DOI:10.1145/3604622

To view the accompanying Technical Perspective, visit doi.acm.org/10.1145/3604623

Mixed Abilities and Varied Experiences: A Group Autoethnography of a Virtual Summer Internship

By Kelly Mack, Maitraye Das, Dhruv Jain, Danielle Bragg, John Tang, Andrew Begel, Erin Beneteau, Josh Urban Davis, Abraham Glasser, Joon Sung Park, and Venkatesh Potluri

Abstract

The COVID-19 pandemic forced many people to convert their daily work lives to a "virtual" format, in which they connected remotely from home. In this new, virtual environment, accessibility barriers changed, in some respects for the better (e.g., more flexibility) and in other aspects, for the worse (e.g., problems including American Sign Language interpreters over video calls). Microsoft Research held its first cohort of all virtual interns in 2020. We, the interns, full-time members, and affiliates of the Ability Team, a Microsoft research team focused on accessibility, report on our experiences navigating the challenges of working remotely. We constituted a variety of abilities, positions, and levels of seniority. Using an autoethnographic method, we provide a nuanced view of how the virtual setting affected the experiences of our mixed-ability team, the strategies we used to improve access, and areas for further improvement. We close by presenting guidelines for future virtual mixed-ability teams to improve workplace accessibility.

1. INTRODUCTION

The COVID-19 pandemic accelerated changes in the way that many people collaborate. In particular, many schools and workplaces in the U.S. shifted their interactions to predominately online remote settings.[16] This change involved shifts in protocols, including a higher reliance on remote connectivity software such as video call apps (e.g., Zoom and Skype) and integrative platforms that facilitate various forms of remote collaboration (e.g., Slack and Microsoft Teams).[19] Since approximately 1 in 4 Americans have some type of disability,[a] many people making this shift to remote collaboration represent a diverse range of disabilities and accessibility requirements.

This shift to remote collaboration impacted access for many people with disabilities. Since 2020, several papers have explored the challenges and benefits of a virtual setting in the context of accessibility, focusing on specific technology features (e.g., the effects of text chats during video calls[19]) and people with specific disabilities (e.g., people who are Deaf[14]). However, no work has yet explored the challenges and synergies of meetings among people with multiple abilities in a virtual setting (e.g., blind, d/Deaf, and non-disabled). Mixed-ability teams must not only ensure that individual team members have access but also face the challenge of communicating and coordinating across disabilities. For example, accommodations may conflict between different disabilities[11] [e.g., a preference for visual communication by deaf or hard of hearing (DHH) individuals versus oral communication by blind team members]. Organizations may not be prepared to accommodate such diverse teams and needs, especially during a rapid shift to virtual environments.

In this work, we examine the interplay of virtual work and mixed abilities to help address such problems and enrich the growing field of work about virtual engagement. Utilizing an autoethnographic research method, 11 of us who were members of or affiliated with Microsoft's Ability Team journaled about our experiences on the mixed-ability team for three to four months. Five authors, whom we refer to as "meta-authors," then iteratively examined the data, to identify five key, interdependent themes. We experienced several *virtual (in)accessibilities* that arose from the new, online context. As this was the first virtual internship and the Ability Team's intern cohort with the most diversity in abilities, we experimented with ways of establishing and executing accommodations in the workplace. We quickly found that the list of mixed-ability accommodations we needed to follow was *difficult to remember*, and in some cases, accommodations *conflicted with each other* in ways that had not been experienced in person. Finally, we discussed how important *allyship* was this summer, and how *power dynamics* impacted overall accommodation success.

We also created a set of guidelines around how we would advise those in similar situations, reflecting on the norms and accommodations we established for the summer that were successful in promoting access and those that could be further improved. These guidelines focus on: (1) the community co-creation of norms that leverage interdependence and shared vulnerability, (2) the invisibility of accessibility failures and access labor, and (3) the impact

The original version of this paper was published in *Proceedings of 23rd International ACM SIGACCESS Conference on Computers and Accessibility* (2021).

a https://www.cdc.gov/media/releases/2018/p0816-disability.html.

that attitude had on accommodation execution and overall comfort with the discussion of access needs.

In summary, this work contributes: (1) in-depth accounts of five key factors that influenced our experiences (virtual inaccessibility, difficulty remembering access accommodations, conflicting accommodations, allyship, and power dynamics), (2) reflections on how these factors interplayed, and helped or hindered the accessibility of the group, and (3) a set of guidelines for future virtual mixed-ability teams.

2. RELATED WORK

2.1. Accessibility in remote work

The sudden shift in work practices due to the COVID-19 pandemic, coupled with demonstrated productivity,[16] has strengthened the argument for the feasibility of remote work. Increased acceptance of remote work raises new employment opportunities for people with disabilities.[20] However, researchers have begun studying how discriminatory organizational policies[9] and lack of accessibility in remote collaboration tools[23] may perpetuate and replicate accessibility challenges in remote work. For example, during remote meetings, deaf and hard of hearing people need to navigate multiple visual channels for access (e.g., lip reading, American Sign Language (ASL) interpreter video, captions) while simultaneously following presenter slides and chat threads.[14] Neurodivergent people who have autism, attention-deficit/hyperactivity disorder, learning disabilities, and psycho-social disabilities must also navigate various sensory and cognitive stressors[25] and negotiate for accessible communication practices during remote meetings.[7] Collectively, this growing body of research sheds light on the access needs of people with disabilities in coordinating and communicating over remote collaboration technologies when teams are distributed in time and space and outlines guidelines and best practices for improving accessibility in remote work.[7,14,23] We extend this body of work by presenting and reflecting on our remote work experience as a team that includes disabled and non-disabled people with a variety of accommodation needs.

