

Toward a More Inclusive Gig Economy: Risks and Opportunities for Workers with Disabilities

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Little is known about whether and how workers with disabilities participate in the many on-demand labor platforms that make up the growing gig economy. Understanding disabled gig workers' experiences is a vital step toward developing inclusive and equitable labor platforms. Through interviews with 24 disabled gig workers and observational fieldwork, we present a rich, in-depth picture of the opportunities and challenges presented by four main types of gig work (ridesharing, delivery, crowdwork, and freelancing) for workers with a wide range of disabilities. We identify a key tension: gig work can be a vital source of needed income for workers who have been excluded from traditional workplaces, but at the same time, the structure of gig platforms present workers with a host of new disability-related challenges, including around algorithmic control and performance evaluation. We discuss how this tension plays out in terms of how workers engage in gig work and protect themselves from risk. We also call attention to how many workers can face complicated, intersectional challenges based on multiple marginalized identities in addition to disability, such as race, gender, sexual orientation, and socioeconomic status. Our work contributes to research on the gig economy by centering the perspectives of workers who are marginalized based on disability and other identities. We show how workers face several penalties based on disability, including shouldering extensive invisible labor to mitigate the challenges they face. Based on our interviews, we suggest several ways that on-demand labor platforms can be designed to be more inclusive of disability, including how to improve the accessibility of various tasks while mitigating the discrimination and negative interactions faced by disabled workers.

CCS Concepts: • **Human-centered computing**:

Additional Key Words and Phrases: labor, disability, accessibility, algorithms, marginalization, discrimination, pandemic, covid-19, intersectionality, invisible labor

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1 INTRODUCTION

“There will always be someone else to replace me. Why should [gig platforms] deal with someone with a health condition when [they] can get a new guy that’s ready to go to do the same thing without having a health condition?”—Study participant

Employment serves as a link between individuals and society, and being employed has a positive impact on people’s self-esteem and mental health [31]. Yet, access to employment for people with disabilities remains a critical challenge. Disabled people have historically faced low employment rates, and in the United States in 2018, only 38% of disabled people of working age were employed, versus 78% of those without disabilities [44]. Given the value placed on work in contemporary

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society, disability activist and scholar Abberley argues that “the social exclusion of disabled people today . . . is intimately related to our exclusion from the world of work” [1, p.5].

Many efforts have been made to improve access to employment for disabled people, including the passing of the Americans with Disabilities Act (ADA), which prohibits discrimination on the basis of disability, including in work contexts. However, there is still far to go. Despite the legal protections afforded by the ADA in the United States (the setting of this study), disabled people still face many challenges in gaining and maintaining employment, including discriminatory hiring practices, prejudice from managers, and inaccessible workplaces [74].

On-demand, digitally-mediated labor platforms that make up the “gig economy” may provide opportunities for disabled people to avoid problems they face in traditional workplaces. These platforms can provide disabled workers with the flexibility to set their own hours to accommodate disability-related needs, as well as to work from anywhere [96].

However, gig work is not a panacea. Initial research shows that disabled workers face additional challenges when completing gig work, such as accessibility issues [96] and potential stigmatization [54], and that they may also earn less than workers without disabilities [40]. Further, since gig workers in the U.S. are classified as independent contractors rather than employees, disabled workers in the gig economy are also not protected by the ADA [14].

Overall, relatively little is known about disabled workers’ economic and personal reasons for engaging in gig work and the challenges they face [42], across both the wide range of impairments disabled workers experience and the many types of gig work available beyond crowdwork. Researchers also have yet to understand how disability impacts the ways disabled workers navigate obstacles faced by all gig workers, including work precarity [73], a hyper-reliance on customer reviews [85], and algorithmic management [76]. Understanding disability-related challenges more fully, including how these challenges interact with the numerous challenges faced by *all* gig workers, is an important step in making the gig economy more inclusive for workers with disabilities.

This paper works toward that step by examining the risks and opportunities of on-demand labor platforms for workers with disabilities. We use a grounded theory-based approach [35] to analyze interviews with 24 disabled gig workers to understand their motivations for participating in gig work, the benefits they derived from gig work as compared to traditional labor, and the challenges they faced. We interviewed workers with a wide range of disabilities, including mobility impairments such as quadriplegia; chronic illnesses such as ulcerative colitis; and mental health conditions such as bipolar disorder. To support the analysis, the lead author also conducted observational fieldwork as a worker on one crowdwork platform and one delivery platform to gain a first-hand perspective of gig work processes.

Our analysis suggests gig work can be a vital source of income for disabled workers who have been excluded from traditional forms of labor. Gig work provides relatively easy access to work and the flexibility needed to navigate physical and mental health conditions. However, disabled workers face several challenges around task and platform accessibility, as well as around performance monitoring and evaluation, that stem from platforms being structured in ways that penalize disabled workers. These challenges require a great deal of “invisible labor” [84] that harms workers’ health and income. We also illustrate how workers who have other marginalized identities in addition to having a disability can face compounding risks that warrant recognition, and we call for more work on intersectional experiences in gig work. Based on our findings, we suggest several ways to address disabled workers’ challenges through more transparent and ability-aware task assignment, and better mechanisms to mitigate the impact of discrimination.

2 RELATED WORK

To set the stage for the study, we first outline the perspective we take on disability in this study, then review the challenges disabled workers face in traditional workplaces in the U.S.. We then review the (limited) work addressing disabled workers in gig work and identify the key gaps in our current understanding.

2.1 Defining Disability

Disability itself is a complicated topic that demands good definitions. Earlier definitions of disability such as the medical model and functional model conflate impairment and disability in ways that can disenfranchise people with disabilities [38] and lead to assumptions that the goal is to “fix” disability to help people be “normal” [63].

The social model of disability, in contrast, emphasizes the role that social attitudes and socio-technical structures play in turning impairments into disadvantages disabled people experience that exclude them from life domains and activities [60]. This, in turn, leads to a focus on understanding and improving those structures rather than “correcting” impairments [37]. It also implies a broad rather than narrow definition of disability to support inclusivity and insight into the scope of people’s needs [20].

Disability also intersects with many other identities, and the disability justice movement promotes an intersectional movement led by people who have been systematically excluded both within and outside of the disability community, including queer and gender non-conforming disabled people and disabled people of color [81]. Disability justice affirms the value of all bodies, recognizes that ability, race, gender, sexual orientation, and other identity characteristics are inextricably linked, and calls attention to the ways that disabled people with multiple marginalized characteristics face compounding challenges.

This study is informed by the social model of disability, disability studies, disability justice, and related fields and movements in a few key ways. In recruiting participants, we sought people who self-identified as being disabled rather than imposing pre-defined restrictions on participation. We center the lived experiences of disabled workers, and focus on how features of gig platforms engender socio-technical challenges for disabled workers and how these features might be improved. Finally, we pay attention to the intersection between disability and other identity-based characteristics (such as race and gender) and their joint impacts on workers’ lived experiences.

2.2 Disability in Traditional Labor

The systematic social exclusion that disabled people have historically faced extends to many arenas of life, including the workplace. Disabled workers are often falsely assumed to be uninterested in (or unable to) work due to perceived limitations posed by their disabilities [10]. They often face considerable discrimination in gaining and maintaining employment [18] despite legal protections such as the ADA in the U.S. This discrimination can be seen both in the employment process, which involves getting hired for a job that is commensurate with one’s skill set, and in the workplace experience, which takes place once the job begins [18].

2.2.1 The Employment Process. Despite the ADA’s protections, disabled workers still face stigma [95] and discrimination in the hiring process. A nationally representative survey of employers across industries conducted by the U.S. Department of Labor (DOL) found that a third of employers noted “discomfort or unfamiliarity” as a reason for not hiring disabled workers [30]. Most respondents were also concerned about the cost of accommodations and healthcare disabled workers might need. These reservations translate into disabled workers receiving fewer interviews and job offers than people without disabilities [6].

To avoid such discrimination, workers may choose to conceal their disabilities during the hiring process when possible, especially in the case of invisible disabilities (e.g., Crohn's disease) that can be easier to conceal until workers have been hired and the need arises [95]. However, this strategy is not available to people with visible disabilities that are hard to conceal. People with invisible disabilities may also need to make these disclosures if they require accommodations during the hiring process, such as extra time during a skills test.

2.2.2 The Workplace Experience. Once hired, disabled workers can face numerous challenges in the workplace, including stigmatization, a lack of accommodations, lower wages, and reduced advancement opportunities (for a review, see [74]).

Disabled workers' opportunities in the workplace can be limited by supervisors' and coworkers' attitudes as well as organizational characteristics such as a company's norms and practices [87]. Navigating these issues poses a complicated decision about whether or not to disclose their disabilities. Disclosing disability-related information can help disabled workers to exercise their legal rights, receive workplace accommodations, and challenge ableist thinking [4]. Still, many disabled workers feel compelled to conceal their disabilities at work to avoid stigmatization or negative aspersions about their productivity [32]. However, being forced to conceal one's disability can negatively impact individuals' cognition, affect, behavior, and self-evaluation [64, 71].

Beyond these challenges, disabled workers can also have unmet needs in the workplace that complicate their experience. Workplace accommodations for disabilities are often unavailable despite the fact these can improve overall company productivity and morale [83]. Disabled workers are also more likely to require flexibility in their work schedules, for example, to be able to attend medical appointments, that is often not offered by traditional jobs [74]. The nine-to-five jobs that characterize the traditional workplace are designed with the abilities and resources of the average worker in mind, and are thus inherently exclusionary to the needs of a broad range of people [1]. Finally, disabled workers receive lower wages on average than workers without disabilities, and can be less likely to receive career advancement opportunities [30]. Instances of wage discrimination persist even after controlling for the demands of the job and workers' impairments [8, 9].

