

# Using Inclusive Research to Promote Inclusive Design: Possibilities and Limitations in a Corporate Environment

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**Abstract.** In this paper, I address the challenges of doing research into the experiences of disabled participants in a corporate context where disability is not often considered. I conducted research into the experiences of blind and visually impaired riders for Uber, and I discovered a number of transportation challenges these individuals face. However, I argue that making a product such as Uber's more inclusive is not simply about fixing the many surface-level design flaws I discovered, but about making the service more broadly useful and promoting accessibility within the corporate culture. This paper is a reflection on my attempt to conduct inclusive research as a means to promoting inclusive app and service design, and the obstacles to inclusivity I encountered along the way.

**Keywords:** Accessibility, Inclusive Design, Disability.

## 1 Introduction: The Alley

A woman named Vera (not her real name) waits in an alley a block away from San Francisco's busy Market Street. She is waiting for a car she ordered through a ridesharing app to arrive and take her home. She has been waiting for about 10 minutes, even though when she ordered the ride the app told her it would only take three or four minutes for the car to reach her location. Vera is getting worried; where is the car?

She tried calling the driver who had been assigned to her trip, but the call went to voicemail. Vera hands me her phone and asks me if I can find the problem, and I spot it immediately: the driver has gone past the alley and is now heading away from our location. I know this because I can see the car's location in real time on the map of our area, and I observe that it is traveling away from us. However, Vera couldn't see this problem for herself because she is blind, and the ridesharing app does not provide any information about distance or relative location between the car and the rider. At this point, without any further contact with Vera, the driver cancels the ride, and Vera is stranded in the alley.

Vera knows the alley well, as do many of her friends. The building houses an organization that serves people with visual disabilities, and Vera and many others come regularly to events there. They often use ridesharing services to get to and from the building, but because drop-offs and pick-ups are not allowed in front on Market Street, they are forced to wait in the alley behind it. Everyone who travels from there with any

regularity has a story of ordering a ride that never came. The pick-up point is infamous among blind people who try to get rides from the building, but rideshare companies and their drivers seem oblivious to its existence.

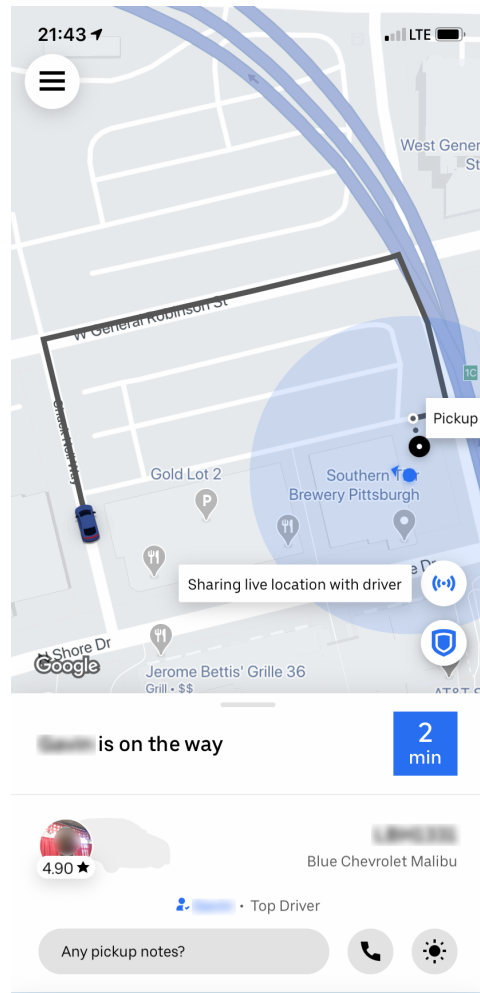
There are many reasons why Vera and others with disabilities have difficulty accessing services like ridesharing, but one major reason is that they are largely invisible to the companies. Human-centered design revolves around the experiences and pain points of real people trying to accomplish a task or use a product. Because it relies on knowledge of users, it is only as inclusive as the user base a company chooses to research and test with. Uber, like many companies large and small, has historically not conducted very much research with people with disabilities, so it is unsurprising that these groups have difficulty using Uber's services.