2.2. Accessibility in mixed-ability collaboration

A growing body of literature within HCI investigates accessibility in mixed-ability teams. Bennett et al.[1] put forth the concept of interdependence, which draws on disability studies and activist work.[12] Access is conceived of as co-created and sustained through "relationship between people and things." Related prior work has explored the ways in which blind and sighted people collaboratively establish accessible living spaces[3] and perform shared tasks such as writing[6] together. A common thread in prior work is that accessibility is produced through "care work"[17] where people with and without disabilities continually attend to each other and fluidly adapt their work routines.[2] For instance, Jain et al. shared how graduate students with disabilities and their able-bodied allies established "uncharted accommodations," and minimized accessibility issues by customizing technologies in-situ.[13] Still, these studies revealed tensions arising when people with diverse access strategies collaborate,[7,13] and how people compromise and work through conflicting access needs.[7,11] Situated in this emerging literature, our work brings in new perspectives by exploring all-virtual mixed-abilities collaboration.

2.3. Invisible disability and access labor

The concepts of disability identity and visibility have a fraught history within the human-computer interaction (HCI) and assistive technology literature. Recent studies within HCI and ASSETS that draw upon disability studies scholarship reject a medicalized deficit narrative. They foreground the lived experiences of disabled people to uncover the nuanced personal relationships people have with disability identity, visibility, and disclosure.[22] For instance, the use of visible assistive tools (e.g., wheelchair or cane) can be beneficial in certain situations by "legitimizing" disabled behaviors,[18] while also perpetuating harms imposed by stigmatization.[22] Thus, visibility of disability (and assistive technology) and social acceptability complicates when and how disabled people choose to hide their disability and when they disclose and advocate for accommodations.[5] Related to this discourse, researchers have also foregrounded the invisibility of access labor,[4] which refers to the (often unacknowledged) labor that is put into a scenario to improve access for an individual or group (e.g., scheduling interpreters).[1] Power dynamics and ability-based hierarchies also play a role, where part of the invisible work involves the emotional labor of weighing potential social costs against accommodation benefits[6] and navigating ableist institutional systems.[21] In our mixed-abilities experience, we explore the impact of virtual collaboration on visibility of both disability and accommodations, and the impact on access, allyship, and team dynamics.

3. METHODS

Our approach to data collection and analysis follows autoethnography, a qualitative research method where the researcher positions themselves as the participant and collects and examines data through self-reflection detailing their lived experiences within particular socio, political, and cultural contexts.[8] In the past decade, autoethnographic methods have been increasingly used in HCI research to foreground rich personal insights that often cannot be captured through other research methods.[8,15] In our project, we had two types of contributors: authors (6 people) and meta-authors (5 people). All authors and meta-authors participated in data collection. The meta-authors led the data analysis and writing.

3.1. Data collection

Data collection began in June 2020 and consisted of two artifacts: fieldnotes—notes documented within a week of an "event" with people with mixed abilities, and retrospective accounts,—accounts of past events generated from memory. Each fieldnote or retrospective account contained a narrative description of the event (including technologies and stakeholders) and the writer's personal interpretation (including emotional responses). Events included social meetings/team morale events (~20–30 total, though not all had relevant experiences to journal), weekly team meetings

(~20 total), Microsoft Research-wide social events (~5 total), and organized intern events. In total, the retrospective accounts and fieldnotes document the experiences of 11 people in about 6000 words.

We established privacy in our journaling process by allowing contributors to report in separate documents that were not shared with the other contributors. Only the meta-authors were able to see this data, with explicit permissions from the contributors.

3.2. Data analysis

The experience reports were analyzed using open, axial, and selective coding to articulate the social, cultural, and personal implications of mixed-ability environments. At the beginning of the analysis, the first author read the experience notes and created eight initial codes (e.g., hidden access needs, power dynamics). These codes were shared with other meta-authors and revised based on critical discussions, which included adding other salient codes and removing or merging codes. This process generated nine axial codes. To ensure external validity and avoid misinterpretation,[15] the final axial codes were shared with the authors, who coded their own experience reports under these codes on a shared document. During this process, we also allowed any new reflections on the contributed data relevant to the axial codes. Finally, the axial codes were combined into the final five overarching themes presented below, and exemplary vignettes were collected from the notes. These themes, codes, and vignettes form the foundation of this autoethnographic narrative. The paper drafts were shared at various stages with the authors.

4. TEAM COMPOSITION AND DYNAMICS

As a result of the COVID-19 pandemic, Microsoft had its first all-remote summer intern cohort, which introduced accessibility and other challenges. Additionally, the group of interns hired by our team, the Ability Team, had a diverse range of abilities. We describe the team and internship experience to contextualize our findings around working on a mixed abilities team in a fully virtual, industrial setting.

4.1. Biographies

The Ability Team consisted of a diverse set of individuals with respect to their backgrounds and identities. Fulltime Microsoft employees with a range of experience in the industry and Microsoft served as official and unofficial mentors of the Ability Team interns or other teams that overlapped in focusing on accessibility. All of these official Ability Team members and affiliates attended weekly hour-long meetings to discuss research topics.

The meta-authors consisted of two full-time employees, who work in the accessibility area, and three PhD student interns, two of whom are disabled. Of all authors, five identified as Asian and six as white. Four authors identified as women and eight as men. The average age was 32.9 years (range 24–60 years). The disability status is summarized in Table 1.

Finally, in this paper when we refer to the experiences of disabled interns, we refer only to those who disclosed their disability status and chose to share their experiences with us, though there may have been other disabled team members. The experiences of the disabled interns who contributed to this work do not necessarily extend to other people with disabilities on the team.