2.3 Disability in Gig Work

Because of the barriers described above, disabled workers have been historically over-represented in part-time and contingent jobs [75], as well as in blue-collar or service roles [74]. Given the service-oriented nature of most gig work, it is likely that many disabled workers also work on gig platforms. However, relatively little is known about the gig economy from the perspective of disabled workers, and existing research at this intersection focuses almost exclusively on crowdwork.¹

Research shows that crowdwork appeals to some disabled people because it is flexible and allows them to avoid some of the disability-related challenges of traditional brick-and-mortar workplaces described above, as well as inaccessible transportation to jobs [96]. Crowdwork can provide disabled workers with a sense of autonomy and self-worth, help them gain skills and experience, and support transitions into traditional jobs [29]. For people with disabilities that can involve communication and interactional challenges (such as autism and generalized anxiety disorder), crowdwork affords work without the social demands of a traditional workplace [41].

However, disabled crowdworkers also face several challenges, such as accessibility issues and difficulties working within tight time constraints [96]. An assessment of 120 common types of MTurk tasks found that few comply with Web Content Accessibility Guidelines [88]. Another study found that while people with autism spectrum disorder were able to complete most crowdwork tasks, they took longer to complete than most workers [41]. Longer completion times likely contribute to

¹Most research on disability in the gig economy has focused on customers rather than workers (e.g., [5, 17, 48, 59]).

why crowdworkers who identify as having a disability earn \$2.80/hour, versus \$3.14/hour earned by workers without disabilities [40]. In principle, many of these issues might be addressed by the ADA in traditional workplaces, but as noted earlier, independent contractors are not protected under this Act [62]. Beyond crowdwork, Lee and colleagues' study of deaf and hard-of-hearing ridesharing drivers found similar accessibility challenges in terms of task and platform design, along with challenges around communicating with passengers that led to concerns about discrimination [54].

2.4 Closing gaps in understanding across platforms, disabilities, and experiences

Existing research on disabled workers in gig work provides us with some clues as to how workers with disabilities can face additional challenges during gig work, particularly around accessibility. However, we see three key research gaps in our current understanding of disability in the gig economy, which we lay out here and seek to address with this study.

First, the focus of most studies on crowdwork leaves out a range of other kinds of higher-skilled online work, as well as offline work. This is a key research gap considering that disabled workers have historically been more likely to hold both online work-from-home jobs and low-paying blue-collar jobs [50]; these trends may extend to the gig economy. Thus, it is vital to examine disabled workers' experiences across the spectrum of online and offline jobs to develop a comprehensive picture of the potential and the pitfalls of the gig economy for this subset of workers.

Second, disabilities vary in type and severity. Existing gig work studies tend to focus on one specific disability, and though focusing on particular communities has value, it also risks centering the concerns of some subsets of disabled workers and marginalizing others. As with broadening the range of platforms, we see studying a wide range of disabilities as critical to deepening our understanding of disabled workers' experiences in the gig economy.

Finally, we see a need to understand what happens when the power asymmetries faced by all gig workers combine with the marginalizing forces faced by disabled workers. Much research has shown that there are profound power asymmetries in the gig economy. Many gig workers are economically precarious [82], and the stress of being economically dependent on unpredictable work can be detrimental to their well-being [13]. They are subject to detailed surveillance, where platforms measure granular personal data, including keystrokes and location data [61]. Workers are also beholden to customers who hold an extraordinary amount of discretionary power to evaluate their performance, and even cut off their access to the platform [85]. Workers must also contend with the fact that much of the work process is controlled by algorithms [67]. While all workers must contend with these challenges, we still do not know how these challenges may be amplified by the broader forces of social marginalization faced by workers with disabilities.

3 METHODS

To address these gaps, we conducted observational fieldwork and interviews with 24 disabled workers across a range of platforms and disabilities to answer the following questions: How do disabled workers experience working on different gig work platforms? How do characteristics of particular platforms, impairments, and people combine to shape these experiences? What are the risks and opportunities of gig work for disabled workers as compared to traditional work?

3.1 Participant Recruitment

We recruited participants on Reddit, a popular community-based social media website, since many gig work communities have active subreddits where workers come together to talk about their experiences. We posted recruitment messages in several subreddits representing different types of gig work (e.g., r/mturk, r/amazonflexdrivers, and r/lyftdrivers) inviting people to sign up for an interview. We were careful to follow individual subreddits' rules, including asking moderators

for permission when necessary. Participants had to be gig workers and self-identify as having a disability, be at least 18 years old, and live in the U.S. We limited the sample to workers in the U.S. to scope the research as there are large differences around disability and employment access in different countries. A U.S.-based sample still provides broad variation along on a number of factors, such as disability type, socioeconomic status, age, other identity markers (such as gender, race, and sexual orientation), technological literacy, and location (e.g., urban versus rural). The recruitment message and sign-up process both stated that we were happy to accommodate any needs around accessibility, such as conducting a text-based interview instead of an audio call.

3.2 Interview Procedure

Interviews were conducted by the lead author from January through July 2020. Most interviews took place via phone or audio-only Skype call; three took place via synchronous text chat secured by end-to-end encryption. Each interview began by taking participants through the online consent form made available during recruitment, and obtaining consent to the interview (and to record audio, if applicable).

Initial interviews were fairly unstructured, organized around general questions about how and why participants started doing gig work, and the benefits and challenges of this work. As is often the case with grounded theory, early interviews helped identify key areas for further data collection, which led to the creation of a semi-structured interview guide to help cover the necessary areas for theory development [15]. Most interviews were based on this semi-structured interview guide, while allowing conversations to flow freely and deviate from the guide whenever needed to explore new relevant concepts as they emerged. When new concepts emerged, we asked questions about these in future interviews; in this way, the interview guide was iterative and evolving.

As per the semi-structured guide, we first asked participants to say a little about themselves, including what motivated them to try gig work and how they decided which types to try and to stick with. Then, we asked them broadly about the benefits and challenges they experienced doing gig work. At this point, participants often brought up their disabilities; we asked them to provide some background about the role their disability played in both their day-to-day life and their work. Our goal was to learn about whether and how their disabilities impacted gig work and vice versa, including whether they disclose their disabilities during gig work, their experiences doing gig work versus traditional work, and any other disability-related considerations. We then asked about their perceptions of risks while working on the platforms and the precautions they took to stay safe, broadly construed. This included safety in relation to the COVID-19 pandemic, which started partway through data collection and provided an opportune, if unwelcome, glimpse into how a public health crisis can further impact precarious workers, many of whom belong to a high-risk population. Finally, we asked if they had suggestions for improving gig platforms in terms of the disability-related challenges they had highlighted. Interviews took approximately one hour, and participants received \$20 USD as a token of appreciation, either via PayPal or an Amazon gift card. The protocol was approved by the IRB at Cornell University, the authors' institution at the time.

3.3 Observational Fieldwork

The interviews were supplemented by extensive observational fieldwork [2], where the lead author spent time (a) temporarily working on two gig work platforms: Amazon Flex (a delivery service platform) and Amazon Mechanical Turk (a crowdwork platform), and (b) regularly reading a variety of gig work subreddits over a period of over three years, starting in 2018. This immersion supported rapport-building with participants and helped craft targeted followup questions that were informed by personal knowledge of how the platforms worked, what typical tasks entailed, and common

issues that came up on each app (though this immersion was privileged in that it was not motivated by the economic precarity many workers face and that shapes their experiences).

3.4 Grounded Theory Analysis

Data collection and analysis occurred as iterative, concurrent processes that informed each other. We used the constant comparison method to compare each ‘incident’ in the dataset with others for conceptual similarities and differences based on extensive memoing [22]. As we accumulated memos from field notes and transcripts, we reviewed them frequently and open-coded them in vivo—i.e., using participants’ words [58]—to stay close to the data. We also conducted axial coding to call out higher level conceptual categories between the codes [21].

We also conducted theoretical sampling, where we selected participants who varied in terms of the concepts that emerged during the coding and memoing processes. For example, an interview with a gig worker who lived in a remote, rural area who faced location-based challenges raised location as an important concept. This led us to seek participants across urban, suburban, and rural areas to understand how variations in location interacted with disability. We also recruited with an eye toward “negative cases” that might “upset our thinking” [11, p.87] to highlight variation and broaden theorizing; for example, we interviewed a high-skilled crowdworker whose specialized skills gave her much more power to control her work practices and mitigate challenges than most other participants reported in other forms of gig work.

We continued the work of open and axial coding, memoing, and theoretical sampling until we had reached theoretical saturation, where interviews weren’t surfacing new concepts and the existing concepts were well-developed in terms of their dimensions and variations [22]. At this point we finalized the coding, compiled all relevant codes into a codebook, and re-coded the dataset. As is common with grounded theory approaches [21], all coding and memoing processes were conducted solely by the first author. The codes and findings were validated by the second author, who was familiar with the interview dataset; this is a common way to ensure the trustworthiness and credibility of qualitative findings [27].

3.5 Ethical Considerations

We thought carefully about participants’ comfort, safety, and autonomy in conducting this research, with the goal of supporting people’s participation and prioritizing their well-being over data collection for the project. This led to several strategies described below.

Aiding Participation. We conducted interviews by phone or text, depending on each participant’s communication preferences and needs around accessibility. We also assured participants who needed longer times to respond (for instance, needing breaks during vocal tics, or using an on-screen keyboard during a text interview) that there was no pressure to respond quickly and thanked them for their patience in taking the time to share their experiences.

Safeguarding privacy. We also took precautions to protect participants’ privacy, because unwanted disability disclosure is both unethical and can result in stigmatization. These precautions include reporting characteristics beyond disability only in aggregate to reduce possible re-identification risks, separating identifying information (such as emails used for compensation) from interview data, and avoiding questions not necessary for the research, such as the origins of people’s disabilities.

Managing power dynamics. Still, there are risks around the power dynamics of interviews, which might make people feel compelled to disclose more than their comfort level. To address these dynamics, we began interviews by emphasizing that all participation was voluntary and they could choose to not answer any question. During the interviews, when participants brought up particularly sensitive incidents, we reminded them that they could provide as little detail as they

wanted to; participants appreciated this, while still sharing many sensitive and sometimes emotional experiences. When they did, we took care to pause and acknowledge the weight of their stories.

