

## **EXTENDING THE DIALOGUE BETWEEN DESIGN(ERS) AND DISABLED USE(RS): FROM CONVERSATION TO EMBODIED SKILL**

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### **1. Introduction**

This paper considers how the relationship between architectural design and disability can be turned from a constraining relationship into a facilitating one. It is argued that limitations can be turned into opportunities through dialogue; opportunities for designers, their designs or design methods, and for all users, whether they are disabled or not. The dialogue can take on different forms, and—as we will show—benefits can be found on the designer’s side as well as on the user’s side. In the following, we will first discuss the problematic relationship between architectural design and disability, both for a designer as for a disabled user. We then turn our attention to the notion of dialogue in design research literature, after which we will consider two empirical cases that explore the possible benefits of architectural design in dialogue with disability. Finally, we present a discussion of the implications for current and future design research and practice. In extending the dialogue, new questions emerge about how we communicate design intent and use design skill.

### **2. Disability and design, a constraining relationship?**

The relationship between architectural design and disability could be said to be problematic, both for disabled users and for architects. For the latter, disability is often experienced as constraining for their way of working and for the resulting designs. One important reason for this lies in the way in which disability ‘comes in’ or is ‘let in’ into the design process. More often than not disability appears throughout the design process as obligation, through guidelines or building codes. Gray et al. (2003: 35) for example, report on the constraints felt by architects and other professionals: “[built environment professionals] expressed the opinion that codes and guidelines restrict their creativity and ‘take away the challenges of the designer to come up with intelligent solutions’.” Disability, in this sense, is presented and represented in a way that not only gives it a pejorative connotation, it also limits the scope in which disability can be considered an interesting source for designers.

On the other side of the numbers, guidelines and building codes, actual experience of real people can be found; that is, on the user’s side, the relationship between architectural design and disability can also be felt or experienced as a constraint. By constraint, we actually mean that the relationship between user and design itself can be disabling. In recent accounts of disability, disability is not seen as an attribute of the person, but as resulting from the interaction between a person and an environment. Or, put in a designerly way: “In this perspective, disability can be defined as a gap between two user representations, without it being necessary to pronounce upon the nature of the gap, its ‘origin’: deficiency of the user/deficiency of the ill-conceived object that proves itself incapable of taking into account the diversity of users.” [Akrich 1999: 39; our translation] This results in a constraint for disabled users in the sense of an absence of certain supports that make use constraining,

more laborious and an environment more arduously to deal with than it is for ‘other’ users. But besides that, and of no lesser importance to disabled persons, it is the constraint of them being deprived from a full-fledged sensory experience that was inscribed in the design by the designer.

The relationship between architectural design and disability as described above does not necessarily have to be a problematic one. If designers and disabled persons engage in a dialogue, the situation might turn from limiting into stimulating for both. Designers learn about the people behind the numbers and regulations and better understand the other’s experience of the built environment. This in turn can inspire the designer for future designs. The disabled persons can get new insights about the built environment, by becoming more aware of the design process. Furthermore, if the gained understanding is applied to future designs, disabled persons will have a less constraining and more pleasant experience of the built environment. Something that is well known by both parties—be it the built environment or something else—is questioned again and considered afresh.

### **3. Design research and the notion of dialogue**

Dialogue as it is most commonly understood implies a verbal exchange of information between two or more human agents on some issue; a conversational to-and-fro of spoken words. This is the conventional version of ‘authentic’ dialogue. To designers and design researchers, this notion of dialogue is not new; by most designers and researchers of design, it has been understood as a conversation. Yet, in design this to-and-fro can also take place between a designer and his-her drawings. In an early account, Donald Schön (1983: 103) has described how “[designers] engage in a conversation with the situation they are shaping, guided by the situation’s back-talk.” This includes the situation of the design, such as aspects of the site, but also the situation of designing with models, sketches or drawings.