Table 1. The demographics of the six authors and five meta authors who participated in this autoethnographic study

Name	Position	Disability status
Mack (meta-author)	Intern	Disabling chronic illness
Das (meta-author)	Intern	None
Jain (meta-author)	Intern	Hard of hearing
Bragg (meta-author)	Full-time researcher	None
Tang (meta-author)	Full-time researcher	None
Andrew Begel	Full-time researcher	ADHD
Erin Benetau	Intern	None
Josh Urban Davis	Intern	None
Abraham Glasser	Intern	Deaf
Joon Sung Park	Intern	None
Venkatesh Potluri	Intern	Blind

4.2. Regular activities and technical infrastructure[b]

In Microsoft's first-ever all-virtual internship, the Ability Team replicated many in-person experiences typically offered during summer internships. Work meetings, such as the weekly Ability Team meeting that existed pre-COVID, persisted in virtual form over group video calls. During these meetings, the team introduced interns, shared announcements, discussed research, and gave presentations. To replicate impromptu socialization, the Ability Team manager created weekly meetings intended for non-work conversation. Interns created their own weekly lunch chats among themselves, which became an informal social space.

Microsoft Teams and email were the primary tools used to support remote collaboration and communication. Microsoft Teams is a combined communication tool and file management system. Both direct messaging and channels for groups of employees were made for text-based conversations. Video calling was a supported and integrated feature that rapidly evolved as Microsoft Teams became more popular and released new features. In video calls, users were able to turn on and off their cameras and microphone. Microsoft Teams automatically arranged the videos shown to a user, prioritizing people with their cameras on and who are speaking with their voice. However, users could curate who was shown on their screen through a pinning feature. At the beginning of the summer, a maximum of nine videos could be shown at a time (the limit has since been increased). A text-based chat was also available during each video call, allowing for simultaneous communication across two main channels; this chat persisted after the meeting ended. Users could also share their screen or an application window, supporting presentations to the group.

4.3. Accessibility accommodations

Accommodations were requested this summer to ensure that interns with disabilities had equitable access to all

b https://www.cdc.gov/media/releases/2018/p0816-disability.html.

materials and events. These accommodations mainly took two forms: accommodations that people with disabilities established for themselves, and accommodations that required changing norms among the full team.

Self-established accommodations were controlled by the intern with a disability and included requesting an ASL or visual interpreter or a captioner who are often critical for access to meetings and/or company-wide intern events.

Other accessibility accommodations were *norm changes* that required effort and commitment from all team members to be successful. Accessibility guidelines for the team meetings were established at the beginning of the summer by the manager of the Ability Team. Interns at Microsoft had different start dates, leading to frequent changes in the disabilities represented in the team. Consequently, the Ability Team manager sent out an email every week with the list of accommodations to be followed. While this email was circulated regularly, this information was not available outside of email. The final *list of best practices* included: (1) speaking slowly for captions, (2) saying your name before speaking to help with speaker identification, (3) making presentations accessible (included links to best practices), and (4) avoiding triggering motion sickness from causes including a shaky camera (e.g., while walking) and scrolling during screen shares.

5. FINDINGS

Through working on a mixed-ability team this summer, several interconnected themes arose as key factors that impacted our experiences. We encourage readers to read the entire section, even if they are seeking information about one theme, as the understanding of an individual theme is incomplete without the understanding of its interplay with others.

Our experiences this summer were shaped by the intersection of our diverse backgrounds, our technological tools (Teams), and our accessibility group norms. To demonstrate the complex interweaving of these key factors, we share a short story from our time together.

5.1. Vignette of our experiences

In one meeting, Jain, who is hard of hearing, presented to the group. Jain was on mute and started sharing his screen, which meant that he could only see his own video and the video of the most recent speaker. While we tried to alert him that he was still on mute, it seemed impossible to get his attention. Since we knew he could not hear us, we tried waving our hands and typing messages in the shared chat; nothing worked. Eventually, one participant made a paper sign that said "you're on mute", but even that took a while to become visible because that person had to speak long enough for his video to be shown to Jain. This experience pointed out a cascade of accessibility problems with video conferencing software while sharing slides that disrupted the meeting.

5.2. Virtually induced (in)accessibility

Meeting exclusively through online collaboration technologies directly impacted accessibility, especially because many of our group meetings included a mixed set of abilities, assistive technologies, and accommodations. Meeting virtually did provide one accessibility advantage[23]: the inclusion of text chat in all video calls[19] meant that people could easily choose a modality of contributing that fit their abilities. However, our mixed ability team communicating in a fully virtual space did result in several accessibility challenges largely revolving around (1) incompatibility between video-conferencing software and assistive technologies and practices employed by people with diverse abilities, which often led to (2) decreased visibility of disability and increased access labor.

Our video conferencing software created several access barriers. Participants who used ASL often are quiet or muted when they sign, whereas the video conferencing software uses audio only to prioritize which video streams to display. Therefore, those participants' video feeds were rarely shown. To address this issue of video prioritization, we recommended an accommodation of pinning the video of ASL users. However, this distributed solution required each meeting participant to individually remember to do so, as there was no mechanism to pin that video stream for everyone. Bragg reflected: *"It was quite frustrating to me when my mentee's video [who was deaf and communicated via ASL through an interpreter] was not included in the set of videos displayed during large meetings ... it seemed that in many cases the other meeting participants were happy to continue without taking action to remedy the situation."* Not seeing the signer meant that the expressive effect of the person was lost. It also resulted in confusion among participants over who was contributing (e.g., confusing the interpreter for the deaf individual), and more generally, unequal access and inclusion.