In this paper, I reflect on the research I conducted at Uber in 2019 into the transportation and mobility experiences of people with visual disabilities. I attempted to incorporate inclusive research methods into my work, with the ultimate goal of making Uber's app and overall service more inclusively designed. In the course of my research, I encountered the structural barriers to inclusive design that often exist in companies, from established business priorities to design and development processes that neglect to make accessibility a regular consideration. Inclusive research is a way of pushing back against the standard operating procedures and drawing more diverse participants into the research process. Like inclusive design, inclusive research is difficult to implement in a corporate setting, but it is essential that user research becomes more inclusive if we want more people to be able to use the products and services that companies create.

## 2 Separate, Not Equal

During my research blind users repeatedly told me that the Uber app does not provide useful information to them. One research participant even told me of her anger when she learned that sighted users get a full map of their area on which they can track the progress of the car on its way to them and then on their trip. In contrast, blind riders using the app with VoiceOver or another screen reader are given only an estimated time of arrival and no real-time tracking information. The lack of appropriate, useful information was one of the most frequent complaints I heard.

Uber's pick-up screen (figure 1) is a case-in-point of the app's information disparity. This screen is one of Uber's most iconic, and a deceptively simple design. The screen presents information about the car's route and position relative to the user (users can see the position of the car and themselves on a map of the area, and can track the progress of the car in real time); the driver (their name, rating, and photograph); the car (make, model, license plate, and often a photograph); and an estimated time of arrival. This wealth of information is the product of extensive and iterative design, development, and research, and is intended to provide the user with the most necessary information in a layout that is intuitive to use.



**Fig. 1.** The Uber pick-up screen. VoiceOver reads out the information displayed on the screen, but does not add information that a blind user would find useful. Screenshot from the author's account, 8 February 2020.

Intuitive for a *sighted* user, that is, because the screen assumes that the user can see it. For an Uber user who can't see the screen and who uses the app with an assistive technology, the experience of the pick-up screen is much less robust. Swiping onto the ETA box will read out only the estimated time of arrival of the car. Swiping further to the car and driver information will read out that text—although, as was repeatedly pointed out to me in interviews, much of that information is only useful to people who can *see* the car and driver in order to match them to the app. The VoiceOver experience of the pick-up screen does not include information such as the distance of the car from the rider or the direction from which the rider can expect the car to arrive. Consequently,

blind riders are given substantially less information than their sighted counterparts, simply because they use the app in a different way.

The pick-up screen in the Uber app demonstrates one of the common accessibility problems in design: the experience for blind users is separate from and inferior to the one for sighted users. Sighted users have access to a wealth of information curated to make a complex experience manageable, while the experience for blind users is made worse by the lack of useful information.

The segregationist language of “separate but equal” was consciously adopted by disability rights advocates in the United States in the 1960s to describe their lives in a world full of environmental barriers that kept them from participating fully in society. As Elizabeth Guffey argues, “Although no one was posting ‘no disabled’ or ‘handicapped keep out’ signs across the walls of North America, disabled activists argued that builders were actively designing inaccessible spaces. They might as well be posting such signs” (Guffey 2018: 97). For these activists, the accessible workarounds were almost as bad: makeshift (often unsafe) ramps and service entrances that could accommodate wheelchairs may have provided access to buildings, but it was a distinctly lesser access than that of non-disabled peers. As Guffey notes, barriers in the designed environment produced de facto segregation that kept disabled people apart from the rest of society.

The unequal information architecture of the Uber rider app is yet another of the many forms of social discrimination that disabled people routinely face. While we should be careful to recognize the broader social contexts of these different moments of inaccessibility and the fight for access, an instance like Uber’s disparate experiences nonetheless has real and often devastating consequences for the blind people who try to use rideshare services.

