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Rethinking while Redoing: Tactical Affordances of Assistive Technologies in Photography by the Visually Impaired

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Abstract

This article addresses ableism in 21st century network society by analysing affordances in the practices of visually impaired photographers. The case study details how these photographers use assistive devices, tweaking affordances of both these devices and the photographic apparatus: its technical materialities, cultural conceptualizations and creative expressions. The main argument is that affordances operate in exchanges where sharing differences is key; visually impaired photographers make differences sharable through images, revealing vulnerabilities that emerge within a socio-digital condition that affects users across a spectrum of abilities. The argument unfolds through a rare combination of affordance theory about imaginative and diverse human-technology relations, media theory about technological dependence and disruption, disability studies on normativity and variation, and art historical readings informed by semiotics and phenomenology. The article contributes to cross-disciplinary research by demonstrating that affordances can be tactical, intervening in pervasive socio-digital systems that limit who counts as a normal user.

Keywords

Affordance, tactics, assistive technology, photography, disability.

Situating affordance: Assistance in following and breaking norms

> Here I am at Advanced Prosthetics / Please, please can you / change my settings /
> THIS IS NOT POETRY, they said / Be happy with what we give you / We got you
>
> Jillian Weise in *Biohack Manifesto* (Davis, 2016: 520)

This article addresses ableism in the 21st century network society through an analysis of the tactical affordances that are realized by visually impaired photographers. More specifically, it explores how the practices of Pete Eckert, Kurt Weston, and the Seeing with Photography Collective address prejudices levied against disability by revealing and reconfiguring the ways in which photographic technology facilitates and enables use. This discussion unfolds at the interdisciplinary intersection between media studies on technological dependence and disruption (e.g. Galloway, 2004; Betancourt, 2016), disability studies on normativity and diversity (e.g. McRuer, 2006; Ellis & Goggin, 2015), and art historical image readings using semiotics and phenomenology (e.g. Andrews, 2011; Schneider, 2011). The additional application of affordance theory will serve a cross-disciplinary purpose, offering insight into interactions of disability, materiality and art in a digital context. These interactions are vital to the article's three-part argument. Firstly, that affordances are realized through exchanges in which the sharing of difference is key. Secondly, that the sharing of difference reveals how users, defined as both able and disabled, are vulnerable in current configurations of the network society. And thirdly, that the visually impaired photographers discussed within the context of this paper provide valuable examples of this sharing by using a visual medium to address norms about visuality; they make difference sharable through their images.

In *Biohack Manifesto,* Jillian Weise poetically captures how the act of sharing differences is a foundational yet precarious experience that unfolds through environments and devices, many of which are shaped by mainstream definitions of normality. Like Weise, visually impaired photographers may need assistance to make art and live life. Yet, they debunk any default notion of need when they develop individual responses to generic assistive devices. Weise's use of personal pronouns – I, you, we – turns the subject position into a mode of embodying possibilities (Butler, 1988: 521; Iversen, 2007: 91). As her poetic hacking extends from body to society, the poem connects possibilities

embodied in users with possibilities embodied in the devices that they use. Mainstream normality shapes technical devices that are built to universal standards as well as assistive ones intended to approximate them. If affordance theorist Donald Norman is reassuring in his notion that assistive devices keep errors from repeating (2013: 216), Weise repositions the error such that it is seen to alert users to settings that shape their agency. Correspondingly, through grounded examinations of contemporary photographic practices undertaken by people living with visual impairment, this article aims to show how their resulting photographs alert users across a diverse and dynamic spectrum of abilities. From this perspective, the capacity of these photographs to alert users to the settings that shape agency may develop into a particular kind of affordance.

In an effort to support this aim, the analysis revisits both classic definitions of affordance associated with 1970s ecological psychology, in which the "affordances of the environment are what it *offers* the animal […] for good or ill" (Gibson, 2015: 119), and 1980s design, where "*affordance* refers to the perceived and actual properties of the thing […] that determine just how the thing could possibly be used" (Norman, 2013: 9). Much of the recent emphases on imagination and variation in communication and sociology research are grounded within these definitions, while also developing them further. A process-oriented and socio-technical focus on imagined affordances, for example, "incorporates the material, the mediated, and the emotional aspects of human–technology interaction" (Nagy & Neff, 2015: 2) in an effort to free affordances from direct experience by stressing its inherently mediated character. A focus on mechanisms and conditions, by contrast, pinpoints "how artifacts *request*, *demand*, *allow*, *encourage*, *discourage*, and *refuse*" and how the user, in turn, perceives function, their physical and cognitive ability to use the artifact, and the cultural and institutional validation of this use (Davis & Chouinard, 2016: 2, 5). Reflecting the theoretical approaches and frameworks developed within these texts, the following study homes in on relationality, variability, and dynamism in the distinction between affordances, features and outcomes (Evans et al, 2016).

The article applies this understanding of affordance in order to investigate the capacity of the selected photographs to alert users to the settings that shape agency and the ways in which this capacity may develop into a particular kind of affordance: a tactical one. A tactical affordance is a possibility for intervention into a limiting system (de

Certeau, 1984: xviii-xxiv, 29-39, 68-72). Tactics become crucial in a network society where users engage with tools and environments in increasingly digital systems that situate sighted users as the norm (Castells, 1996-1998; 2013; Garcia, 2013: n.p.; McRuer, 2018: 90). Tactical affordances recognize and expand how law and policy defines assistive technology, enabling individuals with disabilities to engage more fully in valued activities (e.g. AGE-WELL, 2017: 8). Across today's networked platforms, images often serve to promote and provoke a mainstream stance. By contrast, the Flickr group, Blind Photographers, subverts sighted ideals by claiming that everybody needs assistive technologies (Ellcessor, 2016: 81-83). Furthermore, the affiliated photographers engage in valued activities by using devices whose protocols favour sighted users as well as devices defined as being of assistance only to persons with disabilities. They thereby challenge narrow definitions of both ability and disability as they create images for an audience differently sighted than them – perhaps for everybody.

