Dis/Abling Video Conferences

A Video- and Auto-Ethnographic Exploration of Remote Collaboration Situations

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This article addresses the question of access to video conferencing from the different perspectives of crip techno-science (Hamraie and Fritsch 2019), media ethnography, design theory, and the politics of inclusion during the SARS-CoV-2 pandemic. First, we describe a situation where a blind user and his sighted work assistant create access to a basically inaccessible online conferencing system via several workarounds. This example confronts the two different sensory-technical perspectives of both involved and diverse actors. In the second example, which is even more complex than the first one, a team of variously disabled employees who are blind, deaf or hard of hearing, and non-disabled colleagues and work assistants work out a branched path through a partially inaccessible video conferencing software. One of the team's work sessions we recorded serves as empirical material for the subsequent media and autoethnographic analyses. The focus is on the intertwined loops of interaction and communication between diverse sensory repertoires, technical tools, and social negotiation processes, which all together create a highly complex network of sensory-socio-technical dimensions.

The paper analyses the two examples of circumventing "restricted access" (Ellcessor 2016) and shows how social negotiation processes attempt to construct hacks and workarounds that undermine or circumvent technologically inaccessible solutions for those that do not correspond to the so-called preferred user (Ellcessor 2016, 77; Ellis, Kao and Bitman 2020, 17). While those workarounds, detours, or shortcuts represent a temporary, socially and technologically conceivable solution, they nevertheless demand a great deal of time and organizational work (Schabacher 2017). A screen reader–ready website, revised screen reader logic, or a screen reader–accessible sharing function (example 1), as well as the efforts trying to synchronize spoken and written as well as heard and read language in distributed remote communication (example 2), are just two concrete examples that, on the one hand, demand improved design. Thus, another perspective, that of design theory, comes into play. Participatory, cocreative, and codesigned processes become meaningful on their

own. On the other hand, these examples reveal the underlying political concept of in- and exclusion. However, one may doubt that a fully accessible technical solution for all diverse groups can or should be possible. Though, from a political point of view, this demand is justified, since otherwise the dynamics of political processes would lead to a chronic undersupply of accessible technological solutions. Dealing with such solutions will always involve socio-technical tinkering or everyday design in the making. Much more important, however, is the degree to which this will take place as an open, ongoing process which leads from temporary workarounds and hacking to design improvement and back again.

Workarounds on an Online Conference Platform: Collaboration between a Sighted and a Non-Sighted Person

In November 2021, the authors of this article held a workshop on the topic of this present paper at the "University:Future Festival" (U:FF). There, we discussed digital barriers and workarounds in the context of video conferences and accessibility during the SARS-CoV-2 pandemic from an interdisciplinary perspective and by drawing on approaches from disability studies, media studies, and design studies. We joined the conference remotely from five different localities. The digital UFF was hosted by the "Higher Education Forum on Digitalization" in partnership with the "Foundation for Innovation in Higher Education in Germany." The invitation to this virtual event stated that they "focus on interaction and encounter like never before" and on "exchange at eye level and accessibility."[1] In our case, unfortunately, accessibility turned out to be a complicated issue as the conference platform hampered the participation of people with visual disabilities. Thus, while problematizing the issue of access work and digital frictions with our workshop, we were once again confronted with the ambivalent promises—and failures—of current innovative technologies aiming to "fix," among other things, the societal problems caused by the global pandemic. In the following section, Frithjof Esch and Siegfried Saerberg refer to their experiences as a work assistant and a blind user concerning registration and sign-up to the UFF's Online Conference Platform "Let's Get Digital"—which differs significantly from applications like Zoom or BigBlueButton—from two different points of views: the sighted and the blind.

Sighted Point of View

Some days before the Festival, Siegfried Saerberg and I have registered and signed up on the UFF platform and done some pretesting to get comfortable with it. How-

1 https://festival.hfd.digital/en/archive/universityfuture-festival-2021/festival.

ever, it has taken us more than two hours and even then, full access for the blind user has not been accomplished. The drama has contained three acts of inaccessibility, as is retrospectively described below:

The Eternal Back and Forth between Key Combinations

As we are located in different places, we have connected via the "Quick Assist" feature in Microsoft Windows so that I can see Siegfried's screen. First, Siegfried clicks on the corresponding link in the invitation email. Subsequently, the landing page for the registration opens in his browser and the structure of the website is easily recognizable for me as a sighted person. There is a registration window with the log-in data and a button that says "check in now," which is not apparent to Siegfried. Laboriously, he uses the tab key to find the button. But as the button is not labeled, the screen reader could not read its description. So far it has been an eternal back and forth between key combinations. Siegfried is annoyed and stressed by the simultaneous and contradictory voices from the screen reader and me. We cannot find any workarounds, which is why I take over the remote control and confirm the button to log in.

