Spatialising differently through ability and techné

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Introduction

This paper reflects on multisensorial and multimodal codesigning processes that consider ableism and techné through three case studies in Canada and Belgium that involved persons with visual impairments. Our research brings together three tangible ways of knowing and doing—*exploring, observing and creating*—to enable designers to shift towards codesigning in unique and meaningful ways and come to understand ability and disability differently.

In a thorough review of studies into codesigning with people with disabilities, it became evident that there is one common and dominant approach. These studies tend to focus on disability, by predominantly looking into the disabilities of the participants and their incapacities to contribute to the codesigning process, which involves designers creating workshop methods that reconsider the disabilities of their cocreators in relation to participation (Metatla, Bryan-Kinns Stockman and Martin, 2015; Wilson et al, 2015; Kuber, Yu and McAllister, 2007; Salgado and Botero, 2008; Cober, Au and Son, 2012:). Our work differs from these ways of codesigning with people with disabilities, in that we situate our process within an understanding of ableism and techné, where we reflect on the ability biases of the designers (often ourselves) and not on the disabilities of the participants. This means that we do not assume to understand the abilities of our participants and instead engage in exploring, observing and creating with them towards the re/design of spaces.

In this way, we (as designers) risk ourselves at moments of unknowingness in the codesigning process, and empower our codesigners to play, discover and cocreate their own methods for participation (Butler, 2005). For example, we do not assume that when we work with people who are visually impaired that we have to revert to nonvisual processes for codesigning. On the contrary, by framing the codesigning process around ableism and techné,

we open up the opportunity for design explorations through multimodal and multisensorial ways, outside of ability biases and assumptions.

As such, the methods used in this research advocate for a different codesigning process wherein designers' roles shift from translators, facilitators and leaders, to listeners, observers and followers within parallel methods of exploration, observation and creation. Our research generates a collage of multisensorial, collaborative and co-constitutive knowledge within and about designed spaces, that is continuously in flux with moving bodies relating to or conflicting with objects, environments, and beings. These more embodied design methods stimulate a shift in empowerment from the researchers and designers towards the participants.

Our case studies presented here are not about providing empirical evidence of successful codesigning but are rather examples of how to re-imagine codesigning, as a situated, co-constituted knowledge creation process, though techné and ability. Our multimodal and multisensorial studies (filming, photographing, dialoguing while wandering) situate abilities spatially, in a way that 'brings to light' different knowledge processes and methods for codesigning.

Ableism in the Context of Codesigning

In order to understand the ableist biases in design and codesigning, we turn to the notion of ableism. Chouinard (1997) defines ableism as 'ideas, practices, institutions and social relations that presume ablebodiedness, and by so doing, construct persons with disabilities as marginalised . . . and largely invisible "others"' (380). Ableism, at its core, can be likened to racism and sexism insofar as it involves a bias towards a certain way of engaging with the world (Wolbring, 2008a). Ableism is useful for seeing specific ways that the social world emphasizes certain abilities above others. Every person cherishes certain abilities and finds others non-essential, which leads to an ability-based and ability-justified understanding of oneself, one's body and one's relationships with others and one's environment (Wolbring,

2008a). An example of this is the obvious expectation of people's ability to navigate through public spaces, to take a bus or to cook a meal. Furthermore, studies in ableism contribute more than a re-thinking of disability; they offer a radical re-thinking of designing. Drawing on Butler's work, McRuer (2002) writes:

> Everyone is virtually disabled, both in the sense that able-bodied norms are 'intrinsically impossible to embody fully and in the sense that ablebodied status is always temporary, disability being the one identity category that all people will embody if they live long enough. What we might call a critical disability position, however, would differ from such a virtually disabled position [to engagements that have] resisted the demands of compulsory ablebodiedness (95-96).

