

Developing the theoretical content in Universal Design

Inger Marie Lid*

Faculty of Health Sciences, Oslo and Akershus University College of Applied Sciences, Norway

(Received 21 December 2011; accepted 8 August 2012)

Universal Design (UD) implies to plan and manufacture goods, buildings, outdoor spaces and facilities to be useable by all people to the fullest possible extent. UD has evolved from a focus on disabling barriers in the environments. As a strategy, UD has not yet clarified its relation to disability. The democratic potential for UD lies in recognizing all people as equal; this requires both theoretical and empirical studies. In this article, I focus on theoretical work related to UD, approaching UD as a value-laden concept and argue that there is a need to develop UD with a stronger focus on the dimensions related to the concept of human. A relational model for disability is proposed as a fruitful model for theoretically developing UD on a micro, meso and macro level. This model focuses on the inter-action in situations where disability emerges, and can therefore attend to the complexity inherent in disability and UD.

Keywords: Universal Design; disability; relational model; critical realism; phenomenology; CRPD

Introduction

Universal Design (UD) is a concept and political strategy that has evolved from a focus on disabling barriers and enabling environments. The origin of UD is in USA and the civil rights movement, UD is linked to democratic values by acknowledging all peoples equal citizenship (UN Convention on the Rights of Persons with Disabilities 2008 (CRPD)). The concept can be traced back to the architect Michael Bednar, who used UD to describe his understanding of barrier-free environments (Bednar 1977). The object of Universal Design is to plan and manufacture goods, buildings, outdoor spaces and facilities to be useable by all people to the fullest possible extent. As a legal and political term, Universal Design is based on the values of participation, non-discrimination, equality and equal opportunities. The theoretical content of the concept is, however, poorly developed (Imrie 2012; Lid 2012), and UD has not yet clarified its relation to disability and rehabilitation. In this article I will argue that there is a need to develop UD theoretically, with a stronger focus on the dimensions related to the human condition. From an ethical perspective UD needs to be linked to an understanding of person that includes disability as a human condition.

Professor Rob Imrie notes that creating universally designed places is integral to rehabilitation (Imrie 2012). He argues that UD can challenge the “disabling values and attitudes of society” (Imrie 201, 874). In order to develop this potential in UD,

*Corresponding author. Email: ingermarie.lid@hioa.no

the values inherent in this concept need to be elaborated on as a dimension of the theoretical content. In this article, I will start out by linking UD to disability, and develop the theoretical content in UD informed by perspectives from disability research (Garland-Thomson 1997; Gustavson 2004; Thomas 1999, Tøssebro 2004; Siebers 2008; Söder 2009; Wendell 1996). I will argue that UD needs to be situated in different persons' embodied experiences. Thereafter, I will move forward by focusing on disability as a human condition, seeing the concept of human through the lens of disability. Next I will analyse how disability can emerge in different situations focusing on the potential in critical realism for producing knowledge on disabling barriers as experienced by individuals (Bhaskar and Danermark 2006; Shakespeare 2006). However, in order to highlight the individual perspectives that should inform UD, phenomenology and hermeneutics are helpful as theoretical perspectives to complement critical realism. Finally I will discuss how disability can emerge in different situations in order to illustrate the complexity in Universal Design.

Universal Design and disability

I will here refer to the definition found in CRPD:

'Universal design' means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. "Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed. (CRPD 2008, Article 2)

According to this definition all people, included people with disabilities, are the target group for Universal Design strategies. Disability is a contested concept both in academic and political context (Kristiansen, Vehmas, and Shakespeare 2009; Thomas 2004). According to the CRPD, UD is linked to disability as a human condition with design of usable products, environment, programmes and services as objective. Thus both person and environment are included in this definition, which indicates an understanding of disability as relational. A relational model builds on knowledge from a medical and social model. From a medical model perspective, disability is located in the individual person's medical condition (Scully 2008; Shakespeare 2006). Research from a medical model perspective will primarily focus on individually related topics such as diagnoses, illness, treatment and rehabilitation processes. From a social model perspective, disability is located in society as an oppression of individuals. Research interest from a social model perspective will primarily focus on environmental factors such as politics, legislation, discrimination, architecture and oppression. According to the social model, disability exists as oppression in one's environment (Campbell and Oliver 1996; Thomas 2004; Shakespeare 2006; Scully 2008). UD is, by definition, related to environmental factors, and can therefore be seen as influenced by the social model for disability.