When the End Is the Starting Point

After confirming, the lobby page of the event platform opens. Automatically, a pop-up window appears over the page in which the privacy policy of the platform has to be confirmed. I am confronted with a visual barrier to confirm the privacy policy. For Siegfried, however, this window and thus the policy is not perceptible but he can already navigate in the lobby with his screen reader, which again is not apparent to me. Moreover, he has to move through the entire page to reach the pop-up window. "You may have to go all the way to the end to get to the beginning," I say. It works. But then it turns out that the private policy buttons are not labeled correctly. Finally, he chooses the path of least resistance. He confirms all preset privacy settings.

When Moving Backward Brings You Forward

We are exploring the lobby page of the platform now. We are pleased to realize that it can be navigated via screen reader. But access to the virtual lecture room for pretesting purposes is not possible. At this point, Siegfried is using the provided direct room link from the invitation email. However, before accessing the lecture room, a pop-up window with a "continue" and "cancel" button appears to confirm entry. I try to follow the red screen reader frame to visually orient myself and see where Siegfried is. Everything runs simultaneously. A huge effort for me and Siegfried. I have no idea who is interacting with what. After about thirty clicks with the tab key, the red screen reader frame shows me that Siegfried is on the right button. However, the labeling is wrong. I read, "continue" or "cancel." Siegfried hears, "Get your ticket here button." But then, by coincidence, we come to a new workaround. Siegfried

tabs forward. I ask him to go back one step. And behold: backward, the screen reader reads the labeling of the buttons correctly. "When moving backwards brings you forward," says Siegfried. Finally, he is entering the lecture room.

Blind Point of View

I, Siegfried, as the second part of the work assistance relationship in this socio-technical ensemble of humans, software, and materiality, can say that synchronization is indeed a problem to be overcome. First of all, the acoustics of the spoken words must be put into a communicational order via negotiation. If this is not done, the machine voice of the screen reader and the human voices of the two persons in the work-assistance-relationship often speak at the same time, which makes communication very arduous for me. Since these agreements on the order of words are always made in concrete situations and also acoustically, there is a high potential for mutual interference.

A second need of synchronization is to be found in the spatio-temporal order in which a web page is perceived by the sighted reader and the reader hearing via screen reader. Frithjof often describes his reading practices on a homepage as being based on an economy of visual attention due to graphic design elements which give him a flexible movement in space and time. In contrast, the culture of blind web page reading as designed today, prescribed by screen reader logic, is characterized by only following a very strict one-dimensional sequence. Here, there is no spatial juxtaposition, only a temporal sequence. In spatial view, reading would have to choose between jumping down on the page, moving further down the line, or skipping diagonally. The screen reader culture knows only forward or backward, which varies only in its speed. Therefore, in both personal and professional contexts I have often observed a sighted assistant say, "Right next to it is the button you need to click on."

Disability and Remote Collaboration during the Pandemic

The story of our online conference experience related above is not an isolated episode—neither in academia nor in everyday life. It is an example of how society "consciously and unconsciously, has built in disability into digital technologies" (Goggin and Newell 2003, 147) and how disability is "constructed in and through technology" (12). This experience was embedded in the situation of a global and ongoing health crisis where, since its beginning, many measures were taken to contain the pandemic. Social distancing and prolonged periods of lockdowns brought about radical changes in everyday life, work, and education. Thereby, the pandemic has disproportionately impacted people with disabilities from heterogeneous back-

grounds (Spinney 2022; Garland-Thomson 2020). At the same time, many people with disabilities engaged in mutual aid campaigns and advocacy or invented novel forms of convivial and creative practices (Ginsburg, Mills, and Rapp 2020). These initiatives demonstrate the manifold ways in which people with disabilities used their expertise to critically and practically engage with the pandemic and its spatio-temporal constraints (Shields et al. 2020).

Technology is often given a positive connotation in this context for it provides the necessary conditions for creating a sense of conviviality and perhaps even supporting well-being. One striking example is the massive proliferation of remote collaboration tools during the course of the pandemic. Video conferencing platforms were implemented in many professional and educational settings as a workaround—they allowed the continuation of work in times of social distancing and other governmental measures. However, standardized operating procedures inscribed via platforms such as Zoom would have to be adapted through improvisation and workarounds to make them more accessible for disabled people (Ginsburg, Mills, and Rapp 2020).