The photographers featured here – Eckert, Weston, and the Seeing with Photography Collective – have spearheaded the Blind Photography movement over the last fifteen years, participating in public statements such as the first major museum exhibition, *Sight Unseen: International Photography by Blind Artists* (touring worldwide since 2009), and the publication of the Collective's iconic book, *Shooting Blind: Photography by the Visually Impaired* (2002). These achievements signal a momentous shift in how the work of impaired photographers is understood; it is gaining increased acceptance as art rather than being seen primarily as therapeutic disability art. The move between margins and mainstreams helps to provide context for this article's argument as it captures how disability and photography connect as a discursive formation in which images reflect, perpetuate and generate discourse (McRuer, 2006: 6, 20-21; Siebers, 2008: 30; Foucault, 2010: 38, 74, 116). The featured images capture and render explicit the discursive formations that situate them while also expressing critique. They point to a technologically driven society, especially a digital one that is so markedly visual and geared for augmentation that it becomes ableist, i.e., prejudiced against disability (Siebers, 2008: 7-9; Norman, 2013: 42-43, 283-286; OED). Pervasive yet unperceivable computational structures characterize this "socio-digital" condition, where inaccessi- bility to data is akin to disability – shaping the user with "fits and starts, accommoda-

tions and innovations, learned skills and puzzling interfaces" (Ellis & Goggin, 2015: 39; Ellcessor, 2016: 9, also 63-65, 74-75, 187).

To show how tactical affordances evolve in socio-digital conditions, this analysis evokes the "unruly body" as a position from which to address ableist conceptualizations of normality by detailing its "ragged edges" (Siebers, 2008: 65, also 67; McRuer, 2006: 6-10, 31; 2018: 20-23; Davis, 2016: 1-3). This position links three means of disrupting normality: to queer, to crip, and to glitch. From this perspective, the glitching of technical protocols resembles the cripping of ableist restraints, which evolved from the queering of social scripts that control markers of identity (Butler, 1988: 525-526; McRuer, 2006: 19; 2018: 20-24; Siebers, 2008: 55; Norman, 2013: 128-129; Ellis & Goggin, 2015: 116-117; Hirschmann & Smith, 2016: 273-274). These disruptions become tactics as they affect systems that require a certain kind of body to pass as normal. Both able and unruly users embody sighted norms that are embedded in technologies and that afford vision – such as the photographic apparatus. Photography facilitates unruliness when observers begin to question their means of observation (Iversen, 2007: 91-94; Schneider, 2011: 138-144). The photographers discussed here use their visual impairment to question visuality: a multisensory mix of sight, seeing, visibility, and visualization that points to the ties between embodied experience and social power.

Like Weise's poem, the photographers address normality by sharing their differences in the media landscape, one of the avenues through which disability is defined, governed, and encountered (Ellis & Goggin, 2015: 20, 113-117; Ellcessor, 2016: 4; Kleege, 2016: 448). As art is vital to this landscape, the analogy between unruly bodies and unruly images connects this study to art historical traditions – like Dada and Surrealism – concerned with how breaking aesthetic norms through errors sparks critical reflection. The analysis shows how technical and sensory errors reveal norms, yet avoids tropes like automatically linking errors in bodies and images or assuming that errors are always critical. The theme of disability and technology thus brings the socio-digital condition to bear on art's capacity to test limits. Art offers insight into societal changes by revealing conditions that stay hidden within everyday routine (Noë, 2015: 15-17, 145, 166-167).

The article enters into dialogue with both artists and scholars, offering close qualitative interpretations that enrich the understanding of how affordances work in practice (Flyvbjerg, 2011). It does so by detailing how acts of sharing differences matter for the operation of affordances, grounded in empirical examples of photography to which we now turn.

Operating affordance: Visually impaired photographers at work

> Where I'm going is so different that I have to have a plan […] I visualize and then I adapt. I assume it
> will be about three-quarters the way I planned, and a quarter what happens.
> Pete Eckert in *Sight Unseen: International Photography by Blind Artists* (McCulloh, 2009: 28)

The following section will provide an analysis of three illustrative case studies in an effort to chart how visually impaired photographers activate affordances that enable and articulate both them, as users, and the devices that they use. As Pete Eckert captures in the preceding quote, this interaction reveals how a dynamic between chance and control supports a reconceptualization of the technological apparatus.

Pete Eckert

Pete Eckert calls himself a visual person, turning to photography after becoming legally blind several decades ago (ibid: 2-3, 28). Avoiding digital cameras as they do not "click into place," Eckert uses "all the tools of blindness to build photos" including a dog and cane; a talking computer and timer; an iPhone; a Braille camera and light meter; and various windup gadgets (2018, email). These tools serve both tactile and auditory purposes – and Eckert ensures the "click into place" by carving steps in the focus rail with a jewelry file (ibid). Using these tools, Eckert constructs scenes with homemade props and friends as actors; he composes a "one shot cinema" capable of conveying open-ended narratives (McCulloh 2009: 28). A filmic mode evolves in the darkened space illuminated with lasers, flashlights, lighters, candles, and gunpowder before the open shutter of a large-format, composite body view camera. To him, as to other impaired photographers, the camera is an assistive device for seeing beyond the visual (ibid: 2-3, 28).

Fig. 1: Pete Eckert: ***Bone Light No. 94119-10*** **(2016). Used with permission by the artist.**

The *Bone Light* series (Fig. 1) represents a biofeedback loop that emerged as Eckert worked to rewire his visual cortex; he sought to counter vision loss through the triangulation of touch, echolocation, and memory: "In the world I depict I can see, albeit via my other senses [---] I can see light coming from my skeletal structure" (2018, email, web). In image *No. 94119-10,* Eckert models light and dark to visualize the biofeedback loop with elements that signify mixed emotions. Outstretched fingers

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signal both caution and curiosity together with the feet planted steady on the floor. Eyes peek through the dissolving head with human fortitude. Hemlines of shirt and trousers add familiar contours to the distorted body. The mixed effect comes about through Eckert's bodily investment in visualizing his environment, honed with a degree in sculpture that extends to photography as he sculpts the materials of his tableaux with tactile movements. These movements blend and sharpen the contrasts that form the basis of vision. His response to visual impairment dethrones seeing as the best route to visualization: "maybe especially with no input, the brain keeps creating images" (ibid: 3, 28).