Most emphasis has been on implementation of the strategy in different sectors (Vavik 2009; Bednar 1977; Center for Universal Design <http://www.ncsu.edu/project/design-projects/udi/>). Thus little of the discussion on UD has reflected upon the theoretical content inherent in UD, such as the concept of human and how disability emerges. It has been argued that the social model forms the knowledge base for the legal development towards human rights and full participation (Traustadóttir 2009). This neglects however that UD also brings forth a change towards realizing what

human embodied vulnerability entails. Therefore, the social model is not sufficient as a knowledge base for Universal Design. Consequently, UD require a more comprehensive model of disability. If disability as a human experience and condition is overlooked in UD, the epistemological content risks being reduced to mere technological knowledge about disabling physical barriers and how to avoid them. Few scholars have worked on developing the concept of person implicit in UD and how UD is linked to disability. The potential in UD for challenging disabling values and attitudes in society should be further elaborated on. In order to develop this potential, a concept of person that recognizes disability as a human condition will be needed. The democratic potential in UD lies in a shift from a focus on accessibility for people with disabilities towards the principle underlying UD, which is that there is *one* population comprising people with various abilities and impairments (Iwarsson and Ståhl 2003).

I will now elaborate further on a relational model as it has emerged in Nordic countries, perhaps most prominently in Norway. This model conceptualizes disability as a product of complex person-environment interplay and integrates knowledge from a medical and a social perspective. A relapse to the dichotomy of a social and medical model of disability can be avoided by including both social and medical perspectives together with a focus on the interaction between the two, conceptualizing disability as a *relation* involving both individual and environmental factors (Lid 2012; Tøssebro 2010; Traustadóttir 2009). Disability emerges, according to this model, in the interaction between individuals and the environment, encompassing both social and material factors. The interaction itself is of importance, together with individual and environmental factors. A relational model focuses on a person-environment mismatch, which can be graphically described in what is called the gap-model.

In integrating the individual and environmental factors, a relational model theorises disability as a *gap*. This gap illustrates disability as emerging in a specific situation. The model enables the researcher to develop empirical and theoretical research questions to obtain knowledge involving individual, social, political, economic and material factors. In the CRPD we can also see a conceptualization of disability that frames disability in a relational model similar to the Nordic model:

Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which *in interaction with* various barriers may hinder their full and effective participation in society on an equal basis with others. (UN CRPD 2008, Article 1, my italics)

The relational model shown in Figure 1 calls for an examination of human diversity, social and political factors and the person-environment interaction; examining more deeply what human embodiment and impairments means for the experience of disability. Individual factors are thus crucial for the interpretation and realization of UD. From this background I will argue that a relational model is the best conceptual point of departure for theoretically developing UD and to situate the concept in different individual experiences. The model has its origin in a Nordic welfare state but the fact that both the CRPD and the WHO-World Bank World Report on disability employ a similar relational conceptualization of disability indicates that it may be a productive approach to disability globally. A focus on disability as an interaction does not also entail that the state accommodates all people's need for accommodation. What is of epistemological importance is to

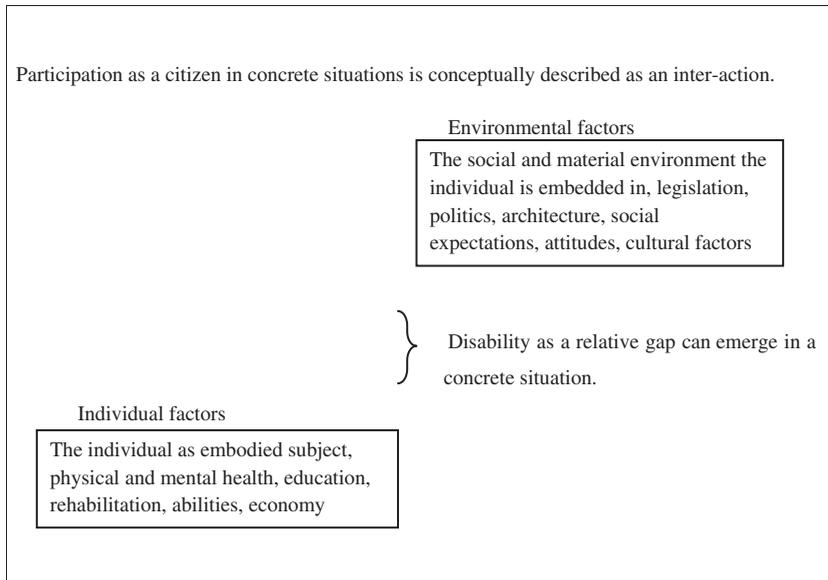


Figure 1. *World Report on Disability* Lie 1996, modified by the author.

develop new research questions involving both individual and environmental factors aimed at understanding disabling and enabling mechanisms and structures in the person-environment interaction (Bickenbach et al. 1999).