Seeing a signer clearly was more challenging when participants shared their screens. The video call's interface gave more screen space to screen sharing, which was afforded by reducing the number of video tiles and the space for live text captioning. This limited screen real-estate when screen sharing could mean losing sight of an ASL interpreter unless their video tile was pinned. Bragg and Glasser's lab spent considerable time developing a protocol that involved pinning interpreters and then screen sharing. This solution was not perfect (technical issue arose) and it took many rounds of iterating, escalating, and collaborating with technical support and leadership to get implemented.

Another issue with ASL interpreters was that they appeared in the video conferencing software's interface without any information about whom they were supporting. Park commented that, in the context of in-person meetings, ASL interpreters were typically positioned across from the person they were supporting and clearly maintained eye contact with them. In contrast, ASL interpreters in the video conferencing software appeared in their own video tile, often without explanation, and were unlinked to the people they supported. This lack of context around interpreters sometimes created confusion, especially early in the summer. Introducing new interns from a list of meeting participants became awkward when people did not realize if an unfamiliar person was a new intern or an ASL interpreter.

Similar to ASL interpretation issues, captioning delays led to less equitable access to DHH caption users, particularly in online settings that limited the shared awareness of those delays. Turning on live text captioning was a choice for each participant, leaving some participants unaware of the delay. Begel, after turning on captions, reflected: *"I never noticed before that Teams' captions have a delay which led to me reading the caption of the [one] speaker as another person already started talking. That led to some difficulty following the thread of the conversation whenever it moved through the DHH speaker."* This delay was even less visible if someone was using a private captioner or interpreter, which was not seen by any other meeting participant. Because there was no shared awareness of these delays, people were not getting feedback on how to pace their conversations relative to the delays involved in communicating with everyone.

Moreover, the limited view that meeting participants saw of a disabled intern often did not include their accommodations. For example, participants using captioners or interpreters often performed a considerable amount of access labor, which involved joining the main meeting and a separate video call on a separate device with an interpreter. However, this labor was obfuscated by the video conferencing software.

As a consequence of this hidden access labor, inaccessibility in virtual settings was great, perhaps greater than in-person meetings, when norms or accommodations were broken. For example, the absence of a captioner is easy to miss in virtual meetings, whereas it would have been visually obvious to sighted people during in-person meetings. Colleagues may adjust their speaking speed or come up with more accessible modes of communication, but only if they are aware of the captioner's absence. Similarly, one intern, Mack, experienced severe motion sickness that was triggered by several video presentations in meetings over the summer, which was almost impossible to notice virtually. Davis noted: *"After presenting my research at the lab meeting, a fellow intern mentioned to me that one of my slides with a time lapse video as the background caused them severe nausea. I had no idea this could potentially be an issue … The intern said that they often didn't mention these things … I wish I had known sooner."* Mack had to choose either repeatedly getting sick from people's videos without their knowledge or starting a direct conversation with a colleague.

While access to multiple modalities for communicating (video, audio, text chat) enabled some accessibility opportunities, it also introduced challenges in demanding much attention during a meeting. The text channel was often used for concurrent side chats or sharing information like links. This problem of split attention, while experienced by nondisabled virtual meeting participants,[19] may be exacerbated for disabled participants. For example, Potluri reflected: *"Our computers' ability to help us multi-task induces stress because of a perceived expectation to be at multiple places (in a meeting + an other chat for example) at the same time … With both the meeting audio, and the screen reader blaring notifications in my ears, I couldn't concentrate on the meeting after a point and I even dropped off a few meetings as I felt that I was being disrespectful to the speaker by pretending to be there, and not really listening."* Attention splitting was also felt by Jain who had to follow captions and chat content.

5.3. Power dynamics

Upholding accommodation norms was a core value of our team, but *power dynamics* affected success. Das noted: *"Following 'best practices' or guidelines that come from top down… helps to set the tone of the meetings and make others aware and mindful of adapting to practices that are more accessible."* For instance, in the Ability Team meetings, we found that if senior members announced their names before speaking (or did not), others were more likely to follow.

Team hierarchy made it difficult for junior team members to advocate for behavior changes. One intern, Mack, felt inner conflict when senior researchers were not following the norms: *"I occasionally put a reminder of 'are we still saying our name before we speak?' in the chat, but it felt so weird to correct others when most of them are very senior researchers who you are hoping will think highly of you when you're on the job market."* She wanted to make a good impression and was uncomfortable correcting people in more powerful positions. However, she also felt guilty if she did not address those breaking the norms, as reminding people to adhere to accessibility practices is an important part of being an ally.

At the same time, it can be difficult for senior team members to determine when their advocacy will help or harm. Bragg presents such an internal conflict created by power dynamics: *"As a mentor… it can be difficult to strike the right balance between shielding the intern from having to advocate for themself, and making sure that you are not speaking/ advocating for them unwantedly."* Someone in a position of power, like Bragg, can help improve access by setting an example or addressing accessibility issues. However, an intern may not always want to draw attention to their disability or access needs. Interns may also prefer to advocate for themselves, knowing their own needs best. A mentor advocating in these situations may feel embarrassing or patronizing. Such concerns may prevent senior team members from speaking on behalf of more junior members, even while aware of accessibility issues.

5.4. Difficulty remembering accessible practices

Keeping track of and implementing multiple accessibility practices while also engaging in meeting content proved to be a challenge for many meeting participants. Participants entered each experience with the intention of inclusivity but struggled to maintain inclusive behaviors. This drift away from adherence to guidelines occurred during individual meetings but also over the course of the summer. The list of accommodations shared was lengthy and verbose and difficulty implementing accommodations seemed to correlate with how clearly the accommodations were outlined. In particular, the group largely failed at implementing accommodations related to motion sickness, which were all grouped together into a single bullet, regardless of when and how the accommodations needed to be implemented. This was likely a result of how these accommodations were curated—requested by individuals with particular disabilities—rather than by how they would need to be consumed (e.g., norms for presentations or conversations).

