, however, that ridesharing markets might be used more extensively, both in terms of number of rides but also prices riders are willing to pay, if consumers know a larger share of fares are going to drivers. There may hence be a significant social cost associated with the control exercised by for-profit, technology companies over technology-mediated marketplaces. My findings hence underscores the importance of examining aspects of marketplace design that go beyond the existing political economy of research, exploring institutions and design features that technology companies may have little incentive to examine.

My results also suggest that the willingness to pay for fairer wages appears localized to participants whose household incomes are above $120,000. While Uber does not disclose the share of its revenues generated from its more premium Uber X services, it began as a "black car" service for more affluent consumers and business travelers, suggesting this group may present a particularly attractive segment of the market. Ridesharing companies like Uber may hence benefit from providing transparency information to affluent consumers, to the extent that this information can induce them to pay more. Gig economy companies may be incentivized to implement a flexible marketplace policy that allows affluent consumers to pay more for "fairness" than less affluent consumers. We see some evidence of this in tipping in both ridesharing and third-party food delivery services, where default tips are set high, but users are free to set tips lower or even to zero.

Consumers Not Influenced by Who Sets Surge Prices in a Commercial App

The "Price-Setter" intervention provided participants with information about whether the surge multiplier was set by the company, or an external state regulator. This had no significant effect on participants choosing to take rideshare over public transport, or the highest multiplier they were willing to pay. In addition, measures of procedural fairness were not significantly different between the external and control group.

One potential reason for the null result of the Price-Setter intervention is relatively low trust in technology companies that manage marketplaces. Only 10% of the sample trusted "technology companies to do what is right" most of the time or just about always. In the previous chapter, when presented with similar interfaces, participants discussed how they were unsure how to interpret information in the "External" level when provided by the ridesharing company within the app: "Multipliers are set by state regulators based on current demand and supply at your location." Some felt that such explanations, and other verbiage in earlier Uber interfaces, were an attempt to defray costs or charge higher prices to consumers. Consumers may not view transparency measures as meaningful unless they include a clear numeric metric for accountability—such as the specific percentage of fares allocated to drivers.

This finding has parallels to Sen and Bhattachrya's (2001) examination of whether company corporate social responsibility (CSR) initiatives influenced consumer intentions to purchase the firm's goods. In a series of scenario-based experiments, they find that depending on "the congruence between their own characters and that of the company," information about a company's CSR initiatives can sometimes *decrease* consumer purchase intentions, having the opposite intended effect of such initiatives (2001, p. 225). While I do not find a negative impact of the "External" level—where information is provided that surge multipliers are set by a state regulator—on consumer preferences for rideshare over public transport or their willingness to pay, Sen and Bhattachrya's findings underscore how efforts to provide more information and transparency to consumers are not always viewed positively by consumers. Consumers interpret these efforts through the lens of their existing perceptions of the company, such that additional information provided by companies may potentially dissuade them from supporting the company.

Combining Transparency Measures Can Lead to Lower Willingness to Pay

One unexpected result is that providing participants with information that 90% of fares go to drivers *and* that multipliers were set by a state regulator resulted in financially independent participants willing to pay 33% *less* in the "90" level as compared to the "No info" level (column 4 of Table 5.5). When analyzed by groups with varying household incomes, this effect is restricted to participants with household income of less than $60,000, with them willing to pay 30% less when both additional information is provided. This result suggests that greater provision of transparency information by ridesharing companies may not always be viewed positively by consumers and might, in some instances, discourage them from using the service.

For participants with lower household incomes, the combination of both pieces of information might feel more as an imposition by the state, rather than a means of increasing transparency and fairness for drivers. This result suggests that consumers may have complex perceptions of the appropriate role of private companies and the state, with state intervention not necessarily perceived as leading to greater fairness or encouraging use of the company's services. My results hence suggest that perceptions of state regulation might be heterogenous across income groups, with participants with lower household incomes perceiving state intervention differently from those with higher household incomes.

Limitations and Future Study Directions

The large proportion of students in our sample is likely to have reduced the power of the experiment - future work could focus recruitment on participants who are financially independent. A second key concern is ecological validity, given that what consumers assert they are willing to pay is not equivalent to revealed preference. Nevertheless, the experiment demonstrates that when randomly assigned, people do profess higher willingness to pay when a greater share goes to the driver. A further reflection is that true field experiments in marketplace design are generally constrained in scope, as ridesharing companies are likely to support or fund experiments which align with their incentives or boosts their bottom line. Scenario-based experiments such as this may be the most feasible way to quantify changes in consumer behavior to a broader range of marketplace design interventions.

In terms of future work, my results suggest that providing information about price-setting procedures (in terms of who sets the multiplier) in an incumbent ridesharing company has limited efficacy in changing consumer perceptions and behavior. My qualitative findings suggest that consumers may have a variety of expectations and pre-existing beliefs about ridesharing companies that affect how they interpret that information. Future work could examine, for example, whether consumers may respond to a new ridesharing service, as opposed to an incumbent ridesharing service with a majority market share.

Conclusion

This experiment examines whether likelihood to take rideshare over public transport, as well as rider willingness to pay, are significantly influenced by transparency information provided within a rideshare app. I find that providing participants with information about who sets the surge multiplier did not significantly affect participant perceptions of procedural fairness, their willingness to use rideshare over public transport, or prices they were willing to pay. I find, however, that providing participants with information that 90% of fares would go to drivers significantly increased both their willingness to use rideshare over public transport, as well as their willingness to pay higher prices.

Among financially independent participants—who make up roughly half the sample—this difference increases to 33% more, or about $2.60 for an $8 ride. This higher willingness to pay appears localized to participants with high household incomes, with participants with a household income of over $120,000 willing to pay 39% for a ride in the “90” level compared to the “No info” level, but participants in lower income groups not showing an increase. Financially independent participants were also roughly twice as likely to order a rideshare over public transport in the “90” level compared to the “No info” level. This result suggests that there may be significant social costs associated with control of for-profit technology companies over ridesharing marketplaces, since ridesharing companies have little incentive to increase share of fares to drivers or provide fare distribution information.

Chapter 6: Synthesis, Implications, & Conclusion

Introduction

Markets serve quotidian functions in our everyday lives. Their functioning is often taken for granted so that we seldom notice them as tangible artifacts. Nevertheless, most consumers have an abstract sense of how markets function, along with moral principles and perceptions of fairness that they apply to interacting with markets in these everyday functions.

With the growth of platforms and the platform economy, the use of technology-mediated marketplaces—more tangible technical artifacts whose market functioning is managed in a centralized way by technology companies—has grown more widespread. This has played out in a more visible manner in the gig economy, where technology companies use marketplaces to allocate resources and connect gig workers and consumers. Consumers who use these everyday services encounter these quasi-markets in new forms. Technology companies face the decision, and responsibility, of how to represent these markets to consumers, and what information to surface to them in the process.