The individual dimension is comprehensive, and plurality is, as Arendt notes, a human condition (Arendt 1998). The environmental factors include architecture, design, politics, economy, legislation, as well as inter personal, social and cultural circumstances. In the human-environment interaction, both the individual and the environment are of importance if disability emerges in a concrete situation. Hence disability analysed as relational is situational and relative. The research questions within disability studies from the relational conceptual model should therefore be interdisciplinary and involve the social sciences, medicine and the humanities.

Up to this point, UD has been mostly worked with in design and architecture (Pullin 2009; Preiser 2009). The strategy and concept is, however, also important in political, ethical and epistemological contexts and calls for an epistemological discussion of disability. Disability studies scholar Tobin Siebers challenges disability studies to “make disability an object of general knowledge” arguing that this far there is little awareness among scholars that impairments can be a site of knowledge (Siebers 2008, 81). Pointing this out, Siebers also touches on why the epistemological content of UD must be closely related to the different situated experiences of disability as a human condition, and thus disability as a situated knowledge in accordance with gender (Garland-Thomson 2011). One question that needs to be raised in a discussion on UD is disabling barriers for *whom*? According to the CRPD definition, *who* is the intended person that Universal Design shall be *usable* for?

Together with all human beings, people with disabilities, are different and have different plans and goals, therefore UD needs to be situated in different individuals’ experience of disabling barriers and an enabling environment. For this reason, a concept of human must be included in UD, both on ontological and epistemological levels (Lid 2012; Iwarsson and Ståhl 2003).

Merging theoretical perspectives

To further elaborate on the person inherent in UD I will draw upon the philosopher Martha Nussbaum. In her “political conception of person that makes sense of the fact that we all have mortal decaying bodies and are all needy and disabled in varying ways and to varying degrees”, Nussbaum gives a well-qualified account of person also for the purpose of UD (Nussbaum 2004, 341). This political conception of person transcends the dichotomy between disabled and non-disabled, and replaces it with a concept that recognizes embodiment and vulnerability as universal categories on an ontological level (Nussbaum 2004; Nussbaum 2006; Sayer 2011).

Since it is the position of this paper that disability should not be theorized solely as an individual or social phenomenon, we need to be able to avoid reducing the inherent complexity. A crucial insight in critical realism is that reality exists independent upon an observer or interpreter, and that this reality is influenced by cultural and social expectations and interpretations (Danermark 2008; Shakespeare 2006; Sayer 2000; Hacking 1999). Critical realism thus provides an opportunity to approach disability focusing on what type of mechanisms can cause disability, together with an acknowledgement that dimensions are also socially constructed and have to do with matters such as cultural prejudices, ableist values and concepts (Hacking 1999). I will illustrate this by using a medical condition, multiple sclerosis (MS), as a case.

MS symptoms vary widely, and include blurred vision, weak limbs, tingling sensations, unsteadiness and fatigue. Some people living with MS use individual devices such as a wheel-chair or a walking stick whereas others do not, and some of the individuals diagnosed with MS actually have few or none symptoms (Aronsen 1997). MS is still a disease that people and society have a negative attitude towards (Mairs 1996), which can have the effect of making it difficult for people diagnosed with this disease to get a job. A person with MS risks being discriminated in the job market because employers fear the consequences of this disease, so the diagnosis itself also can have an effect even when there are no symptoms following the diagnosis. People with MS are also excluded from the possibility of obtaining life insurance from most insurance companies. In the case of MS, different factors come into play on different levels such as the macro, meso and micro level. Following Nussbaum’s political conception of person, one question to be explored concerns how politics, law and architecture can make sense of such diagnosis. The relational model for disability may detail consequences. On an individual level, experience-based knowledge from a first person perspective, including medical knowledge, will be needed. From the socio-spatial level, knowledge of social and material structures will be needed.

If the task is to reduce and remove disabling barriers as in UD, there is a need to attain knowledge about human embodied vulnerability and how this can inform politics and the law on a macro level. On this level, UD may point at impairments as a human condition that need to be accommodated for, together with e.g. childhood, old age and giving birth. Within a given population, some people will have MS, and this should be accommodated for in terms of flexibility and non-discriminatory politics and attitudes. In the case of MS, disability emerges on this level if it is not expected that people with MS should be able to participate in various arenas. At the meso level, the fact that physical barriers hinder people in taking part in life and society as citizens should be met with technical standards in planning and building

regulations, as disability can emerge if the technical standards omit people with impairments as citizens with equal rights.