Difficulties implementing accommodations were compounded by the novelty of the accommodations to some people. Many team members had experience with *some* disabilities, but not all of them. As a result, nearly all meeting participants faced a learning curve in learning how to follow accessible practices. Tang added: *"I remember the first time I was called out for not verbally identifying myself before speaking at the [team] meeting on July 2, I quickly moved from being annoyed to realizing I needed to learn a new practice, and it just took a little nudge for me to make that shift—I think we needed more of that throughout."*

Changes in the set of accommodations that needed to be implemented in different meetings due to the *variation in group membership* further complicated the task. The set of meeting attendees was not constant, and as a new disability appeared or disappeared from the group, the list of accommodations that needed to be top of mind changed. This summer, the attendee list was particularly prone to fluctuate, as interns began and ended their internship experiences on different timelines. Bragg reflected: *"It becomes increasingly difficult to always remember all of the accessibility protocols during meetings as the number of disabilities grows. … This becomes more difficult if you are an occasional meeting participant, and if the set of disabilities/accommodations changes over time."*

5.5. Conflicting access needs

Maintaining coordination and communication among people with diverse abilities led to situations where access needs conflicted with each other.[7, 11] For example, Teams' limited screen real estate during screen sharing often excluded the interpreters' videos. Bragg described the dichotomy in presenting during meetings to ensure interpreter visibility: *"… we came up with a protocol where the meeting presenter shared their screen, which included both the pinned interpreter and the meeting slides. This enabled everybody in the lab to view the interpreter at a reasonable size while simultaneously viewing the [presentation]. However, sometimes this resulted in the slides (especially text) becoming prohibitively small to read."*

Other accommodations could increase access in one dimension while decreasing access in another. For example, performing allyship through backchannels can increase access through advocacy, but splits attention,[19] as Jain and Potluri noted earlier. Relatedly, Benetau, a sighted, hearing person, described challenges in adapting to the influx of information in multiple modalities during a remote meeting with automatic captioning. She was distracted and overwhelmed since *"the speaker used a high rate of speech so there were lots and lots of words being typed on the screen, more than I would be able to read at a time, and they were also disappearing faster than I could keep up."*

Further, creating content that everyone could participate in required carefully navigating conflicting access needs. We observed a striking example of this challenge during a challenge to make a piece of art that the full group could enjoy. Davis reflected: *"I spent a considerable amount of time brainstorming multimodal sensory recordings that would be usable by as many people in the group as possible. Recording the ducks, for example, took over an hour and a half and comprised 37 separate recordings because I needed the ducks to be visible, make a sound, and not have the camera move too much (since a shaky camera phone recording could cause motion sickness)."* Davis's experience sheds light on the care and labor needed to make content multimodal, so that diverse team members could access them.

5.6. Allyship

Allyship was key for gaining access and feeling supported in lapses in the Ability Team and company-wide events in following accessibility guidelines. Being fully online provided a unique new channel for allyship: back-channeling via text messaging. Allies harnessed both the group chat associated with each meeting and direct messaging for allyship, allowing allies to explicitly or implicitly call out inaccessible practices. For example, as stated earlier, Mack and other team members throughout the summer used the chat to remind people to say their names before speaking—an explicit reminder. The chat could also be used to mitigate accessibility issues and share implicit reminders. Das reflected: *"when the work anniversary video was being played without description, an intern quickly wrote down a short description of the video on chat. She wrote, 'alt: pictures from M's friends. ranging from Mt. St. Helens to Texas, pictures of M and his spouse hiking, thank you's from [team members] saying how much they love the hikes he suggested.' Six team members 'loved' this message and two others 'liked', including one of our interns who is blind. I think it was a very thoughtful and nice gesture from the intern who proactively provided this alt-text."* This method of making up for omitted alt text in the chat was a reasonable, in-the-moment solution.[13] However, splitting a user's attention between video and chat is not ideal. Therefore, the public meeting chat was a way to mitigate accessibility issues but was no replacement for prepared, accessible content.

Power dynamics seemed to influence allyship, as more senior team members often had less visibility into discussions about access issues, access labor, and allyship. In contrast, most interns regularly engaged in deep discussions on these topics. We suspect this difference in experiences between full-time employees and interns could be due to several factors. First, power dynamics cause tensions between mentors and interns when providing allyship, as Bragg described earlier when she tried to strike a balance between being an ally and not being over-eager. Second, power dynamics often affected the type of information that was conveyed in conversations. For example, one disabled intern, Mack, grew to be close friends with one of the interns this summer, Yamagami. Because of their connection and frequent communication, Mack shared her daily accessibility issues with Yamagami. In turn, Yamagami became a strong ally for Mack; she would speak up about aspects of events that were problematic for Mack after checking in with her when she felt too shy or bothersome to say them herself.

On the other hand, Mack did not message her manager or other senior team members regularly and therefore didn't build this same level of connection with them. Thus, they were not privy to her daily challenges. As Tang noted: *"I think I only became aware of Mack's sensitivity to motion in videos because of the multi-modal scavenger hunt, which is well into*

the summer season, and if I wasn't consciously aware of it, I wouldn't have known to need to warn about potential motion sensitivity." Without hearing about the inaccessibility Mack faced or seeing the effects of triggered motion sickness, Tang was, in a way, excluded from performing effective allyship.