With regard to the academy and higher education that are often criticized for not facilitating proper participation of students or scholars with disabilities (Dolmage 2017), there are several aspects to consider regarding issues of access in terms of the built environment and digital learning architectures. For instance, during the pandemic teaching was mostly transferred to video conference and learning platforms with varying degrees of success and access options (Ellcessor 2021; Ellis, Kao, and Bitman 2020) radically impacting universities' network traffic and information infrastructure. Research, in many cases, was reorganized as well. Ashley Shew from Virginia Tech reported in an article published by *Nature* that a research project addressing technology development mainly by non-disabled developers and daily practices with assistive devices by people with disabilities was easily done remotely:

> I planned my work intending to recruit disabled students among my researchers. Most of the studies can be done remotely … And because of its disability-led design, my team's project is pandemic-proof. … we conduct our interviews by text, e-mail, Zoom and other means. Because we planned for disabled people to lead and participate in the research, we're well prepared for the current situation—or for any other. (Shew 2020)

Shew highlights that many not-yet-disabled colleagues would have adopted their work, research, and teaching according to disability-led hacks during the pandemic. At the same time, the STS scholar laments that disabled people were most affected by the pandemic, yet their merits regarding remote collaborations and doing work from home were not recognized as they should be. While stressing the benefits of remote research, Shew does not directly address the question of how remote collab-

oration—be it research or teaching—might be complicated by the respective technological frameworks and data infrastructures. Yet elsewhere she emphasizes the bias and problematic impact of technologies that disfavor certain corporealities or neurodiverse ways of being by coining the concept of "technoableism" (2020).

Digital media such as video conferencing platforms are ambivalent in the ways they aim to foster participation through complex infrastructures (Star and Bowker 2002, 242). These technologies can be considered as frictional, political, and partially open infrastructures. They form contradictory "emancipatory devices" that transform into "uneven ensembles for articulating political engagements" (Houston, Gabrys, and Pritchard 2019, 845). Hence, the workaround implemented through video conferencing systems might not be appropriate for all people. Against this background and associated with the complex socio-technological issues, it is necessary to reconceptualize the concept of accessibility and the ways in which remote collaboration systems "provide" access for their users. We hence propose that access is not a fixed condition or stable configuration. The abovementioned experience with the UFF platform and many other examples demonstrate this poignantly. Thus, access can rather be understood as "a relational, unstable phenomenon that both grants benefits and interpellates individuals into larger social systems that may be empowering, exploitative, or both" (Ellcessor 2016, 7).

As we will see in more detail below, remote video conferencing gets more complex when adding the need for (automatic) closed captioning, audio description, sign language interpretation, or CART (Hickman 2019). One finds some cues for the challenges of accessible video conferencing in academia when looking at guidelines for teaching involving students with disabilities from the University of Cologne (Melzer et al. 2020) or the "Mapping Access" project information about "Teaching in time of Covid-19." Note that projects like "Mapping Access" (Critical Design Lab, Hamraie 2018) and theoretical approaches like the "Crip Technoscience Manifesto" (Hamraie and Fritsch 2019) stress that people with disabilities are makers and actively participating through their expertise in hacking, tinkering with, and working around non-accessible media environments building non-innocent, situated, interdependent, and sometimes messy human-technology arrangements. Accessing video conferences as we describe it in this chapter might be considered part of "the crip politics of interdependence," that is, "a technoscientific phenomenon, the weaving of relational circuits between bodies, environments, and tools to create non-innocent, frictional access" (Hamraie and Fritsch 2019).

While acknowledging the productive and positive impact of video conference systems during the pandemic for the "pandemic preferred user" (Ellis, Kao, and Pitman 2020) and partly also for disabled people, we argue that such platforms often incorporate a "potential for inaccessible elements" (Kent 2020, 269). Therefore, the following sections explore the material and performative doing of frictional access by focusing on remote collaboration settings in German higher education: we ana-

lyze a second example of a video conference situation during the pandemic at the Centre for Disability Studies ZeDiSplus in Hamburg. There we focus on the diverse sensory practices within groups of persons with varying disabilities and abilities using digital communications like Zoom Technologies and other assistive applications. By drawing on conversational analysis and auto-ethnographic reflections (Ellis, Adams, and Bochner 2010) we map socio-technical assemblages of people, diverse sensory practices, and (individual) media devices (like screen readers) that became problematic during the pandemic which fosters the remote working practices. Tracing the communicative processes, individual bodily techniques, and different sensory enactments during video conferences provides us with the possibility of approaching the various translational processes that are at stake in these media settings involving eye-camera contacts, bodily techniques, spoken words that are being transcribed and appear on screens, shared documents or chat messages read (or not) by screen readers, lip reading complicated by low video quality, and other factors.