Disability can emerge and be struggled with and opposed on these different levels since accessibility, usability and Universal Design can be achieved on different levels. As a political strategy, ethical concept and technical standard, it will however be difficult to evaluate a UD approach on a micro level. The term ‘usability’, as stated in the CRPD’s Article 2, can prove more suitable here. These different levels must be interwoven so that efforts taken on macro and meso levels can improve the life situation for individual people on a micro level. The interaction between the person with different impairments and various barriers causes disability in accordance with an interpretation of disability as relational. Because of this, disability is theorized not as a characteristic in individuals or solely as a characteristic in the social and material environment, but as emerging from the interaction between individuals and their social-material environments.

As discussed earlier, disability studies have been challenged by Siebers to develop situated knowledge from disability perspectives. This is also where I see a possibility for productive interchange between Universal Design and disability studies. The question of exactly *how* to produce knowledge from different perspectives builds on theory that also makes explicit what lenses are used in analyses. A phenomenological approach can develop situated knowledge, thereby also recognizing disability as a situated place to generate knowledge from (Carling 1962; Murphy 1990; Mairs 1996; Wendell 1996; Merleau-Ponty 2008). To build and develop knowledge from a first person perspective that focuses on embodied experiences situating the person as embedded in social and cultural contexts is productive because disability emerges in concrete situations involving individuals in contexts.

A phenomenological approach can illuminate embodied experiences in some depth in order to make these situated experiences understandable by other people who do not have the same experiences. In her influential book *Waist-high in the world*, the disability studies scholar Nancy Mairs discusses what it means to her knowledge that she approaches the social, cultural and material world sitting down as a wheelchair user (Mairs 1996). In posing this question Mairs ask what it means that she is a wheel-chair user and lives with MS. Analysing from a first person perspective in which the person is both embodied and embedded in social, cultural and material environments implies a phenomenological approach to the phenomenon. Knowledge from individual perspectives is crucial in developing the theoretical content in UD, not first and foremost provided by the health sciences, but also by philosophers and scholars in the humanities (Carling 1962; Murphy 1990; Wendell 1996).

Garland-Thomson notes that feminist disability theory suggests that people should individually and collectively accommodate bodily limits, rather than eliminate or deny them (Garland-Thomson 2011, 34). In this remark, she implicitly argues for disability as an experience from which situated knowledge can be produced since accommodating bodily limits presupposes knowledge on what such limits imply throughout a life-span. Such recognition on a collective level may be what Universal Design can produce if the concept of a person is closely related to the basic human condition as embodied.

A hermeneutical perspective clarifies through what lenses a topic is seen. Disability, theorized as a human condition, is the lens that affects the analyses I put forward on all three levels identified in Figure 2. As the CRPD interpretation of UD focuses on,

Macro level	Concept of human, legislation and social justice: Universal Design
Meso level	Projects and technical standards: Universal Design
Micro level	Individual experience: Accessibility and usability

Figure 2. Suggests an analytical approach to universal design and accessibility, differentiating between a macro meso and micro level.

the design should be *usable* and should be evaluated on a micro level and from different individual perspectives. Experiences from different people with disabilities should therefore be used as a hermeneutical lens in approaching UD as a strategy and concept. Conception of person, this is the perspective to inform the ethical and political concept of person that I draw upon. Outlined here is a hermeneutical position; disability as a point of departure for knowledge production.

However, this knowledge has not only been elaborated on by different individuals; as Rob Imrie has argued, rehabilitation should also work on creating universally designed places. One important reason why rehabilitation should acknowledge this task is because these professions possess knowledge of individual conditions on a more general level, together with knowledge of human-environment interactions that comprise the use of different assistive devices. For this reason, people working in rehabilitation can strengthen the knowledge base in UD. As we saw earlier, UD is defined in the CRPD by use of the term *usability*, which is a subjective term. If design is to be *usable* by all people to the greatest extent possible, there is a need for knowledge from a diverse number of individual perspectives.

How do disabling barriers emerge?

Empirical studies of qualitative design can prove to be well-suited in building a knowledge base that can inform UD with knowledge of how barriers are experienced from different individual perspectives. So far, there have been few studies which have focused on precisely how disability emerges in concrete situations. In my qualitative studies, I have found a phenomenological perspective as a stronger basis for knowledge production than disability simulation (Lid 2012; see also Siebers 2008). I will argue that it is not possible to develop a theoretical content in UD without involving experiences from people's various experiences of disability and accessibility. Thus, the empirical person that guide the interpretation of UD must be informed by disability as a human condition.