For instance, a woman named Luisa told me about a persistent problem she has with ridesharing services. Luisa has a young child and uses Uber and Lyft to take her child to doctor appointments, daycare, and other places. She typically calls the driver in advance to tell them she is blind and will not be able to see the car arrive. This is a common practice among blind Uber users, who find that it generally helps to alert the driver and ask *them* to be on the lookout. The call usually eases the pick-up process—unless the driver doesn’t answer the phone. Luisa told me that she has sometimes been stranded by an incommunicative driver:

*We’ve had people not answer their phones, and it’s taken us a while to find them... Sometimes they even cancel because they’re tired of looking or tired of waiting... I’ve reported it. I felt discriminated against because I couldn’t see my driver and they weren’t answering their phones and I got charged with a no-show fee because I couldn’t see them. That’s not fair.*

Transportation is a substantial obstacle for many blind people, and in principle ridesharing represents a substantial improvement over other options. Blind people use diverse modes of transportation, including fixed-route public transit, paratransit services provided by local governments, rides from friends and family, and, increasingly, ridesharing. Each of these forms of transportation has barriers. Fixed-route public transit, for instance, is cheap, but it requires the user to wayfind to and from the set stops, which

can be a substantial challenge, particularly when the person is not familiar with the area. Paratransit services operate door-to-door and are affordable, but they are very time-consuming and unreliable: they typically have pick-up windows of 30 minutes, make multiple stops en route, and can take as much as two hours for a journey that a car can make in 20 minutes.

Against these options, ridesharing has obvious appeal: the ease and reliability of ordering a ride from your phone, the ability to travel directly from one point to another without unnecessary delay. A large proportion of the blind people I met operate with substantial financial restriction (a reported 70% of blind working-age adults are un- or under-employed) that prevents them from using ridesharing services as much as they want, but for blind riders who can afford to use these services extensively, Lyft and Uber have indeed been revelatory.

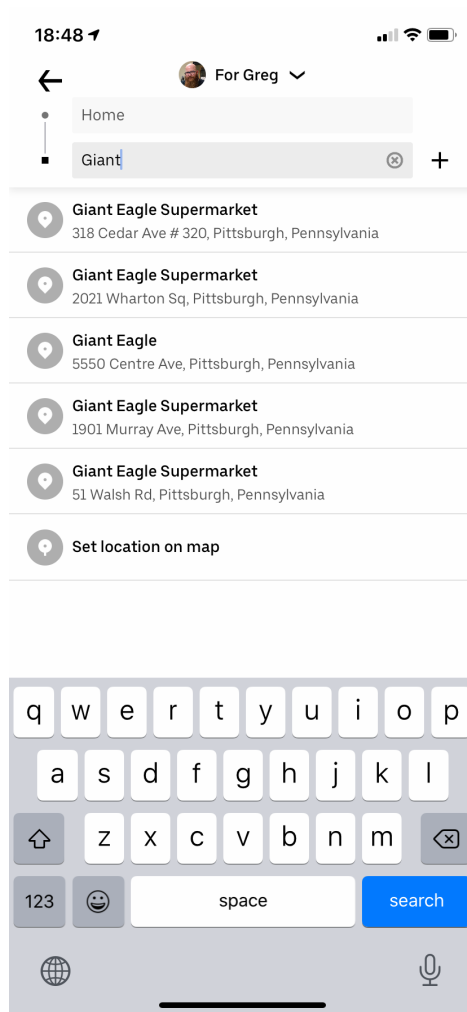
However, even for these users, rideshare services contain barriers to use that make them unappealing or impossible. For example, a man named Chuck told me about his experiences using Uber, and generally they were positive. Chuck is blind since birth and he is extremely mobile and skilled at getting around using assistive technologies and remarkably acute hearing. He is able to afford Uber by taking shared rides, which are cheaper than rides when you have the car to yourself. He is also a savvy Uber user, making sure the driver says Chuck's name so that he knows he is getting into the correct car.