6. DISCUSSION

We reflect on themes arising from our unique set of multiple people with varying abilities involved in a virtual summer internship. Our work joins that of others who call attention to the ways *access is created by establishing group norms*.[1, 6, 13, 14, 24] Furthermore, our reflections revealed that the community's ability and commitment to adhere to these norms determined how supported disabled interns felt and how effectively they could engage with the work content. We then discuss how the *invisibility of access labor and disability* could be beneficial or harmful to an individual depending on their desire to disclose their disability.

6.1. Community norm making

In this section, we dive into the mechanics of our groups' accommodations to understand why we, members of the accessibility research group, still struggled to reach full accessibility.

Norm selection. The formation of community accommodation norms (i.e., those norms that strengthen accessibility) was crafted according to the individual needs of each disabled intern and changed regularly as interns joined and left the team. Due to the sudden global pandemic, the team needed to choose how and which norms from in-person interactions to translate to a virtual setting. Some common in-person accessibility norms (e.g., speaking clearly for an interpreter) were adopted in a virtual space without much alteration. Other norms became unnecessary. For example, a common norm is to not touch a disabled person without their permission, which was inherently satisfied by the virtual context.

In other cases, norms were not translated to a virtual space which caused inequity or confusion. For example, a common norm shared with groups working with signing d/Deaf individuals is to speak to and look at the d/Deaf person, not their interpreter. This in-person norm required adaptation, as verbally communicating interpreters' videos were prioritized over d/Deaf signers'. However, this issue was not identified until the internship began and was not addressed until weeks later.

Recommendations. Rather than requesting or establishing norms individually, we recommend holding a team discussion to establish norms *collectively* and *holistically*. In such a model, all of the access needs of team members can be viewed at once. This structure allows for a more holistic approach to norm creation rather than siloing the accommodations for each individual, and could help minimize access conflicts. Additionally, drawing from interdependent models of communities,[1, 12] this process could lead to more accommodations with benefits for multiple people, including those without disabilities in the team. As Sins Invalid notes: "Everyone has access needs, and they can be talked about without shame."[12]

It is important to note that a few factors complicate this process of community norm formation. First, community discussions including non-disabled and disabled team members about their needs require vulnerability,[5, 22] and it might not be safe to do so. One way to mitigate this issue could be to encourage all group members, regardless of disability status, to list access needs. For example, a team member who is also a parent might ask that meetings not be held earlier than 10 AM to allow for school preparation. This norm might benefit disabled team members, but it also normalizes asking for changes.

The second way in which this community-based norm-creation process can be complicated is due to changes in group membership over time. Consequently, we suggest that communities develop a regularly scheduled time to review and adjust norms, which both facilitate the onboarding of new group members and benefits people whose needs change over time. A regularly scheduled review of the norms means there is an established pathway for a person to request changes to norms, which can be more comfortable than instigating a review of norms on one's own.

Norm sharing and teaching. We recognize several ways our large list of emailed norms grouped by disability was potentially ineffective. First, the *list was updated* without much announcement. Therefore, it was easy to skim the list and not internalize the new norms or otherwise miss updates. Second, the list was organized by disability. The norms specific to one activity (e.g., presentations) were scattered throughout long bullets of text. Finally, the list *omitted background information*, for example, explaining how interpreters are used or how a screen reader is used. Our experience highlights that a comprehensive background in accessibility cannot be assumed and that without the background information, norms may not be carried out effectively. For example, Tang realized that he had not consistently carried out the norm of announcing his name before speaking, since he mistakenly assumed that it was unnecessary as people got familiar with each other through the conversation. Without understanding the rationale that those who are DHH are perceiving conversations (through interpreters or captions) that do not afford familiarity over time, he was not consistently executing the norm in an effective way.

Recommendations. After reflecting on our experience, we discussed the ways in which norms could have been communicated more clearly and effectively. First, a list grouped by accommodation *context* rather than disability can make the accommodations more actionable. For example, our accommodations this summer could have been grouped into "conversational norms" and "slide deck norms." Relatedly, updates to the list should be announced in synchronous meetings, if possible, to ensure that the community is aware of new changes. Second, to avoid assuming background knowledge of meeting attendees, group members can make a concise list of basic accessibility background for the disabilities present in the group (e.g., what is a visual interpreter), with links to more detailed resources. This list may benefit existing group members, new group members (e.g., interns), and short-term guests to the community (e.g., guest

speakers). When there is a large group of new community members, like a group of interns, going over this information synchronously can help ensure understanding, while also establishing accessibility as an important group value.

Norm execution and accountability. There were three main aspects of our summer meetings that affected the norm execution and accountability. First, as the list of accommodations grew, *it became harder and more time consuming* for team members to ensure they followed each accommodation listed. Particularly for conversational norms, team members found it challenging to remember to follow the accommodations every time they spoke. The real-time nature of live meetings does not easily support multitasking (i.e., engaging with accessibility guidelines and conversation simultaneously) or allow much time for corrections.

Second, accommodations were *implemented only when the person who the group viewed as needing the accommodations was present*. For example, Das noticed that the norms were followed less strictly in intern lunch meetings where disabled interns were not present than in larger team meetings.

Finally, we had no established method for correcting people when they failed to follow norms. In a group where members had a wide range of seniority levels, it became uncomfortable for those with less power to correct those with more power.[1,6]

Recommendations. We identify social and technology-based interventions that can improve norm execution and accountability. First, teams can apply community norms during all team meetings, regardless of who attends. The consistent application helps habituate behaviors and allows disabled participants to experience their accommodations without needing to disclose their disability status. Second, the community can establish norms around how to correct people who break a norm (perhaps with an anonymous option), which may mitigate tensions due to power differentials.