This framing of codesign through ableism questions current ways of knowing in relation to authority and power by allowing marginalized voices to engage in the design of spatial environments (Rieger & Strickfaden, 2016). In other words, through codesign and codesigning processes, which ask for design to be more symmetrical among participants, other stakeholders and designers, ableism and ability biases need to be acknowledged as a part of this process. Here ableism is positioned outside of the ghettoization of disability studies and situated it as a critique of hegemony, the normalizing vision of ability, and the production of space (Wolbring, 2008a). The term ability should not be used exclusively in relation to disabled people but should be understood in a broader cultural perspective and specifically in relation to the production of different kinds of spaces that play to the abilities of a range of different people and things (Wolbring, 2014). This way of codesigning spaces in relation to ableism is deeply connected to multisensorial experiences and embodied knowledge (or know-how) that are linked to techné.

Bridging Techné with Codesigning

We believe that the embodied, lived experience and know-how of users, termed techné by Strickfaden and Devlieger (2011b), inspired by Flyvbjerg (2001), is under-examined, particularly when applying this understanding to codesign and coupling it with ableism.

Techné as embodied knowledge forms a part of communication and this is where it bridges specifically with codesigning (Shepard, St. John and Striphas, 2006). Rather than codesigning methods based on what participants think or say, techné allows for creating and communicating around what people do (Shepard, St. John and Striphas, 2006). Another significance of techné, is that it is personal knowledge based on learned and lived experiences and on people's abilities (Shepard, St. John and Striphas, 2006). Further, our use of techné in relation to abilities is inspired by recent shifts in disability studies that push "the techné of disability from its historically and continuingly oppressive ideation and practice into a techné of possibility." (Hickey-Moody and Crowley, 2010, 400). Strickfaden and Devlieger (2011b) further explain:

> Techné is considered to be the knowledge that is enacted in daily life, is naturally occurring, involves genuine human expertise, and is bound to necessity and something practical. Techné is connected to embodiment, which is defined as experiences and performances that are contained within the memory of peoples' bodies (223).

The concept of techné enacted by people as a performance means embracing the notion of practice and movement, particularly the everyday practices of mundane activities. Most significant is that the everyday expertise of people is recognized as knowledge that can inform other kinds of practice. Techné is connected to embodiment, which is sometimes described as body knowledge or ways of being that are within the body and acted out by the body. Techné offers a knowledge system that leads to a deepening sense of involvement for designers and results in more holistic and embodied ways of designing for and with people (Devlieger and Strickfaden, 2011b). Techné also has the capability to disrupt the asymmetrical balance between designers and users and thus create an intervention in the production of ableist space.

We explore the techné of people in order to expand the ways that meanings and values come to constitute ways of knowing and communicating in codesign. Engaging

designers in a means to understanding difference, opens up the possibility of activating design knowledge in new and exciting directions. Ability is linked to context, which includes a range of things that make up the context that are interlinked with behaviours and related performances that people engage in towards accomplishing a particular goal. The theories of ableism and techné combined provide an invaluable lens to reconsider ways of codesigning. These are further explored through three international case studies conducted in various spatial environments.

Case Studies Outlining Ableism and Techné

Three case studies from Canada and Belgium, are explored to put the theories of ableism and techné to work and to provide three methods for use in a codesigning process. The authors of this article engaged in researching some of these case studies separately and some collaboratively. The highlighted case studies focus on spatial environments and include settings such as an urban environment, a museum, and a school. Case studies allow the researcher to explore individuals, through complex interventions, relationships, communities and environments (Yin, 2003). Each case study involved a multiple-method approach that afforded the researchers the opportunity to explore a phenomenon in a particular context (Baxter and Jack, 2008). These case studies took place at different sites, thus as a grouping can be considered multi-sited case study research. By looking at these three case studies in parallel, it allows for an exploration of the phenomena of visual impairment, ability and techné through multiple lenses with many facets to be analysed (Baxter and Jack, 2008). The case studies reported here are not reported in totality but focus on the data-driven methods that emerged in relation to ableism and techné. In this paper, we are presenting case studies, from different countries, different environments and with different researchers and participants, to evidence the diversity of our codesigning process and to call for more multimodal and multisensorial codesign methods.