Video Conferencing at ZeDiSplus

In times of the global SARS-CoV-2 pandemic, working remotely from home has become the new normal: while before the pandemic, many employers considered it an unnecessary effort to make accommodations supporting remote working for people with disabilities, the world has changed with the impact of the SARS-CoV-2 pandemic. Many organizations had to send their employees—whether disabled or not—home to work remotely, enabled by digital assistive technologies. Assessing the effects of the pandemic for workers with disabilities, some researchers see a "silver lining" (Schur, Ameri, and Kruse 2020) in the evolving teleworking options. A recent post on Microsoft Accessibility Blog says it best: "The biggest source of knowledge right now are your employees, especially those in your disability employee communities" (Lay-Flurrie 2020). Meanwhile, others draw attention to the growing risks and disadvantages for workers with disabilities within the labor market (Morgan 2021). However, they all point out that we still know little about how people with disabilities engage in remote work or act in videoconference meetings during and (hopefully) after SARS-CoV-2.

The Centre for Disability Studies ZeDiSplus is a striking example of inclusive workplaces assembling socio-technical arrangements of people, diverse sensory practices, and digital media devices. Compared to our first example ("Sighted Point of View"), all members of the working meeting know each other and have a longer experience in organizing their work environment together. Consequently, they are used to coping with various technical devices such as laptops, additional beamers for speech-to-text-translations, personal assistants, and screen readers. Since SARS-CoV-2, however, they—like all of us—could no longer meet in person, which

made further additional technical systems like the video conferencing system Zoom necessary. This, in turn, requires further workarounds like prior arrangements as to who speaks or writes for whom in which channel and in which function. We videotaped a selection of video conferences at the Centre to examine the experiences with and manifold effects of videoconferencing technologies and practices in interaction with previously established human and/or technical assistance.

The following analysis is based on the video footage. The researcher was not present at the meeting and did not claim any other footage or further information except for the responsibilities and functions of the participants. The analysis focuses on processes of synchronization between spoken and written as well as heard and read language in distributed remote communication. These "normally" not visible or audible translational practices and agreements become visible and audible in the opening agenda process where temporal overlapping and misunderstandings are produced by the pre-arranged settings of different socio-technical translations like speech to text, text to speech, or speech to speech, which prove to be highly complex in execution. It thus became evident that it is not a matter of getting things done but of doing itself. We will see that this complex sociotechnical network of things, differently abled persons, as well as technologies requires constant adaptation work like, for example, previously agreed workarounds, which on the basis of a reorganization of both the standard software Zoom and specific assistive technologies, determines which person or software (e.g., screen reader) is responsible for which translation (speech-to-text, text-to-speech) in which media (live transcription, spoken language, text chat).

Some facts in advance: The chosen video conferencing system is Zoom; seven participants are involved in the selected scene. Their functions vary from passive or active participant, personal assistant, and translator from speech to text and from speech to speech. Different persons take on several functions:

- Alex[2], researcher at the ZeDiS and chair of this meeting, is blind. Alex uses the computer audio for speech contributions in the meeting and headphones for the text-to-speech translation via screen reader. Alex, whose video is turned on, is furthermore supported by a personal assistant, Kim.
- Kim, personal assistant to Alex, uses the computer audio. Kim's video is turned off in the situation in question. Kim is additionally tasked with writing the speech-to-speech translation of Leslie by Kai in the chat. This is important for Alex to be able to distinguish who Kai is speaking for.

2 In order to preserve the anonymity of the persons involved, we work with gender-neutral pseudonyms.

- Leslie, researcher at the ZeDiS, uses the computer audio and video. Leslie is deaf and uses speech-to-text-translation to follow the meeting. Since Leslie's pronunciation is not always understandable for the other participants, Kai translates the inputs (speech-to-speech) if necessary.
- Kai uses the computer audio; the video is switched off. As a project coordinator at the ZeDiS, Kai participates in the meeting, and, if necessary, functions as a speech-to-speech interpreter for Leslie.
- Luca functions as a speech-to-text interpreter for the deaf participants. The computer audio is muted; the video is turned off; we only see the shared screen on which the text appears.
- Noa, researcher at the ZeDiS, is deaf and uses speech-to-text-translation. The video is turned on, but Noa does not actively participate in the selected video clip.
- Mika works as an editor on the book projects. The video is turned on, but, like Noa, Mika is not actively involved in the clip.