The implications of this may seem subtle. But what was formerly a distributed, decentralized system, is now controlled by centralized companies. Platform proponents and technological optimists may argue that robust competition still exists *between* marketplaces, serving as the true larger marketplace, where marketplaces compete with one another. Even so, across industries from the gig economy, mobile apps, e-commerce, and ad sales, we rapidly see dominance from incumbent players. Even where industries where robust competition between two or more marketplaces can exist, the fundamental structure of the market has changed, where technology companies operating marketplaces now hold decision-making power over how market information and choices are represented to marketplace users.

A Current Historical Instantiation

The forefront of where the use of technology-mediated marketplaces has occurred is in the gig economy. The gig economy represented an opportunity since many service classes, such as ridesharing and food delivery, did not fully exist prior to the advent of companies like Uber or DoorDash, and substantial benefits come from the sharing of fixed assets (such as cars and homes), the connecting of consumers and workers, as well as the ease of use many consumer-facing apps provide.

These new gig economy services are, however, tightly coupled with corporate control of marketplaces. Consumers approach marketplaces colored by their expectations and perceptions of technology companies. This can have subtle but important effects with how they interact with these markets. In Chapter 3, we see how tipping practices have shifted in technology-mediated marketplaces operated by third-party food delivery companies, moving from tipping in third-party food delivery based on reciprocity to customers tipping before their order to support a general social norm of providing a living wage to workers. Participants also described an unwillingness to tip workers because they see it as supporting major technology companies, since their tips can go towards reducing labor costs for third-party food delivery companies.

In Chapter 4, we see how increased transparency of market processes can dissuade riders from using the services, explaining why marketplaces have chosen to subsume such information. Some consumers express skepticism that surge prices reflect true demand and supply, instead seeing it as a way for the ridesharing company to extract further profit. Nevertheless, many consumers do not question surge prices presented when numeric multipliers and other demand and supply information is hidden from them.

Drawing from history of technology studies, Jackson et al. (2014) describe a "process of 'stabilization' or 'closure' through which emergent technological artifacts and practices take on their more settled and durable forms" (p. 592). My research reveals how and why this is taking place in third-party food delivery and ridesharing services, and helps explain how technology companies have adjusted marketplace and app design to hide marketplace processes from consumers over time. To the extent we do not question and explore market alternatives, the use of marketplaces as a control technology may hence "stabilize" through time, as consumers accept the affordances and choices provided by technology companies to interact with marketplaces. The current design and political economy of the use of marketplaces hence reflects a historical instantiation, one that is not inevitable, but can be difficult to change.

Antitrust and Regulation

Critiques of technology companies have often objected to platforms as extensions of neoliberalism and globalization. Critics are often dismissed as misunderstanding how markets work and reflecting a kneejerk response to globalization and neoliberalism, and whose recommendations are ultimately bad for efficiency, social welfare, and societies at large. In antitrust, some of these critiques have been lumped under the banner of neo-Brandeisian economics (Hovenkamp, 2019). Shapiro (2018) names his paper challenging such pro-regulation attempts as "Antitrust in a Time of Populism," stressing the need for cautious intervention informed by rigorous economic analysis.

In the United States, antitrust enforcement is divided between per se rules and a rule of reason standard. Under per se rules, certain business practices are regarded as so egregious that they automatically count as an antitrust violation. Obvious examples are price fixing or bid rigging, or more subtly, tying arrangements where a company with dominant market power in a single market forces its customers to purchase a secondary product. For example, in 2001, Microsoft was ruled as engaging in illegal tying practices by requiring PC manufacturers to install Internet Explorer as a condition for licensing Windows (*United States v. Microsoft Corp.*, 2001). Microsoft was viewed as using its dominance in operating systems for personal computers to gain an unfair advantage in the emerging market of web browsers.

The rule of reason standard is applied when it is unclear whether a business practice is anti-competitive, for practices that cannot be ruled outright as illegal. Hovenkamp (2021) summarizes it thus:

> Under antitrust's rule of reason, the plaintiff must make out a prima facie case of competitive harm. The burden of proof then shifts to the defendant to provide a justification. If the defendant succeeds, the burden shifts back to the plaintiff to show that

> the same effect could have been achieved with a less competitively harmful alternative. This three-step burden-shifting framework is designed to be based on such enforcement-neutral factors as the presence of market power and the nature and availability of evidence. (p. 298)

Beginning in the 1970s, the Chicago School's influence on antitrust law convinced lawmakers to shift many practices from per se illegality to a more nuanced rule-of-reason analysis. Examples include maximum and minimum resale price maintenance, where a manufacturer sets a price ceiling and price floor at which retailers can sell its product, or exclusive dealing, where a manufacturer requires that a retailor or distributor only buys from them and not their competitors (Hovenkamp, 2010). Using abstract models and economic theory, a range of practices that might have appeared anti-competitive were shown to potentially improve consumer welfare (Hovenkamp, 1985). Courts that were principally trained in legal reasoning, found themselves increasingly called upon to assess complex economic arguments, which scholars such as Stucke (2008) have argued courts are ill-equipped to perform.

Furthermore, the three-step framework established by the rule of reason standard set up a high bar for enforcement, making it exceedingly difficult for companies to be found liable for rule of reason violations.[2] Foer (1983) remarks: "With only slight exaggeration, there is really only one thing one needs to know about the rule of reason: when the rule is applied, the defendant virtually always wins." Piraino (1991) describes: "The rule of reason and per se approaches have been so divergent that a court's choice of one analysis over the other will usually determine the outcome of an antitrust case. Traditionally, the rule of reason has meant a decision for the defendant and the per se rule a victory for the plaintiff." Similarly, Hovenkamp (2021) observes:

> In his 2021 opinion for the Court in NCAA v. Alston, Justice Gorsuch himself observed one strong consequence of anti-enforcement error cost bias: plaintiffs lose nearly all of their rule of reason antitrust cases. … *Justice Gorsuch observed that the courts have 'disposed of nearly all rule of reason cases in the last 45 years' without ever getting to the second step* [emphasis added]. Given that the best evidence for the motives and effects of the defendant's conduct is in the defendant's control, the result is a lopsided rule that ends up overlooking instances of competitive harm. (p. 278)