Our three case studies are outlined as: *exploring* an urban space (photovoice); *observing* through a national museum (dialoguing); and *creating* through sensorial and haptic encounters in a school (photovoice). These three methods have been developed as they start to provide a lens into the different ways that we can come to understand ability and techné in order to codesign with people with visual impairments. We have chosen these three methods, not only to organize our case studies, but because they are the ways in which people with visual impairments interact with their context in order to understand spatial designs. More importantly, the ways in which people with visual impairments explore, observe and create are often misunderstood by designers and therefore by showcasing these three things across our case studies, we can start to evidence the diversity of these experiences and the importance of understanding this diversity for the creation of a codesigning process and methods.

Exploring: *Light in the Borderlands*

Light in the Borderlands (███████████████████████) is a co-created film between designers and people who are legally blind. It is an embodied examination of geography and narratives while it explores 'atmospheres, emotions' and 'reflections' (Anderson, 2004, 260). The goal of the project was to explore and understand the unique 'phenomenological and sociocultural experiences' of legally blind people as 'vastly different from those of either sighted or totally blind' (Omansky, 2011, 5) as they documented spatial environments within the city.

Figure 1:

To some extent, *Light in the Borderlands* was an extension of research done on the Brussels metro where the techné of people who are visually impaired was examined as a driver in the redesign of the metro system (████████████████████████████ ████████████████████████). In the Brussels metro project, techné was used as

an inroad to the phenomenon of visual impairment in order to push against normative

abilities and discover the nuances of the abilities of those with visual impairments. As a

complex spatial environment, the Brussels Metro involved an exploration of the navigation

through a public transportation system where ways of getting somewhere varies from person

to person. The techné of many people with visual impairments were engaged through

dialoguing and walking whilst talking. Consequently, the multisensorial experiences in the

Brussels Metro space like the smell of Belgian waffles, the sound of the corridors and the

textures of the tiles facilitate the navigation as a converging by means of varying

multisensory abilities acting as a kind of design intervention that shifts the notion of public

transportation for people with impairments.

　　　　Light in the Borderlands goes beyond the Brussels metro project by further

exploring techné through multimodality. The importance of urban dialoguing and using

photovoice through video to get at techné resulted in a short film that documents a series of

conversations and images that explore spaces. The nature of the spaces created were not as

important as how dialoguing is put to work to better understand how techné is performed

within the material landscape, and how the techné of visually impaired people can reveal

little known details about urban environments. Consequently, the goal of the *Light in the*

Borderlands project was to understand the performances and dynamic actions of techné.

　　　　Figure 2:

　　　　The combination of dialoguing combined with photovoice illustrated different kinds

of movement such as running and jumping and was a unique way of telling stories and

exploring space similar to Anderson's 'conversations in place' (2004, 254). Capturing

mobility in action demonstrated that discovering the built environment in new ways could

lead towards a deeper understanding of the abilities of the participants and move beyond the

notion that we should not engage in visual methods when participants cannot 'see' (see

Figure 2). By allowing participants with diverse perceptual abilities to engage with a visual

medium like video and visual method like photovoice, it allows for a new kind of

knowledge production and a new way of seeing.

Observing: *Canadian War Museum (CWM)*

The Canadian War Museum (*CWM)* in Ottawa, one case study which is part of a series

investigated by ██████████████, further explored dialoguing through collaborations

with people with visual impairments to come to understand their differing perspectives on

accessing the museums and museum content, which resulted in the observation of stories on

and about performances through people's embodied knowledge. These differing

observations within material spaces, involved a plethora of multisensory encounters, such as

touching, stepping, tapping, climbing and kneeling (see Figure 3).

Figure 3:

While observing through wandering in the *Canadian War Museum* with a visitor who is

visually impaired she dialogued about her encounters and observations:

> I liked the experience of walking through the trenches. It was something that I had
> heard about before but never understood what they looked like. Having the chance
> to walk through and touch everything gave me a better understanding of what they
> experienced as young soldiers. Also having the chance to touch items like the
> weapons and outfits helped me to understand what they looked like. Also, the tanks
> were very interesting as I didn't have even an idea of what a tank looked like
> (Dialoguing Interview at the *Canadian War Museum*, Ottawa, Canada, May, 2015).