Centering participants' experiences. We also assured participants that we valued their voice and experience. Discussions of gig work tend to have a binary focus on either positive or negative aspects of the work. Both extremes discount the experiences of gig workers, who are vocal about problems such as low pay and lack of worker protection, but who also reject narrow, negative framings that position gig workers as exploited victims in need of rescue. We assured participants that we were interested in their experiences with gig work—positive, neutral, or negative—and had no agenda of our own to cater to when telling their stories. We also observed the language individual participants used about their disabilities and used that language with them.

Several participants said that the interview was an opportunity for them to reflect on their experiences with someone in a way that they didn't get the chance to in day-to-day life, which is a noted potential benefit of participating in research interviews [16]. At the end of the interview, about a fifth of participants either said compensation was not necessary or that the interview was worth participating in regardless of compensation. In these cases, we assured them that we would like to compensate them as a gesture of appreciation, and did so.

Writing about Disability. Terminology around disability remains a debated issue with several geographical and academic divides [57]. "People-first" language aims to center the individual rather than their disability (e.g., by saying "people with disabilities" rather than "disabled people"); however, others argue that because disability is a key part of many individuals' identities, decentering disability in terminology implies that disability is something inherently negative [51, 80]. Thus, the current convention in disability studies and many activist circles is to use identity-first language (e.g., "disabled people") when appropriate [77]. We follow this convention and occasionally use both types of terminology based on contextual appropriateness as well as the preferences of the people we interviewed.

4 FINDINGS

We begin reporting our findings by describing our participants. We then discuss how and why they chose to engage in gig work, and how this decision was shaped by disability-related needs around access to work, flexibility, and income. Then, we discuss disabled workers' experiences in the gig economy and how the challenges they face are complicated by disability. These challenges are broadly structured around accessibility issues that arise around choosing and doing tasks, and evaluation and surveillance by both customers and the platforms themselves. Finally, we look at the broader challenges disabled workers faced around the COVID-19 pandemic and their intersectional identities.

4.1 Who were the workers we spoke with?

We interviewed 24 disabled workers across four categories of gig work: delivery services (8 workers' main type of gig work), crowdwork (7), ridesharing (5), and online freelancing (4). Participants had between three months and seven years of experience in gig work; seven reported using multiple platforms within their main category, and three had tried two categories.

Participants also reported a range of disabilities across the broad categories listed in the SAGE Reference Series on Disability [3]; fourteen reported more than one. The majority had physical disabilities, including chronic illnesses (e.g., multiple sclerosis) and mobility impairments (e.g., quadriplegia). Several had mental health conditions (e.g., bipolar disorder). One participant reported a sensory disability (blindness). Several participants used durable medical equipment (DME) or assistive devices, including canes, wheelchairs, screen magnifiers, voice recognition software, ventilators, and oxygen tanks. In Table 1, we list participants' self-identified disabilities along with

the types of gig work they engaged in. We present other demographic information in aggregate, non-tabular form below in order to protect the privacy of our participants.

Participants ranged from 19 to 70 years in age. Twelve identified as women, eleven as men, and one as non-binary. In terms of race, 15 participants identified as White, six as Latino, one as Black, one as Asian, and one as biracial (Native American/White). Several reported another identity marker associated with marginalization, such as being LGBTQ+ or a veteran. Participants also lived across the U.S., representing several states from each of the four main U.S. Census Bureau regions (Northeast, Midwest, South, and West) and a mix of urban, suburban, and rural areas.

Gig work was the main or only source of income for most participants (19), and most (15) earned \$25,000 or less a year. A few earned significantly less than the U.S. poverty line, between \$1,500 and \$6,000 a year. This was particularly true of people doing crowdwork, which is typically low paid. In contrast, a few participants who did relatively higher-skilled freelancing work earned up to \$100,000. Five participants earned income from either full-time or part-time traditional work in addition to gig work, though most of them still relied on gig work to help pay monthly bills or disability-related expenditures (such as buying a motorized wheelchair or clearing medical debts). Some participants also received financial assistance from family members. Several workers also received additional income from public disability-related benefits or social security, or received other income-based benefits, such as food stamps.

4.2 Why Do Disabled Gig Workers Do Gig Work?

As with workers in general, disabled workers appreciated both the low barrier to entry for gig work and the flexibility it can offer around work conditions and income. However, the reasons participants appreciated these features, and the benefits they got from them, were heavily influenced by their disability-related needs and the barriers they had faced in accessing traditional work.

4.2.1 Low barrier to entry. Gig work has relatively low barriers to entry versus traditional work. Instead of spending weeks looking for a job and then going through the interviewing and hiring process, many gig workers can sign up and start working within a few days or hours.

Easy access to work is particularly helpful for disabled workers who experience hiring discrimination in traditional workplaces. For example, a freelancer described her experience with overt discrimination, saying *“I was straight up told that because you’re in a wheelchair, we won’t hire you, even though it had nothing to do with the position”* (P24). Discrimination could also be more subtle. For example, a blind crowdworker had a master’s degree and internship experience, but after three years, she still had not been able to find a job in her field:

“[Companies] don’t want to deal with accommodations. My eyes definitely look ‘off’ and I do use a cane, so I think it’s very visible. Of course they aren’t aware of it until the in-person interview. They always tend to be a little surprised from what I can tell.” (P13)

Gig work allowed these participants to sidestep discrimination in hiring. Traditional employers are often leery of employment gaps; some participants had these gaps due to disability-related issues. For example, a delivery worker with chronic fatigue syndrome and clinical depression had been unable to work for extended periods of time and as a result had large gaps in her work history; she started working for GrubHub because *“[Gig platforms] don’t ask you, ‘What was your last job?’ or ‘How long did you work here? What’s your resume and everything?’ And like, for me, not having worked in six years. . . It’s great not to have to be judged by that”* (P8).

Given work’s importance in American society, access to work can provide benefits around dignity, identity, and autonomy. For example, a crowdworker who lived with his parents explained his motivation to work on MTurk by saying, *“So I’m 26 and I feel like it’s ridiculous for my parents to provide for me at this age. And it’s hard for me to get a job outside due to my medical condition”* (P18).

Work Type	Disability and/or Health Condition	P#
CW	Quadriplegia	P11
CW	Bipolar disorder, post-traumatic stress disorder (PTSD)	P12
CW	Blindness	P13
CW	Diabetes (type 1)	P14
CW	Muscular dystrophy, scoliosis	P15
CW	Tourette's syndrome, anxiety, depression	P18
CW	Multiple sclerosis, single-sided deafness	P19
FL	Arteriovenous malformation	P6
FL	Sjogrens syndrome, psoriatic arthritis	P23
FL	Sjogrens syndrome, syringomyelia	P24
FL; CW	POTS, autoimmune neuropathy, chronic fatigue syndrome	P4
DS	Diabetes (type 1), chronic knee pain	P1
DS (2)	Chronic back pain, arthritis	P2
DS (2)	Autoimmune disorder	P7
DS	Chronic fatigue syndrome, depression	P8
DS (5)	Ulcerative colitis	P9
DS (2)	Ehlers-Danlos syndrome	P10
DS (2); RS	Ehlers-Danlos syndrome	P5
RS	Psoriatic arthritis, Wolff-Parkinson-White syndrome	P16
RS (2)	Tarsal tunnel syndrome	P17
RS (2)	Generalized anxiety disorder (GAD), PTSD, panic disorder	P20
RS	Diabetes (type 2), depression	P21
RS	Chronic obstructive pulmonary disease (COPD)	P22
RS; DS	Endometriosis, postural orthostatic tachycardia syndrome (POTS)	P3

Table 1. Participants' gig work categories and self-described disabilities. Work Type acronyms are as follows: Crowdwork (CW), Freelancing (FL), Delivery Services (DS), and Ridesharing (RS). In the case of multiple work types, participants' primary work is listed first; numbers in parentheses indicate that the participant used multiple platforms of that work type.

However, the gigs that are easiest to get into are also the lowest paid, while better-paying gigs require assets disabled workers might not have. MTurk, where the median pay is \$2 an hour [39], only requires a smart phone or computer. Delivery and ridesharing services pay better, but many require a car that is not too old or visibly damaged. Freelancing can pay very well, but also requires more skills and can be hard to break into. For example, Upwork freelancers have to set up a profile and secure some high-rated reviews to be able to compete with other freelancers for clients.

These barriers, along with lack of knowledge of other types of gig work, lead to a lack of job mobility: participants tended to stay on one platform or type of gig work, and several who tried Upwork found it too overwhelming to learn and eventually chose other types of work instead.

4.2.2 Flexibility. Gig work also provides several dimensions of flexibility that help disabled workers in terms of time, location, effort, and social interaction.

Flexibility of time. Standard nine-to-five work schedules are exclusionary of many disabilities [1]. Being able to set one's own hours is a big appeal of gig work, as described by a delivery driver:

"The flexibility is amazing. And if there was [a traditional job where] I could go, just you know, pick up shifts, I would, but the flexibility really doesn't exist in any kind of traditional workspace." (P2)

This flexibility allowed disabled workers to manage the impact of their disability on their ability to work, as well as to do other needed activities related to their disability, as described by a freelancer with an autoimmune disorder:

“I get infusions every four weeks and bloodwork every two weeks. So trying to have more of a regular job, I would be constantly taking time off, constantly having somebody pick up my shift. So that’s another reason why I really like doing freelance, is because I can work around my schedule.” (P24)

Flexibility of location. The ability to work from anywhere is another commonly cited advantage of gig work, especially for people who have geographical constraints that limit their access to work [55]. For many disabled workers, spatial flexibility is even more important. For example, we spoke with a quadriplegic wheelchair user who lived in an isolated area; crowdwork allowed him to access income without the health risks and accessibility issues involved in leaving his home:

“I live on a farm. So going outside in a wheelchair, I tend to get stuck in the sand. And since I’m a quadriplegic, my body doesn’t sweat, so I’m real susceptible to heat. So when it’s hot outside, I’ve got to stay inside.” (P11)

Spatial flexibility is also important for disabled workers who face structural barriers in using transportation to access traditional jobs. For example, a blind participant had to navigate inaccessible bus routes to reach her internship; she was often late and was eventually asked to leave. Similarly, a participant with Tourette’s syndrome and had been turned down for restaurant server jobs near him due to his motor tics; those tics made him unable to drive to workplaces further away. Both of these participants had turned to crowdwork as a means of earning income from home.