According to Douglas McCulloh, curator of *Sight Unseen*, practice and condition are collapsed in the series: "[t]he roving light is an uncanny substitute for the artist's missing sight" (ibid: 28). Here, disability comes across as an advantage, as Eckert's deteriorating physical sight has given way to a form of inner vision (ibid: 2-7, 28). The photographers in this case study offer nuance to this binary stance in the understanding of the relation between inner and outer vision as opposites, as the concluding section will clarify. Eckert's effort to visualize "a nonvisible wavelength" is one example (ibid, also 42). His first photographic experiments in response to losing his sight was to shoot at night with a small, fast camera that allowed for easy movement. To venture out like this became a way for him to reclaim an altered experience of personal space while also expanding his physical range in an environment that was no longer visually accessible to him. While later works such as *Bone Light* appear more staged, his interaction with the environment still reveals a deep interest in photographing the nonvisible. This reclaiming seems like a feature or an outcome of using the camera, rather than a typical affordance. However, the camera affords an engagement that is not only visual, but also haptic and kinetic as it connects visual and tactile aspects of experience with bodily movement. By harnessing and implementing the affordances of the camera, Eckert was able to add sensory data rather than reducing it, emphasizing a visceral corporeality rather than a more cerebral inner vision. This activity would enable his later explorations, bringing about new possibilities for action.

The Seeing with Photography Collective

Although sighted, Mark Andres initiated the Seeing with Photography Collective, in 1980s New York, in an effort to develop photography as a mental and physical process

while confronting issues around disability (Hoagland, 2002: 19). The group, which he calls an "ensemble," undertakes collective experiments in an effort to re-evaluate the perceived intersection between photography and vision (ibid, 2002: 19-20). A key example of this re-evaluation is that the collaborations include photographers that range from fully sighted to fully blind, and from amateur to professional. By creating a space where individuals can share a wide spectrum of visual abilities, the Collective counteracts an ableist notion that photography is only for the fully sighted. In *Portrait in Paper* (Fig. 2), for instance, Andres assisted Sonia Soberats, who had no professional background in photography when she joined the Collective, to use photography as a means of processing the experience of going blind after losing her family.

The collaborations involve articulating ideas, setting scenes, posing people, pointing cameras, directing flashlights, and focusing the enlarger to make a print that carries the bright distorted layers characteristic of chronophotography (ibid: 19-20). Photography comes across as multi-sensory, as the collaborators use their voices and bodies to gauge the sizes and scales of sitters and scenes. The image renders these relations as a process unfolding between individuals, objects and environments rather than as the frozen framed instant often associated with photography: "Nobody sees the whole image until the Polaroid is opened" (ibid: 19, also 21). The quote signals inclusion as it points out that nobody, regardless of visual ability, has complete control over the photographic process and its resulting image. Furthermore, this lack is a source of creativity for all photographers rather than an obstacle to creativity for photographers with a visual impairment.

Yet, the narrative about the Collective in *Shooting Blind* sometimes emphasizes obstacles. Disability seems overpowering in portraits presented as "plaintive bones" that show the "strain and resignation" of a "pared and harrowed" life (ibid: cover, 5, 7). Such wording dramatizes disability in a similar way as *Sight Unseen* does with regards to the work of Eckert (discussed above) and the work of Weston (discussed below). However, the interpretations put forth in these publications also convey a more enriching complexity, that corresponds with the interpretation in this analysis: "Stamina, tension, imprisonment, humour, and hallucination are frequent themes, yet the element of mourning is often playful, and the collective enterprise is more than therapy" (ibid: 5, also 6, 21). This complexity is evident in the image by Andres and

Soberats (Fig. 2). The sitter's face appears through thin sheets of wet paper, modulated by the rapid swirls of the moving flashlight during an exposure long enough to capture movements between profile and frontal view. The aesthetic renders the body's boundaries unfinished and vibrant, as if in an emergent state in which the eyes are about to form a gaze that meets the viewer from within their deeply shaded sockets. With and without its accompanying disability narrative, the image conveys both the tension and the play noted above. In this analysis, the image conveys the emergent state of all bodies – thus exemplifying a state in which we share differences and make differences sharable.

Fig. 2: Sonia Soberats and Mark Andres: *Portrait in Paper* **(2009). Used with permission by SWP.**

While a sighted photographer, like Andres, may handle the flashlight during the image-making process, it gains an assistive quality through Soberats' use as it further enables her to be active in the creation of the image. The flashlight in this case affords both a controlling of light that is prevalent in mainstream sighted photography while also facilitating the aestheticization and inclusion of alternative perspectives, namely the haptic and embodied perspectives of blind and visually impaired photographers. The resulting image in this case captures and collapses the diverse bodily and spatio-temporal dynamics of a collaboration that includes variously sighted participants. These dynamics are readable in the image as traces of light, aligning the Collective with mainstream traditions while providing alternatives to ableism: "It is very different from a normal photographic method where you see what you are going to take" (Andres in Hoagland, 2002: 19). Andres's statement confirms that these photographers move between mainstream and margin, sharing characteristics with both common and uncommon photographic practices. This analysis confirms that their in-between position facilitates the re-evaluation of the perceived intersection of photography and vision that Andres seeks, by inviting viewers with diverse abilities to reflect on what counts as normal both within and beyond photography.

Kurt Weston

Kurt Weston stresses that blindness is a common yet contested part of being human (Grundell, 2018). Weston's practice changed from fashion to art photography after he lost his sight in the mid-1990s because of complications associated with HIV/AIDS. He describes being gay, ill, and blind as "a journey into otherness" that is stigmatizing, but that also calls attention to the fact that "we are all headed toward decay and dis-ability" (Weston in McCulloh, 2009: 100, also 2-3). Despite identifying the universality of this experience, he engages critically with the term 'disability'. Assistive devices enable his life and work: magnifying loupes, monoculars, handheld LED-lights to illu-minate camera controls, glasses for low vision optometry and large monitors with en-larging software. Not only does Weston explicitly advance the claim that everybody needs assistive technology, identifying another universality, but these tools also figure into his art, revealing affordances that help and hinder his engagement with the image (ibid).