Still, when I shadowed Chuck on a ride, the difficulties with the app became immediately evident. First, he had difficulty finding his destination in the app. He dictated the name of the store and scrolled through a list of options using the VoiceOver gestures. None of the options was correct, though, and he couldn't figure out how to modify the search to get the correct location. As a workaround, he used the name of a store next to the one he wanted to go to. Second, the app was not correctly detecting Chuck's location, putting him not in his home, but instead on an adjacent street. Fortunately, he realized this problem before requesting his ride and was able to dictate his home address so that the driver would come to the correct place to pick us up.

We went outside to wait for the car in front of Chuck's house. Chuck double-checked the information in the Uber app, and it's a good thing he did: despite all of his efforts to input the correct destination, the app had it wrong and had arranged a much longer trip than he anticipated. Chuck did not know how to fix the problem, so he canceled that trip and went through the process again, finally finding his desired destination (and likely incurring a penalty for canceling the trip). Ultimately, from the time Chuck began using the app to when he had correctly ordered his ride, almost ten minutes had elapsed—and all to accomplish a task that typically takes sighted people well under one minute.

Finding the correct destination can be difficult for all Uber riders, particularly when one knows the name of the destination but not its address. For example, use the Uber app (or any map program) to search for your local chain supermarket by name and it will come up with a list of options with only street addresses to differentiate them (figure 2). But the difficulty is exaggerated for blind users, because they have the double difficulty of not knowing which street address is correct *and* being unable to visually verify that they have chosen the correct location once they have selected from the list.

There is no alternative means to verify a destination or starting point for blind users, placing an additional burden on them to know information that is not expected of sighted users, and thus making their experience distinctly more stressful and unpleasant.



**Fig. 2.** A list of suggested destinations. Only street addresses differentiate between the different options. Blind users get no additional information (such as distance) to help them determine which destination they want to select. Screenshot from the author's account, 23 February 2020.

### 3 Inclusive Design: Ensuring *All* Users Can Participate

There is a long-held perception that while accessible design might be necessary, it is not good business because there are not enough consumers of accessible products and

services to justify the investment. Steinfeld and Maisel argue that thinking only in terms of “accessibility” leads designers to believe that there is only a small “niche market” in serving people with disabilities (2012: 68). However, accessibility advocates counter that designing for people at the extremes makes *everyone’s* experience better.

The curb cut is the classic example of a design innovation that had impact far beyond its initial use case. These sloping transitions between sidewalk and street came into prominent use to aid the mobility of veterans in wheelchairs after World War II, but they are also valuable for people pushing babies in prams, workers wheeling equipment, people with luggage, skateboarders, cyclists, and many others.

Perhaps more relevant, though, are innovations that have become foundational for experiences many of us take for granted today, like turn-by-turn directions, which was developed largely because of their accessible features. Kat Holmes makes a powerful case that “inclusion drives innovation,” with such examples as the typewriter and the touch screen to demonstrate how an assistive technology can find broad appeal. (The typewriter was developed by a blind countess and her lover to enable her to write her own letters, and thus maintain their privacy, while the touchscreen that became the central innovation of the iPhone began as a gesture-based computer controller for people who could not type because of carpal tunnel syndrome.)

Holmes suggests that the reason people don’t often view accessible designs as drivers of innovation is because they are used to seeing accessibility as a necessary and onerous add-on, rather than a critical element of the design process. She argues, “When a solution is treated as ‘for disability’ or ‘for accessibility,’ there’s often little or no attention paid to the design. A solution might meet all of its functional requirements but still lead to emotional or aesthetic mismatches that can be equally alienating” (Holmes 2018, 117). In this mindset, the accessible design is thought of entirely separately from the “normal” one, and this separation allows the designers to maintain the fiction that these really are separate domains.