The shift towards applying a rule of reason standard away from categorical per se proscriptions reflects a shift in U.S. antitrust due to the Chicago School's influence. In *The Antitrust Paradox*, Bork (1978) argued that a consumer welfare standard should be the goal of antitrust enforcement, with business practices proscribed only if they could be shown to harm consumer welfare through higher prices or lower efficiency. Easterbrook's (1984) influential error cost framework in "The Limits of Antitrust" argued that the false positives, i.e. wrongly punishing pro-competitive acts, were far more costly in the long-run, as compared to false negatives, i.e. letting some anti-competitive acts go unchecked. Easterbrook justified the latter due to his belief that markets were self-correcting, and that changing market conditions and the possibility of entry by new competitors would reduce the long-run costs of false negatives. Essentially, both Bork and Easterbrook put the presumption that markets were largely functioning as they should

[2] See Crane (2007) for a detailed explication of the shift from per se rules to a rule of reason standard in U.S. antitrust.

be, requiring a higher bar of proof for a specific business practice to be considered anti-competitive. The influence of these and other figures in The Chicago School, as well as generations of work complicating and often rightly justifying the potentially pro-competitive nature of a range of business practices, meant that the rule of reason standard became much more widely applied in antitrust. Hovenkamp (2021) discusses this presumption and the favor towards plaintiffs can "overlook[] instances of competitive harm" (p. 278).

The question of where to set antitrust enforcement between the risk of false positives and false negatives remains a complicated issue, reflecting larger, more philosophical debates on the proper role of large companies and market competition. To an extent, it also reflects empirical difficulties. Simply put, demonstrating anti-competitive effects is a difficult economic analysis dependent on one's models and assumptions. Determining the appropriate counterfactual to compare to the status quo is often challenging, since what the market might look like in an alternative state of the world without dominance by a single firm is unclear.

As technology companies increasingly take up the role of managing market processes and market information, there have been antitrust and regulatory concerns with this increased control. In "Amazon's Antitrust Paradox," Khan (2017) has suggested governing dominant platforms like Amazon as public utilities, such as water or electric power, which would give governments wider latitude to intervene than antitrust would allow. In addition to top-down regulation, technology companies notably face constraints in what Hirschman (1970) would characterize as *exit* or *voice*, in his influential work *Exit, Voice, and Loyalty*. Consumers can *exit*, or stop using a company's services, or *voice*, i.e. raise disagreements in the public sphere.

My research suggests, however, that consumers using gig economy services, which are often predicated on consumer convenience, are reluctant to take on transaction and supervisory costs to keep technology companies in check. Pushback against marketplace policies in TMMs often arise from media attention, which typically arises only in response to more visible marketplace practices, such as numeric surge multipliers. This lack of restraints and demands for transparency from consumers suggests that marketplace transparency measures need to come top-down from regulation. The current deadlock in antitrust regulation in the United States, however, presents a conundrum, suggesting top-down regulation has its hands tied. This deadlock emphasizes the importance of exploring other institutional arrangements outside of TMMs managed by for-profit technology companies, since it may represent the most viable alternative to ensure the socially efficient and beneficial use of marketplaces.

Social Imaginaries and Possibilities

Part of the intent of this dissertation is to hence to extend the scope for market design, to explore alternatives away from our current historical instantiation of how technology-mediated marketplaces function. In Chapter 5, I investigated whether providing consumers with who sets multipliers and what share of fares goes to drivers changed their rideshare behavior. Marketplace design choices such as these are unlikely to come from incumbent marketplaces, who have few incentives to explore a broader market design landscape. In terms of providing additional transparency features to consumers, my findings show how such attempts by technology companies can backfire. My qualitative interviews show that providing numeric multipliers and providing more visibility of marketplace processes, such as Uber attempted to do early on when

it introduced surge pricing, raised more questions for consumers and drew attention to the uneasy position technology companies have in managing market processes and information on behalf of users. Incumbent technology companies hence have few incentives not just to explore broader market design, but also to add transparency features for users.

The likely path for more transparent markets may hence need to come *outside* of marketplaces run by for-profit technology companies. Ostrom's (1990) research on common pool resources is instructive in its exploration of an alternative to state control or privatization, by examining how different communities manage their common pool resources with a variety of institutional forms. What such an institutional form for marketplaces might look like is unclear, and largely uncharted territory.

In many ways, the rise of technology-mediated marketplaces in the gig economy reflects the history of the internet. Gig economy services like ridesharing or homestays formerly represented themselves as socially beneficial services as part of the "sharing economy," that promoted the socially efficient sharing of fixed assets like cars and homes (Ravenelle, 2019; Schor & Vallas, 2021). These services have expanded to now take the form of consumer-centered industries, where technology companies now make market architecture and information decisions on behalf of both buyers and workers, acting as the de-facto custodians of these market processes. Gillespie (2018) uses the same term in his book *Custodians of the Internet*, arguing that a panoply of hidden decisions shape how users interact in these computer-mediated spaces. Barlow's (1996) *A Declaration of the Independence of Cyberspace* promotes the internet as an egalitarian and democratic sphere, but this view of the internet has since been replaced by concerns over dominance by large technology companies over the internet and online spaces for social discourse (Gillespie, 2010; Zuboff, 2023).

Firefox, operated by Mozilla, a non-profit organization, provides a more transparent alternative to the Google Chrome browser. Similarly, Bluesky, an open source social media service started by Twitter co-founder Jack Dorsey, seeks to provide a decentralized alternative to other platforms, allowing users to choose what goes in their content feed. Can an equivalent be created for marketplaces, so that organizations serve as genuine clearinghouses providing marketplace services for users?

My research suggests some natural limits to this, as consumers, first and foremost, often seek convenience. Alternatives need to prioritize simplicity and appeal to consumer's own wallets, as opposed to highlighting equitability or asking consumers to take on transaction costs of using the marketplace service. This difficulty is compounded by the considerable cross-network effects and economies of scale that existing marketplace companies possess as incumbents. This state of affairs is reflected by the experience of ridesharing companies which have sought to position themselves as services which are transparent or equitable to drivers, including Fasten, which advertised itself as charging a flat $0.99 service fee to drivers and hence serving as a true marketplace service. These alternatives have largely failed, due to their inability to appeal to consumers or achieve critical mass (Albus, 2025; Lekach, 2018)

Some blockchain projects have positioned themselves as an alternative to centralized control by technology companies over both social media and marketplaces. The existing history of

blockchain technologies is highly checkered, involving scams, hype cycles and market manipulation, with some viewing the industry as a predatory and speculative movement (Rehman et al., 2020; X. Wu et al., 2024). Nevertheless, continued development of blockchain technologies offer some possibilities.