Weston's engagement with disability revolves around levelling his own impairment with those of others, creating viewer positions that share his situation (2018, email). He creates these positions through both his images and their display. One example of this is the video installation *Paper Doll*, which forms part of the series *Visual Assist* that explores assistive devices as both blessing and curse (ibid). The video shows a person using an assistive device to see a doll moving to a recording. The audience mirrors the situation, forced to peer through holes in a partition. These positions – doll, user, audience, artist – bring the viewer of the artwork closer to the viewer in and behind the artwork, sharing diverse and challenging views. A similar theme and a similar effect characterize *Outside Looking In* (Fig. 3) from the series *Blind Vision* (2000 – ongoing). This series comprises a collection of self-portraits produced with the use of a scanner – an imaging technology that Weston began incorporating into his practice after experiencing sight loss. While the display of this series does not involve the viewer spatially and physically as in *Paper Doll*, it does exemplify how the image invites the viewer to share the photographer's situation through aesthetic means.

Fig. 3: Kurt Weston: *Outside Looking In* (2015). Used with permission by the artist.

In order to create the images in *Blind Vision*, Weston presses his body against the scanner glass and is illuminated by light coming from inside the machine rather than from an external source, as is usually the case in photography. As *Outside Looking In*

(2015) illustrates, the process results in a shallow depth-of-field, rendering the scanned objects through sharp contrasts that take on semiotic importance. Minute details of skin are articulated yet blurred as the tips of the nose and fingers touch the glass. Face and hand fill the visual space with a human presence destabilized by the flat expanses where the scanner has failed to register, challenging the representation of a unified body. Glasses and camera visually mirror each other's lenses, underlining their assistive quality yet also becoming dysfunctional as they exclude the human user: the glasses are opaque and placed rather than worn, and the grip on the camera only permits to "shoot blind."

This analysis of the interaction between visual elements suggests that Weston's work, like the work of Eckert and the Collective, engages with disability discourse and beyond. For instance, the images' emphasis on visual apparatuses calls attention to the coinciding terms of vision and visual impairment in a manner that remains regardless of whether or not the viewer knows about the photographer's condition. The image points out that visual apparatuses integrate human and nonhuman eyes in both enabling and disabling ways, exemplified by the glasses placed over the eyes yet blocking the view. Like the earlier examples, Weston thus conveys the body in a way that invites reflection on what a normal body is or what it could be. This happens in part through his creative negotiation of what counts as a normal performance of both photographers and their devices – for instance, what you can and should do with a scanner depending on how you perceive its affordances. In his self-portraits, Weston expresses himself as "an abnormal, anti-conventional, and culturally marginalized body" (ibid.). This statement addresses ableist notions that limit definitions of normality and yet it does so in a way that underlines the important role that shared spaces play in linking experiences across and beyond abilities. By drawing on photography as well as medical visual culture – the *Blind Vision* series combines optical devices with syringes or, as in *Outside Looking In*, echo the aesthetic of a botched medical scan – he points out affinities between technologies that manage and mediate shared instances of vulnerability. In this vein, his work demonstrates how these imaging technologies can counteract vulnerability by assisting both disabled bodies and the idealized abled body, while also facilitating an interrogation of discourses that define the terms of vulnerability, assistance and normality. In doing so, they open up a space for viewers with varying abilities to share their experiences.

Eckert, Weston, and the Seeing with Photography Collective: Diverse responses to disabling experiences

This section brings out connections between the three cases as they have unfolded in the discussion of individual practices and particular works. The connections link the work of these specific artists to more general questions about disability and user agency, discussed further in the following sections.

Eckert carves steps in the focus rail, Weston pushes his face against the scanner bed and Soberats puts wet paper on her sitter's face. Their hands-on and head-on approaches to photography may be practices developed in response to disability yet, beyond any specifically disabled positions, they may reflect the ways that all users necessarily "gesture and dance to interact with […] devices" (Norman, 2013: 283). These photographers incorporate the so-called 'tools of blindness' into their photographic practices, the affordances of which are intended to neutralize disability by enabling the approximation of normal sight. At the same time, the photographers' need for assistance also calls attention to disability, occasioning an opportunity to address the terms and limits of normality.

Eckert, Soberats and Weston all incorporate devices designed for disabled individuals into the photographic apparatus, while simultaneously identifying the assistive qualities of devices designed for able-bodied users. They thereby expand both the possibilities of visualizing their environment and the functions of their devices. These devices assist the visually impaired in managing light and optics in both normative and experimental ways. Management of light and optics is fundamental to photography while also connecting the medium to the 19th century Impressionist practice of painting-with-light. Within the Blind Photography movement, references to such culturally validated experiments in visual perception recur in descriptions of the sensory particularities of photographs and photographers as well as in claims to a historical link with canonized avant-gardes; both of these tendencies are seen to add legitimacy to works emerging from the movement (Hoagland, 2002: cover, 5-6, 8; Eckert, 2018, email).

While this connection plays an important role in grounding the work of photographers who live with disability, it may result in reductive interpretations of their work as disability art, or of themselves not only as crips but as supercrips. A supercrip does not only reclaim the pejorative label cripple by identifying as a crip but turns cripness into

a superpower. This figure is ascribed a unique expertise in a struggle for normality that involves everybody crippled by injury, illness or age (McRuer, 2006: 30, 35-37, 2018: 13, 19-22; Siebers 2008: 63, 68; Ellis & Goggin, 2015: 114). The refiguration of artists living with disability as supercrips appears in artistic and institutional framings of visually impaired photographers; this is apparent in McCulloh's emphasis on inner vision and Eckert's command of his visual cortex. This is perhaps unsurprising as the artistic avant-garde is often construed as a social position with augmentative tendencies in both ableist and disability discourses. This being said, while a blind person may have the advantages that blindness affords, such as potentially moving with greater confidence in the dark, it is risky to frame disability as either an augmentative advantage or disadvantage. An emphasis on advantage can be essentializing as it often treats advantage as an *essential* quality of a particular disability; from this perspective, advantage is construed as a potential (though perhaps unrealized) enhancement re-gardless of the unique reality of individual experience and actions. Advantage should instead be recognized as a matter of practice – ongoing labour – rather than being bound up with a conceptualization of identity as "a publicly regulated and sanctioned form of essence fabrication" (Butler, 1988: 528). The discursively encouraged identity of the supercrip recalls the societal support needed to validate particular perceptions and dexterities (Davis & Chouinard, 2016: 4-6). However, this analysis shows that the images reveal a more complex position than any simplified dichotomy between ability and disability: they question all kinds of settings as well as their accompanying labels. The interplay of light and dark serves as more than a metaphor for the presence or absence of sight, as the blurs and edges that articulate the bodies in these images also connote diverse responses to multifaceted disabling experiences.