Considering accessible design separate from “normal” design can only happen if one ignores the social dimensions of disability. The social model of disability, which is widely accepted among accessibility advocates and theorists, distinguishes between “impairment” and “disability”: “the terms *impairment* and *disability* distinguish between bodily states or conditions taken to be impaired, and the social process of disablement that gives meaning and consequences to those impairments in the world” (Garland-Thomson 2011: 591). As a group, a given company’s users will have a wide variety of abilities and impairments—but only some of these will functionally be disabilities based on the ways in which the company’s designs include or exclude them from using their product or service. For instance, a user might have the impairment of no sight, but this becomes a disability in relation to a particular service when that service can only be performed by sighted people (such as if you need to visually identify a button on a screen in order to tap it).

In other words, disability is substantially produced through inaccessible design. Holmes describes this as a “mismatch,” a design that requires particular abilities to use and that therefore excludes anyone who does not possess those particular abilities. She draws this concept from Garland-Thomson, who describes these situations as “misfits,” in that they are the product of a person not fitting a particular context, and vice versa.

Garland-Thomson emphasizes that misfits are material and unstable because they result from real conditions in the world, and those conditions are always shifting. Moreover, “the concept of the misfit...lodges injustice and discrimination in the materiality of the world more than in social attitudes or representational practices” (Garland-Thomson 2011: 593). Thus, while recognizing the importance of changing social attitudes towards disability, Garland-Thomson suggests that the key to ensuring everyone can participate equally in society lies in producing better fits between people and the built environment—essentially, inclusive design.

Inclusive design is often seen as a remedy to the mismatches between impairments and the built environment. Ron Mace, a designer and disability rights advocate, coined the term “universal design” (often used synonymously with “inclusive design”), which he defined as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (Center for Universal Design website). The Center for Universal Design, founded by Ron Mace at North Carolina State University, developed seven principles to elaborate on the general definition. These included ideas such as equitable use, flexibility to “accommodate a wide range of individual preferences and abilities,” and tolerance for error to minimize the negative impacts of mistakes that users make.

It is easy to see in a system like Uber’s how little the principles of universal design have been applied. As an example, take Chuck’s experience, described above. At a minimum, his lengthy attempt to order a ride in the Uber app points to a lack of equitable use (principle one) arising from a lack of consideration to the design of the Voice-Over experience; a lack of flexibility (principle two), particularly “facilitate[ing] the user’s accuracy and precision” with information input, seen in Chuck’s inability to find and confirm the correct destination; and a lack of simple and intuitive use (principle three). Further, the Uber app showed little tolerance for error: when Chuck discovered he had ordered a ride to the wrong location, he could not figure out how to fix his error other than to cancel the ride (and incur a penalty) and then order a new ride.

At the same time, where there are exclusive designs such as Uber’s, there are also opportunities to innovate something inclusive. I argued earlier that Uber’s pick-up screen (figure 1) creates a disparity of information—and, thus, ease of use—for sighted and blind users. The solution to such a problem is dictated by the principles of universal design: create an experience for screen reader users that provides useful information, such as distance and direction. Doing so need not alter anything about the existing design, since it is only in the VoiceOver readouts that users would notice the difference. It would simply make the experience of that screen more flexible, allowing more users to access relevant information in a way that fit their needs and preferences.

#### **4 Inclusive Research: Value and Barriers**

But how can a company achieve the goal of creating more inclusive design? I argue that in order to achieve truly inclusive design, companies must promote inclusive research that goes well beyond what is typically done by in-house and external researchers.



Melanie Nind has written extensively about inclusive research, arguing that it is less a method and more of a philosophy of how to conduct research. She suggests that participants ought to have control over how the research is conducted, input into the meanings and outputs generated by the research, and a greater degree of ownership over the entire research process (Nind 2014).

By giving greater control to participant-researchers, Nind believes, professional researchers can combat the power dynamics inherent in much human-centered research. She observes, “most qualitative research...retains the status quo of the researcher being the person who defines the questions, handles and controls the interpretation of the data, and makes and communicates the conclusions” (Nind 2014: 4). Inclusive research, in contrast, disrupts the usual relationship between researcher and participants by shifting control to the people most directly affected by the research, the participants themselves. By disrupting those relationships, inclusive research can combat the biases and assumptions of researchers, including very foundational assumptions about the capabilities of their users. Nind describes inclusive research as “research *with, by* or sometimes *for* them...in contrast to research *on* them” (*ibid.*: 3).