Within blockchain technologies for marketplaces, the most notable developments have been around decentralized finance, which seek to replace centralized financial exchanges. For example, the Gnosis Protocol and CowSwap seeks to provide transparent trading protocols for price discovery for crypto and other assets, to avoid digital market manipulation. There are also attempts to extend blockchain technologies to gig economy and other services. The Origin protocol, for example, seeks to use smart contracts to promote market transparency, and designs its protocol to be amenable to application in different domains, such as potentially, e-commerce and the gig economy. Within ridesharing itself, services such as Teleport and La'Zooz have sought to use blockchain technologies to connect riders and drivers in a more transparent and decentralized manner, serving as true marketplace services. Most of these services have, however, failed after failing to reach critical mass or gain support from consumers. (Albus, 2025; "Crypto's Rideshare Dream Dies Again: Teleport Shuts Down," 2025).

Practical Implications of Findings

In this section, I summarize practical implications of my findings.

1. **Many consumers are not opposed to markets in principle, on the basis of fairness**

In my interviews, consumers are often not categorically opposed to markets, seeing the value of using price to regulate demand and supply. This is an important distinction, since it indicates that consumers are not opposed to the use of markets in principle, but to their control by for-profit technology companies. Markets serve a quotidian function is matching the needs, wants and resources of marketplace users, and society at large. My research suggests the potential of alternative institutional arrangements that utilize marketplaces and provide greater transparency, away from their centralized control by for-profit technology companies.

2. **Companies have a strong incentive to obscure market processes**

Uber has chosen to incrementally reduce the visibility of market processes through the years, first by removing a separate screen, that sought to justify price increases by reference to market process. Later, briefly, numeric multipliers were still visible, with no separate screen. Finally, however, numeric multipliers are no longer visible.

Why have they done this? There are two important perspectives insights here. My qualitative interviews reveal how market visibility and transparency measures, such as providing numeric multipliers, raised more questions for consumers about how prices were determined and set. Second, and perhaps more importantly, such information provided to consumers often highlight for them the fundamental conflict of interest and tensions that arise when marketplaces are governed by private, for-profit companies. The result is that efforts at market transparency by technology companies can either draw scrutiny or invite cynicism or irritation by consumers. Consumers dislike having to take on supervisory costs in using gig economy services operated

by for-profit technology companies, and can view the provision of additional transparency information as an attempt by companies to defray costs or deflect responsibility for high prices.

3. Consumers seek convenience first and do not wish to take on supervisory costs

A repeated theme arising throughout the dissertation is that consumers are not well-placed and do not wish to take on supervisory costs of ensuring markets are fair and/or transparent when they are simply "just buying some food" (P5, Chapter 3) or "have to get home," (P20, Chapter 4) etc. When provided information to do so, participants sometimes resist these attempts. As P5 in Chapter 3 described around tipping in third-party food delivery: "Why do I have to make sure the driver's being paid properly? I mean, come on, I'm just buying some food," or P8 in Chapter 4 around who sets surge multipliers, "I know what I'm asking for. I know what service I'm asking for, and all the others has nothing to do with me. I just want to know how much I'm paying. I don't care who pays or who sets pricing."

4. Technological mediation by for-profit companies can reduce utilization of marketplaces

Nevertheless, in Chapter 5, I find that financially independent consumers were willing to pay significantly more, as well as use ridesharing services more frequently if provided with information that 90% of the fare goes to drivers. Financially independent participants were willing to pay 33% more, or about $2.60 for an $8 ride, and roughly twice as likely to order a rideshare over public transport, when provided with information that 90% of fare goes to drivers This result suggests a significant social cost to control by for-profit technology companies over marketplaces, since ridesharing companies have little incentive to increase share of fares to drivers or provide fare distribution information to consumers.

5. Institutional landscape prohibits experimentation with market forms

An ongoing theme is that acting as custodians of markets provides some cover for technology companies, since markets inherently provide social benefits from their use. Various economic research, some with financial support from Uber, has shown that surge prices provide benefits to riders, and sometimes drivers, and can increase total social welfare and social surplus. My results show that this has some legitimacy among riders, most of whom rarely questioned how surge prices are set and felt surge prices accurately reflected the demand and supply of drivers. While participants described how they did not like the increase in prices, many felt that it did perform a useful function in managing the demand and supply of workers.

For-profit technology companies have few incentives to expand the scope for market design. In addition, efforts at regulation for greater transparency in marketplace services have reached a deadlock in the United States. This deadlock emphasizes the importance of exploring other institutional arrangements outside of TMMs managed by for-profit technology companies, since it may represent the most viable alternative to ensure the socially efficient and beneficial use of marketplaces.

Conclusion

Modern social democracies combine democratic systems with the careful and controlled use of markets. While variants exist globally, they remain the basic social promise and norm across the world. While we have examined the effect of technological and platform mediation of spaces for social discourse on democratic processes more broadly, the full implications of the management of market systems by for-profit companies has been less studied.

In this dissertation, through the lens of how consumers engage with marketplaces in the gig economy, I advance the notion that technological mediation for markets, and its corresponding historical instantiation of being controlled by for-profit technology companies, is historically and sociologically interesting. While evidence is mixed, many consumers do not object to the use of markets in principle, but private control over marketplaces raises many areas of doubt.

The question of why consumers do not simply "vote out" some marketplace forms over others is a more difficult question. Firstly, similar to the history of social media platforms, hegemony tends to result in marketplaces. The viability of competition between separate marketplaces is less plausible, because of the substantial cross-network effects and economies of scale incumbent technology companies possess. In industries like ridesharing, marketplace practices also tend to be parallelized across companies (such as Uber and Lyft in ridesharing), offering consumers fewer alternatives. For consumers who prioritize their own wallets, the lower prices offered by incumbent technology companies benefitting from larger and more efficient marketplaces acts a high bar for entry for potential competitors.

Similar to the discourse on privacy then (Gibbs, 2016), the evidence that TMMs continue to grow and consumers continue to use them at a large scale, is not necessarily evidence that consumers do not find private control of marketplaces problematic. My qualitative work shows that consumers do find salient many issues of private control, from how tips are represented and distributed, to whether market information is accurately represented in surge pricing.

Put colloquially, the choice for consumer acceptance of incumbent platforms is take-it or leave-it—they come as a package deal. Competition is between marketplaces as a whole, rather than modularly, where one may swap out and interchange features for market information and transparency. Companies carefully curate and design marketplaces, choosing what information to obscure and make visible, and deciding the choice and design architecture of these environments. They do so in part to manage the inevitable tensions between buyers and sellers, or consumers and workers in gig economy marketplaces, but also to serve private interests.

The marketplace policies of TMMs can sometimes come to light, falling under the scrutiny what might be the most durable and effectual constraint on private companies—that of public opinion. This is, however, often driven by media attention, as well as the visibility of marketplace features to consumers. Consumers objected to the use of tips to defray costs to delivery workers, where wages were adjusted downwards if tips were higher in DoorDash. Similarly, Uber's provision of a numeric multiplier, where prices were 8.25 times higher during a snowstorm, provided a flashpoint that consumers to object to (Golding, 2013). The strategy for companies then is to move in the opposite direction, that of subsuming marketplace policies and hiding them from the

consumer. Consumers, in their haste for convenience, are unlikely to undertake the supervisory costs to keep marketplaces in check.