These observations support a reframing of narrow definitions of disability and the assistive technologies that are intended to simplify the work of visually impaired photographers. Instead of signifying a lack within the photographer, or turning lack into asset for the sake of the supercrip, this analysis suggests that the images do not passively carry disability as a marker of identity. They rather mediate an agency of expressing experience, as they stress that asking questions about how to do disability is more important than illustrating how to be disabled. This shift from being to doing becomes apparent through a consideration of the dynamics of light and dark, notable in all three examples. Their aesthetic similarities, though differently expressed, contra-

dict a default uniqueness assigned to inner vision. Instead, a common ground emerges from which to engage with the discursive pressures that define us all. The analysis affirms that these images shape such a common ground, facilitating an understanding of difference beyond dichotomy. The visual realm thus encompasses blindness as a part of the sensory and social relations that shape notions of visuality in its deepest sense: sight and seeing, visualization and visibility.

Disability brings a "visual friction" that invites the impaired to develop "social hacks" against stereotypical behaviours – a blending-in that masks impairment so that it ceases to impair (Lehmuskallio, 2015: 100, 102). This social hack resembles Weise's poetic biohack as the invocation to "change my settings" expresses a desire to pass as normal while simultaneously claiming space for disabled bodies by collapsing the experiences inside and outside the poem: "the metaphor of walking and poetry assumes a certain functionality that fails in reality" (Davis, 2016: 519). Both hacks expose a tension between abled and disabled, pointing to the need for a shared space where for instance variously sighted individuals can explore and perhaps resolve that tension. This analysis suggests that creative practices like poetry and photography provide such a space by drawing out and subverting stereotypes.

While narratives that chart the overcoming of disability pervade the network society, digital augmentations seem primarily available to able-bodied users who, for example, may not need devices to click. Though disabled users are often early adopters of new technologies, many devices remain inaccessible because average users perceive that adapted designs affect the average user experience – a problematic effect, negative or not (Ellis & Goggin: 2015: 41-44). Differing experiences of access, as detailed here, point to how the socio-digital condition regulates technologies in ways that exclude certain users on both material and affective levels (Ellcessor, 2016: 158-164). The material and affective dimensions of technologies and their corresponding affordances are thus increasingly important within mediated environments (Nagy & Neff, 2015).

Building on the preceding analyses of how several visually impaired photographers activate the photographic apparatus to produce meditations on vision, the following sections will advance the article's two main arguments: namely, that affordances are realized through exchanges where the sharing of differences is key; and, correspondingly, that visually impaired photographers make difference sharable

through images that reveal users as vulnerable across a spectrum of abilities. In an effort to accomplish this, the next section puts these examples in dialogue with conceptualizations of affordance that define which actions become possible depending on how – and how much – we can see.

Troubling classical theories of affordance: With and against blindness

Without a good model, we operate by rote, blindly; we do operations as we were told to do them; we can't fully appreciate why, what effects to expect, or what to do if things go wrong.

Donald Norman in *The Design of Everyday Things* (Norman, 2013: 28)

[A] boundary that is unique to the observer's particular anatomy. It is called the *blind region* in physiological optics. [---] It is altered when a person puts on eyeglasses […] Thus, whenever a point of observation is occupied, the occupier is uniquely specified…

James J. Gibson in *The Ecological Approach to Visual Perception* (Gibson, 2015: 197)

James J. Gibson and Donald Norman, key figures within canonical accounts of affordance, situate blindness as both lack and excess. Underperformance or over-presence, both correspond blindness to a kind of dysfunction: an obstacle to being in the world. In doing so, they offer an entry-point through which to reflect on how visually impaired photographers expand the concept of affordance by engaging the presumed obstacle: their eyes.

Blindness appears in Norman's discussion of 'conceptual models' as the mental maps that enable us to predict the effects of actions performed by objects and by ourselves (2013: 25-28, also 98-99). In this model, prediction is the basis for understanding. Since predicting depends on recognizing visual patterns – i.e., on seeing – a bad model makes this recognition harder. In other words, a bad model is bad because it does not attain a fully sighted ideal. For Norman, individuals thus become dependent upon their visual capacities and corresponding apparatuses. Considered in relation to technologies, users may suffer not only because of conventional visual impairments, but also if their age, height or language hinders them from recognizing the visual patterns that enable use – all of which are obstacles to achieve an able-bodied ideal. While Norman supports designing for diversity, in a manner that might help to overcome these barriers, he claims that assistive devices may remain unused because they advertise infirmity or are ugly. "Most people do not wish to advertise their infirmities […] to admit having infirmities, even to themselves. [---] Most of these devices are ugly. They cry out 'Dis-

ability here"' (ibid: 243-245, also 285). To advertise the wrong thing or the right thing in the wrong – ugly – way is an expected concern in design.

Norman's conceptual model positions disabled people as special whether they fail or surpass a standard; this is similar to the narratives of overcoming associated with the supercrip. This contradiction exposes the difficulty in handling specialness when discourses that determine normality can ascribe ableist functions to both norms and deviations (Davis, 2010; Cryle & Stephens, 2017). Specialness here draws on a flexibility lauded in design for affording a universal inclusivity, which paradoxically shapes a subject whose striving for normal abilities is necessary in order to fulfil societal logics that perpetuate exclusion (McRuer, 2006: 12-13, 16-17, 41; Norman, 2013: 246-247; Davis, 2016: 2; Ellcessor, 2016: 112-116, 158, 187-188). Flexible users adapt more easily to universal standards than unruly users do. This process recalls how institutions codify normality in Weise's poem: "Insurance: You are allowed ten socks/year / Insurance: You are not allowed to walk in oceans" (Davis, 2016: 520). An emphasis on hiding infirmities – the opposite of advertising as a public token of social acceptance – confers the ugliness of the mediation to a user who, like Weise, cannot avoid stating: "Disability here."