Finally, we acknowledge the space for technical contributions in upholding access norms in a virtual setting. Our accessibility failures were partly due to the difficulty of the problem; remembering different needs in different settings is challenging. Therefore, technologically prompted reminders of norms (e.g., Microsoft Teams prompting: "Did you introduce yourself before speaking?") may improve adherence. At the same time, a system that does this task well can shift the access labor from group members with disabilities or their allies to itself.

6.2. Invisibility

We discuss the challenges that were introduced in a fully virtual setting due to the invisibility of access labor, accommodations, and the effects of inaccessibility in remote settings.

The access labor that people performed tended to be hidden[3, 21] in the virtual setting, making it challenging for allies and team members to understand the scope of the accommodations. For example, team members were unaware of the complex setup required to receive captions, which also splits the caption user's attention. This considerable access labor in a virtual setting led to Jain's hesitation to join company-wide intern events, while his allies were unaware that his lack of attendance was due to access challenges. More generally, allies for people with disabilities may have a harder time sharing in the access labor when they are not co-located with the person with a disability.

Similarly, the effects of inaccessibility could be easily hidden from other team members in virtual settings. In an extreme example, Mack would turn her camera off if she became ill from her motion sickness being triggered on video calls. Relatedly, Potluri silently left a meeting due to feeling overwhelmed by too many audio streams. The hidden nature of many of the consequences of inaccessibility made it more challenging for allies to identify inaccessible situations. Consequently, allyship was forced to be more proactive in virtual settings. For example, after hearing about Mack's situation, Yamagami was proactive in reaching out to Mack to provide support.

Finally, the virtual setting made the distinction of accommodations and who received them murky, particularly in the case of ASL interpreters. Because interpreters were unlinked, Park, Das, and Davis commented that they were unclear of the interpreter's role (i.e., not a team member) and who the interpreter was interpreting for. Tang noted this was especially confusing when the perceived gender of the interpreter for one colleague changed mid-meeting.

Recommendations. Because the virtual context makes key aspects of disability and accessibility hidden, we suggest a few tips for allies to help improve accessibility. First, we suggest creating ways of making access needs and accommodation use more explicit in virtual settings. For example, this may include developing methods for linking interpreters or other accessibility support members to the person they work with. Additionally, when a person is using an interpreter, participants sharing their name before their thoughts can help reinforce this connection to who is communicating, which is helpful in large groups.[14] From a more high-tech perspective, an ideal solution would be for an interpreter's voice to be linked to the Deaf signer's video. Second, disabled members may explain how they would prefer to engage in meetings if they are comfortable doing so. For example, Jain could explain his complex setup or state "if you need to reach out to me, reach out via a text message." Ideally, as videoconferencing platforms evolve, they should build accessibility features into the platform, thus decreasing the access burden for the disabled participant.

Allyship also became more difficult in a virtual setting due to the invisibility of access labor and the effects of inaccessibility in virtual meetings. We suggest that allies take a proactive approach in providing support,[10] without being overbearing. Unprompted access check-ins may be appreciated. These check-ins may be even more critical for mentors/managers to do with their mentees, as our experiences highlight the natural team and power dynamics that may make it more difficult for interns to share access issues with their managers.

Additionally, our work demonstrated a new communication channel available to allies because of the virtual setting:

text back-channeling. This affordance may allow for more effective allyship in some cases. For example, Bragg felt a tension around when she should speak up for her mentee. An established back-channel could allow her to ask her intern with a disability if he wants her to speak up instead of assuming that help is needed.[11] On the other hand, use of back-channels for allyship has the disadvantage of making ally work invisible. Team members should initiate conversations around if and when it is appropriate to make accessibility issues and/or allyship visible.

7. CONCLUSION

Due to the pandemic, our team at Microsoft Research experienced a fully virtual internship on a team with mixed abilities. Through our autoethnography, we share our rich, personal experiences and discuss the key features that combined in unique ways to shape the accessibility of our team: virtually induced (in)accessibility, power dynamics, remembering lengthy and conflicting accommodations, and allyship. Finally, we reflect on practices around community norm formation, the invisibility of disability and access to labor, and team attitudes, commenting both on successful and unsuccessful approaches. We note that there are several opportunities for technology to support the accessibility of virtual teams. Particularly as video calling and conferencing software are evolving rapidly now, we ask platforms to build with accessibility in mind, and for scripted plugins to allow for more customizable accessibility features.

Acknowledgments

We thank Meredith Ringel Morris, former manager of Microsoft Research's Ability team, for helping inspire this project and creating a safe, comfortable work environment that made this type of reflection possible. C