While critical realism can analyse the interaction, a phenomenological perspective can, as I have argued, deepen the knowledge on disability from different embodied perspectives. Disability as a phenomenon is real, and can be experienced on an individual level, even though disability is not an individual phenomenon and cannot be localized within the individual body. According to Gadamer, hermeneutics can be used in more than textual analyses (Gadamer 1975); in this context, the material is public spaces and the accessibility for people with various disabilities.

The relational model for disability points at the interaction and situations where disability emerges. One example is when a person who is a wheelchair user is entering a bus. This person must negotiate the gap between the street and the bus, which is often dimensioned to accommodate people who are able to take one step and by this step bridge the gap. The philosopher S. Kay Toombs describes a situation in which as a wheelchair user, she is attempting to bridge the gap by tipping her chair a little

backwards in order to lift up the two front wheels. In doing this, she tips backwards and falls in her wheelchair onto the street. This situation creates a deep anxiety in her towards using public transportation and thus affects her experience of accessibility in everyday situations. (Toombs 1997) Consequently, accessibility to public transportation has physical along with psychological and mental dimensions. In discussing the size of the gap between a platform and a means of transport like a bus or train, the psychological factor also must be taken into consideration in conjunction with technological issues such as the type of wheelchair and bus.

The interaction between the woman using a wheelchair and her environment is complex involving various dimensions, and other people's attitudes are also of importance in this interaction. People can meet Toombs with a negative attitude towards her using a bus, or they can meet her situation with acceptance, recognizing her right to use the bus on a par with other people. Accessible streets and public spaces are highly important, although the experience described by Toombs illustrates how complex accessibility to public places can be. Following Garland-Thomson, disability emerges when the body is out of sync with the physical and attitudinal environment (Garland-Thomson 2011, 33). She recognizes this certain point of experience as a place for knowledge, thereby asking what kind of knowledge can be produced by being, for example, a wheelchair user. This is situated knowledge; hence, a theoretical elaboration of UD needs, as I have discussed earlier, to be informed by situated knowledge from a great variety of perspectives. As Garland-Thomson notes, this approach is dependent upon feminist theory, but also transcends this, challenging the stability of categories by arguing that disability is a wide-open category with the potential to encompass all people throughout their lifespan.

Another situation where disability may emerge in public spaces, due to regulation and design can be found in the design of pedestrian crossings. In Norway, kerb cuts near pedestrian crossings are at a height of two centimeters, thereby allowing people with sight loss to find the pedestrian crossing while at the same time allowing wheelchair users to negotiate the kerb. Whether this design solution is usable to all people depends upon context and the person's individual conditions. In a street, this kerb cut may be sufficient for most pedestrians, but there may also be contexts where a kerb cut does not improve accessibility for pedestrians with some types of impairment. A new design principle entitled *Shared Space* is a way of planning traffic areas that integrates all road users in the same area instead of segregating pedestrians from motor traffic and bicyclists, thus making all road users dependent on communication and cooperation. Physical barriers and traffic signs are limited, if present at all. According to this design principle there should be no kerbs higher than two centimeters and no designated lines for different groups; *Shared Space* does not give priority to any single group. Road users must communicate using their eyes, and must interact with one another (Ramböll 2008; Imrie and Kumar 2010). One important premise for this to function properly is that cars maintain a low speed. The idea of *Shared Space* is ascribed to the Dutch traffic engineer, Hans Mondermann (Vanderbilt 2008). In an area with chaotic use, disability might emerge for reasons other than a high kerb at a pedestrian crossing. The traffic situation may be too chaotic and not understandable or road users with visually impairments refrain from using their eyes in communication with the road users. In such traffic areas kerb cuts may not lead to accessibility for street users as in other contexts, and should therefore not be recognized as an improvement of accessibility.

In public areas of this type, the most important disabling barrier may be a lack of safety and predictability (Lid 2012; Imrie and Kumar 2010).

When entering the streets as a pedestrian, disability emerges in the individual's interaction with other people and with the physical environment. The sociologist Dag Østerberg referred to such a social-material interaction, coining it as a social-material *field of action* (Østerberg 1998). The discussion regarding Shared Space encompasses ethics, politics and urban quality. *Communication* is one of the most important ethical aspects of this design.