Here touch is understood not just about touching with the hand but about the full bodily

encounter with people and things. Touch creates a different kind of knowledge and

requires a different level of concentration and focus (Candlin, 2006). Observing touch

through the techné of people's differing abilities as enacted in museums has the potential

to generate new knowledge for design, exhibition design and a codesigning process that

often take for granted what touch is and what kind of knowledge and experiences touch generates.

As designers and researchers, we followed our participants paths, which opened us up to the potentialities of 'seeing' and started to reveal our assumptions and biases around touch and vision. This knowledge creation could only be done through a situated dialoguing while wandering, with people with differing abilities. Prescriptive guidelines and knowledge on spatial design mostly refer to visible performances, whereas the methods for ableism and techné expand the sensory perceptions and embrace the invisible holistic experiences. By means of attentive dialoguing and observation, researchers and designers gain insights into the more descriptive experiences of spatial design and codesigning.

Figure 4:

Design details that would have otherwise gone unnoticed or unobserved through more fixed methods (like seated interviews in an office or workshops in a classroom environment) were illuminated through observing and dialoguing with participants through spatial environments, where the techné of people with differing abilities becomes paramount to the evaluation of existing designs to inform future designs and alterations.

These museum encounters are shared and become a co-constitutive knowledge creation that requires embodied and collaborative processes. These museum encounters are also co-constitutive in that they are dependent upon the collaborators, the environment and the modes or methods followed in the study. Moreover, these collaborations are specific to the embodied encounters and entanglements with differing *things* in the museum (e.g., artefacts, displays, canes, stairs and dogs) and not just people. Multisensory observation can be a codesign method that reveals invisible embodied knowledge.

Creating: *School for the Blind*

█████ research on multisensory design parameters involved various case studies with people born blind in their home environments and at the *School for the Blind.* In this project at the school, insights relied on the expertise of children born blind who had never seen longer than the age of five (█████████). In this project, photovoice was used as a tool in order to start dialoguing with children born blind about their spatial architectural environment. This dialoguing around photographs was used with a view to understanding the nuances of experiencing the world with less sight. The photographs were taken whilst walking and talking with the children and they created a space to discuss ability, techné and situated action related to tasks. The photographs taken by the visually impaired children revealed three important aspects. First, they literally show the architectural topics and interest of children born blind. In other words, they revealed the techné the children were living with. Second, the photographs unexpectedly represented the children's' ways of perceiving the world, and their abilities, more precisely their high-level perception by means of touch, and non-visual sensory images. Therefore, movement throughout dialoguing became very important and explicit because in the context of haptic perception, movement is a condition to perceive and by means of movement people without vision may investigate and discover the world (█████████).

Finally, non-visual triggers to take photographs turned out to be tangible (haptic, olfactory, auditory) and intangible (memories and knowledge) in nature (█████████ █████████). This shows that the act of dialoguing, both in words and in actions, results in photographs that reveal a form of techné that is difficult to capture in guidelines or norms but that explains the importance of insights in perception in order to create experiences. For example, one child took a picture of his gym mat but this picture consisted of 12 pictures, slowly taken with a lot of caution (see Figure 5).

Figure 5:

While he moved his hand, he took pictures step by step. Meantime, he explained why he favoured this mat. This mat demarcated a place that he associated with good memories like pleasant games and no fear when falling unexpectedly. So, this photograph was in fact the result of 12 photographs that illustrate the sequential steps in haptic perception and revealed the intangible experiences of the child by means of narratives. The compilation of the pictures demonstrates that the sense of touch has the ability to eliminate the distance that the eye creates as touch requires an intimate encounter (Candlin, 2006, ▮▮▮▮▮▮▮▮). Two other pictures (Figure 6) show how the children took a picture in the direction of a sound or a sound making radio. One radio was playing while the other was not on. These 2 different actions demonstrate that pictures were taken based on multisensory triggers as well as memories on multisensory experiences.

Figure 6:

Moreover, the camera itself served as a tool, a vehicle to create this knowledge both by means of tangible actions as well as intangible experiences referred to by the children (▮▮▮▮▮▮▮▮▮▮▮). The meaning of experience is considered as a form of expertise at several levels (▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮) and in this way the camera and the act of photographing led to a personal creation of the expert who was born blind. Data is actually created by the user him/herself. This data-*creation* empowers the user and informs the designer instead of the other way around.