Flexibility of effort. Differences in the effort required by different types of gig work and tasks also allowed participants to better manage disability-related issues. For example, a participant with type 1 diabetes found that crowdwork tasks were short and didn’t require a lot of attention, and so he was able to monitor his glucose levels frequently:

“You know, if I have five minutes, I can do it and use it. If I know that it’s gonna be a day I’m heavily involved in work and health management, then I adjust how much I work on MTurk. I mean, there’s something to be said about quick and easy and efficient.” (P14)

He had specialized skills that he could have used to access higher-paying freelancing tasks on Upwork, but he preferred crowdwork because the tasks were more “mindless” and did not require his full attention.

The low effort required for many gigs also helped some disabled workers who face dips in motivation. For example, a rideshare driver who had clinical depression said, “[Lyft] just made it easier for me to work. Because if I was too depressed, I just wouldn’t work, but even when I’m like, most depressed, I could just sit in my car and be on my phone at the airport” (P21).

Flexibility of social interaction. Gig work also affords varying amounts of social interaction. Crowdwork tasks can be done independently at home, making it a good fit for people who would like to minimize social interaction, as with some autistic workers [41]. A participant with bipolar disorder earned about \$30 a week on MTurk; when the first author asked her why she chose to do crowdwork, she said, “I can do it myself and be by myself” (P12).

On the other hand, some people with disabilities can become socially isolated [56]. Ridesharing and some kinds of delivery work afford social interactions that can help mitigate this isolation. For instance, we interviewed a delivery worker who had clinical depression and, as a 70 year old living alone without family nearby, faced considerable feelings of loneliness. Working for Grubhub had given her a reason to get out of the house, and had improved her outlook: “this has been really good

for me . . . I'm able to see people, I'm able to laugh . . . the job is helping me to be more active and I'm getting healthier and more positive" (P8).

4.2.3 Balancing income constraints and needs. Gig work also supported a variety of participants' economic needs. Participants reported working both full- and part-time, with varying levels of dependence on the income they earned from gig work. This dependence was mediated by their access to other work and support. Many participants who primarily worked on gig platforms also received support from public benefits programs such as Social Security Disability Insurance (SSDI), Supplemental Security Income (SSI), Veterans Disability Compensation (VDC), or food stamps.

The laws around public benefits impact how disabled workers approach gig work. The amount paid out by disability benefits is below the federal poverty level and is insufficient to cover basic necessities, such as rent.² People on these benefits must find other sources of income to cover their expenses, but at the same time, they are also subject to stringent limits on their income and resources. SSI recipients cannot have more than \$2,000 in assets, which prevents them from saving and renders them financially vulnerable. They are also ineligible for SSI if they earn more than a certain income threshold; in 2020, that threshold was \$1,260 per month for most people.³

As a consequence, low-income disabled people can be caught between the need to earn income for basic expenses and the risk of losing benefits. Participants who received benefits were aware of the income threshold that would disqualify them and took care not to exceed this threshold. Gig work allowed them to set their own work hours and thus control their income more effectively than in traditional workplaces where schedules are generally set by supervisors. Participants could stop working if they came close to the earnings threshold—although in practice, most workers' gig work earnings were low enough that exceeding the threshold was not an immediate concern.

Even when support came from other sources such as family, workers' incomes were typically low. For example, one delivery driver earned \$8,000 a year, mainly from Instacart and Postmates. He had received SSI in the past, but was no longer eligible. To support him, his father matched his earnings from gig work so that his total income was \$16,000 a year. Many participants had such safety nets in place, but even after factoring in these additional sources of support, most workers' yearly income was below \$25,000. Freelancers were the main exceptions to this rule; for example, an experienced technical writer in her fifties was able to earn \$95k a year freelancing while only working part-time, so as not to exacerbate her health condition.

Even among disabled workers who held full-time jobs and used gig work as supplementary income, gig work was often less a discretionary "side hustle" and more a matter of needing money for disability-related reasons. For example, many participants had large medical debts (such as hospital bills) or expenses (such as needing to purchase a motorized wheelchair). A few participants reported using gig work as a way to support themselves while taking college or certification courses to gain specialized skills to access higher-paying work in the future.

4.2.4 A Less-than-ideal, Necessary Job. While it is clear that gig work provides disabled workers with the opportunity to earn much-needed income, it is important to note that many workers choose to do gig work not because it is an ideal choice for them, but because they do not have other viable options that fit their needs. A delivery driver worked for Instacart because he needed the flexibility to navigate flare-ups of his chronic autoimmune illness, but he reflected on whether he would recommend the work to someone who did not have a disability (and who therefore would not share his acute need for flexibility), saying:

²In 2020, the maximum monthly SSI federal individual benefit for an individual was \$783, per <https://www.ssa.gov/policy/docs/statcomps/supplement/2020/ssi.html>

³See <https://www.ssa.gov/oact/cola/sga.html> for more information.

“What about somebody who works for Instacart, but doesn’t have [health] issues? I would probably tell them to go find something else. Like, there’s definitely so many better options. If they don’t need the flexibility, then yeah, I’d probably say just get a normal 9-to-5.” (P7)

4.3 Challenges on the Job: Doing Gig Work with a Disability

In this section, we unpack why gig work was a less-than-ideal, but necessary, job for most disabled workers we interviewed. While gig work could be an essential source of income, participants encountered a number of challenges: inaccessible tasks, a lack of control and agency in the face of ability-unaware algorithms, and mismatches between customer expectations and worker abilities that lead to unfair evaluations. We discuss each in turn.

4.3.1 Inaccessibility and Necessary Workarounds in Tasks. Gig work platforms are typically not set up with accessibility in mind, which makes it hard for workers to complete tasks and requires them to create workarounds.

Inaccessible tasks. When a platform focuses on a set of homogeneous tasks, workers can choose to work on platforms that suit their needs and abilities. For example, a worker with a mobility impairment may decide to drive for a ridesharing platform (but not a delivery platform) because staying seated in a car matches their mobility ability. In contrast, platforms that offer heterogeneous tasks—such as crowdwork—can be harder to navigate, as workers must sift through a variety of tasks to find ones that match their abilities. For example, a deaf crowdworker may be able to complete many kinds of tasks on MTurk, but some tasks require listening to audio clips; sorting through these requires time and effort.

Tasks also often don’t support the assistive technologies that expand disabled workers’ abilities, which can be a particular problem in MTurk because third party requesters design the tasks, often without accessibility in mind. This can lead to situations such as full-screen tasks being inaccessible to disabled workers who use onscreen keyboards, tasks that work badly with screenreaders, and time limits that exclude disabled people who can do a given task but require more time.

Compounding the problem, many tasks lack up-front transparency about what they entail. In the worst case, accessibility issues might not arise until a crowdworker has already expended considerable effort. For example, a crowdworker may begin a survey and find later on that some of the radio buttons are not recognized by their accessibility software. In these kinds of situations, workers have two main options. One is to try to complete the task anyway, though it may take them longer or require external assistance. Another is to close the task without completing it. Both options require additional costly labor that workers must take on.

Inefficient and costly workarounds. Because lucrative tasks are rare, disabled workers sometimes take them on despite accessibility issues. For example, many audio recording and transcription tasks pay relatively well. One crowdworker with Tourette’s syndrome found it difficult to record his speech because of his vocal tics. In response, he had developed a strategy to continuously mute and unmute his mic while recording—though he worried this might increase the chance his work would be rejected, and had sometimes included a note disclosing his disability in a bid to avoid that.

A quadriplegic crowdworker who used speech recognition software described similar effortful workarounds in taking on well-paying audio transcription tasks:

“I was happy I got approved. But it took me like 45 minutes. For most people, I think they could do it in 10 or 20 with the keyboard. I had to play the video for a couple of seconds, stop it, indicate with my voice, because you can’t dictate speech while there’s sound from the video at the same time. So [I was] going back and forth.” (P11)

In the context of online gig work, participants who chose freelancing platforms reported fewer task-specific accessibility issues than in crowdwork, perhaps because freelancers specialize in particular kinds of tasks, and also have more control over how they work than crowdworkers.

4.3.2 How Ability-Unaware Algorithms Harm Worker Choice. Although choosing among heterogeneous tasks on online platforms imposes some search costs, it also increases the chance that disabled workers can find tasks that match their abilities. In offline work platforms, workers face a double-whammy: limited information about the conditions of a given task, and limited meaningful choice between tasks. Offline gig workers may see a list of tasks to choose from, but these are “minute decisions” [76], such as whether or not to accept a time block to work, or to accept a given passenger’s request. Workers are not able to make more important decisions, such as choosing their routes or tasks according to their abilities and preferences.

Instead, these decisions are made by algorithms unaware of individual workers’ situations, and workers have limited information about the tasks they select until they are underway. This lack of control over task assignment, and the resulting inability to match tasks to individual needs, is a common complaint regarding offline gigs. This can affect all workers, for instance, when assigned a route that ends far away from their home (as often happened to the first author during their fieldwork doing deliveries), but is especially challenging for those who have additional disability-related needs to consider.