The complexity of urban contexts involves communication between people who are strange to one another. Therefore it is needed also to acknowledge the limits of what can be communicated between strangers in public places. A public place designed as a shared space may entail socio-material hindrances of another kind than those already catered for by cutting kerbs and establishing tactile and visible guidelines. Such barriers are experienced differently by different people, so for this reason it is of importance to seek knowledge from various individual perspectives, and to explicitly recognize disability as a place from which knowledge needs to be further developed in relation to UD strategies.

Another example to illustrate this point can be found in level differences as a barrier for people with mobility restrictions. Consider a restaurant situated on the second floor of a building has two paths to the door: one is a ramp with level difference of 1:20, and the other is a staircase; both of these are outside the restaurant, hence they are in a public outdoor area. A wheelchair user will use the ramp, whereas a person without mobility restrictions will use the staircase since this is shorter than the ramp. But what about a person who does not use a wheelchair, but who has mobility restrictions? For this person, the ramp is too long, and he/she may be slow in walking and the stairs are too steep and dangerous to use. This person will need a lift in order to enter the restaurant safely.

These examples have illustrated some ways of how disability emerges in different situations. Disability is experienced on an individual level as a disabling barrier that also involves a macro and a meso level. This complexity thematises what *kind* of knowledge is needed on different levels. Knowledge plays an important role in developing inclusive technological standards and political and juridical documents. Nevertheless, knowledge is also crucial when the concept of person is developed within UD.

Another arena in which disability emerges is the job market. In the Norwegian job market, applicants are invited to put a cross in the application form for positions in public administration if they identify themselves as a person with a disability. This is meant to help them obtain a job interview. The strategy is dependent upon a medical model for disability by asking applicants to categorize themselves as *disabled*. With this practice, there is a risk that those individuals invited to interviews will not get the job. After being rejected for the job, it may be more difficult to prove that one has been discriminated against since the person interviewing may argue that this applicant was simply not the best applicant. Therefore, claiming a disability can lead to a more diffuse kind of discrimination instead of being an instrument to help end discrimination. As previously stated in this article, people with certain diagnoses are among those vulnerable to discrimination, as the diagnosis itself can have an effect even when there are no visible symptoms. Considering this, individuals might be careful in disclosing their status so as to better protect themselves against discrimination instead of stigmatizing themselves as a person with a disability.

The medical and social models have rightly been criticized for not being comprehensive enough given the complexity of disability as a concept and experience (Thomas 2004). A remanational model can include complexity better than these two frameworks. The World Bank and the WHO describe disability as “part of the human condition” and as “complex, dynamic, multidimensional, and contested” (World Health Organization and World Bank 2011, 2). Disability is universal, and hence of universal relevance, whereas a complex, dynamic, multidimensional and contested disability is also important to address using methods, concepts and theories that can unfold the complexity rather than dissolve the complexity into banality. Both the social and medical models of disability risk rendering trivial the complex dimensions inherent in disability. The WHO and World Bank’s *World report on disability* is closely related to the CRPD by means of how disability is conceptualized, as well as by including both rehabilitation and what is called a *culture of accessibility*. The report states: “Once the concept of accessibility has become ingrained and as more resources become available, it becomes easier to raise standards and attain a higher level of universal design.” (World Health Organization and World bank 2011) But the writers also underscore that even when physical barriers have been removed, there may be negative attitudes, ignorance and prejudice associated with disability that can cause barriers. If there is a causal link between architectural barriers, social prejudices need to be examined.

In order to include disability as a part of the human condition, I have argued that it is necessary to analyse disability as a complex interplay between internal and external factors, with a focus on the concrete situations disability emerges in. The social and attitudinal dimension is of importance for comprehending accessibility, as accessibility does not have solely material dimensions. UD as implemented in Norwegian politics and law indicates that UD as a strategy in Norwegian politics and legislation has overlooked the non-material dimensions in accessibility by focusing too strongly on physical accessibility in the built environment. Following the CRPD, accessibility is linked to the ability of persons with disabilities to be able to live independently and participate in all aspects of life (UN CRPD 2008, Article 9). This access is comprehensive and concerns, “information and communications technologies and systems, and to other facilities and services open or provided to the public” (CRPD 2008, Article 9).

Phenomenological analyses can yield insight into how it is to live with different impairments or to analyse the experience of being discriminated against. In order to elaborate on disability as emerging in concrete situations, critical realism provides relevant perspectives by enabling an analytical distinction between the fact that differences in abilities and disabilities are a part of human diversity and the way the environment responds to this fact. Critical realism also proves useful by suggesting an analytical division between the concepts and research methods used and the ontological level. To a certain extent, the research methods, concepts and language have influence upon, but do not determine, research questions and topics. On an ontological level, UD is about all of us, vulnerable and embodied persons living with different abilities and impairments. On the epistemological level, UD is concerned with how to gain knowledge of accessibility and disabling barriers as experienced by different people.