References

1. Bennett, C.L., Brady, E., Branham, S.M. Interdependence as a frame for assistive technology research and design. In *Proceedings of the 20th International ACM SIGACCESS Conference on Computers and Accessibility, ASSETS '18* (2018), ACM, NY, 161–173.
2. Bennett, C.L., Rosner, D.K., Taylor, A.S. The care work of access. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, CHI '20* (2020), ACM, NY, 1–15.
3. Branham, S.M., Kane, S.K. Collaborative accessibility: How blind and sighted companions co-create accessible home spaces. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems, CHI '15*, (2015), ACM, NY, 2373–2382.
4. Branham, S.M., Kane, S.K. The invisible work of accessibility: How blind employees manage accessibility in mixed-ability workplaces. In *Proceedings of the 17th International ACM SIGACCESS Conference on Computers & Accessibility, ASSETS '15* (2015), ACM, NY, 163–171.
5. Cory, R.C. *Identity, Support and Disclosure: Issues Facing University Students with Invisible Disabilities*. Ph.D thesis, Syracuse University, NY, 2005.
6. Das, M., Gergle, D., Piper, A.M. "It doesn't win you friends": Understanding accessibility in collaborative writing for people with vision impairments. *Proc. ACM Hum. Comput. Interact. 3*, CSCW (Nov. 2019) 1–26.
7. Das, M., Tang, J., Ringland, K.E., Piper, A.M. Towards accessible remote work: Understanding work-from-home practices of neurodivergent professionals. *Proc. ACM Hum. Comput. Interact. 5*, CSCW1 (2021) 1–30.
8. Desjardins, A., Ball, A. Revealing tensions in autobiographical design in HCI. In *Proceedings of the 2018 Designing Interactive Systems Conference, DIS '18* (2018), ACM, NY, 753–764.
9. Gleason, C., Valencia, S., Kirabo, L., Wu, J., Guo, A., Jeanne Carter, E., et al. Disability and the covid-19 pandemic: Using twitter to understand accessibility during rapid societal transition. In *The 22nd International ACM SIGACCESS Conference on Computers and Accessibility, ASSETS '20* (2020), ACM, NY.
10. Hadley, B. Allyship in disability arts: Roles, relationships, and practices. *Res. Drama Educ.: J. Appl. Theatre Perform. 25*, 2 (2020), 178–194.
11. Hofmann, M., Kasnitz, D., Mankoff, J., Bennett, C.L. Living disability theory: Reflections on access, research, and design. In *The 22nd International ACM SIGACCESS Conference on Computers and Accessibility, ASSETS '20* (2020), ACM, NY.
12. Invalid, S. *Skin, Tooth, and Bone: The Basis of Movement is Our People*, 2nd edn., 2019.
13. Jain, D., Potluri, V., Sharif, A. Navigating graduate school with a disability. In *The 22nd International ACM SIGACCESS Conference on Computers and Accessibility, ASSETS '20* (2020), ACM, NY.
14. Kushalnagar, R.S., Vogler, C. Teleconference accessibility and guidelines for deaf and hard of hearing users. In *The 22nd International ACM SIGACCESS Conference on Computers and Accessibility, ASSETS '20* (2020), ACM, NY.
15. Lucero, A. Living without a mobile phone: an autoethnography. In *Proceedings of the 2018 Designing Interactive Systems Conference, Hong Kong* (2018), 765–776.
16. Parker, K., Horowitz, J.M., Minkin, R. *How the Coronavirus Outbreak Has -and Hasn't -Changed The Way Americans Work*. Synthesis Report, Pew Research Center, Washington, DC, 2020.
17. Piepzna-Samarasinha, L.L. *Care Work: Dreaming Disability Justice*. Arsenal Pulp Press, Vancouver, CA, 2018.
18. Profita, H., Albaghli, R., Findlater, L., Jaeger, P., Kane, S.K. The at effect: How disability affects the perceived social acceptability of head-mounted display use. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, CHI '16* (2016), ACM, NY, 4884–4895.
19. Sarkar, A., Rintel, S., Borowiec, D., Bergmann, R., Gillett, S., Bragg, D., et al. *The Promise and Peril of Parallel Chat in Video Meetings for Work*. ACM, NY, 2021.
20. Schur, L.A., Ameri, M., Kruse, D. Telework after Covid: A "silver lining" for workers with disabilities? *J. Occup. Rehabil. 30*, (2020), 521–536.
21. Shinohara, K., McQuaid, M., Jacobo, N. The burden of survival: How doctoral students in computing bridge the chasm of inaccessibility. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems, CHI '21* (2021), ACM, NY, 1–20.
22. Shinohara, K., Wobbrock, J.O. Self-conscious or self-confident? a diary study conceptualizing the social accessibility of assistive technology. *ACM Trans. Access. Comput. 8*, 2 (Jan. 2016) 1–31.
23. Tang, J.C. Understanding the telework experience of people with disabilities. *Proc. ACM Hum. Comput. Interact. 5*, CSCW1 (2021) 1–27.
24. Thieme, A., Morrison, C., Villar, N., Grayson, M., Lindley, S. Enabling collaboration in learning computer programing inclusive of children with vision impairments. In *Proceedings of the 2017 Conference on Designing Interactive Systems, DIS '17* (2017), ACM, NY, 739–752.
25. Zolyomi, A., Begel, A., Waldern, J.F., Tang, J., Barnett, M., Cutrell, E., et al. Managing stress: The needs of autistic adults in video calling. *Proc. ACM Hum. Comput. Interact. 3*, CSCW (Nov. 2019) 1–29.

Kelly Mack, Maitraye Das, and Erin Beneteau ({kmack3, maitraye, ebenet}@uw.edu), University of Washington, Seattle, WA, USA.

Dhruv Jain (profdj@umich.edu_, University of Michigan, Ann Arbor, MI, USA.

Danielle Bragg (danielle.bragg@microsoft.com), Microsoft Research, Mountain View, CA, USA.

John Tang (johntang@microsoft.com), Cambridge, MA, USA.

Andrew Begel (abegel@cmu.edu), Carnegie Mellon University, Pittsburgh, PA, USA.

Josh Urban Davis (josh.u.davis.gr@dartmouth.edu), Dartmouth College, Hanover, NH, USA.

Abraham Glasser (atg2036@rit.edu), Rochester Institute of Technology Rochester, NY, USA; and Microsoft Research, Cambridge, MA, USA.

Joon Sung Park (joonspk@stanford.edu), Stanford University Stanford, CA, USA; and Microsoft Research, Redmond, WA, USA.

Venkatesh Potluri (vpotluri@cs.washington.edu), University of Washington, Seattle, WA, USA.