All this is somewhat pessimistic, suggesting that the tighthold technology companies have over the basic social function of marketplaces will continue. Antitrust and consumer protection regulation presents an alternative, as reflected in the introduction of the Digital Markets Act in the E.U., but there is mixed evidence for whether such regulation is socially beneficial or efficient. Within the United States, antitrust regulation is experiencing a deadlock, with pushes for greater marketplace transparency and regulation from the neo-Brandeisians, but resistance from antitrust scholars who find such regulation often problematic and harmful to consumers.

This deadlock emphasizes the importance of exploring other institutional arrangements outside of TMMs managed by for-profit technology companies, since it may represent the most viable alternative to ensure the socially efficient and beneficial use of marketplaces. Ostrom's examination of alternative institutional arrangements to state control or privatization provides an instructive path to explore these possibilities. Blockchain technologies provide some tentative possibilities for decentralized marketplace services promoting greater transparency, but is beset by its own reputational and credibility issues.

Ultimately, this dissertation examines how consumer interaction with marketplaces can shift when marketplaces are operated by for-profit technology companies. I find that the takeover of marketplace functions by technology companies has profound implications on how consumers perceive fairness and their willingness to use technology-mediated marketplaces. When consumers interact with markets in gig economy marketplaces, they often focus on their relationship with the company, viewing their interactions with individual gig workers or the market as large through the lens of their beliefs and expectations of technology companies. Around surge pricing specifically, I also find that increasing visibility and transparency about market processes can have an opposing effect, raising more questions for consumers on how market prices are set, and giving companies an incentive to obscure market processes. In a blinded, randomized experiment, I find that participants were both willing to pay significantly more, as well as use ridesharing services more frequently, when they are provided with information that 90% of fares go to drivers.

This result suggests broader social costs that can result when consumers under-use marketplaces that are run by technology companies, not because of their inherent opposition to markets in principle, but because of their concerns over how such markets are managed by technology companies. Existing research on TMMs often center on efficiency or other market design features that can improve the bottom line for technology companies, which often provide funding and access to their data for such research. More work is needed to explore the broader, deeper range of marketplace design possibilities, most of which do not exist under the status quo. My research hence emphasizes the need to explore alternative institutional arrangements to ensure and maximize the beneficial use of markets for society.

References

Akerlof, G. A. (1970). The market for “lemons”: Quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, *84*(3), 488–500.

Albus, J. (2025, January 31). Crypto’s rideshare dreams crash again. *Blockworks*. https://blockworks.co/news/crypto-lack-of-utility

Armstrong, M. (2006). *Recent Developments in the Economics of Price Discrimination*.

Arrow, K. (1970). Political and economic evaluation of social effects and externalities. In *The analysis of public output* (pp. 1–30).

Arrow, K., & Debreu, G. (1954). Existence of an equilibrium for a competitive economy. *Econometrica: Journal of the Econometric Society*, 265–290.

Azar, O. H. (2007). The Social Norm of Tipping: A Review. *Journal of Applied Social Psychology*, *37*(2), 380–402. https://doi.org/10.1111/j.0021-9029.2007.00165.x

Azar, O. H. (2010). Do people tip because of psychological or strategic motivations? An empirical analysis of restaurant tipping. *Applied Economics*, *42*(23), 3039–3044. https://doi.org/10.1080/00036840801964831

Barlow, J. (1996). *Declaration of Independence for Cyberspace*.

Beniger, J. (1986). *The control revolution: Technological and economic origins of the information society*. Harvard university press.

Boeva, Y., Berger, A., Bischof, A., Doggett, O., Heuer, H., Jarke, J., Treusch, P., Søraa, R. A., Tacheva, Z., & Voigt, M.-L. (2023). Behind the Scenes of Automation: Ghostly Care-Work, Maintenance, and Interferences: Exploring Participatory Practices and Methods to Uncover the Ghostly Presence of Humans and Human Labor in Automation. *Extended*

References

Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems. https://doi.org/10.1145/3544549.3573830

Bork, R. H. (1978). *The Antitrust Paradox*. Free Press.

Burrell, J., Kahn, Z., Jonas, A., & Griffin, D. (2019). *When Users Control the Algorithms: Values Expressed in Practices on the Twitter Platform*. *3*, 20.

Caliskan, K. (2007). Price as a Market Device: Cotton Trading in Izmir Mercantile Exchange. *The Sociological Review*, *55*(2_suppl), 241–260. https://doi.org/10.1111/j.1467-954X.2007.00738.x

Calo, R. (2014). Digital Market Manipulation. *THE GEORGE WASHINGTON LAW REVIEW*, *82*, 58.

Calo, R., & Rosenblat, A. (2017). THE TAKING ECONOMY: UBER, INFORMATION, AND POWER. *COLUMBIA LAW REVIEW*, *117*, 73.

Castillo, J. C. (2018). Who Benefits from Surge Pricing? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3245533

Castillo, J. C., Knoepfle, D., & Weyl, G. (2017). Surge Pricing Solves the Wild Goose Chase. *Proceedings of the 2017 ACM Conference on Economics and Computation*, 241–242. https://doi.org/10.1145/3033274.3085098

Chandler Jr, A. D. (1977). *The Visible Hand*. Harvard university press.

Charisi, V., Dennis, L., Fisher, M., Lieck, R., Matthias, A., Slavkovik, M., Sombetzki, J., Winfield, A. F. T., & Yampolskiy, R. (2017). *Towards Moral Autonomous Systems* (arXiv:1703.04741). arXiv. http://arxiv.org/abs/1703.04741

References

Chen, Z., Lan, X., Piao, J., Zhang, Y., & Li, Y. (2022). A Mixed-Methods Analysis of the Algorithm-Mediated Labor of Online Food Deliverers in China. *Proceedings of the ACM on Human-Computer Interaction*, *6*(CSCW2), 1–24. https://doi.org/10.1145/3555585

Chong, A., Yoo, J. S., & Cheshire, C. (2024). Perceptions of Fairness in Technology-Mediated Marketplaces. *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 1–13. https://doi.org/10.1145/3613904.3642678

Coase, R. H. (1937). The nature of the firm. *Economica*, *4*(16), 386–405.