In the CRPD Article 4, a call for research in relation to implementing UD is also emphasized, thus recognizing that UD requires new research questions in order to develop facilitating environments. The epistemological consequence thus, involves

systematic work on producing knowledge about accessibility and disability from a multitude of different individual angles.

Conclusion

The democratic potential for UD lies in recognizing all people as equal and requires both theoretical and empirical studies. In this article, I have focused on theoretical work related to UD as this strategy is receiving increased political and juridical importance. Theory should not be a straightjacket but rather a help in analysing complexity in an interchange with empirical studies (Gustavson 2004). I have discussed UD by taking a relational model for disability as a point of departure. This model can encompass the complexity that is needed in approaching a discussion concerning equality, equity and human rights. Ontologically-speaking, the concept of person inherent in UD is a person that is vulnerable and embodied. I have argued that together with phenomenology and hermeneutics, critical realism can help build new knowledge in a further developing of UD. More studies are needed in order to analyse how disability emerges in concrete situations encompassing economic, political, social and juridical levels. Anchoring the research in a relational model gives the opportunity to include both environmental and individual factors. Both a theoretical and empirical approach to Universal Design should be situated in disability as a dimension of human plurality. If not situated in different embodied perspectives, UD risks being nothing more than a new and perhaps slightly more inclusive minimum standard for inclusion.

Acknowledgements

This paper has been discussed and commented on by members of the Rehabilitation and Disability studies Research Group at Oslo and Akershus University College of Applied Sciences. An earlier version of this article has been presented at the International Association of Critical Realism Annual Conference September 2011 in Oslo. The article is an adjusted part of my PhD-thesis "Accessibility for all?: A discussion on disability and concept of human focusing on ethical problems related to Universal Design, human diversity and participation as citizens", Oslo: 2012. My supervisors have been Professor Kjetil Hafstad and Professor Per Koren Solvang. I wish to thank the anonymous reviewers of this article for their valuable comments.

References

- Arendt, H. 1998. *The Human Condition*. Chicago: The University of Chicago Press.
- Aronson, K.J. 1997. Quality of life among persons with multiple sclerosis and their caregivers. *Neurology* 48: 74–80.
- Bednar, M.J. 1977. *Barrier-free environments*. Stroudsburg, Pa: Dowden, Hutchinson & Ross.
- Bhaskar, R., and B. Danermark. 2006. Metatheory, Interdisciplinarity and Disability Research—A Critical Realist Perspective. *Scandinavian Journal of Disability Research* 8, no. 4: 278–97.
- Bickenbach, J.E., S. Chatterji, E.M. Badley, and T.B. Üstün. 1999. Models of disablement, universalism and the international classification of impairments, disabilities and handicaps. *Social Science and Medicine* 48: 1173–87.
- Buch-Hansen, H., and P. Nielsen. 2005. *Kritisk realisme*. Frederiksberg: Roskilde Universitetsforlag.
- Campbell, J., and M. Oliver. 1996. *Disability politics: Understanding our past, changing our future*. London: Routledge.
- Carling, F. 1962. *And yet we are human*. London: Chatto & Windus.