James J. Gibson's ecological optics, from which the theory of affordance develops, offers an opening towards diversity. A blind spot appears with every position: wherever I look, I see my own nose too (Gibson, 2015: 197). My body blocks an entirely free access to my surroundings. The environment changes in the presence of my unique anatomy, as it perceives places and movements. The body thereby specifies the occupied position and the individual who occupies it. Since the body becomes an excessive presence, blindness becomes an impairment. If following Gibson, this impairment seems easily remedied with glasses despite being an inescapable part of human embodiment. This perspective points to a wish for pure seeing similar to the notions of inner vision earlier, and a simplified notion of assistive devices. Yet, it also implies that all observers with noses, and bodies more generally, share a similar experience as a result of their differences and not despite them. This shared experience is fundamental to meaningful relations between individuals and environments; significantly, it does not exclude blindness from the exchange that shapes the terms of relation and therefore the realization of affordances (Evans et al, 2016: 36, 46-47). Acts

of sharing, as a result, help to afford understanding between variously abled individuals.

This discussion brings out a recurring theme of universality and difference in classical affordance theory. This theme causes a lingering problem for the visually impaired. The problem occurs as these theorizations posit a normative kind of visuality: seeing, and seeing in a particular way, becomes fundamental since it shapes relational activities like insight, attention and empathy – turning blindness into a negative metaphor (Kleege, 2016: 440-441, 448; McRuer, 2018: 191). This limited understanding of visuality limits the affordances of assistive devices within medical, social and cultural models of disability if unchecked. Meanwhile, these models develop in ways that challenge such limitation, for instance by shifting the issue of assistance. If a medical model focuses on the individual defined as disabled, the social model focuses on which environments produce definitions like disabled, and the cultural model combines them with an emphasis on critical creative expression (Siebers, 2008: 3-5, 25-27, 63; Ellis & Goggin, 2015: 21-35; Ellcessor, 2016: 3-4, 10; Hirschmann & Smith, 2016: 263-274).

Blindness and Photography in the Network Society

This analysis recognizes how non-normative users make the terms of a normative visuality explicit, and therefore sharable, as their position as other-than-able-bodied is well suited to demonstrate the inevitability of all human corporeality (Butler, 1988: 522-523; Siebers, 2008: 193). The featured photographers accomplish this by confronting various models of disability through their own body. As Weston puts it, "these images confound restrictive conventional discourses and defy oppressive norms for bodily appearance and behaviour" (2018, email).

However, conceptualizations of blindness in classical affordance theory are premised on and emerge from an able-bodied experience of sight. Impaired photographers intensify this tension since their use of technologies to make art and live life recalls that an able-bodied ideal underpins a social identity that is encouraged and even expected but unattainable (Siebers, 2008: 15-16). Their circumstances make their choice of photography as existential as it is pragmatic, pointing out that our activities shape our identities. The mode of vulnerability aestheticized in their works is not endemic to a marginal group but affects user agency in a world defined by visually navigated technologies. The acknowledgement of shared vulnerability supports the

notion that affordances operate in exchanges defined by the sharing of differences – for instance, when observers begin to question their own means of observation, like their eyes. As the case studies show, to share experiences of vulnerability through images affords such self-reflection both in those who create them and those who view them. We become aware of the ableist norms that make us vulnerable: less a characteristic of our specific identity than a characteristic of the process through which identity is continuously constructed. The remainder of the article delves into this process to clarify how this affordance may become tactical – starting with the integration of the social, the technical and the bodily that pervades network society.

The effects of visually-oriented vulnerabilities are made particularly apparent through photography as it has become a key feature of contemporary digital culture; the constellation of technologies and practices that comprise photography work to attract, interpellate, steer, track, and target users within the digital flows of the 21st century network society (Lister, 2013; Kuc & Zylinska, 2016; Lagerkvist, 2018). The impact of these functions raises the issue of whether vulnerability may be an affordance, a feature or an outcome of digital technology – or perhaps all three (Evans et al, 2016: 39-41). Over time, certain visualizations circulating through the network society may take precedence over others as more accurate depictions of reality. Conceptualized as diverse yet designed to neutralize disruption, the photographic apparatus prescribes a bodily investment that pertains to all but disables some. If photography primarily serves a user who embodies an imagined consensus on normality (Nagy & Neff, 2015: 2-7), it may also afford resistance since it calls the universality of the reality that it depicts into question. This performative quality reveals the hidden structures that are mediated by the apparatus (Iversen, 2007: 94, 97, 100-101; Schneider, 2011: 135, 144). One structure revealed here is the ableism that produces disability by excluding some bodies from participation and feeding insecurities about all bodies (Butler, 1988: 522, 528; McRuer, 2006: 20; Ellcessor, 2016: 2-3, 77; Hirschmann & Smith, 2016: 269-271).

Impaired photographers, like those discussed above, develop tactics against the normative limitations that are mediated through such structures by changing the affordances of assistive devices: using them to question them. Their visualizations describe ability and disability together, intervening in the systems that validate depiction. This tactic gains ground if it makes the system visible to itself, facilitating a direct address of

hidden structures (de Certeau, 1984: xvii-xxiv, 34-39). Users can thus reposition disability as an "othering other" that recognizes the otherness of the able body too (Siebers, 2008: 6, also 60). The images here visualize an impairment that awaits all bodies to some degree, someday, as nobody is able enough for long enough.

This being said, assistive technologies complicate the assumption that tactics can be seamlessly equated with the breaking of norms. Technology conditions the statements that it enables. For visually impaired photographers, technological assistance thus supports the vulnerability that drives them to create images with and about impairment. They may follow a norm by balancing out the disability while also breaking the norm by exposing it in the image. The image turns the error into a tactic against standardization, a cultural constraint resulting from a push towards universal usability where "everyone learns the system only once" (Norman, 2013: 252, also 248). Nonetheless, human erring is due to the system's requirements overriding the requirements of a user who is "forced to serve machines [and] punished […] for deviating from the tightly prescribed routines" (ibid; 168).