By empowering people with a disability, we create new knowledge and insights on the perceptual modes of ability. For example, in the context of haptic experiences, this design process can reveal the potentialities of touch and can put assumptions and biases around touch and vision in perspective. The act of photographing actually creates outputs generated by expertise.

Exploring, Observing and Creating through Ability & Techné

Our three case studies that show the methods of exploring, observing and creating use photovoice and dialoguing that illustrate a means to better understand the techné of participants. This categorisation of methods gets at ability through techné and begin to consider techné as an alternative means of generating knowledge with and about participants to enhance design solutions. The techné of the persons with visual impairments are revealed through encounters within the spaces and with the objects that are familiar and unfamiliar. The techné of our participants illustrates a variety of unique ways that the world is experienced including how what things are made from, help with orientation, how design features within spatial environments act as barriers or supports, and how exploration, observation and creation are overarching themes related to the data collection of techné of people.

What is interesting with our participants is that by engaging with them in a more symmetrical and reciprocal way, it opens up opportunities for designers to understand more about their users. Anthropologist Jackson (1998) writes: 'in most cultures, people assume a cut-off point between a world they count as theirs and a world they consider other. (...The) lines of distinction inevitably entail questions as to how one negotiates, controls and crosses them' (167). By considering techné as a viable means to better understanding people and their abilities, designers begin to have deeper emotional connections to users and therefore begin to listen, watch, experience, understand, and enact users' lived experiences. The 'reciprocity of viewpoints' of users and designers support a deep dialoguing that reveals a great deal more about people's abilities and embodied know-how because understanding techné with ableism taps into the non-mechanistic frameworks of people's minds and bodies with a means to excavating their personalized knowledge, assumptions and ability biases (Geiser, 2008). The understanding of people's techné further involves dynamic

movement resulting in the emergence of a myriad of physical and intellectual viewpoints of users and designers.

Ingold (2011) describes this as perceiving things, not from a single perspective, but rather by walking around it to perceive spaces from multiple viewpoints, physical positions and more. This opportunity for multisensorial knowledge gained through moving along paths or in random directions is what Gibson (1979) calls a 'path of observation', a continuous itinerary of movement (196). Reminiscent of the peripatetic tradition 'talking whilst walking' is articulated as a means of refreshing the ideological space (Anderson, 2004, 257). Through this revised peripatetic tradition, talking whilst walking opens up a dialogue between body and mind, spatial environments and the body, and between people (e.g., designer and user) who engage in such an exploration (Anderson, 2004). This practice of talking whilst walking is also useful as it produces not a conventional interrogative encounter, but a collage of collaboration: an unstructured dialogue where all actors participate in a conversational, geographical and multisensorial informational pathway creation (Anderson, 2004, 260).

Our case studies illustrate the techné of various people of different ages, cultures, genders and (naturally) abilities. The techné of our visually impaired participants reveals unique relationships to the world around them that involved engaging with designed things in deep ways. For instance, the children who were born blind showed us that design details matter because the materials they touched helped them to orient to spaces of comfort and places they understood. While walking through these projects, each of our participants showed that they preferred closed spaces rather than open spaces. They liked spatial environments they could explore and that had unique features; they did not like spatial environments where lighting was inconsistent and where mirrors created confusion.

For people who are visually impaired, in general across all of our case studies, sight is actually a very significant ability, as is shown with other studies (███████████). The ability to see colour, light, contrasts and volumes are elements of the spatial environment that were essential to the design. Within each of our case studies this was a very important finding because designing for sightlessness is very different from designing for sight (even in the limited ways that it plays out for many people). This is also very important to understanding the possibilities for a codesigning process and the creation of codesign methods that move beyond the assumed abilities of people with visual impairments. It is important to point out that not all of our participants had residual vision, but those that did, use it all the time to help them orient within spaces, to help them find their way through spaces, to help them find things and people, and to mark the times of the day. The ability to perceive different materials and notice small details was another finding across some of our case studies (████████████████). Another example is the ability to perceive very specific locations through multisensory nuances felt through observations. For example, the ability to apprehend different lighting conditions including the differentiation between natural, fluorescent, and incandescent lighting; and the ability to understand the layout of a space through acoustics including whether a room was large, small, had a high ceiling, or was square, round or oddly shaped. A multisensory codesigning process unravels these abilities in the form of techné.