- Center for Universal Design, North Carolina State University. 2012. Projects. <http://www.ncsu.edu/project/design-projects/udi/projects/>.
- Danermark, B. 2008. Interseksjonalitet och kritisk realism. In *Bara funktionshindrad? Funktionshinder och interseksjonalitet*, ed. L. Grönvik and M. Söder, 137–54. Malmø: Gleerups Utbildning.
- Gadamer, H-G. 1975. *Truth and method*. Århus: Akademika.
- Garland-Thomson, R. 1997. *Extraordinary bodies: Figuring physical disability in American culture and literature*. New York: Colombia University Press.
- Garland-Thomson, R. 2011. Integrating disability, transforming feminist theory. In *Feminist disability studies*, ed. K.Q. Hall, 13–47. Bloomington: Indiana University Press.
- Gustavson, A. 2004. The role of theory in disability research—spring board or straightjacket? *Scandinavian Journal of Disability Research* 1, no. 6: 55–70.
- Hacking, I. 1999. *The social construction of what?* Cambridge, MA: Harvard University Press.
- Imrie, R. 2012. Universalism, universal design and equitable access to the built environment. *Disability & Rehabilitation* 34, no. 10: 873–82.
- Imrie, R., and M. Kumar. 2010. *Shared Space and sight loss. Policies and practices in English Local Authorities*. London: Thomas Pocklington Trust.
- Iwarsson, S., and A. Ståhl. 2003. “Accessibility, usability, and Universal Design - positioning and definition of concepts describing person-environment relationships.” *Disability and Rehabilitation* 25, no. 2: 57–66.
- Kristiansen, K., S. Vehmas, and T. Shakespeare. 2009. *Arguing about disability: philosophical perspectives*. London: Routledge.
- Lid, I.M. 2009. What can be achieved by universal design? An investigation of various aspects of the concept. *FORMakademisk* 2, no. 1: 17–27.
- Lid, I.M. 2012. Accessibility for all? A discussion on disability and concept of human focusing on ethical problems related to Universal Design, human diversity and participation as citizens. PhD diss., Oslo University.
- Lie, I. 1996. *Rehabilitering og habilitering: prinsipper og praktisk organisering*. Oslo: Ad notam Gyldendal.
- Mairs, N. 1996. *Waist-high in the world: A life among the nondisabled*. Boston: Beacon Press.
- Merleau-Ponty, M. 2008. *Phenomenology of perception*. London: Routledge.
- Murphy, R.F. 1990. *The Body Silent: The different world of the disabled*. New York: W.W: Norton and Company.
- North Carolina State University. *Center of Universal Design* <http://www.ncsu.edu/project/design-projects/udi/>.
- Nussbaum, M.C. 2004. *Hiding from humanity: Disgust, shame, and the law*. Princeton, N.J: Princeton University Press.
- Nussbaum, M.C. 2006. *Frontiers of justice: Disability, nationality, species membership*. Cambridge, Mass: Belknap Press of Harvard University Press.
- Preiser, W.F.E. 2009. “Paradigm for the 21st Century: The Challenge of implementing Universal Design.” In *Inclusive buildings, products and services. Challenges in Universal Design*, edited by Tom Vavik, 28–49. Trondheim: Tapir Academic Pres.
- Pullin, G. 2009. *Design meets disability*. Massachusetts: Massachusetts Institute of Technology.
- Rambøll. 2008. *Shared Space Erfaringer med “Shared Space” ved kryssutforming*. Rapport til Statens vegvesen, Vegdirektoratet.
- Sayer, R.A. 2000. *Realism and social science*. London: Sage.
- Sayer, A. 2011. *Why things matter to people. Social Science, values and ethical life*. Cambridge: Cambridge University Press.
- Scully, J.L. 2008. *Disability Bioethics: Moral bodies, moral difference*. Landham: Rowman & Littlefield.
- Shakespeare, T. 2006. *Disability rights and wrongs*. London: Routledge.
- Siebers, T. 2008. *Disability theory*. Ann Arbor: The University of Michigan Press.
- Söder, M. 2009. Tensions, perspectives and themes in disability studies. *Scandinavian Journal of Disability Research* 2, no. 11: 67–81.
- The United Nations. 2008. *The UN Convention on the rights of persons with disabilities*.
- Thomas, C. 1999. *Female forms: Experiencing and understanding disability*. Buckingham: Open University Press.

- Thomas, C. 2004. Rescuing a social relational understanding of disability. *Scandinavian Journal of Disability Research* 6, no. 1: 22–36.
- Toombs, S.K. 1997. Illness and the way of the body. *Environmental and Architectural Phenomenology Newsletter* 8, no. 2: 7.
- Traustadóttir, R. 2009. Disability studies, the social model and legal developments. In *The UN Convention on the rights of persons with disabilities. European and Scandinavian perspectives*, ed. O.M. Arnardóttir and G. Quinn. Leiden: Martinus Nijhoff Publishers.
- Tøssebro, J. 2004. Understanding disability. *Scandinavian Journal of Disability Studies* 1, no. 6: 3–7.
- Tøssebro, J. 2010. *Hva er funksjonshemming?* Oslo: Universitetsforlaget.
- Vanderbilt, T. 2008. The Traffic Guru. *The Wilson Quarterly* Summer: 26–32.
- Vavik, T. 2009. *Inclusive buildings, products & services: Challenges in Universal Design*. Trondheim: Tapir Academic Press.
- Wendell, S. 1996. *The rejected body: Feminist philosophical reflections on disability*. New York: Routledge.
- World Health Organization and World Bank. 2011. *World report on Disability*. Malta: World Health Organization.
- Østerberg, D. 1998. *Arkitektur og sosiologi i Oslo: en sosio-materiell fortolkning*. Oslo: Pax.