The value of task granularity. Other dimensions of tasks, such as whether a delivery is in a downtown, suburban, or rural area, or the weight of goods delivered, can substantially impact the difficulty of the task and its accessibility. For example, a delivery worker with chronic pain and arthritis could not carry heavy objects. He worked on Amazon Flex, which gave him the option to deliver groceries from Whole Foods supermarkets or packages from Amazon warehouses. As groceries can often involve carrying heavier objects than standard packages, and he had no information about what groceries he would be delivering beforehand, he avoided these tasks, even though they were more lucrative than package deliveries:

“Whole Foods definitely is way more profitable, but it’s just kind of not worth the risk for me and if I get an order with 500 gallons of water, that presents a huge challenge. And I will pass up extra money to just kind of have the sure thing . . .” (P2)

In this case, the participant was able to do some deliveries, but did not have the ability to choose which ones he did (e.g., light versus heavy loads). In contrast, a rideshare driver with COPD could not do some kinds of tasks at all because of how tasks were set up. He drove for Uber, and the Uber app allows drivers to also deliver food for UberEats to earn more money. However, delivering for UberEats posed an accessibility challenge, as he described:

“I can’t even do UberEats because I’m not getting out of my car, walking up and down stairs with my oxygen tanks in order to grab somebody’s hamburger, you know. With Uber, I can stay in my car. . . . There’s no way to set it to where I can say, I’ll take your food to you, but you have to come to my car and get it.” (P22)

Having the ability to customize the task to his needs (such as by indicating that he could do curbside food deliveries) would allow him to participate in UberEats. However, since this kind of task selection was not possible—even though many customers might be happy with curbside delivery—he was excluded from working on the platform altogether.

The value of control. When platforms do give workers some degree of control, disabled workers can use this to maximize their abilities. For example, a food delivery worker had a mobility impairment that made navigating stairs a challenge. So, she preferred delivering in suburban areas

that typically contain more houses than apartment buildings. Interestingly, Doordash allowed her to select a general neighborhood for delivery, while Postmates did not; Doordash's design allowed her to choose areas that were more likely to be physically accessible, and consequently to participate in the delivery labor market when she otherwise would not have been able to.

Having limited control over tasks has repercussions beyond workers' earnings. Accepting a task that pushes one's abilities can put some disabled workers' health at risk. For example, a delivery worker who had stage 3 endometriosis found that delivering on bumpy rural routes caused her pain, but the platform she used (Amazon Flex) did not allow her to choose her routes so she was unable to avoid exacerbating her disability:

"So I think they should have more options as to, 'do you want to do rural? Do you want to do suburbs or city areas?' Because that would help out a lot. Not just with our frustration, but also you're not jiggling the insides, agitating them, making them swell up and increasing the pain." (P3)

Without these kinds of control, workers experience accessibility issues over and over again, resulting in large amounts of lost labor. Because of this, several workers wanted their disability to be considered in task assignments. However, they also worried that voicing these needs would open them up to potential discrimination based on disability, as noted by a delivery worker:

"if I were to go to Whole Foods and have five cases of water, 20 gallons of water again, yeah, I would absolutely say I can't do this. I want to decline. And honestly, Amazon and Whole Foods should have some option to indicate that in-app so that heavy orders are just automatically not assigned to less able people. Um, but I also feel like at that point, I probably just wouldn't hire less able people." (P2)

Algorithmic evaluation concerns. In fact, gig workers often develop folk theories about platform algorithms and how they interpret workers' behavior. Some participants theorized that the algorithms penalize workers who take breaks from the platform by directing work away from them when they rejoin, a problem for disabled workers who may take longer periods of time off for health reasons. Relatedly, a delivery worker with an autoimmune condition worked fewer hours on Instacart to avoid negatively impacting his health, but felt that he was penalized because he completed fewer jobs than other users:

"You know, you're only getting like, four or five ratings a week, somebody else gets like, a hundred, they're still gonna get more orders and they're gonna get better orders. Yeah, it knows how many you do in a day. Like, they are a money-making business. If you're making them more money, they're gonna help you make more money, I guess. Just doesn't really help out people like me very much." (P7)

Similarly, disabled workers can be nervous about being negatively evaluated by algorithms if they turn down too many tasks, even if these decisions are due to their disabilities. For example, a delivery worker with a mobility impairment had to decline deliveries to places that were not accessible, but said *"Like you could obviously decline [an offer], but if you kept on constantly declining it . . . [that] can lower your rate. . . . Postmates has been a little bit iffy about that" (P10).*

Workers can also feel the need to perform at an increased pace to win the favor of the algorithms that govern the platforms, which can cause them to discount their health-related needs. However, over time, a delivery worker described how this pressure can ease: *"when I first started out, I felt tracked by the app and really pushed myself to be very efficient and not waste time. . . . Now, I've become a lot more comfortable in being able to take time to take care of myself" (P2).*

Other workers who are unable to work at an increased pace can make a conscious decision to reduce their earning potential so as to not be penalized for working slowly. For example, one

participant chose to deliver single food delivery orders at a time instead of “stacking” multiple orders so that he could take his time delivering each one. He knew this was a less efficient way to manage deliveries and could halve his earnings, but it reduced the risk that he would be penalized by the platform for being slower than other workers.

Overall, failure to consider workers’ abilities and agency in both task design and algorithmic assignment and assessment of tasks causes problems for disabled workers by restricting their ability to match tasks with their abilities. As a result, workers are faced with a dilemma: they can either risk their health to complete tasks that they would prefer to avoid, or they can avoid these tasks altogether and lose the ability to maximize their earnings. Further, algorithms that dictate how work is assigned can also negatively penalize disabled workers who need accommodations.

4.3.3 Mismatches Between Customer Expectations and Workers’ Abilities. Inattention to disability in task design and algorithmic evaluation extends to the much larger set of concerns that arise for disabled workers around how their disabilities amplify the power that customers already wield in evaluating workers’ performance, with implications for their pay and their access to work.

The power customers have to monitor and evaluate workers’ performance frustrates many workers [92], especially because customers have many expectations that gig workers feel compelled to meet by performing a number of unpaid activities and emotional labor [65]. Customers’ evaluations are extremely consequential, as they can impact workers’ pay rates, the tasks they can access, and even their ability to work on the platform.

Unaccommodating expectations. For disabled workers, this power imbalance is especially stark. Customer expectations about how tasks should be completed can mesh badly with disabled workers’ abilities. Because most customer-facing gigs involve short, one-off interactions, disabled workers are placed in the difficult position of having to navigate working with a disability under the watchful eye of strangers who are evaluating their performance. These interactions are further complicated by the fact that it is common for people to have their disabilities questioned or delegitimized [70].

Managing this tension around expectations and ability leads to a number of negative consequences. For instance, workers can be subjected to unpleasant and/or ableist attitudes. A rideshare driver who wore a visible leg brace found that passengers often asked him to help them lift heavy objects, and that disclosing his disability did not shield him from negative customer reactions. He told us about one of many incidents where a passenger had asked him to lift a heavy box:

“You know, I explained to him I have, you know, a disability in my ankle. I really can’t walk. And he just got very, you know, just very upset. And he goes, ‘Well, this is what you Uber drivers are supposed to do’.” (P17)

All workers face the frustrations of dealing with high customer expectations, but disabled workers who are unable to meet these expectations due to a disability may be disproportionately impacted by such incidents. The same driver discussed the impact of not lifting customers’ luggage, saying:

“[Customers] will tip, they will, but only when you bow down to their every command, which most of the time I can’t. So like, when I do say I can’t carry the box . . . I can tell my rating gets impacted, my tips get impacted, because I wasn’t able to assist the [customer].” (P17)

Not all customers had these expectations; another rideshare driver who used a cane found that customers were generally understanding that he could not lift heavy objects, and did not negatively review him for it. Still, some customers do penalize some workers based on expectations, and workers who receive too many low ratings risk being deactivated. This risk is especially problematic given that disabled workers often do gig work in the face of few other viable options.

Customers also expect work to be completed quickly; much of gig work is predicated on speed [94]. These pressures are additionally difficult to navigate with a disability, which is paradoxical given that many disabled workers turn to gig work for flexibility, including being able to take breaks and take longer to do things. A freelancer described the difficulties of managing deadlines:

“It’s mainly just about, like client understanding, like, a lot of clients want what they want, and they wanted it yesterday. And when you have a bunch of clients like that and you’re juggling a chronic illness, it’s kind of like, you know, some of the balls are gonna drop, or you can’t take as much work on. As you know, you might have been able to if people were more flexible about deadlines.” (P4)

Fine-grained monitoring. Customers’ expectations can be partly enforced through granular monitoring on many platforms. For example, Upwork’s time tracker provides clients with a screenshot of workers’ screens every 10 minutes plus a log of their keyboard and mouse activity; workers can opt out of using this feature, but then do not receive payment protections from Upwork. Many delivery and ridesharing platforms allow customers to see workers’ locations.

Inferences made based on this granular tracking can penalize workers trying to accommodate their disabilities. For example, a worker with type 1 diabetes used a cane and made deliveries on foot for Postmates. He said:

“The customer can see where you are at all times. And like I would start off going at a certain pace, and then my blood sugar would drop, or I’d start having a lot of pain. And I would slow down and then I would be able to end up finishing the job, but like, sometimes the customers will call me or call Postmates and be like, ‘I don’t know what’s happening. This person isn’t moving anymore.’” (P1)

Many workers are hyper-aware that they are being tracked, and some will try to mitigate negative impacts of being surveilled by customers. For example, a delivery worker with ulcerative colitis sometimes had to take impromptu bathroom breaks while making food deliveries. He said:

“I just have to stop while I’m driving to the customer and just pull over somewhere. And I would just say [to the customer via the app], ‘there’s been a delay’, I would have to make an excuse, like ‘oh, there’s a delay, sorry about it.’ And then go on from there.” (P9)

While updating customers was a strategy that generally worked for him, detailed surveillance puts a spotlight on any worker behavior that is out of the ordinary, and in doing so, puts the burden on workers with disabilities to mitigate any negative repercussions.