Inclusive research has been a particularly powerful tool for empowering people with disabilities to represent themselves in various contexts. Indeed, much of Nind’s inclusive research has been oriented towards putting the tools of inquiry and representation into the hands of people with learning disabilities (see, for instance, Nind et al. 2016). While there is debate about how much and what sort of training participant-researchers need in order to take control of research, these methods invariably decenter the power hierarchies present when professional researchers lead the research. As Booth and Booth observe, “too often the potential problems of interviewing inarticulate subjects are seen in terms of *their* deficits rather than the limitations of *our* methods” (1996: 67, emphasis added). Participant-researchers, who are not professionals, are not bound by the histories and training of professional research.

#### 4.1 Inclusive Research and Corporate Ethics

Advocates of inclusive research often frame their advocacy in ethical terms: by empowering participants to take control of the research and shape its objectives and methods, the people most impacted by the research can also have the most central voice in the process and outcomes. The alternative, for these advocates, is coopting the voices of their participants, potentially misrepresenting them and failing to help them through the research.

For this reason, inclusive research has largely found its home in academic contexts and in non-profit, public, and community organizations. Academic researchers are strongly bound by professional and institutional codes of ethics and they possess an acute awareness of structural power dynamics. Sam Ladner observes, “University-based researchers have privilege, and ethnographic research brings that privilege into stark relief, particularly when the study focuses on some facet of inequality itself” (Ladner 2014: 90). Thus the ethical drive to empower participants can be highly motivating in academic contexts. Research, for instance, was often a tool of colonial oppression,

and consequently, “inclusive research has developed as the antidote to the bulk of research *done to* people which is experienced as oppressive” (Nind 2014: 17). Relatedly, Nind suggests that the rise of inclusive research in public and non-profit contexts has been driven by concerns with inclusion, democracy, and empowerment: “Concerns with social reform and community development have driven the more critical action research and emancipatory research. Grass roots organizations have been major drivers informing the development of ideas about collaborative, co-produced knowledge for change” (*ibid.*: 19).

In contrast, private sector ethnographers have to contend with the ethics of doing research in a setting where their work is intended to generate profit for a company. While Ladner rightly insists that the profit motivations of companies sponsoring ethnographic research are not inherently corrupting, researchers must still give careful consideration to the moral implications of their work—such as whether insights derived from research with people will be used in a way that benefits or exploits those people. It is important, for instance, that participants know who is sponsoring the research because “deceit does nothing to improve the outcomes and simply serves to corrode the relationship between ethnographer and participant” (Ladner 2014: 93).

Private sector researchers have substantial power to conduct their research ethically—as Ladner says, by being as truthful as possible with participants—but at the same time, they are limited in how *inclusive* they can make their work. Corporate approaches to research, no matter how ethical, are almost always fundamentally at odds with the principles of inclusive research. Inclusive research requires participants to have ownership over research processes and outputs to a substantial degree. But in corporate user research, participants invariably sign non-disclosure agreements in advance that stipulate that anything said during their interview is property of the company. Legal departments exert substantial control over how research participants are recruited and treated. Inclusive research’s challenge to power hierarchies, as well as more radical attempts to shift ownership of research, are inherently discordant with corporate procedures.

Nonetheless, there are things researchers can do to be more inclusive in their research practices.

## 4.2 Recruiting Inclusively

As a result of this dissonance between private sector research and inclusive methodologies, it can be difficult to even do the most fundamental part of research, the recruiting of participants. When I was beginning my research into the experiences of blind users at Uber, I needed to recruit a pool of blind users who would be willing to participate in interviews and be shadowed on trips. However, the first challenge arose immediately: Uber does not track information on disabilities, so there was no way to derive a list of potential participants from Uber’s internal database. While you can obtain a list of riders who have taken so many trips in the past month or who have traveled a certain distance, there is no way to find the riders who are blind.