Cohen, P., Hahn, R., Hall, J., Levitt, S., & Metcalfe, R. (2016). *Using Big Data to Estimate Consumer Surplus: The Case of Uber*. National Bureau of Economic Research. https://doi.org/10.3386/w22627

Conlin, M., Lynn, M., & O'Donoghue, T. (2003). The norm of restaurant tipping. *Journal of Economic Behavior & Organization*, *52*(3), 297–321. https://doi.org/10.1016/S0167-2681(03)00030-1

Corrigan, J. R., & Rousu, M. C. (2006). The Effect of Initial Endowments in Experimental Auctions. *American Journal of Agricultural Economics*, *88*(2), 448–457. https://doi.org/10.1111/j.1467-8276.2006.00870.x

Crane, D. A. (2007). Rules versus standards in antitrust adjudication. *Wash. & Lee L. Rev.*, *64*, 49.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (Fifth edition). SAGE.

Crypto's Rideshare Dream Dies Again: Teleport Shuts Down. (2025, January 31). *Coin World*. https://www.ainvest.com/news/crypto-s-rideshare-dream-dies-again-teleport-shuts-down-25011010500375d003fb8efe/

References

De Pelsmacker, P., Driesen, L., & Rayp, G. (2005). Do Consumers Care about Ethics? Willingness to Pay for Fair-Trade Coffee. *Journal of Consumer Affairs*, *39*(2), 363–385. https://doi.org/10.1111/j.1745-6606.2005.00019.x

De Streel, A., & Jacques, F. (2019). *Personalised pricing and EU law*.

Donath, J. S. (2002). Identity and deception in the virtual community. In *Communities in cyberspace* (pp. 37–68). Routledge. https://courses.cs.umbc.edu/graduate/691/spring21/pdf/Identity%20and%20Deception%20in%20the%20Virtual%20Community.pdf

Duhaime, E. P., & Woessner, Z. W. (2019). Explaining the decline of tipping norms in the gig economy. *Journal of Managerial Psychology*, *34*(4), 233–245. https://doi.org/10.1108/JMP-06-2018-0270

Dwork, C., Hardt, M., Pitassi, T., Reingold, O., & Zemel, R. (2012). Fairness through awareness. *Proceedings of the 3rd Innovations in Theoretical Computer Science Conference*, 214–226. https://doi.org/10.1145/2090236.2090255

Easterbrook, F. H. (1984). Limits of Antitrust. *Texas Law Review*, *63*, 1.

Elish, M. C. (2019). Moral crumple zones: Cautionary tales in human-robot interaction (pre-print). *Engaging Science, Technology, and Society (Pre-Print)*.

Falk, A. (2021). Bargaining and market behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An experimental study (by Alvin E. Roth, Vesna Prasnikar, Masahiro Okuno-Fujiwara, and Shmuel Zamir). In G. Charness & M. Pingle, *The Art of Experimental Economics* (1st ed., pp. 103–108). Routledge. https://doi.org/10.4324/9781003019121-9

Fehr, E., & Schmidt, K. (2001). *Theories of fairness and reciprocity—Evidence and economic applications* [Application/pdf,Online Datei]. https://doi.org/10.3929/ETHZ-A-004373709

References

Fehr, E., & Schmidt, K. M. (2006). Chapter 8 The Economics of Fairness, Reciprocity and Altruism – Experimental Evidence and New Theories. In *Handbook of the Economics of Giving, Altruism and Reciprocity* (Vol. 1, pp. 615–691). Elsevier. https://doi.org/10.1016/S1574-0714(06)01008-6

Fitzsimmons, E. G. (2017, April 17). New York City Moves to Require Uber to Provide a TIpping Option in Its App. *The New York Times*. https://www.nytimes.com/2017/04/17/nyregion/new-york-city-uber-tipping-app.html?_r=0

Foer, A. A. (1983). *The Political-Economic Nature of Antitrust*. *27*, 331.

Frank, D. (2003). Where are the Workers in Consumer-Worker Alliances? Class Dynamics and the History of Consumer-Labor Campaigns. *Politics & Society*, *31*(3), 363–379. https://doi.org/10.1177/0032329203254860

Gallie, W. B. (1956). IX.—Essentially Contested Concepts. *Proceedings of the Aristotelian Society*, *56*(1), 167–198. https://doi.org/10.1093/aristotelian/56.1.167

Garrity, K., & Degelman, D. (1990). Effect of Server Introduction on Restaurant Tipping1. *Journal of Applied Social Psychology*, *20*(2), 168–172. https://doi.org/10.1111/j.1559-1816.1990.tb00405.x

Gibbs, S. (2016, July 8). We know people care about privacy, so why won't they pay for it? *The Guardian*. https://www.theguardian.com/technology/2016/jul/08/we-know-people-care-about-privacy-so-why-wont-they-pay-for-it

Gillespie, T. (2010). The politics of 'platforms.' *New Media & Society*, *12*(3), 347–364. https://doi.org/10.1177/1461444809342738

References

Gillespie, T. (2018). *Custodians of the Internet: Platforms, content moderation, and the hidden decisions that shape social media*. Yale University Press.

Golding, B. (2013, December 16). Uber under fire for storm price "surge." *New York Post*.

Granovetter, M. (1985). Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology*, 31.

Gray, M. L., & Suri, S. (2019). *Ghost work: How to stop Silicon Valley from building a new global underclass*. Eamon Dolan Books.

Haley, J. (1990). THEORETICAL FOUNDATIONS FOR STICKY WAGES. *Journal of Economic Surveys*, *4*(2), 115–155. https://doi.org/10.1111/j.1467-6419.1990.tb00083.x

Harrison, S., Tatar, D., & Sengers, P. (2007). *The Three Paradigms of HCI*.

Harvey, D. (2007). *A brief history of neoliberalism*. Oxford University Press.

Hayek, F. A. (1944). *The Road to Serfdom*.

Hayek, F. A. (1945). The Use of Knowledge in Society. *THE AMERICAN ECONOMIC REVIEW*.

Hayek, F. A. (1960). *The Constitution of Liberty*.

Healy, J., Pekarek, A., & Vromen, A. (2020). Sceptics or supporters? Consumers' views of work in the gig economy. *New Technology, Work and Employment*, *35*(1), 1–19. https://doi.org/10.1111/ntwe.12157

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., & McElreath, R. (2001). In Search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies. *American Economic Review*, *91*(2), 73–78. https://doi.org/10.1257/aer.91.2.73

Hirschman, A. O. (1970). *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*. Harvard university press.

References

Hodgson, G. M. (2019). Taxonomic definitions in social science, with firms, markets and institutions as case studies. *Journal of Institutional Economics*, *15*(2), 207–233. https://doi.org/10.1017/S1744137418000334

Hovenkamp, H. (1985). Antitrust Policy after Chicago. *Michigan Law Review*, *84*(2), 213. https://doi.org/10.2307/1289065

Hovenkamp, H. (2010). *The Harvard and Chicago Schools and the dominant firm* (07–19). U Iowa Legal Studies Research Paper.