Multimodality and Multisensoriality in Codesigning

Ability and techné have significant potential to inspire future spatial designs and allow for a reimagining of codesign through multimodal and multisensorial methods. Multimodality assumes that representation and communication draw upon a multiplicity of modes, all of which contribute to meaning (Bezemer and Mavers, 2011; ████████ Multimodality focuses on describing and developing the full repertoire of meaning-making resources such

as visual, spoken, gestural, written, drawn, objects, embodiment and others in different contexts (Bezemer and Mavers, 2011; ██████████ Multisensoriality is also about the entanglement of the senses (a more holistic sensory experience) and not about the privileging of one sense (usually vision) over the others. Dicks et al (2006) expand: "What we actually observe in the field are the various media in which these modes are produced—marks on the page, movements of the body, sounds of voices, pictures on the wall" (82). Multimodality is about representation and communication whereas multisensoriality is about *how* we interact with and explore these different modes ██████████ Our three case studies are explored through exploring, observing and creating to assist in thinking about techné and to re-imagine abilities. This section discusses these three methods in the context of ability and techné in order to discover new ways that a codesigning process can use methods that support multimodality and multisensoriality.

Light in the Borderlands is a project that demonstrates the codesigning method of exploration by means of navigating through spatial environments including a shopping mall, an art gallery and a workout gym. Ambulating is often accomplished by using various tools such as white canes, guide dogs, tactile flooring, residual vision, learning spaces in advance, spending a great deal of time in those spaces, going to specific spaces with friends, and memorizing the details of spaces. Along with knowing how and thinking about using tools for exploring and navigating, the abilities that are necessary involve: acoustics, smells, air movements, materials, light, shadow, moveable elements within spaces, fixed elements of spaces, and spatial configurations.

The implications for motivating new spatial designs likely don't sound particularly unique or novel. However, seeds of innovation lie in countless epiphanies that come out of designers bumping up against different kinds of abilities. However, when considering the design elements that link to the unique abilities of persons with visual impairments the

problem of navigation can be partially solved. To begin, when things are tools, these become important things to take into account (like canes, tactile flooring, etc). Tools extend abilities and in essence act like prostheses even if they are not connected to the human body. Abilities, such as using residual vision; attentiveness to acoustics, smells and air streams; and materials detailing, make up a complex system for exploring and navigating spaces, are very important to developing spatial environments that have embedded characteristics that are useful to a range of people. In other words, through the unknowingness of what tools and abilities people with visual impairments use, it opens up a codesigning process wherein the designers followed, listened and observed to begin to understand the multisensorial ways that people with visual impairments explore and make sense of environments.

Observation was illustrated through the *CWM* museum project. The spatial environments included outdoor spaces, entrances, exits, pay points, parking lots, gift shops, classrooms, theatres, libraries, toileting facilities, exhibitions and cafés or cafeteria spaces. Although there are many different areas within museum spaces, for people with visual impairments other non-visual sensory perceptions became important to visiting a museum. Partially because most museums focus on occularcentric displays, which means that in order for persons with visual impairments to make the most of a museum they need to engage the other senses. For example, touch, in this situation, becomes an alternative mode to understanding spaces and information within those spaces. The abilities inherent to touching are all about engaging with the spatial environment and objects through the body including touching with the hands, feet, face, arms and sometimes other parts of the body. Tools for touching include canes (as extensions of the hand), footwear, using the hands to move a material or object against a facial cheek, brushing an arm or leg against objects or

walls, and more. Tools are used to engage deeply with objects and spatial environments and are highly relative to materials and design.