More recently, Rachael Luck and Janet McDonnell have been studying dialogue in design settings between architects and users to a great extent. They have focused mainly on ‘conversation’, but in their most recent work they evolved to ‘interaction’ between participants [Luck 2009, McDonnell 2009], which is a broader concept than just talk. This fits in with their larger theoretical stance that design is a form of social constructivism that emerges in interaction: “When the activity of design is viewed as a social process, in design interactions the notion that attributes of a ‘design’ are modified and negotiated is readily accepted.” [Luck 2009: 21] In this sense, not only the design is developed in interaction, also the roles of the different participants are not a fixed given. They are in constant negotiation throughout the design session: “We can see that a priori designations of the roles of building user, client, designer and so on play their part, but that they are also to some extent continually negotiated during conversation; to some degree they are emergent features of the social interaction.” [McDonnell 2009: 49] Although a focus on conversation has allowed for a detailed study of human interaction during the design process, there are often artefacts present in these interactions that also have their role in designing. McDonnell (2009: 49) formulates it as follows: “Here, with a focus on conversational interaction, notwithstanding any shortcomings as a means of communicating design intentions they may have, the drawings provided an external, common reference point for organizing systematic consideration of issues that needed to be talked about, without imposing stringent control over what might be discussed.”

The notion of dialogue thus is changing. It is moving from dialogue as conversation to dialogue as interaction. One important difference is that the role artefacts—and by extension, non-human actors—play in this interaction is acknowledged. Non-human actors can have a more active role, and mediate the dialogue as much as the persons involved. We will develop this further in the following empirical cases. Another understanding of the notion of dialogue will allow us to show different ways in which the interaction between design(ers) and disabled use(rs) can offer opportunities for both.

## **4. Empirical cases**

### **4.1 Methods and empirical material**

To better understand the possible opportunities that may lie in a dialogue between design(ers) and disabled use(rs) we will discuss two different cases that are part of an ongoing research project. Its

basic method stems from design anthropology, i.e. *design ethnography*. The first is the case of Chris Downey, an architect who recently became blind and continues practicing. The other is the case of a performance workshop where people with different disabilities together with able-bodied participants visit a recently finished building to assess its accessibility and usability. The data for the case of Chris Downey come from a semi-structured in-depth interview at the office where he works. The interview is audiotaped and transcribed word-for-word for further analysis. The data for the performance workshop come from observations obtained from participatory observation of the visit and the collective discussions afterwards. The observations are recorded in fieldnotes and photographs. For each case we have selected two examples to describe more in detail different instances of dialogue that may hold an opportunity for use or design, or both.

#### **4.2 Non-alignment between a designer and his design tools**

For a first case of how a dialogue between architectural design and disability can create opportunities, we turn to Chris Downey. After an extensive career in architecture, he lost his sight due to surgery in 2008. He chooses to continue his career as an architect and is asked to work with Smith Group, a design firm in San Francisco, to assist them in the design for a new Polytrauma and Blind Rehabilitation Centre in Palo Alto. Downey joins Smith Group when the design has already started, after the client asked the architects how they would properly inform themselves on designing a building for people who are blind or have low vision. Apart from that, the architects need to explain the design to the people working and teaching at the Rehabilitation Centre, some of whom are blind.

One of the first issues Downey has to tackle is finding tools he could use to design now that he has become blind. Most common design tools and representations that are used in architectural design do not allow to be read other than in a visual way. These concerns started at a very practical level, but as we will see, may shift attention to more profound issues. We will explain this further based on two examples: one where he has to find a way of getting the design information stored in CAD-drawings of a BIM-model; another where he reinterprets the use of a material palette during a design meeting. If we understand disability emerging from the interaction of a person with his/her environment, rather than as an intrinsic attribute of the person, in these examples the disabling situation lies in the interaction of Downey with the design tools used in the architectural office where he works.