Since internal methods were not available, I worked with a colleague in research operations to find a way to recruit outside the company. Our proposed solution was to

approach organizations in the Bay Area who serve people with visual disabilities and ask them to pass on our screener to their constituencies. The next hurdle was convincing the legal department to allow this approach. Their concerns were twofold: one, that the information gathered through the screener would be available to the organizations as well; and two, that we would be gathering data about blind riders who were already in Uber's system. The first concern was easy to address, since the external organizations would email our screener out to their members, but all of the responses would come directly and only to us. The second concern was more substantial, due to concerns about potential bias claims, but we addressed this by agreeing to anonymize participants and not keep personal data longer than needed for the project—which are good ethnographic practices anyhow.

Partnering with local organizations presented ethical as well as pragmatic challenges. Because the organizations were not approved vendors, we were not able to hire them as third-party recruiters (which is a service that they all provide to Bay Area companies). Instead, I was in the rather uncomfortable position of coming from a large corporation and asking these local non-profits to essentially do us a favor—which they did, because they understood the potential value of the research to their members. I was fortunate that they saw the situation in this way, because needing to approach these organizations emphasized the difference in power between the large for-profit corporation and the smaller non-profits that helped to further my research.

This leads to another ethical consideration in corporate research. Participants are interested in the company and the research they are conducting, and they derive sometimes unrealistic expectations about what will come of it. I experienced this regularly when I met with research participants. They took my presence as a sign that Uber as a company cared about their experiences and wanted to improve the services they provided. This is a fair inference based on what I told them about my project and the sorts of questions I asked, but of course it is not reasonable when one thinks about how long it takes for research to filter up through an organization and bring about noticeable results. Trying to be as truthful as possible with participants, I tempered expectations somewhat without being discouraging. However, since participants cannot have greater ownership of the research—the research cannot be truly inclusive—some have likely been disappointed by the lack of quick and appreciable improvements to their experiences of Uber's services.

## **5 Participant Phonography: An Inclusive Methodology**

In order to make my research at Uber more inclusive, I attempted to implement a research method I call participant phonography. The method is analogous to the more widely known participatory visual methods such as photovoice, in which research participants are empowered to represent themselves through photographs. However, I adapted the visual method to an acoustic one, in order to access insights about sound that could help design for people with visual disabilities.

Participatory photographic methods combine elements of inclusive research with the affective representations of photography to produce evidence and analysis that might

otherwise be inaccessible to researchers. By arming participants with cameras and guidelines to capture a particular experience in photographs, those participants “acquire great power to represent the personal, cultural, and economic influences that shape their lives and present obstacles to their vitality” (Ozanne et al., 2013: 46).

Although researchers often still exercise considerable control over the form of participatory photographic research, these methods encourage participants to take greater ownership over the research process. Tabitha Steager aims to empower participants even further in a slightly different method she calls “participant photography”:

Participatory to me implies an active role on the part of the research participant, which is not always the case with photo voice. Rather than imposing my presuppositions on the experience and telling my participants what photos they should make, I wanted participants to lead the process, not only in what and how they chose to photograph but also within the interview process itself when we discussed their photos, so that they were working with me to build a shared understanding, of a shared experience, of place. (Steager 2018: 163)

In conceptualizing my sound recording method, I followed Steager’s lead in prioritizing the ability of research participants to control the form of the recording research. I initially intended to equip participants with small microphones that plug into their phones and leave them to make recordings on their own, thus substantially removing myself from much of the research process. However, I discovered that the microphones I wanted to use are not accessible—they turn off VoiceOver readouts when plugged into the iPhone, and thus are completely unusable for blind participants—and I had to revise the method.

In the revised approach, I retained the objective of letting participants pick the focus of the recordings, but I went with them and we made the recordings together using my more complicated set-up of digital recorder, wired microphone, and headphones. As I anticipated, participants felt constricted in this method, because my presence inhibited them from experimenting with the recording equipment. Nonetheless, they were generally intrigued by the different perspective they heard through microphones and headphones, and after some initial uncertainty, most participants found the recording process interesting.