Errors become useful when users accept that our devices and our selves are vulnerable: systems and individuals are always already broken (McRuer, 2006: 30; 2018: 23; Siebers, 2008: 67; Hirschmann & Smith, 2016: 280). The undesignable gains value when the system cannot fix an error and the uninterpretable causes a time-out for reflection: a temporary suspension of dependence (Norman, 2013: 184-185, 231). The photographers' interactions involve both the known and the unknowable. Eckert states, "I use any light source I can understand" and then uses the light he perceives as radiating from his bones (McCulloh, 2009: 28). As the analysis shows, the inaccessibility of a prescribed use alerts users to their own access and affords other uses. In the process, the recognition of patterns that are not exclusively visual challenges the primacy of vision in the conceptual model of the world. For instance, the Collective's use of flashlights reveals scratch-like patterns (Hoagland, 2002: 6) that trace kinetic and haptic actions in a photographic space that is also a social space. The images generate knowledge through a "repeated corporeal project" with stylized gestures that yield unexpected outcomes (Butler, 1988: 522, 519).

The analysis in this section shows how vulnerability characterizes users positioned by both assistive and other technologies, and how disruptive practices reveal and reclaim

positions of vulnerability. The argument that the sharing of differences is key to the operation of affordances, and that this exchange rests on an acknowledgement of shared vulnerability, finds support as the photographers here make vulnerability productive without neutralizing disruption and reinforcing normality. Rather, disruption affords a kind of repositioning: "[i]t is only when we come across something new or reach some impasse, some problem that disrupts the normal flow of activity, that conscious attention is required" (Norman, 2013: 42). The next section analyses this repositioning of the vulnerable user – and thereby of the affordances of the devices that they use – in further detail to bring out its tactical potential: alerting users to the conditions of their use.

Repositioning affordance: Unsmooth operations and tactical coalitions

> All of us are the other.
>
> Kurt Weston in *Sight Unseen: International Photography by Blind Artists* (McCulloh, 2009: 100)

Weston's words signal that the other is intrinsic to a socio-digital condition. While this sense that we might all be the other within one context or another has a universalizing effect, within digital contexts, the other is often associated with that which falls outside of the normalized parameters of computability, namely the disruptive error or glitch. To harness such disruptions is an incentive in glitch art, which explores technical errors to question a system by making it "injured, sore, and unguarded" (quote in Galloway, 2004: 206; Kelly, 2009: 285-295; Krapp, 2011: 53-54, 67-68; Manon & Temkin, 2011: §15, 33, 46, 55; Betancourt, 2014: 10-12, 2016; Grundell, 2016, 2018). The photographers here share this approach to vulnerability as that which poses a contingent risk to the normalized operations of technological systems. While they do not identify as glitch artists, their concern for risks around normality connects their work to glitch art. In this analysis, glitches do not mark a moment of failure as much as a moment of disrupting expectations of technical operations (ibid). Both glitch art and disability aesthetics reveal the socio-digital conditions of the medium by calling attention to the structures and processes of mediation – and to how the technical is always at once social and bodily. In the following, the glitch thus serves as an analytical tool to deepen the discussion of the featured photographers.

The risk for technologically situated bodies evokes the roots of the word glitch: losing balance in a slippery place (OED). This snagging slipperiness juxtaposes a smooth operation. Smoothness rests on protocol: instructions that govern material and symbolic conditions of network society (Galloway, 2004: 74-75, 122, 241-246). Protocols shape affordances by shaping how humans and devices interact. While tactical uses like hacking may support a particular protocol, users can also "resculpt it for people's real desires" (ibid: 175-176, 241-242; Garcia, 2013: n.p.). Weise satirizes how the system feeds and denies desire: "be happy with what we give you / we got you" (Davis, 2016: 520).

Assistive devices keep us from slipping and steady us if we do: they facilitate an able-bodied form of control that is positioned as normal (Norman, 2013: 243-248; AGE-WELL, 2017: 8). For instance, failure causes a "taught helplessness" when things break down (Norman, 2013: 62-63, 113). Established definitions of assistive technologies target those deemed helpless: the ones that Weise's system "gets". Disability and glitch cultures game such systems: activism through and against prescriptive mediation (Ellcessor, 2016: 136-137). In this analysis, a glitched body – not as an ontological essence, but as an experience of disrupting normative systems – points to a shared glitchability.

The photographers here perform photographic protocols, using cameras and bodies to manage light and optics. Yet, they break protocol by turning a scanner into a camera or treating phantom sensations as a light source. They defy a standard integration of the sensory and technological apparatuses that determine which users pass as normal in systems where normality is key (Schneider, 2011: 137, 156, 160; McRuer, 2018: 14-16, 22, 29, 190-191). A preferred user position emerges through an imagined consensus about the meaning of default structures and the positioning of user bodies within them (Nagy & Neff, 2015: 2-7; Ellcessor, 2016: 76-77). A digital designer may smooth out Eckert's clicks and notches if they perceive the uses, or affordances, that they enable as negative. Disability reveals such ordinary design processes as hegemonic ableism and, yet, individuals adapt to such cultural decisions: from eyes to fingertips to posture, and from attention span to typing pace. Eckert modifies and replaces his devices. These instances of adaptation are disruptive and ultimately reveal, and therefore afford, the development of more diverse devices (Ellcessor, 2016: 76-77). While both users and devices typically perform protocols by repeating norms, disability factors in re-

imagining them – and, in turn, calling for validation (Ellis & Goggin, 2015: 116-117; Davis & Chouinard, 2016: 2-6; Ellcessor, 2016: 63-65). This study details a creative attention and physical grit that empowers individuals to transform painful experiences by sharing them (Butler, 1988: 522; Siebers, 2008: 60-61, 188-189, 193; McRuer, 2018: 24).