In terms of a dialogue, we could comprehend this interaction as a dialogue between Downey and his design tools, much as Schön (1983) sees design as a conversation with the materials of the design situation. Moreover, it is an embodied dialogue, a dialogue mediated through his body. Through his body, Downey understands the existing design tools in a new, non-visual way. Because the loops between perception (that is visual perception) and action are interrupted, a non-alignment between Downey and the tools manifests itself. Now, non-alignment between the designer and his tools makes working with it impossible and prompts enquiry and reflexivity about how to go about designing. It thus informs him about flaws and possibilities that enable him to further enhance the tools.

When Downey arrives at Smith Group, he has to get to know the design of the Rehabilitation Centre up to the point where it is in the development. The primary method to do this is through CAD-drawings and for that he obtains a medium format embossing printer, which was developed to print out Braille texts and graphics in Braille. Although this printer is meant for more basic shapes, Downey starts to print out entire CAD-drawings with it. But as a CAD-drawing is meant to be read visually, using a set of visual signs, Downey finds out that such plans need some extra alterations before they can be read in a tactile way. For the time being he can always get help from a colleague, for instance someone who explains the drawing to him first. But he is looking for ways of doing this more and more independently.

One of the first problems encountered is that of the size of the drawings. Not only does the embossing printer limit the physical size to a roll of paper of 16 inches wide; also the question arises what is an appropriate size for a tactile drawing. “You need to get the size that’s appropriate, and you need to shed some information like if there’s too many notes or things that, visually you can easily separate things, but if all that becomes tactile it’s overwhelming.” [interview Chris Downey] The literal translation of the visual language of a CAD-drawing to a tactile format seems to be problematic in the sense that he has to search again for the balance between scale and the amount and types of

information conveyed by, for instance, a plan. One way of doing this, Downey and his colleague find, is through layer management in the BIM-file. First Downey discusses with a colleague what information is crucial, after which this colleague turns off layers, decides which scale to use and the size of the drawing and saves all this in a PDF-file. From this intermediary file, Downey can then create a tactile print. Although this procedure works within the established structure of the architectural office, it takes a lot of time, and the information passes quite some modes of representation, with a transformation of information as result. On the other hand, this goes for every translation between modes of representation [Latour 1990].

Moreover, translation from one representation to another also creates new possibilities for different use, or displaying different information. Besides providing Downey the design information he needs from the central BIM-model, these tactile translations also facilitate communicating the design to clients with a visual impairment. One of the teachers at the Rehabilitation Centre is blind and, before, the architects have to explain the design through talk, which sometimes leads to problems of having the same understanding. But with these tactile plans Downey generated, they can “share those with the director of the living skill department, and that in a way, had drawings of [...] the plans and elevations of the kitchens. She was like, ok, now I know what you’re talking about, [...], she was right in on it and this was an incredibly useful mean.” [interview Chris Downey] The tactile drawings provided a more fixed representation of the design where both parties can start from or fall back on in case of doubt.

The specific way in which Downey starts reinterpreting the use of CAD-drawings in architectural design holds some opportunities in terms of communicating the design, but also of the types of information stored in them, or ways of retrieving this information. CAD-drawings are still developed from a visual standpoint. They evolved from the hand drawn plans, sections and elevations, and they are still plotted with ink on paper for evaluation. Downey’s interaction with the CAD-drawings not only questions what information can be stored this way, but he also reads these plans in a more sequential way compared to the direct overview one gets from looking at a plan. This might be more in tune with a blind person’s perception of the built environment.