Tensions around disclosure. Workers can choose to disclose about their disabilities to customers in order to mitigate negative repercussions by helping customers understand their situation, though this was not common practice among participants. Some disabled workers had good experiences with disclosure, including sometimes getting positive support; a rideshare driver drove while being visibly on continuous oxygen therapy, and said of his passengers: *“They’ve been really supportive, saying like, ‘good for you. You know, you’re trying to work. You don’t have to sit at home’” (P22).*

However, disclosure raises the risk of discrimination. For example, a freelancer with an autoimmune disorder had experienced overt discrimination during traditional job interviews because she used a wheelchair, and as a result, she ensured that her wheelchair was not visible in her Upwork profile picture and work email.

To avoid this kind of discrimination or judgment, disabled workers can feel compelled to avoid disclosing about their disabilities, though this can be detrimental to their health. For example, a rideshare driver who used a walking cane described how she navigates requests from passengers to lift objects:

“Some days, it’s manageable. And then some days, I just have to clench my jaw, and just breathe in real deep and hoist it. And then kind of just appear normal walking around, because I don’t want them to think that just because I’m hurting. . . . [PAUSES] The judgment is what it is. I don’t want them to judge me for that.” (P3)

Concerns about customers’ evaluations can also affect how workers choose platforms to work on. For example, a crowdworker who checked his glucose monitor every 15 minutes chose to do online crowdwork rather than ridesharing because he thought it could be a problem if passengers saw him checking his phone and assumed he was distracted.

Worker control and expectation management. Workers on freelancing platforms often have more power to choose well-matched tasks and negotiate work conditions than on other gig work platforms. For example, the ability to set one’s own rates affords flexibility; some freelancers charged a flat rate for work rather than an hourly rate to reduce the pressure to get work done quickly.

Upworkers can also set their own turnaround times, and some workers use this to manage customers’ expectations by overestimating the time required for tasks. This also provides flexibility, particularly for workers who are highly skilled and not easily replaced by others with comparable skills, as explained by one freelancer: *“I do have really premium skills that clients are willing to make trade-offs for. So I don’t do work on tight deadlines. I always build in buffer for myself in case I have days when I can’t work”* (P6). However, disabled workers can also feel compelled to work for lower rates to ‘make up’ for slower turnaround times, and some freelancers we spoke with worked for less than their skills could earn.

Having unique skills, business savvy, and customer relationship management chops also allows some Upworkers to be discerning about the clients they take on, supporting their health needs. As one freelancer explained: *“I really cherry pick my clients to make sure that they are somebody that is not going to be dead set on an exact date and time with a deadline, because I know that I can’t fulfill that”* (P24). Finally, in contrast to freelancers who lowered their rates to balance slower turnaround times, some freelancers actually raised their rates, with the rationale that *“the more I charge, the better the clients are to work with”* (P23).

Finally, platforms where workers and customers have many repeat interactions—typically freelancing, though some MTurk workers develop relationships with particular requesters—allow the creation of longer-term rapport that can be used to negotiate disabilities. For example, two freelancers had nurtured long-standing relationships with their clients; they were able to leverage these relationships when they needed occasional health-related extensions.

Overall, workers with disabilities must contend with customers’ expectations about how, when, and what work is done, and when there is a mismatch between their abilities and these expectations, they are subject to prejudice, negative interactions, and lower tips and ratings. Customers’ ability to monitor workers in detail creates additional stress for disabled workers, who may feel compelled to engage in costly strategies to mitigate these negative consequences. For example, they may feel compelled to put their health at risk or to disclose their disability so as to avoid a negative rating. Even when workers have stronger relationships or more power over customer expectations, these problems are often mitigated rather than eliminated.

4.4 Broader Challenges Beyond the Job or Disability: COVID-19 and Intersectionality

Beyond what has been discussed already, there were two additional themes that related to disabled gig workers’ circumstances. One involves the difficult choices many workers faced during the COVID-19 pandemic. The other emphasizes that disability is only one of several factors that can intersect to shape how disabled workers experience the gig economy.

4.4.1 The Impact of the COVID-19 Pandemic. The COVID-19 pandemic began partway through the study, leading us to ask participants about how their work and lives had been affected. We found a clear divide between online and offline gig workers. Most online workers we interviewed had not been directly affected, though some were worried that the demand for online gig services may decrease as a result of budget cuts.

However, delivery and ridesharing workers—many of whom already had increased risks of illness through autoimmune illnesses, immunosuppressant medications, and disability-related co-morbidities—faced tough decisions that traded off health risks against the economic dependence on gig work described earlier. Some decided to stop working:

“So I was working as much as I could until it was not safe to, and then I just pretty much had to be like, ‘Okay, well I don’t have the money to go to the emergency room or pay the \$200 for deductible if I end up having to go that route, so it’s not really worth it.’ Because if that were to happen, my immune system is not great, I don’t know if I’d survive it or not. Like, I don’t have money to afford it.” (P7)

A rideshare driver who was at higher risk for COVID-19 due to diabetes paused working because she was concerned that negative customer interactions would be heightened during the pandemic: *“I’m a woman of color, and I’m darker, so they still see me as inferior. People always want to argue with me. So I’m not gonna put myself at the risk of having someone yell at me over a face mask because they don’t want to wear it” (P21).* Like her, some workers who paused working were able to lean on support from friends, family, and public service, though these were rarely sufficient and many workers described being in dire financial straits. For example, the same worker described the repercussions of stopping gig work, her only source of income, by saying:

“I basically didn’t pay my bills for like a month and a half because, you know, if I’m not working, I’m not paying bills. But I got some help from my brother, we split the cell phone bill, he paid it for a month, my fiancé gave me some funds for some of my bigger bills, I ignored my credit cards. The stimulus check⁴ came after a while. (P21)

For other participants, stopping work wasn’t a realistic option because of their economic situation. In these cases, they took several steps to reduce their risks to a tolerable level (even if they had elevated risks due to disability or age). These steps including buying their own personal protective equipment (PPE) and regularly disinfecting their cars—but they were frustrated that they had to buy their own PPE despite platform companies’ promises to provide this equipment.

4.4.2 Intersectionality: Disability as One of Many Identities. Many disabled gig workers we spoke with held multiple marginalized identities along the lines of race, gender, sexual orientation, and socioeconomic status, in addition to disability. We found that these workers faced new, complex challenges that were compounded by the intersection of these identities. Kimberlé Crenshaw described how oppression occurs along multiple axes of identity when she coined the term *intersectionality*, highlighting how black women are marginalized on the basis of race and gender in ways that compound each other [24]. Crenshaw describes intersectionality as “a prism, for seeing the way in which various forms of inequality often operate together and exacerbate each other” [86]. We use the prism of intersectionality to understand the narratives of several participants who faced challenges based on the intersection of multiple marginalized identities, including disability.

Race and Disability. A Black delivery driver with Ehlers-Danlos syndrome began working for Instacart, Postmates, and Lyft for income while navigating the job market after being laid off from his former job. Even though he had turned to service work due to being unemployed, he was unable

⁴The U.S. sent most taxpayers \$1,200 checks in April 2020 to ease the financial impact of the pandemic.

to engage in heavy physical labor due to his disability. Thus, he tried to avoid Instacart orders with heavy items and limited the number of shifts he picked up despite the loss in potential earnings.

Race-related challenges at work, however, were harder to navigate. Making deliveries in a conservative state, he was concerned about his safety: *“People are trigger happy out here, especially if they see a Black man coming up to the house.”* To protect himself, he carried a knife, wore nicer clothes, didn’t deliver after dark, and even contacted customers via the app before he approached their houses. He also engaged in emotional labor to avoid explicitly racist interactions, but all of this effort was not enough to mitigate race-based discrimination from customers, as he explained: *“I try to kill them with kindness. So I think sometimes people may want to be rude, but I’m just like, so nice and smiling in their face. But I have noticed some of the tips that I’ve gotten, or the frequency of the tips that I get, don’t match up with other gig workers from the same area.”*

Thus, this participant had to engage in additional labor to protect himself both on account of his disability and his race, but at the same time, both of these marginalizing factors also reduced his earnings relative to other drivers regardless of their disability status.

Disability and Socioeconomic Status. A second participant’s story shows how disability and socioeconomic status interact to limit the options of some disabled workers. This participant, an Uber driver in his forties, had worked in a manual trade until he developed chronic obstructive pulmonary disease (COPD). Eventually he needed continuous oxygen therapy, but being constantly connected to an oxygen tank hampered his mobility enough that he eventually had to leave his job. He qualified for SSDI but needed to supplement those benefits.

His employment options were constrained by both his COPD and his socioeconomic status. The mobility constraints imposed by the oxygen tanks led him to desire a sedentary, stay-at-home job, but because of his high school education and experience, most jobs he was qualified for required too much manual labor or extended movement. Thus, he didn’t see a realistic path toward these sedentary jobs: *“Because of how severe my COPD is, the best I can probably do is an office job. And I’m pushing 50, I have no training in office work. I can’t type on a computer. I don’t have a computer. I don’t know nothing about computers.”*

Given these constraints, he started driving for Uber, though COPD also impacted his driving: he needed to stash his oxygen tank between the car door and his leg to keep the passenger seat free, he made sure to carry a spare tank, and he was unable to work when waiting for replacement tanks—including on the day of our interview. Still, despite the low pay and the challenges of driving with COPD, he saw Uber as a positive force in his life: *“On the whole, I call Uber a godsend sometimes. Because if it wasn’t for Uber, I would literally have no options.”*

Gender Identity, Sexual Orientation, and Disability. Disability can also interact deeply with other marginalizing factors to shape disabled workers’ experience of gig work. One participant, a gay, non-binary rideshare driver who had PTSD, panic disorder, and generalized anxiety disorder, *“struggled tremendously”* with maintaining a traditional job, and turned to gig work for its flexibility.

However, this participant explained that because they were *“a small person who’s read on the surface as female”*, they commonly faced physical and sexual harassment from passengers:

“And then [the passenger] asked me, ‘are you –’, and he used a couple of expletives for gay people. And I actually do identify as homosexual, but I did not reveal that at that point. But he decided from my non-answer that I was, and he spent the rest of the ride espousing his views that the answer to that was corrective rape. . . . So I just kind of delivered him to his destination and was grateful that he got out of the car without further incident.”