## 5.1 Participatory Phonography and Disability Research

The rise of inclusive research, as noted earlier, has been substantially driven by research into disability and the social structures that produce it. However, remarkably few participatory methods use multimedia approaches. Of the examples Nind analyzes, only two involve participants creating in a medium other than spoken or printed words. This seems to me a remarkable shortcoming, since inclusive research is concerned with ensuring that participants are able to control how their experiences are represented, and quite obviously, not everyone prefers or is able to represent themselves in words.

There are some reasons why multimedia methods may be absent from inclusive disability research. First, inclusive multimedia methods such as participant photography

raise pragmatic and ethical questions. Pragmatically, participants need to understand how to use technologies to capture experiences in any given medium. With the rapid advances in smartphone technology, though, this is less of a barrier than before.

But a bigger challenge is that inclusive multimedia research demands more time and investment from participants. In the case of my participatory phonography project, I simply did not have time within the fairly rigid boundaries of an interview to train participants to use my recording equipment (which is not particularly accessible), and the smartphone-based version of the research was not possible because the microphones were not accessible. Moreover, this research would ideally consist of a recording portion and then a subsequent interview, but it would not have been appropriate to ask participants to commit that much time without being able to promise a greater sense of ownership over the results.

As a result, the insights generated directly from my participant phonography were limited. I did gain some knowledge that was otherwise inaccessible, though, such as the subtle sonic cues that some of my participants use to navigate public spaces. I had not realized before how silent the Uber app is. Certainly, blind users have VoiceOver turned on, and that is a sonic experience. But it is not an experience designed by Uber, and overall, Uber had not conceived of their service as having a sonic dimension. With some further research and development, the sorts of subtle sonic cues I learned about could be used to make the app more inclusive and flexible, allowing people who prefer sound and those who rely on it to make better use of Uber's services.

## 6 Conclusions

I regret that I was not able to make my research at Uber even more inclusive. Limited severely by the length of my own contract and the institutional research practices that constrain research session lengths, I could not develop the participatory dimension of my work as much as I wanted. However, my research did point to a few practices that can make research more inclusive, even in a restrictive corporate environment.

First, adapting research methods to the context and needs of participants. By this, I mean not only the difference between surveys and semi-structured interviews, but rather, being willing to make changes to the form and medium of research as a situation dictates. Participant photography works very well for some projects; for people who can't see, but who rely on sound for navigation, a sonic research method would clearly be preferable.

Second let participants shape the focus of the research. This is a good practice for human-centered research anyhow, but to make research inclusive, participants need to be able to direct the research in directions that haven't been considered before. Participants have questions and needs that a researcher can't anticipate. For instance, I went into my research expecting that finding the car would be a central problem to solve. However, while that was indeed a challenge that participants noted, it was rarely the most important pain point. Rather, participants themselves directed me towards parts of the Uber experience outside the bounds of what the company usually thinks about,

such as wayfinding *after* being dropped off, and thus, I adjusted my research beyond the goals I initially set.

Finally, let participants represent their own experiences as much as possible. Again, this sounds like a routine part of human-centered design and research. But it is surprisingly easy to coopt the voices of participants, editing not only their words but also their identities to fit neatly into a slide or make a particular point. But the more power people have to represent themselves directly—whether through photographs, words, or sound recordings—the more inclusive the research can be.

None of these points made my research as radically inclusive as many inclusive research practitioners advocate, or that I wanted. Participants did not get any sort of ownership in the research and subsequent design and development that came out of it, and there was no opportunity for them to take on the role of the researcher and guide the project from a position of leadership and power. In short, I view my research as a partial, though still important, step in making Uber’s products and services more inclusive. The culture of thinking about accessibility as “niche” is deeply embedded, and the institutional barriers to inclusive research and design are strong. But if researchers can make the process more transparent and inclusive for participants, we can begin to make inclusive research a more constant feature in corporate contexts, and thus, can make inclusion a real priority.

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