A second example of a design tool altered in interaction with Downey is that of the material palette, a collection of different samples of materials. One of the ways to decide about materials for a design at Smith Group is for an interior designer to compose such a material palette and put it on the table for discussion. This was common practice before Downey joined them, but the way he reacts to it was not. Downey describes the first meeting he had with an interior designer of the office. “She had put together a sorting on a material palette, and [she] wanted to have some difference in flooring materials. [She] wanted to use that as a transition. [...] They had slightly different textures, but feel pretty much the same. I put them on the floor and pulled out my cane, and they’re exactly the same. They were visually very different, and they had different textures but not at a level that would be translated through a cane.” [interview Chris Downey]

Compared to the tactile plans, the example of the material palette illustrates how a certain tool or way of working already contains certain possibilities that allow for a richer use, without them always being clear to the user. The material palette as it was used before was more directed towards a visual appreciation. Paradoxically, the choice of distinct materials based on tactile qualities was guided more by a visual evaluation of the tactile difference between the textures than by their actual tactile qualities. This becomes suddenly very clear when Downey interacts with the materials in a tactile way, and then a tactile way as taught to the blind, through a cane. Yet, this is only an indication of the opportunities encompassed in such a material palette. The representation of materials and material combinations through material samples allows informing design decisions in a more multi-sensory way, other than a mainly visual one.

### **4.3 A performance workshop as a framed activity**

The next case of dialogue between architectural design and disability is situated more toward the user’s side. It has to do with a workshop that is organized by the Equal Opportunities Consultant (EOC) of the city of Leuven. Together with the local Advisory Committee Accessibility (ACA), the EOC organizes a workshop for the assessment of a public building on its accessibility and usability.

The outcome is intended to inform future design decisions. The ACA is made up of people with different disabilities or their spokespersons. They make up for three quarters of the workshop participants. The rest of the group are able-bodied participants, mostly novices in the matter of accessibility assessments. The narratives of the workshop include using the building according to real-world counter-part narratives: these could be typical sequences such as way finding in and around the building; site-specific sequences like looking for information, or using a ‘service cubicle’; and further, some participant interactions with the building result in small ‘plays’, revolving around problems that could possibly occur, and how they could be solved.

Organizing such a workshop as an instance of dialogue within the reflexive loops between use(rs) and design(ers)—in which use informs design, which in turn brings into being new use through new designs—holds the promise of disclosing at least two opportunities. Framing the dialogue between user and building through a workshop on the one hand entails a move from user experience to user expertise in the disabled users. This means a move from tacit skill and experiential knowledge that often stays unaccounted for to uttered articulations that can be shared with others. On the other hand, it becomes a learning situation for able-bodied novices. A hands-on and performative learning, in which they learn to perceive the built environment in novel ways.

The way the workshop is set up, makes it into a performance workshop. It is constructed around the actual, embodied use of the building by actual, disabled users. But why disabled users? In their everyday experience of the built environment, disabled people develop particular skills to deal with disabling environments. The more, besides identifying obstacles, they also appreciate qualities that other people are not aware of. For designers, such skills and experiential knowledge are interesting to know (about); to translate and integrate this information in designs not only for disabled users, but for all users. However, the problem is that the skills and knowledge are of a tacit nature to the user. S-he knows about them in an embodied way, in ‘doing’ them. But s-he does not necessarily exteriorize them by verbalizing or having any other representation of them. The information stays where it is, in (the experience of) the user.

One of the ‘plays’ of the workshop participants, for example, emerges around the accessibility of a toilet. Two wheelchair users get in a discussion whether the toilet space could be entered. After some to-and-fro of arguments, one participant states “but why don’t you try it!”. As he tries and fails, the other participant asks whether she could try. As she moves to the door, she says: “usually, when I have this problem, I use my feet”. She then tilts her wheelchair backwards, lifts it so that her foot brace cling to the door handle, and then with a subtle turning away she opens the door. While the participant ‘usually’ does this, the problem nor its inventive solution would have been shown and uttered had there been no workshop.

What we can retain from this is that framing experience of a building through the mediation of a workshop calls for reflexivity; a reflexivity that a user would not have in mundane or ordinary use. Contrary to ordinary use, the workshop acts like a moment of attention in which the person shifts towards the object, while at the same time, and in the same movement, the object shifts toward the person. The workshop draws attention to use, user, and building in a way that allows for experience to be turned into expertise. The user becomes more aware of his-her (embodied) experience, use or skills, and looks for ways, words, or concepts to communicate about them. While the language or representations used are not necessarily those of the designer, they often reveal a compelling knowledge.