Transcription of Zoom Meeting, ZeDiSplus (June 14, 2020)

Table 1

TC	Persons/Functions	Display	Sound
00:00	Leslie takes his/her/their turn, and Luca, the speech to text interpreter, starts to translate.	I would like to add …	*I would like to add …*
00:04	The translation stops and a question mark appears.	I would like to add?	
00:04–00:10	Leslie continues without translation.		
00:11	Luca deletes "to add" and replaces it by "our" and adds another question mark.	I would like to … our?	*I would like to… our?*
00:12–00:15	Kai takes his/her/their turn, Luca immediately starts to caption.	I would like to add under the category of miscellaneous.	*I would like to add under the category of miscellaneous.*

00:16	**Alex interrupts.**		**Stop, just one moment, before you continue, I'm missing the …**
00:19	Leslie (re)takes his/her/their turn without being immediately translated.		
00:20	With Leslie speaking, Kai is barely understandable but is translated into text.	I'm trying to repeat what Leslie said.	*I'm trying to repeat what Leslie said.*
00:21	Alex interrupts; Luca notes what Alex says.	Sorry, I see, but we agreed that Kim should write this in the chat, but I don't have anything from Kim.	*Sorry, I see, but we agreed that Kim should write this in the chat, but I don't have anything from Kim.*
00:23	Kim intervenes.		Yes, but Kai has already translated what Leslie said.
00:29	**Confusion of voices, interruption of the agenda**		
00:31	Alex takes his/her/their turn.		Okay, what? I didn't get that now … ?
00:33	Kai explains.		When Luca doesn't caption, I'll see that, and then I try to repeat what I understood.
00:40	**Situation is cleared up, Alex sums up.**		**Sorry, now I see, I didn't get that.**

Analysis

The meeting essentially serves the purpose of bringing participants to a common level of information regarding past as well as future events or projects. The chair has just opened the meeting and the participants are asked for further suggestions for the meeting agenda. After discussing the order of the topics, Alex, the chair, suggests starting with the general question about how each participant, in particular Noa, is doing. However, Alex continues, they should move this topic to the end of the agenda. While Alex is still speaking, Leslie takes his/her/their turn, but the caption-

ing does not start immediately. Alex responds to Leslie and adds to also be interested in knowing how Leslie is doing. At this point the recording begins.

Leslie continues, this time the captioning works: "I would like to add." After the first words, however, the translation stops and a question mark appears. Leslie continues while Luca deletes the words "to add" and replaces them with "our," followed by another question mark. Leslie keeps on talking. After some seconds, Luca deletes the "our" and the question mark. Kai takes his/her/their turn as a translator for Leslie. Luca immediately starts captioning Kai without signaling that Kai translates what Leslie said: "I would like to add under the category of miscellaneous …"

At this point, the confusion starts: Alex, who only receives what the screen reader translates, apparently thinks that Kai speaks for her-/himself/them and interrupts: "Stop, just one moment, before you continue, I'm missing the …" While Alex speaks without being captioned, Leslie speaks up again. Kai tries to "repair" the situation by explaining: "I'm trying to repeat what Leslie said." Since neither Kai nor Luca clarify on whose behalf they speak or write, Alex thinks that Kai, the coordinator of the research group, wants to bring in her/his/their own agenda. Only after the explicit clarification of what role Kai currently plays, Alex understands that Kai translated what Leslie said. However, the problem is not completely cleared: previously, the participants of the meeting had agreed on a different system of distributed remote speaking. Alex is referring to that and says: "Sorry, I see, but we agreed that Kim should write this [Kai functioning as a translator to Leslie, B.O.] in the chat; but I don't have anything from Kim." While Alex talks, Luca captions. Kim intervenes to clarify: "Yes, but Kai has already translated what Leslie said." For Kim, it seems unnecessary to write down Leslie's contribution in the chat, since Kai has already translated it into speech and Alex has heard this. This is also true, but Alex cannot distinguish in which role Kai is speaking, therefore differentiation is needed. Since everybody now tries to clear up the situation, the scene culminates in a renewed confusion of voices. Alex can't understand Kim and continues: "Okay, what? I didn't get that now." Kai finally clears up the situation: "When Luca doesn't caption, I'll see that, and then I try to repeat what I understood." It is interesting that this meta-explanatory utterance by Kai isn't captioned. Alex concludes: "Sorry, now I see, I didn't get that." The meeting continues.