Being the target of homophobia and sexual harassment while working exacerbated this driver’s mental health issues, which also impacted their work:

“The next day, I went out to go to work, I just got up, I went out to go to work, and I was driving out. I got about five minutes away from my house before I had a panic attack and turned around and went home. I knew that I was not gonna be able to do it.”

The driver used a number of strategies to limit harassment, including not driving at night, presenting an appearance of being cisgender and straight, and telling *privacy lies* [68] in response to passengers’ questions. They also felt compelled to hide their mental health status from passengers. But regularly taking these precautions was draining, imposing “*a certain level of constant vigilance that I don’t feel like most people experience.*” It also meant that they had to put up a facade to do gig work, saying “*there’s very little of myself in what I do.*”

This labor and its consequences fell heavily on the driver because they were unable to get support from either the platform or the online community of rideshare drivers. Lyft responded by unmatching the driver from the passenger so they would not have to transport him again, a shadow of the protections available around harassment in traditional workplaces. When they turned to an online gig work community for support over the incident, they received several negative responses (such as “*if you don’t like it, quit driving*”), which led them to stop posting on the forum.

Their story illustrates the complicated interactions that intersectional marginalization can cause disabled workers. Their main reason for doing gig work was because they were unable to hold a traditional job due to their disability. The income they earned from gig work was vital as it not only paid for essentials (such as rent), but also was meant to finance a future relocation to a more progressive area to avoid the daily harassment they faced based on their gender presentation. However, gig work exposed them to additional harassment on the basis of their gender identity and sexual orientation. This harassment exacerbated their mental health disorders, reducing their ability to both hold traditional jobs and do gig work; together, the interaction of disability, discrimination, and economic need had locked this participant into place in a cycle that is hard to escape.

5 DISCUSSION

Our findings call out broader themes around invisible labor, accessibility, and discrimination, along with a number of suggestions for designing gig work platforms to mitigate some disability-related challenges. We root these suggestions in participants’ own thoughts about how to improve their experiences and address their challenges; representing their voice along with our ideas for change is important to reduce the risk of creating “disability dongles” that are neither wanted nor used by the people that they are created for [46].

5.1 A Brief Summary of Participants’ Experiences

It’s important to remember that participants described real advantages of gig work that bypass some challenges posed by traditional work. First, it is easy to start working on gig platforms, without the kinds of discrimination that often impact disabled workers in traditional hiring processes. Second, and crucially, gig work offers multiple forms of flexibility that are vital for many disabled workers. Being able to set their own hours, work from anywhere, and control the amount of income they earn and the effort they put in allows them to finesse a number of issues, including managing restrictions on receiving disability benefits and managing needs associated with their disability.

However, the opportunities afforded by gig work come hand-in-hand with several costs, some of which have an outsized impact on workers with disabilities. Participants described many challenges, including accessibility issues, algorithmic task-setting and evaluation, and the need to assess the health risks of any given task based on limited information and with limited control. They must also manage interactions with gig work customers, who are able to monitor and evaluate workers at their discretion, and whose expectations often do not accommodate accessibility needs. These

problems are exacerbated when disabled workers are at risk of marginalization because of other characteristics, such as race, gender, and sexual orientation.

5.2 Disability, Intersectionality, and Invisible Labor

To manage the many challenges they face in gig work, disabled workers have to engage in a significant amount of invisible labor, which is defined as unpaid activities that are necessary for the completion of work [84]. Just as prior work has found that privacy management can constitute a form of invisible labor that depresses workers' wages in digital labor [69], we find that navigating disability in the gig economy imposes several forms of additional labor on disabled workers.

Some of this invisible labor arises because of accessibility issues of the task itself. For instance, when choosing tasks to complete, workers must expend energy assessing whether the tasks will be accessible or might exacerbate their disability. Since these decisions are made in the face of limited information, workers sometimes discover accessibility issues after investing time and effort in a task. Workers can then be forced to abandon these tasks halfway, losing the time and effort they have put in, or be compelled to expend extra effort to work around these issues. Because most gig work platforms provide limited support or training, and even less support focused on accessibility issues, disabled workers also have to put in unpaid time seeking this support and advice on how to develop these strategies, for example by participating in gig work forums.

Much invisible labor, however, comes in the context of managing customer expectations and disabled workers' own mental states. While all gig workers engage in invisible labor for customers that is beyond the scope of the task at hand [47], workers with disabilities face additional tensions, including concealing their disabilities to avoid potential discrimination, or performing cost-benefit analyses to assess the social consequences of advocating for accommodations [26]. More generally, many customer-facing and service-oriented professions require a great deal of "emotional labor" where workers must regulate their emotions to please customers as an official or unofficial part of their jobs [43]. Many gig platforms share these characteristics, imposing emotional labor on gig workers in general [19, 65, 66]. Performing this labor may be harder for many disabled workers who also have to manage the pain, fatigue, and stress involved in doing gig work with a disability.

Together, these forms of invisible labor are an additional burden that workers with disabilities must take on in order to participate in gig work, reducing both their satisfaction and their earnings relative to other gig workers.

Further, we found that disabled workers who also hold other marginalized identities can face new and compounded challenges around discrimination and harassment in gig work, necessitating additional forms of invisible labor to manage these in addition to disability-related challenges. These findings add empirical weight to arguments in the disability studies community about the need to move beyond discussions of disability that are often centered on the White, middle-class experience [33], and in the HCI community to move beyond studies of identity that focus on single dimensions of identity [72].

More broadly, intersectionality is "not just about identities but about the institutions that use identity to exclude and privilege" [25]. Understanding the sociocultural context in which work takes place can be crucial to unpacking workers' experiences, as Anwar et al. illustrate in their study on how existing hierarchies around gender, class, and caste impact women gig workers in India [7]. Our findings also call out the need to address the role played by wider social inequities around disability, gender, race, and sexual orientation in the U.S., in terms of the challenges workers faced, the costs and invisible labor they posed, and the insights that looking at these intersections can provide for understanding accessibility-related issues [12].

5.3 Improving Accessibility of Tasks

One key driver of invisible labor in both our findings and prior work [96] is the accessibility of the tasks themselves. In this section we discuss ideas for improving disabled workers' ability to choose tasks that suit them well, grounded in their own suggestions. We structure the section around three main approaches: increasing task transparency, matching tasks to abilities, and providing workers with increased control over task-related decisions.

5.3.1 Transparency and Task Selection. Several workers expressed a desire for greater transparency around the requirements of individual tasks so that they could make informed decisions about accepting them. Currently, many offline platforms provide limited information about tasks, such as the time and schedule requirements, the estimated pay, or the general location. This was sometimes not enough to help workers avoid tasks that raised accessibility or health issues.

Providing disabled workers with more detailed task descriptions would help them make more informed decisions. In the context of crowdwork, platforms could collect and display metadata about the abilities required to complete a task, such as the ability to see images or listen to audio [96]. In the context of offline delivery gigs, this might mean giving workers accessibility-related information about the locations involved, such as whether the pickup and drop-off locations are wheelchair accessible, and the task itself, such as the size and weight of the delivery.

In work contexts such as crowdwork and freelancing that involve customers directly creating tasks, platforms could also provide customers with accessibility-informed guidelines and templates. For example, customers who use visual CAPTCHAs could be shown accessible alternatives to use.

5.3.2 Control over Workflow and Adaptable Gigs. Beyond increased transparency, many workers wanted to be able to adapt work processes to their abilities. For example, some rideshare drivers couldn't work on food delivery platforms because mobility impairments prevented them from easily entering and exiting their cars. Curbside delivery options that became common during the COVID-19 pandemic could allow many more workers with disabilities to work for delivery services—and would likely be preferred by some customers and workers, pandemic or not.

Both this study and prior work [96] also show that some disabled workers find it difficult to complete timed tasks with tight deadlines. A delivery worker with ulcerative colitis who was concerned about his need to take disability-related breaks suggested to “*maybe have something on the application where I'm able to have some breaks in between while I'm on a trip where I need to use the restroom*” (P9). Allowing workers to make minor adjustments to their work process without being penalized would make the work more flexible and reduce the impact of timed tasks for disabled workers (though their overall rate of pay may still be lower, either by consciously setting lower prices, or through simply not being able to complete as many tasks).

Designs to support disability-related adaptation, however, need to both account for customers' expectations of gig work and mitigate negative consequences that could stem from misperceptions about disability [91]. Several of the suggestions in this section and the next try to achieve this by framing disability-related adaptations as places where customers' and disabled workers' goals might align; for instance, providing workers with additional options for completing tasks could be convenient for customers as well. But the general problem of negotiating customers' expectations and power highlights the need to attend to social accessibility and acceptability, beyond just making the task itself more functionally accessible [78, 79].

5.3.3 Supporting Preferences Versus Disclosing Disabilities. Several workers brought up the desire for an option to indicate impairments on gig platforms that might help algorithms better assign tasks based on workers' abilities. However, disclosing a disability can lead to negative social consequences [26, 91] and harassment [70], and can negatively impact work-related outcomes [32].

Similarly, in our study, workers were worried that disclosing their disabilities would open them up to discrimination from the platforms or could cause them to lose access to work altogether. Consequently, they were uncertain whether they would actually use such a feature.

An alternate solution that might reduce bias while allowing for tailored work assignments might focus on workers' and customers' preferences about characteristics of tasks rather than requiring workers to disclose their disabilities. Offering curbside versus door delivery as discussed above is one example; more generally, platforms could consider dimensions of tasks that might affect accessibility such as routes, weight, and destinations, and then allow workers to select types of tasks that they are willing to do. This could make the market both more inclusive and more efficient, as with Instacart's existing ability to tag "heavy orders" that have slightly higher pay rates and support ability-aligned task choices. More granular task metadata could also allow platforms to infer task characteristics that match workers' abilities, as suggested by Zyskowski et al. in the context of crowdwork [96]. A similar approach could be useful in offline contexts, given our finding that many disabled workers do engage in varied offline gig work; workers could rate the tasks they were assigned and those ratings could be used to support better matching in the future.