This brings us to the second opportunity that the workshop as a framed dialogue holds. It also acts as a learning situation for able-bodied participants; learning about disability experience and skill. Part of the learning situation follows from the framed and reflexive character of the workshop, and part follows from the performance aspect. Performance workshops, as Halse & Clark (2008) discuss, can be said to be established, institutionalized minimal space, a space where “participants are willing to explore the ‘what if’ often requiring a ‘sanctioning off’ of time and space from the structural accountability of everyday activities.” [Halse & Clark 2008: 9]. The workshop prompts people—disabled or able-bodied—to talk and try freely; it leads people to test and critique things more easily. And this is also reinforced by the attention the workshop asks for. Attention drawn to accessibility and disability experience, ‘imagining how it would be’. This reflexivity in turn leads to seeing things that

can be derived from what one knows on disabled people, however limited. Moreover, knowledge on disabled people is increased during the process; and this not only in a discursive way—through talk—but also based on embodied display of information.

Another important aspect of the learning situation thus lies in the performances of the disabled participants during the workshop. In the wheelchair user group, the first ‘obstacle’ on the tour is a public elevator. Upon arrival, the group does not really know what to do. B., president of the ACA, takes up his role as an experienced expert and performs this by taking the elevator while the others stand there as an audience. He seems to be used to this kind of scrutiny of his actions. At that point, he does not only perform his disability, he also performs his expertise, which in the course of the workshop takes on a whole different meaning. Other, able-bodied participants also seem to see it like that; later on during the workshop, an able-bodied participant says to B.: “Yes, you need to test it for us, hey!”. We could say that the performance of disability within the framework of a workshop is like a learning dispositive.

Besides expertise-in-experience that develops thanks to the framing of the dialogue between (disabled) user and building as we described above, the dialogue mediated through a performance workshop also instigates expertise-on-experience. As a learning process for able-bodied participants, the embodied character of the workshop encompasses mere discursive dialogue. Much in parallel with the learning of professional vision [Goodwin 1994], the embodied, situated and performance-based apprenticeship of able-bodied participants has a propensity for the learning of expert vision. As one of the able-bodied novices literally puts forward during the workshop: “I’m already learning how to see, too!”

## 5. Discussion

In the previous cases we have seen different ways of how dialogue between architectural design and disability can take form. Framed activities such as a performance workshop, for example, make certain aspects of the interaction between person and object (e.g. a building) more explicit. Further, points of non-alignment between a designer and his design tools provide another example of how reflexivity is evoked in the persons involved. Framing the usual ways in which users deal with buildings (or objects), or being pushed to problem solving during the design process discloses opportunities that were barely noticed before. Opportunities that went unnoticed, although they were already there. Dialogue, in this, can be said to amplify these so-called silent realities [Law 2004]. Amplifying silent realities that can lead to new insights that were not explored before. This is a feature of dialogue that can create opportunities for the practice of design in a much broader sense. However, there are also some implications for future research and analysis that come to the fore. Following the above-mentioned cases, and in order to grasp the full extent of use and design through dialogue, we propose to further extend the notion of dialogue beyond the purely conversational.

So, what does it mean to ‘amplify silent realities’? In order to understand this better, we first might briefly reconsider the silent realities that are present in our cases. If we identify the silent realities in the case about Chris Downey, we can acknowledge that they exist in a specific, rather unusual use of existing design tools, and that they can reside in design aids (as is the case with the material palette). In the case of the workshop, one of the silent realities can be said to be the tacit skills and experiential knowledge that are present in the user. Another could be learning the embodied knowledge of other users in using a building. Consequently, we can suggest that silent realities exist either in bodies, or in buildings/objects, or in-between, in use. This knowledge and these possibilities exist, but usually stay unaccounted for. Reasons for this can be multiple, but we can sum up some: the relationship between designer and design tool is *unproblematic* and thus is not questioned; the use of a design aid or sample is so *obvious* that looking for other functions is not considered; skills in the user are literally *invisible* to the designer; or extra-curricular learning effects of given design methods (such as a workshop) are *overlooked*.