Tactical transformation starts with noticing the systems on which you depend. The glitch extends beyond technology to the affective realm where haptic and episte-mological levels of use meet: where I learn from my experience. Inclusive design that invites disruption without isolating the disrupter as 'too special' avoids enforcing a difference that only benefits the mainstream – especially design for mediation that constitutes and corrects identities (McRuer, 2006: 12-13, 41; Siebers, 2008:17, 30, 56, 189-190; Ellis & Goggin, 2015: 1-2; 113-115; Ellcessor, 2016: 187; Hirschmann & Smith, 2016. 278; IDRC, 2018). Disruptions ease the burden of acting in concert and accord (Butler, 1988: 525-526). Creating images without seeing as the manual prescribes thus offers a non-normative way of learning. By modifying devices to ex-plore boundaries around normality, the featured photographers set examples for everybody who feels anxious about these boundaries. Such explorations invite an ack-nowledgement of the brokenness that shapes processes of seeing and making, being and becoming (Siebers, 2006: 68; Hirschmann & Smith, 2016: 279-284). The analysis supports the claim that everybody needs assistive technologies, insofar as variously abled users need assistance to approximate current norms of visuality that prioritize control. Technology cannot avoid "the injured, sore and unguarded" – the unruly.

The photographers here take a position of mutuality: they are in control and in need. A choice emerges between the mainstreaming of difference and the subversion of the mainstream in an effort to accommodate difference. The images address this choice by either hiding or stressing their conditions of production. To display assistive elements stresses disability yet makes it transparent and therefore negotiable. As exemplified in all three images included here, fragmented layers of assembled bits break up the unified image to signal the impossibility of a unified body (Siebers, 2008: 27). A first step to repositioning this unruly body is to invite viewers to acknowledge vulnerability, by anchoring all participants in the intimate interactions of an environ-ment that allows for the uncontrollable. These interactions happen in everyday life but

require further attention from users – including the artists and scholars that this article connects. The visceral strength of these photographic practices amplifies everyday experiences rather than deviating from them. For instance, technology sensitizes users as they adapt to the conditions of the interaction on a subconscious muscular level, while responding to unexpected events with an affective startle not unlike a glitch (Norman, 2013: 50-51).

From this perspective, Weston's legal blindness is different from my near-sightedness by degree rather than type. The opposition between ability and disability is a cultural decision. Weston's lenses on display remind me of my glasses, and of how the auto-focus on my camera stands in for them to adjust my sight. The triviality of this observation is relevant from a tactical viewpoint since intervention happens from within a system.

Visually impaired photographers engage with the mediation of the image, the image-maker and the image discourse. In doing so, they spark a seeing that reshapes the imagined affordances of the eyes: what eyes let us do and be (Nagy & Neff, 2015: 5). Experiences of sensory and technological integration are grounded in a process of embodiment that "resists universalizing claims and uses the multiple particularities as a source of knowledge" (Ellcessor, 2016: 160, 163). Particularities put forth in the case studies exemplify the sense that tactics are both spatial and temporal. Time invested in creation – moving flashlights, waiting for a scan – becomes time to experience, generating "leaky, syncopated, and errant moments […] that play with time as malleable *political* material" (Schneider, 2011: 180; original italics). It is tactically important to assert the presence of disabled users in a network society with socio-digital conditions that place them "outside the normal range of civic and cultural experiences" (Ellcessor, 2016: 25, 81). The interactions of these photographers invite coalitions between users, affording the acknowledgment that questions directed to the blind apply to us all: "how do you orient yourselves, bear the loneliness, stand the streets?" (Hoagland, 2002: 8). The media environment yields manifold positions when a focus on disability invites a "wrestling with the margins" – margins presumed within a socio-digital hegemony (ibid: 196). Such a margin cuts through Weston's work as he incorporates assistive devices that afford both support and discomfort. In this vein, these devices are prosthetic both in the sense of extending the body and of othering

the body in need of assistance. Otherness becomes a shared condition with an acknowledgment of the experiential as inextricable from the discursive: necessarily social and political. The physical investment in making these photographs thereby extends to include the viewer, whose experience of the image is equally inextricable from the discursive.

These creative practices do not glitch technology – only slightly modify it. Still, they replicate a glitched mediation to capture a disabling moment: to transform it and share it with a variously sighted viewer. In this analysis, this results in a glitching of our habitual expectations on both users and use: who could or should be doing what with which devices. Such expectations form part of how we perceive and actualize affordances. When their photographic work exposes and challenges expectations, it thus develops a tactical affordance.

Like the excerpt of Weise's poem cited earlier, their images both mirror and generate the structures that shape them – that shape the definition of the bodies in which the seeing resides and that make the images possible. Weise points out that you notice your settings only when they need to be changed. These settings are technical and sensory, the two ever more intertwined. The hacking that occurs in the poem – like the queering, cripping, and glitching in the images – reaches into the settings so that users can identify the conditions that define their position as able or disabled. This alert may contribute to visualizing a more accessible future (Ellcessor, 2016: 97, 199-200).

Conclusion

This article shows how the photographic practices of the visually impaired can facilitate a self-reflective alert through a disruption that activates a tactical affordance. The tactical quality is not an object or a feature of an object they use, since these enable mainstream uses too, nor is it an outcome of how they use them since the interpretation of the resulting image may repeat mainstream tropes – its range of appearances and interpretations indicates variability. Within these parameters, the analysis does identify an affordance (Evans et al, 2016: 39-41). Moreover, this affordance is specifically tactical since it enables interventions into a socio-digital condition that is at once pervasive and limiting.

Tactical affordance is pertinent since it is inclusive: it alerts users across a diverse and dynamic spectrum of abilities. Acknowledging the tactical affordances in photography by the visually impaired thus contributes towards this article's aim to address ableism in network society. The analysis meets this aim by working through the main argument, detailing how the photographers make differences sharable through images that reveal how users defined as both able and disabled become vulnerable under the network society's socio-digital condition, defined largely through terms of visuality and visualization emerging from an able-bodied perspective. The case study demonstrates that digital affordances affect their life and work in conflicting ways. While digital devices and platforms are intrinsic to the photographers' photographic production and circulation, digitality also excludes them by generating and upholding a sighted user position.

The act of sharing emerges as key to the operation of affordances. The analysis shows how this operation actualizes classic and contemporary interpretations as it connects environmental factors, object properties, and human agency in technologically mediated relations. The photographs reveal mechanisms and conditions of affordance, as the photographers reconfigure given functions of both assistive and mainstream technologies as well as their own dexterity to use these technologies. Furthermore, they reclaim societal validation for this reconfiguration. Their images thus provide tactical examples for users to react to and act upon.

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