At the same time, one concern with offering workers too much choice over tasks is that it can lead to discrimination by workers themselves. For instance, research has shown that gig workers are less willing to deliver to low-income neighborhoods [89, 90], and are more likely to cancel trips when presented with a customer with a Black-sounding name than a White-sounding name [34]. Further, individual choices made purely based on accessibility concerns could still lead to aggregate discrimination: allowing workers to prefer deliveries that don't involve stairs might inadvertently increase wait times or prices for customers in apartment buildings, who on average are people with lower socio-economic status [23]. Balancing these interests might be easier if disabled gig workers had legal protections that allowed them to make protected disability disclosures and expect reasonable accommodations. Then platforms could limit how often their task allocation algorithms respect task preferences that might have downstream discriminatory effects, and prioritize requests by disabled workers as part of providing accommodations. But as it stands, this is a hard problem, and care must be taken to ensure that designs that are intended to help certain populations do not inadvertently harm others.

5.4 Mitigating Unfairness, Discrimination, and Negative Interactions

Beyond the accessibility of tasks, customer expectations that do not consider workers' abilities are another key driver of invisible labor. This leads to a need for effective management of disclosures and expectations, as well as ways to contest and identify customers whose evaluations might be driven in part by discrimination and bias.

5.4.1 Disability Disclosure Dilemmas. Several workers thought that some form of up front, in-app disclosure about their disability could be useful to facilitate interactions with customers and manage their expectations about the roles that they can reasonably fulfill. These expectations might be high because prior work shows that rideshare drivers fulfill a number of additional roles for passengers [47, 67], and this study suggests that disabled workers may be disproportionately impacted if their disabilities preclude them from meeting these expectations. A Lyft driver with a mobility impairment mentioned the 'deaf or hard-of-hearing' option to us, saying "*that's the only thing you can put [about a disability in the app], which is kind of crazy to me, like, you should be able to put other stuff*" (P17). At the same time, workers were also worried that disability disclosures could lead to increased bias from customers—much as deaf or hard-of-hearing drivers are sometimes ambivalent about using the 'deaf' option on ridesharing platforms [54].

The desire for some form of upfront disclosure coupled with the concern around bias stemming from such disclosures poses an interesting design challenge. Parallel in some ways to expressing preferences about tasks that would allow better algorithmic matching, we suggest adding an optional field that allows these disclosures prior to the start of a customer interaction. We think this field should be open-ended because a closed-ended list of common disabilities (such as the deaf or hard of hearing feature on ridesharing apps) risks both excluding some disabilities and emphasizing impairments rather than the needed accommodations. An open-ended text box where workers can use their own phrasing would allow workers to test out different types of disclosures and to protect their privacy; for example, a worker who does not feel comfortable disclosing their specific type of disability could still indicate attributes of tasks that they will not or cannot do. The consequences of such disability disclosures should also be examined by future research.

5.4.2 Contesting and Identifying Discriminatory Customers. A number of workers experienced harassment and discrimination from customers, either explicitly through interaction or implicitly through ratings and evaluations, and saw the need for ways to address this. For instance, a driver who was pondering the usefulness of upfront disclosures said, “. . . but then that’s gonna make them rate the driver lower unless Uber puts protections in to make sure that they’re not unfairly rated. Definitely flagging someone would be nice” (P17).

Workers currently have few options to address these problems; flagging negative interactions or calling platforms’ worker support services often has little impact beyond being unmatched from the customer, while still bearing the costs of a negative review or no tip. The same driver said, “*This one kid gave me a one star rating because I wouldn’t help him move a box. He told me he’s gonna get me a one star rating. And I explained to Uber, I said, ‘I think I’m going to be rated unfairly’, explained the whole situation. And they were just like, ‘thanks for the feedback’, and did nothing about it, but I was clearly discriminated against*” (P17).

This is a tough nut to crack, because without traditional employment protections and with platform companies’ income flowing from customers, workers are often treated more as an expense and a commodity rather than an asset. But the power to contest ratings and interactions is critical to addressing many of the challenges workers face.

Better vetting of customers might help both workers and platforms. Some ridesharing platforms have customer ratings that drivers can use when deciding to accept a ride; freelancing and crowdwork often involve repeat interaction with customers that allows for both vetting and relationship building; and crowdwork collectives like Turkopticon [45] support community-level vetting of customers outside of the platform. Institutionalizing this vetting inside platforms, putting teeth behind it by charging or banning troublesome customers, and making customer history more visible to workers could reduce the power imbalances that appear around customer evaluation, with the potential to benefit workers (through better working conditions) and platforms (when bad customers cost more money than they bring in) alike.

5.5 Bridging Knowledge Gaps about the Gig Work Ecosystem

Beyond improving individual platforms’ handling of accessibility issues around tasks and customers, another direction for improving disabled workers’ experiences is to help them find kinds of gig work that best match their situations. Extending prior findings that many disabled people are not aware of crowdwork as an employment option at all [96], our participants were often not aware of the broader ecosystem of gig work and the range of gig work options that were open to them. Instead, most workers had discovered gig work through recommendations from family or friends and they stayed with the kind of gig work they started with, even if they tried multiple platforms within that category. This satisfied many workers’ needs; however, several workers who were

dissatisfied with their earnings and experiences with gig work may have benefited from increased knowledge of other kinds of available gig work that suited their needs and abilities.

Developing resources that introduce workers to multiple types of gig work might help them think about transitions and advancement in the gig economy. For instance, one blind participant had a master's degree but was earning very low income via crowdwork because she was unaware of online freelancing options that may have been a better fit for her skill and education level. Conversely, the rideshare driver with COPD who felt he had no office skills might benefit from knowing about the lower skilled crowdwork tasks that some participants found appealing and that might allow him to earn some income on the days he couldn't drive.

These resources would ideally also have useful information for getting started quickly in a new type of gig work. This might include how to make decisions about choosing tasks, customers, and platforms; useful tools and resources for doing the work; common situations when doing a certain kind of work and how to manage them; ways to track earnings and costs; and ways to transition between different kinds of work. Of course these would be helpful for all workers, but for disabled workers whose earnings are even more at risk, these guides would be especially valuable, and these resources could include strategies around navigating disabilities in different work contexts.

It is less clear who would create, maintain, and match people with these resources. One option is the kinds of service agencies and organizations that help people with disabilities find work, such as the Campaign for Disability Employment convened by the U.S. Department of Labor. Our findings provide evidence that gig work should be on the radar of employment support services, given that it can provide some people with disabilities with a flexible—albeit imperfect—way to work, earn money, and increase their independence.

5.6 Limitations and Opportunities for Future Research

Before we conclude, it is important to recognize that despite our efforts to foreground disabled workers' voices, our sampling choices mean that this study has gaps that warrant future research. For instance, there is immense variation in disabilities and how individuals experience them; we sought to represent people with a range of different disabilities, but our findings do not capture all experiences. We recruited on Reddit because online forums are commonly used by gig workers [36], but there may be important differences between our sample and workers who do not use these online resources. For example, some workers may be unaware of these resources or be unable to access them because of digital literacy gaps or accessibility issues. Recruiting on Reddit also means that we spoke with people who were currently working on gig work platforms, but not those who may have tried gig work but left because it was untenable or too inaccessible, or workers who considered gig work but in the end decided not to try it. As such, our sample is made up of people who are able to derive at least some benefit from gig work despite its costs.

We also want to acknowledge that implementing large-scale changes in how the gig economy supports accessibility will require legal and policy thinking, following arguments about accessibility in other technology design contexts (e.g., [49, 52]). Because we ground this study in workers' actual experiences, in this paper we take the current legal context at face value: that as independent contractors, disabled gig workers have no ADA protections, and that although there are more general protections around accessible design of platform websites, these are often ineffective or weakly enforced [93], and likely do not extend to making the work processes on these platforms more accessible. Thus, we focus our design work on elaborating participants' ideas in ways that try to benefit most stakeholders in the market, such that companies might have some incentive to implement them despite a lack of legal obligation to do so. As Lazar et al. point out, making technologies more accessible increases the number of people who can use them, and as such, presents a financial opportunity for businesses [53]. At the same time, there is limited work on

policy in relation to the sharing/gig economy within HCI research [28], and we see a pressing need for legal and policy work that focuses on improving both access to work and outcomes for disabled workers in the gig economy.

6 CONCLUSION

Accessibility is not a property of individual technologies in a vacuum, but rather, is “achieved through the interplay of the social and technical” [48, p.19]. Based on participants’ stories, accessibility in gig work is no exception.

Many workers with disabilities saw gig work as providing valuable flexibility and control over work conditions—but not enough. Their descriptions of workarounds and wishlists led us to discuss several design suggestions that, done well, might benefit workers, customers, and platforms alike even in the context of the larger systemic issues described in the paper. These include increasing transparency and granularity around the abilities required to complete tasks, promoting ability-aware design of the tasks themselves and the algorithms that match workers and tasks, developing nuanced ways to express abilities and preferences to both customers and platforms, and providing stronger mechanisms to identify and rectify customer discrimination.

However, these design decisions must respect the interplay of social and technical factors that engender the challenges that are faced by disabled workers and shape their experiences. Although participants identified plenty of specific accessibility issues around how individual platforms and tasks are designed and assigned, their experiences and outcomes were shaped by many other factors. These included the level of support provided by family, gig work platforms, and online forums; social expectations and attitudes around work and physical ability; workers’ economic necessity and regulations around disability benefits; transportation infrastructures and geographical features; and intersections with other marginalized characteristics.

Our work suggests that thinking about gig work not at the level of individual platforms but as a larger ecosystem, and attending to the larger social context beyond the work itself in both research and design, both have something to offer in improving our understanding of how the gig economy can work for people with disabilities, and for society as a whole.

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