A dialogue between architectural design and disability can amplify these silent realities because of the very explicit way it problematizes aspects that are often taken for granted. The role disability plays in the finding, disclosing and identifying of silent realities, in part, is due to the fact that for ‘able-bodied’ persons, whether able-bodied users or designers, things are taken for granted to such an extent that they stay invisible. Other aspects or dimensions of use are, more than just taken for granted, literally

invisible or imperceptible to able-bodied users and/or designers. This makes that the experience of disabled persons is almost actively (though not intentionally) disregarded. For disabled persons, on the contrary, having to deal with problematic and disabling situations, objects or buildings makes them aware of flaws, things being ill adapted, and/or new possibilities, either of sensory qualities or of use aspects. Chris Downey, for example, opened up the discussion around the material palette with such natural flair that he makes people wonder why they did not use it like that before. Furthermore, the maladjusted relation between a disabled user and object/building problematizes the taken for grantedness more quickly and makes things clearer. It does not mean however that a maladjusted relation cannot be the case for able-bodied users and designers. In their case, it is just less obvious or flagrant.

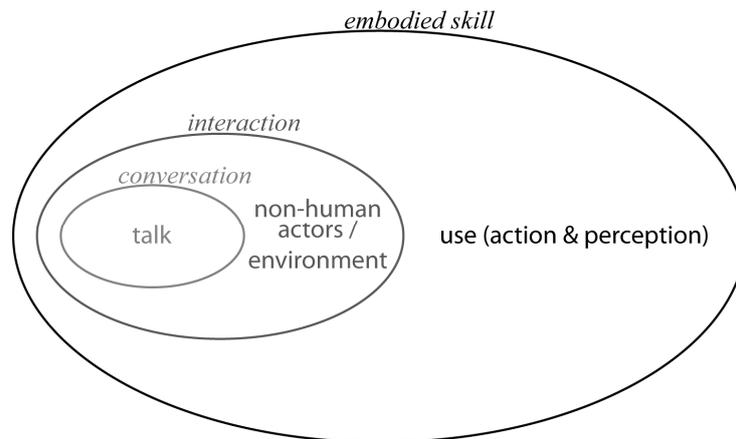
Now, what does this all mean for the notion of dialogue? Given the fact that the notion of dialogue in design research is shifting (cf. section 3), and given the outcome of our analyses (cf. section 4), we deem it useful—if not necessary—to further extend the notion of dialogue. First of all, the idea of dialogue *as such* is an interesting one for design and design research: it stresses the two-way relationship between use(rs) and design(ers), that is that they both inform each other and thus mutually constitute each other [Halse & Clark 2008: 4]. However, in order to be able to grasp the full extent of the dialogue between use and design, we need to further extend the notion of dialogue beyond conversation. We propose to move from conversation to embodied skill. Without being prone to too wide of an extension, understanding dialogue in terms of embodied skill encompasses conversation, it acknowledges the role of design artefacts as well as other non-human actors, and incorporates use as action and perception.

In order to develop a notion of dialogue in terms of embodied skill we have recourse to the way Tim Ingold (2000) understands it. Ingold puts that “skill, in short, is a property not of the individual human body [...] but of the total field of relations constituted by the presence of the organism-person [...] in a richly structured environment.” [Ingold 2000: 353] The latter version of skill allows us to consider dialogue in a more elaborate manner. First of all, we can tackle the question of *conversation*. Conversation as a mere verbal interaction, as speech, is not opposed to embodied skill according to Ingold. According to the author “speaking itself is a form of skilled practice.” [ibid. 361] Moreover, and much in line with the propositions of Luck (2009) and McDonnell (2009), conversation becomes indissoluble from the *context* in which it is enacted. On the one hand we can refer to design contexts as richly structured environments, on the other hand we can refer to such environments on the user’s side—which in our present case is a building.