Hovenkamp, H. (2019). Is Antitrust's Consumer Welfare Principle Imperiled? *The Journalof CorporationLaw*, *45*.

Hovenkamp, H. (2021). Antitrust Error Costs. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3853282

Hwang, T., & Elish, M. C. (2015, July 27). The Mirage of the Marketplace. *Slate*. https://slate.com/technology/2015/07/ubers-algorithm-and-the-mirage-of-the-marketplace.html

Isaac, M. (2017, January 31). What You Need to Know About #DeleteUber. *The New York Times*. https://www.nytimes.com/2017/01/31/business/delete-uber.html

Jackson, S. J., Gillespie, T., & Payette, S. (2014). The policy knot: Re-integrating policy, practice and design in cscw studies of social computing. *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 588–602. https://doi.org/10.1145/2531602.2531674

Jain, A. (2023, December 4). *TaskRabbit's Changing Business Model*. Oyelabs. https://oyelabs.com/taskrabbits-new-vs-old-business-model-compared/

References

Kahneman, D., Knetsch, J. L., & Thaler, R. (1986). Fairness as a constraint on profit-seeking: Entitlements in the market. *The American Economic Review*, 728–741.

Katwala, A. (2018, June 26). Uber's latest app update is great for drivers, but terrible for riders. *Wired*. https://www.wired.com/story/uber-upfront-destinations/

Kaye, D., Gamio, L., & Kang, C. (2025, April 21). Google, Meta, Visa, JetBlue: A Guide to a New Era of U.S. Antitrust Cases. *The New York Times*. https://www.nytimes.com/interactive/2024/business/antitrust-case-tracker.html

Keeble, M., Adams, J., Sacks, G., Vanderlee, L., White, C. M., Hammond, D., & Burgoine, T. (2020). Use of Online Food Delivery Services to Order Food Prepared Away-From-Home and Associated Sociodemographic Characteristics: A Cross-Sectional, Multi-Country Analysis. *International Journal of Environmental Research and Public Health*, *17*(14), 5190. https://doi.org/10.3390/ijerph17145190

Keynes, J. M. (1944). *How to Pay for the War: A Radical Plan for the Chancellor of the Exchequer*. MAcmillan and Co., Ltd.

Khan, M. (2017). *Amazon's Antitrust Paradox*.

Kleinberg, J., Ludwig, J., Mullainathan, S., & Rambachan, A. (2025). *Algorithmic Fairness*. *108*.

Lampinen, A., & Brown, B. (2017). Market Design for HCI: Successes and Failures of Peer-to-Peer Exchange Platforms. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, 4331–4343. https://doi.org/10.1145/3025453.3025515

Lee, M. K., Kusbit, D., Metsky, E., & Dabbish, L. (2015). Working with Machines: The Impact of Algorithmic and Data-Driven Management on Human Workers. *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 1603–1612. https://doi.org/10.1145/2702123.2702548

References

Lekach, S. (2018, March 5). Why ride-hailing app Fasten couldn't make it against the big players. *Mashable*. https://mashable.com/article/fasten-ride-hailing-app-uber-lyft

Leskin, P. (2019, April 11). Uber says the #DeleteUber movement led to "hundreds of thousands" of people quitting the app. *Business Insider*. https://www.businessinsider.com/uber-deleteuber-protest-hundreds-of-thousands-quit-app-2019-4

Lessig, L. (1999). *Code and Other Laws of Cyberspace*.

Leventhal, G. S. (1980). What should be done with equity theory? New approaches to the study of fairness in social relationships. In *Social exchange: Advances in theory and research* (pp. 27–55). Springer US.

Libecap, G. D. (2013). *Addressing Global Environmental Externalities: Transaction Costs Considerations*.

Mackie-Mason, J. K., & Varian, Hal R., J. K. (1994). Economic FAQs about the Internet. *Journal of Economic Perspectives*, *8(3)*, 75–96.

Marshall, A. (1890). *Principles of economics*. Springer.

Martin, D., O'Neill, J., Gupta, N., & Hanrahan, B. V. (2016). Turking in a Global Labour Market. *Computer Supported Cooperative Work (CSCW)*, *25*(1), 39–77. https://doi.org/10.1007/s10606-015-9241-6

Maxwell, S., & Garbarino, E. (2010). The identification of social norms of price discrimination on the internet. *Journal of Product & Brand Management*, *19*(3), 218–224. https://doi.org/10.1108/10610421011046193

References

McFall, M. R. (2025, June 30). Nationwide Amazon Boycott Planned for Jul 1: What To Know. *Newsweek*. https://www.newsweek.com/nationwide-amazon-boycott-planned-july-sanchez-wedding-prime-day-sale-2092506

Mill, J. S. (1859). *On liberty*.

Morozov, E. (2012). *The net delusion: The dark side of Internet freedom*. PublicAffairs.

Mulligan, D. K., Kroll, J. A., Kohli, N., & Wong, R. Y. (2019). This Thing Called Fairness: Disciplinary Confusion Realizing a Value in Technology. *Proceedings of the ACM on Human-Computer Interaction*, *3*(CSCW), 1–36. https://doi.org/10.1145/3359221

Newman, A. (2019a, July 21). My Frantic Life as a Cab-Dodging, Tip-Chasing Food App Deliveryman. *The New York Times*. https://www.nytimes.com/2019/07/21/nyregion/doordash-ubereats-food-app-delivery-bike.html

Newman, A. (2019b, July 24). DoorDash Changes Tipping Model After Uproar from Customers. *The New York Times*. https://www.nytimes.com/2019/07/24/nyregion/doordash-tip-policy.html

North, D. C. (1991). Institutions. *Journal of Economic Perspectives*, *5*(1), 97–12.

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.

Pareto, V. (1906). *Manual of political economy*. OUP Oxford.

Pasquale, F. (2016). Two Narratives of Platform Capitalism. *POLICY REVIEW*, 13.

Piraino, T. A. (1991). RECONCILING THE PER SE AND RULE OF REASON APPROACHES TO ANTITRUST ANALYSIS. *SOUTHERN CALIFORNIA LAW REVIEW*, *64*.

References

Pirolli, P., & Russell, D. (2011). Introduction to this Special Issue on Sensemaking. *Human-Computer Interaction*, *26*(1), 1–8. https://doi.org/10.1080/07370024.2011.556557

Polanyi, K. (1944). *The Grreat Transformation*.