In situations like this, it is almost impossible to decide from the outside, whether the interruption is due to individual dis/abilities, technical delays, or misunderstood meta-information. These situations need both explanations and synchronization to allow continuation. If it can be assumed that workarounds like the one described above enable comparatively complex situations. Nevertheless, frictions and specific modifications of dis/abled temporalities prevent the sociotechnical zigzag from running (Schabacher 2017, 13–14; Löffler 2017, 137). The combination of text and voice-based translation services as well as a prearranged distribution of written translations between subtitles and chat, only work if ev-

eryone strictly adheres to the workaround. In the present situation, the interplay between the different actors ultimately fails to synchronize Luca's captioning of Leslie's statement via Kai's translation as well as Kim's transfer of the same into the chat. Thus, Luca needs time to understand what is being said before typing it, and we furthermore note a considerable delay before the live translation appears or disappears (is deleted). So, it takes time for Kai to realize that Luca hasn't understood, etc. Thus, Luca's captioning fails, Kai starts a bit late, Luca deletes the text written before in favor of what Kai is now saying, and Kim does not feel the need to pick it up again. Alex interrupts, thinking that Kai wants to introduce a separate agenda item. However, Alex would like to postpone this. Kai starts again and realizes only belatedly that Alex does not understand that it is "only" a translation. When Kai and Kim try to clarify the situation, the buzz of voices is already so great that Alex cannot understand them acoustically.

As the example showed, meta-practices of communication that deal with the different abilities and temporalities draw our attention to the relationality and precarity of social, cultural, and technical infrastructures of communication that necessitates constant repair work (Star and Ruhleder 1996). And this does not mean to restore a presupposed continuity or common abledness. According to Schabacher, workarounds are specific embedded practices which involve a labor-intensive detour. In a certain sense, they are robust, and, at the same time, since they represent a specific solution to a problem which occurs in a concrete situation at a particular time, they have to be highly flexible and cannot be directly addressed in advance (Schabacher 2017, 13). So although it was agreed beforehand that certain forms of speech would be written in the chat to create distinctiveness, this did not work. So the situation has to be interrupted and resolved on very short notice to clarify what has happened. After the communicative order has been restored, the conversation continues. Against this backdrop, interferences or discontinuities between the social and the technical, between materiality and meaning-making, shouldn't only be understood as a problem to be solved; they should rather be regarded as a chance to enable situative "crip" reorderings or productive deviations from the norm with a nonstandardized character and relevant political and ethical implications (Star and Bowker 2002, 242). As such, workarounds are continuous processes which "operate … with what is currently available, be it people, things or information, in order to informally establish solutions" (Schabacher 2017, 23)—even if previously agreed workarounds seem to fail, as Siegfried Saerberg from an auto-ethnographic point of view will now elaborate on.

Autoethnographic Exploration of Video Conferencing at ZeDiSplus

In this section, I Siegfried Saerberg—and Alex in the little piece that has just been analysed and interpreted—reflect on the logic of doing auto-ethnography (Ellis, Adams, and Bochner 2010). A reflection of this kind is essential for any auto-ethnography especially in a context in which the perspectives involved are so heterogeneous as they are in situations of digital access connected to the issue of disability. Therefore, I will turn to an interpretation of the situation at stake. The section follows the written manuscript for a short presentation I held at the Siegen conference in autumn of 2020. There I used a special technique: Because I did not have a braille-manuscript at hand, because I wanted to read it out exactly, and because there was no time to learn the text by heart, I let my screen reader read the text via headphone to me before I repeated it loudly for my audience. Therefore, I always structure the sentences into little pieces as shown beneath.

Meta-Auto-Ethnographic Observation

Yesterday
when I listened
to the little piece
that had just been analyzed and interpreted above,
I did not really understand anymore
what I was doing in that situation
Why?
Experience builds up moment by moment.
Every moment that once took place
is important for this process
Auto-ethnography tries to record
all inner movements
and outer observations
that a subject of experience has.
But it is always behind
the flow of events
especially if this flow is fast.
If the movement of feeling
is changing a lot
it is difficult to remember
when exactly
joy turned into anger,
relaxation transformed into stress
and so on.