Whether it is a building or a design studio with design tools (and other artefacts), the extended notion of dialogue includes these, and takes them into account for analysis. A purely conversational approach would not be enough to fully understand the complexity of the different interactions under study. For instance, when Chris Downey is explaining the design to the blind client, he also uses tactile drawings as part of their dialogue. But even when he is alone with these drawings—or his tools for that matter—a certain form of dialogue occurs. Without there being any other persons involved, Downey is in dialogue with his drawings and his design tools. The same could apply for the disabled users interacting with the building. Besides them interacting with other workshop participants, the ‘mute’ interactions with the building are part and parcel of the dialogue. It thus can be suggested that *non-human actors* (such as design artefacts and buildings) are inherent features of dialogue.

This brings us to the final point about extending dialogue as embodied skill, namely that of *use*. Use as embodied skill implies *perception and action*. This also has become apparent in the cases mentioned. In the case of Downey, he starts out with a ‘failing’ dialogue: because of his blindness, he cannot see and consequently cannot use the tools needed. In order to get perceptually attuned to the CAD-drawings, he adapts them to his way of perceiving (i.e. tactile perceiving). Moreover, with him, the blind client—and by extension the blind community—is able to interact about a design proposal beyond conversation. In essence, this is what any form of dialogue is about—a dialogue towards understanding. And this is equally true for our second case, in which the goal of the dialogue is to better understand how disabled persons make use of a building. By performing their disability, by showing their actions and how they ‘see’ or rather perceive things, the able-bodied participants—which can also be designers—are put in a learning situation that exceeds mere conversation. Surely,

speech can be a meaningful scaffolding to gain understanding through dialogue, but it is of no less importance to learn to perceive and to act as/for disabled users.



**Figure 1. Extending the dialogue from conversation to embodied skill**

Turning our attention back to design and design research, we can summarize what to retain from this move of extension. We can put forward that the amplification of silent realities exists in making new possibilities perceivable. Things are made perceivable in either an object, or a user, or the designer her-himself learns to perceive things differently. Rendering these unnoticed things noticeable, the designer can use them as input for the design process. We argue that the amplification of silent realities or getting unnoticed things in the picture can come from dialogue. From dialogue in a framework of embodied skill, then, it follows that there are implications for the ways in which dialogue is set up, the ways in which the data are subsequently gathered, and how they are treated in analysis. Throughout the paper we have put forward that there are different ways of establishing dialogue, and different instances within it; and this in a broader way than current conventional understanding of dialogue suggests. In doing so, we are opening up new horizons to be explored in design practice as well as in design research.

## 6. Conclusion

Because of the mainstream representation of disability in architectural design as regulations based on numbers, architects often find disability more constraining the design than it is inspiring. Disabled persons, on the other hand, have to deal with maladjusted environments on a daily basis; environments that are designed. But a dialogue between architectural design and disability can change those restrictions into opportunities. We investigated two cases where such dialogue occurs and gave some examples of opportunities for designers, disabled users, or both. These opportunities are already present in the situation, but they are not acknowledged as such, or immediately obvious before the dialogue occurs. In these cases, framing a dialogue between architectural design and disability makes problematic situations explicit, but at the same time informs solutions to these non-alignments. This is what we call amplifying silent realities. In addition, dialogue has to be understood in terms of embodied skill, rather than only as a conversation between a designer and a disabled user. Only then can we more fully understand how opportunities emerge from conversation, but also from interaction between human agents and non-human actors, as well as from use in relation to action and perception in a richly structured environment.

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