Poort, J., & Zuiderveen Borgesius, F. J. (2019). Does everyone have a price? Understanding people's attitude towards online and offline price discrimination. *Internet Policy Review*, *8*(1). https://doi.org/10.14763/2019.1.1383

Pricing. (2025). https://www.uber.com/us/en/marketplace/pricing/

Rabin, M. (1993). Incorporating Fairness into Game Theory and Economics. *The American Economic Review*, *83*(5), 1281–1302.

Ravenelle, A. J. (2019). *Hustle and gig*. University of California Press.

Rawls, J. (1971). *A Theory of Justice*. Belknap Press.

Rawls, J. (2001). *Justice as fairness: A restatement*. Harvard university press.

Rehman, M. H. U., Salah, K., Damiani, E., & Svetinovic, D. (2020). Trust in Blockchain Cryptocurrency Ecosystem. *IEEE Transactions on Engineering Management*, *67*(4), 1196–1212. https://doi.org/10.1109/TEM.2019.2948861

Richardson, L. (2020). Platforms, Markets, and Contingent Calculation: The Flexible Arrangement of the Delivered Meal. *Antipode*, *52*(3), 619–636. https://doi.org/10.1111/anti.12546

Robertson, S., Nguyen, T., & Salehi, N. (2021). Modeling Assumptions Clash with the Real World: Transparency, Equity, and Community Challenges for Student Assignment Algorithms. *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, 1–14. https://doi.org/10.1145/3411764.3445748

References

Rogelberg, S. G., Ployhart, R. E., Balzer, W. K., & Yonker, R. D. (1999). Using Policy Capturing to Examine Tipping Decisions. *Journal of Applied Social Psychology*, *29*(12), 2567–2590. https://doi.org/10.1111/j.1559-1816.1999.tb00126.x

Roth, A. E. (2002). The Economist as Engineer: Game Theory, Experimentation, and Computation as Tools for Design Economics. *Econometrica*, *70*(4), 1341–1378. https://doi.org/10.1111/1468-0262.00335

Roth, A. E. (2018). Marketplaces, Markets, and Market Design. *American Economic Review*, *108*(7), 1609–1658. https://doi.org/10.1257/aer.108.7.1609

Said, C. (2021, April 6). Uber may stop letting drivers see destinations and name prices. *San Francisco Chronicle*. https://www.sfchronicle.com/business/article/Uber-may-stop-letting-drivers-see-destinations-16078491.php

Saldaña, J. (2016). *The Coding Manual for Qualitative Researchers* (3rd ed.). SAGE Publications.

Schor, J. B., & Vallas, S. P. (2021). The Sharing Economy: Rhetoric and Reality. *Annual Review of Sociology*, *47*(1), 369–389. https://doi.org/10.1146/annurev-soc-082620-031411

Schumpeter, J. A. (1942). *Capitalism, socialism and democracy*. Routledge.

Sen, S., & Bhattacharya, C. B. (2001). Does Doing Good Always Lead to Doing Better? Consumer Reactions to Corporate Social Responsibility. *Journal of Marketing Research*, *38*(2), 225–243. https://doi.org/10.1509/jmkr.38.2.225.18838

Shapiro, C. (2018). Antitrust in a time of populism. *International Journal of Industrial Organization*, *61*, 714–748. https://doi.org/10.1016/j.ijindorg.2018.01.001

References

Siegel, R. (2019, July 24). Tipping to change its controversial tipping policy after outcry. *The Washington Post*. https://www.washingtonpost.com/business/2019/07/24/doordash-change-its-controversial-tipping-policy-after-outcry/

Smith, A. (1776). *The Wealth of Nations*.

Smith, S. (2023). *Procedural fairness toolkit*. Center for Justice Innovation. https://justiceinnovation.org/sites/default/files/media/document/2023/CJI_PROCEDURAL_FAIRNESS.pdf

Sondak, H., & Tyler, T. R. (2007). How does procedural justice shape the desirability of markets? *Journal of Economic Psychology*, *28*(1), 79–92. https://doi.org/10.1016/j.joep.2006.02.002

Srnicek, N. (2017). *Platform capitalism*. John Wiley & Sons.

Stucke, M. E. (2008). Does the rule of reason violate the rule of law. *UC Davis L. Rev.*, *42*, 1375.

Tuco, C., Boulard, C., Calleau, R., & Shreepriya, S. (2021). Food Delivery Eco-System: When Platforms Get Enterprises and Gig-Workers to Implicitly Cooperate. *Companion Publication of the 2021 Conference on Computer Supported Cooperative Work and Social Computing*, 183–186. https://doi.org/10.1145/3462204.3481757

United States v. Microsoft Corp., 253 F.3d 34 (U.S. Court of Appeals for the District of Columbia Circuit 2001).

US Foods. (2019). *New Food Delivery Study Shows What Consumers Crave in a Service*. https://www.usfoods.com/our-services/business-trends/2019-food-delivery-statistics.html

Varian, H. R. (1989). Price discrimination. In *Handbook of industrial organization* (Vol. 1, pp. 597–654). Elsevier.

References

Varian, H. R. (2009). Online Ad Auctions. *American Economic Review*, *99*(2), 430–434. https://doi.org/10.1257/aer.99.2.430

Warren, N. B., & Hanson, S. (2023). Tipping, Disrupted: The Multi-Stakeholder Digital Tipped Service Journey. *Journal of Service Research*, *26*(3), 389–404. https://doi.org/10.1177/10946705231166742

Weick, K. E. (2008). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Studi Organizzativi*.

Weiss, T. (2000, September 28). *Amazon apologizes for price-testing program that angered customers*. https://www.computerworld.com/article/1356061/amazon-apologizes-for-price-testing-program-that-angered-customers.html

Williamson, O. E. (1973). Markets and Hierarchies: Some Elementary Considerations. *THE AMERICAN ECONOMIC REVIEW*.

Wohlsen, M. (2013, December 17). Uber Boss Says Surging Prices Rescue People from the Snow. *Wired*. https://www.wired.com/2013/12/uber-surge-pricing/

Wu, T. (2011). *The Master Switch: The Rise and Fall of Information Empire*. Vintage.

Wu, X., Deng, W., Quan, Y., & Zhang, L. (2024). *Trust Dynamics and Market Behavior in Cryptocurrency: A Comparative Study of Centralized and Decentralized Exchanges* (arXiv:2404.17227). arXiv. https://doi.org/10.48550/arXiv.2404.17227

Zhang, A., Boltz, A., Wang, C. W., & Lee, M. K. (2022). Algorithmic Management Reimagined For Workers and By Workers: Centering Worker Well-Being in Gig Work. *CHI Conference on Human Factors in Computing Systems*, 1–20. https://doi.org/10.1145/3491102.3501866

Zuboff, S. (2023). *The age of surveillance capitalism*. Routledge.