You only remember
a general, synoptic pattern,
that relates events to feelings.
Phenomenological description of events,
cognitions, perceptions, and interactions
tries to reconstruct
as exact as possible
what and how it happened.
Succession is important as well.
It tries to find little bits of
interpretive action
in interaction and communication.
In a polythetic
step by step way,
to use Husserl's term (Husserl 1954),
But often it finds big pieces
of clustered meaning.
Thus,
you can only find an action
in a monothetical piece of working practice.
For lack of those kinds
of polythetic description
of the process of becoming,
I now turn
to the monothetic built up experience
in the form of receipt knowledge ("Rezeptwissen")
in Schütz's term (Schütz and Luckmann 1979/1984).

Captioning

Captioning has its own speed
which is always slower than spoken words
When I (remember that I am Alex in the situation at stake) speak,
I always try to accommodate
to its speed.
I feel uncomfortable
to hear my colleagues, usually Kai or Luca, say:
"slower please."
I divide a sentence
into little pieces
like an actor.

Sometimes I can hear
the sound of the keyboard
which Luca uses.
In this case
I can synchronize
my speaking to the sounds
s/he makes with the keyboard.
In other cases
when I don't hear the keyboard
I rely on my inner sense
of the flow of time.
It is difficult for me
to understand one colleague (Leslie).
Generally, Kai understands those utterances quite well,
Luca nearly the same.
The others rely on the captioning
but I cannot hear the captioning,
because the screenreader does not read it.
Often in consequence
there was a response to Leslie's utterance
before I knew
what Leslie has said.
A first solution to this problem was
that Kai voiced this utterance for me.
But that created a lot more of speaking.
To solve this problem
we decided in June
that Kim
should type this utterance
in a summarized form
via the chat.

Interpretation of the Situation

In the situation at stake
two interpretations of my actions
are possible:
I misunderstood Kai's utterance
as an "own utterance"

- *Speaking on one's own behalf,*
  - *Where the word "I" in this example signifies Kai –*
  - *and not as voicing*
- *Reading out loud the utterance of another person,*
  - *Where "I" in this example signifies Leslie.*

But could I really have misunderstood
the different sound of voice
that exists
between "own utterance" and voicing?
Having listened to it again yesterday,
I understood it at once as voicing.
Second interpretation is:
I wanted to reaffirm
this newly found solution (chat-typing)
against the old solution
which contained in voicing.
But I misinterpreted
the aim of the voicing
which for all others
was to clear the meaning
of the utterance from Leslie
for the captioning.
This
because I did not monitor
the question mark in the captioning.
Now you may ask: "Why all these complicated communicative interactions?"
To answer this, first of all, I have to say that captioning is not accessible for me, the blind user, via the shared screen in Zoom. And we have not found any technical hack as a solution to this problem.
Second, and as a consequence of this, we had to work around this lack of accessibility in various communicative ways.

Workarounds as Design Resources

These observations demonstrate the potential of digital technologies to both enable and prevent access and participation in society. We argue that inclusion/exclusion are deeply interrelated and connected to the ways technologies are being designed. Consequently, "access is a variable relationship between numerous material, and cultural, social factors" (Ellcessor 2016, 12). This analysis raises at least two important

issues: On the one hand, it sets a focus on the concept of design as empowerment. On the other, it sheds light on the aspect of participation in the design process itself. Constantly driven by the question of how conclusions can be drawn, like for instance in this case, conclusions from an everyday video conference situation, which may lead to a set of design guidelines, in which the full range of possible or impossible types of use can be addressed. The question is how to move from the observation of such improvised "error handling" (Schabacher 2017, 14) and workarounds to the mode of solution-oriented development that does justice to the diversity of the different modes and contexts of use and thus also to the diversity of non-/users such as "non-preferred or disabled user" (Ellis, Kao, and Bitman 2020). Understanding workarounds might be a first step.

Questioning the access work related to digital technologies is closely linked to the concept of Non-Intentional Design (NID), which was introduced by Uta Brandes and Michael Erlhoff into design theory and research (Brandes and Erlhoff 2006) and refers to the conversion or repurposing (Schüttpelz 2006) of things ("*Zweckentfremdung der Dinge*") contrary to their original design intention. Function or meaning of designed objects and software architectures such as video conferencing platforms can therefore shift, a process that Brandes describes as the "production of things through use" (Brandes, Stich, and Wender 2009, 10). Take, for example, the party project "Remote Access" of the Critical Design Lab. It drew on the platform Zoom and aimed to translate disability party culture to the virtual realm. Standard operations were shifted by using "remote access as a method for organizing pleasure and kinship" in March 2020. The initiative produced Zoom in a situated setting that strived for inclusion of users with bodily and cognitive variability: "The participation guide for the party took as given that Zoom is not an ideal platform … So some partygoers volunteered to be access doulas—to troubleshoot and accompany—alongside captioners and sound and video describers. People dropped in and out of the party, danced, tried on clothes, lay in bed, kept their video off, chatted, were alone on camera or not" (Ginsburg, Mills, and Rapp 2020). Our two examples mentioned above point in a similar direction: they also reframe standard communicative settings enacted through video conferencing while not transforming free-time online activities, but professional practices relevant for the daily processes of higher education.