These abilities and tools can motivate future designs specifically in that awareness of the impact of materials and construction for designers can result in different approaches to incorporating these into designs. For instance, designers can create mindful material contrasts, careful positioning where the materials and objects are within human reach, especially through the feet and face and not just with their hands. For example, the *CWM* project is largely successful in its use of materials and construction techniques, as the walls are concrete with impressions of wood and other textures. Moreover, the walls of the *CWM* are sometimes slanted for unusual body engagements and the walls are rough whereas the floors are smooth thus contrasting touch for different parts of the body. When it comes to the exhibits, the *CWM* has many items that can be experienced such as a full-scale trench that can be walked through and a swamp embedded with soldier's bodies that can be walked on. It also has hand-held artefacts that can be held, stroked and smelled; and larger scaled artefacts such as vehicles and tanks that can be touched and even climbed upon. The *CWM* also has grounds and outdoor spaces that encourage experiencing outdoor trenches, rolling hills, grasses, plants and a look-out point where the wind can bite at the bodies of the visitors. Abilities linked to touching are powerful ways to provoke future spatial designs where spaces (even within one building) can utilize materials, construction techniques, sounds, smells and built spaces, which push human sensations towards unique and meaningful experiences. The experience of dialoguing while wandering with a visitor who is blind, revealed all of the knowledge, assumptions and biases that we as designers had about the abilities, capacities, interests, wants and needs of a visitor to a museum, and therefore completely shifted our understanding of codesigning processes and practices for the creation of inclusive museums.

The *School for the Blind* outlined and demonstrated the impact of creation. For the purpose of this article, the theme of creation is defined as the data generating process by the user for a more holistic process of engaging multisensory perceptions, as well as, memory and knowledge as cognitive perceptions. The spatial environments included indoor and outdoor spaces, entrances, rooms, exits, toileting facilities, eating areas, and entertainment areas with a school. Creation was the dominant theme in this case study because the participants were all born blind and were invited to explore their environment by means of taking photographs as a specific kind of visual impairment that results in the potential for a higher range of abilities. This "creation", with this case, involves new data output and hence alternative modes of understanding and expressing aspects of spatial design. The abilities inherent to creation are about multisensory experiences and embodiment: smelling, hearing and even tasting in the environment and all these actions relate to memories, remembrances or knowledge of spaces. These abilities are felt through the body and involve engaging with objects and spatial environments in alternative ways. Tools for perceiving include feeling with a cane, encouraging a guide dog to feel with its body, feeling with the body, smelling with the nose, hearing with the ears, seeing through echolocation, critical thinking, problem solving, and using intuition. These abilities and tools have the potential to motivate future codesign processes by developing a more holistic understanding of spatial environments whereby designs can be created as complicated systems or networks for multimodal and multisensorial encounters.

Conclusion

Our three case studies push the boundaries of abilities and what is considered techné; to provoke epistemological and codesigning processes. By focusing on how theories of ableism and techné are embedded in ways of knowing and doing, we look towards new ways to

codesigning with people with differing abilities. For instance, designers might assume that if someone is visually impaired, that they cannot give meaning to design. Our research and case studies provide evidence that reconsidering a codesigning process through ableism and techné, people who are visually impaired can create inspiring and meaningful designs through multisensorial processes that are inclusive of 'seeing'. Furthermore, our research explores the abilities and techné of people who were born blind and people who have visual impairments thus shows that the possibilities for codesigning and cocreating differs from person to person and requires a completely different codesigning process. In other words, designers cannot assume that if they work with several individuals who are blind that they can then create codesign methods for all people who are blind. Through our combined research, we have worked with people who are blind across three continents, for over twenty-five years and every time we codesign with someone new it requires a new understanding of their techné and requires us, as designers and researchers, to confront our own biases and assumptions of ableism.

Our three case studies presented here are not about providing empirical evidence of successful codesigning to create a codesigned product or environment, but rather a process of following and playing with the multisensorial and multimodal in order to create insights into abilities and techné. Through these processes, it is possible to overcome the traditional designer/user and interviewer/interviewee power relations and to forge something uniquely collaborative in codesign (Anderson, 2004). Through our research we are advocating for a different codesigning process wherein the designer's role shifts from translator, facilitator or leader, to listener, observer and follower within parallel methods of exploration, observation and creation.

Acknowledgements

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