Eventually, design is realized in the process of use meaning that the user has a far less passive role than is often assumed. From a design (research) perspective, practices of tinkering (see Hamraie 2018), DIY practices, everyday hacks, and workarounds (see Schabacher 2017) are important resources of information. The ability to find a "knack" (German: *Kniff*) in dealing with technical objects or infrastructures that is able to "grasp the zigzag of technical beings" (Latour 2014, 312, cited in Löffler 2017, 139) allows us to understand what is really missing. At this point, we should once again refer to the "Crip Technoscience Manifesto," in which

Hamraie and Fritsch put maker and design practice at the center and emphasize how much disabled people are experts and designers of everyday life (2019). Design principles extend across at least two dimensions: on the one hand, to the inclusive process itself, and on the other, to resulting process outcomes that are inclusive in their design or manageability (Bieling 2019). However, in many research and development processes, a strong underrepresentation of disabled people can be observed (Hendren 2020). In the course of what the sociologist Madeleine Akrich has described as the "I-methodology," researchers tend to use their own expectations of certain products or circumstances as a frame of reference for design decisions or research tendencies (Akrich 1995). There is a risk of not considering, penetrating, or even registering the claims and needs of "other" groups of people (Bessing and Lukoschat 2013, 29).

Considering the diverse situations of video conferencing analyzed above, we aim to further problematize design issues with regard to such platforms (Ang et al. 2022) that enable but also disable remote communicative practices.[3] Our observations and discussions around the relations of sensory and bodily differences and digital technologies led us to think about, for example, how screen readers read web pages and that their path to the appropriate button is often very long in time sequence. With regard to blind or visually impaired people, there is also often no highlighting of single buttons or elements via color or size of letters, only a strict rule of succession. In the case of video conferencing, the technical construction of screen sharing often turns out to be inaccessible for a blind user. Workarounds are essential for all these synchronization problems in socio-technological settings. However, it is quite conceivable that a technical improvement drawing on processes of codesign in screen reader logic, web page design, and the video conferencing platforms could optimize the initial conditions for workarounds here. Screen readers could have additional functional logic in spatial terms or in highlighting certain elements. Web pages could be structured more intuitively for people with visual disabilities. Both optimizations would need to be explored in a participatory, contextualized, codesigned setting.

Outlook

Understanding media and disability as mutually constitutive and as being enacted in sensory media practices is necessary to ethnographically explore and conceptualize new applications such as video conference systems. These platforms had a massive impact during the SARS-CoV-2 pandemic, which also extends to higher edu-

3 We strive to further develop our interdisciplinary approach and construct a full research project to thoroughly tackle these questions.

cation and its possibilities to continue teaching and research under difficult and constrained conditions. Yet their implications for heterogeneous populations and user groups with disabilities remain to be fully explored. The analysis of our empirical material demonstrates some of the enabling potentials but mainly points to the uneven character of such "emancipatory devices" (Houston, Gabrys, and Pritchard 2019, 845) that promise a technological "fix" to complex social and political issues. Creating more inclusive environments for remote collaboration in the future depends on how cocreation and remote digital prototyping will involve programmers, designers, and humanities scholars with varying bodily and sensory abilities.

By assembling people with varying abilities and disabilities, their social relations, senses, and (assistive) devices around a data stream, the remote collaboration situations under analysis transgress a notion of accessibility limited to a technological dimension. Rather, by drawing on recent scholarship about crip technoscience and tinkering practices, we argue that access is an ongoing collaborative effort involving access knowledge and access work. Hence, access work is to be understood as a situated assemblage engaging various human and nonhuman actors. These collaborative processes are composed of situated workarounds, individual hacks, and improvisations that lay bare the creative potential of bringing together people with varying dis/abilities, sensory practices, experiences, and digital media. Whether and how such platforms and their users might enact inclusive collaboration processes in just ways remains to be explored in future research.

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