CO-ABILITY PRACTICES

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ABSTRACT

This paper explores philosophical and strategic possibilities to understand the concept of co-Ability, and generate critical and new insights to our value system in human centred societal challenges. I apply an experimental approach of research through design, analysed from an interpretive point of view to prove a grounded theory. The paper starts from a prosthesis development presented as a tangible pragmatic procedure. The purpose of the case study is the notion of care through practical design that is marked with concern since the probability of harm can be incised by pure design decisions. Instead of describing the politics of roles and ethics in a situation characterised by 'design for care' inspirations, I use reflection on design practice to understand embodied thoughts concerning relationships and the ways of doing. In the second part of the paper, I proceed with literature review in disability research and parallel design strategies. In the final section – in relation to co-design – I introduce the term of 'co-Ability' that is rooted in the critical approach of posthuman disability studies outlined by scholars such as Rosi Braidotti. It serves as a broad umbrella term under which we can reconsider the potentials of various entities (biological and artificial) enhancing the shared competence rather than dwelling on the oppressive nature of human-centred norms.

Overall, I suggest that the dominant normative vision manifesting in societal challenges is in relational matter with multiple body representations.

INTRODUCTION

The objective of this paper is to raise crucial issues of which designers should be aware of at a time of great challenges of anthropocentric societies. The novel research approach is supported by social science and an engagement in a form of implicit conceptual work that distributed important points in 'design for care' (Jones, 2013) that questioning human centered normative visions of our world. This paper brings potential insights to the topical, procedural, pragmatic and conceptual articulations of co-Ability.

I present the body of this paper in three main sections. First, I introduce a prosthetic design case study project developed with co-design methods.

What can be an act of greater caring in the design industry than creating a project for a person with a disability? The primary design concern was to focus genuinely on inclusivity and transitive practice with a caring attitude, which appeared in the area of the internal operation of the prosthesis and human interactions – such as timing, function, mechanical needs and cost efficiency. Soon the initial selection of questions in the design method was repositioned at another point in the framework, raising new questions and ideas considering the normative symbol of the material object. Under the influence of critical disability studies, the role of a designer in the 'design for care' situation shifted towards being an interpreter of messages and semiotics. Semantic and rhetorical functioning expressed by visual appearance lead to the questions: what are the ethical, political dimensions of design for disability? How does design help to improve the experience of being human, and not necessarily the user experience of a disabled person? In these circumstances, designers would no longer be viewed as individuals who create objects for the healthcare industry, but as communicators who seek to discover convincing arguments by means of a new synthesis of objects and words. In return, this could shift attention towards disability issues. “To discover new relationships among signs, things, actions, and thoughts is one indication that design is not merely a technical specialization but a new liberal art” (Buchanan, 1992). In the second section of this paper I present the literature review of critical disability studies reflected on design culture that has developed in association with disability politics. I present the contrasting accounts of universal design and rehabilitation engineering in parallel with a pathological approach and a political view of disability. This comparison suggests that the normative attitude of the traditional design strategies are not compatible with the prosthesis design case study I experienced.

In the third section of the paper I draw out fundamental features in the case study design work that accompanies co-design theories as a provisional and a possible aspirational method to work with. In this last section of this paper by the insights gathered from the mixed methods of: case study experiment, participatory observation and self-reflective observation suggest that the development of prosthesis created with collaborative design practice should target not only methods of solving design problems, but also informal and social interactions in posthuman collection. Rooted in the presented analysis I explore the aspirational theory of co-Ability grounded in critical disability studies and posthumanism. The output of the novel method in the research process helps us to explore further the way we use bodily information and also determines the way the brain encodes our greater shared understandings based on our own body recognitions. An understanding of both the scientific and phenomenological details of embodiment also means exploring the ways the different modes of somatic consciousness can be related and collaboratively deployed to improve representation of the self. The output of the paper leads me to explore further the way we use bodily information that also determines the way the bio-techné encodes our greater shared understandings in human life

CASE STUDY, PROSTHETIC DESIGN

In 2016, thanks to the Enable Design Tour organised by MOME Transfer Lab I met Luca Szabados, whose left lower arm is missing due to a lifelong disability. Luca is a visual artist in her 20s, who primarily creates puppets. “Disabled people are often outstanding problem solvers because they simply have to be creative. Life for disabled people is a continuous series of challenges to be overcome (Miller et al., 2004)”.

The first and most important question was as follows: ‘For what kind of act or movement would a prosthesis be useful for her?’ As it was very soon revealed, Luca has an unusually high creative independence and can solve most of her daily routines without any aid. There were very few occasions where she would definitely need a prosthesis for her daily routine. It was easier for her to recall situations where she could act on her own and an artificial aid could make it only more complicated. Both the aesthetic value for people around her and the somaesthetic experience in her freedom in movements were limited with classical prosthetics. We also had to establish with Luca what we mean by prosthesis because it has a rich visual, political and material vocabulary in present time. Traditionally, prosthetics is a range of detachable, wearable, implanted, or integrated body parts that mostly has a functional or cosmetic purpose (Anon, 2015).

With keeping an eye on the concept of inclusion, we focussed on improving the ability to work instead of pushing aesthetics to the fore. As a key situation for Luca, we defined the problems of using a cutter while working, because this work exercise requires that she use two hands – when Luca is holding the cutter in her intact hand, the support she provides on a single point of the paper with her elbow stump is insufficient. If the surface to be cut is not supported properly, the cutting will be imprecise while the supporting elbow stump might be wounded too, which is more prone to injuries already. Involving the user at the designing stage was highly important, thus need have been defined based on Luca’s personal experiences. Instead of the grabbing function of the hand, the key function here became the ability to support precisely. It is a mechanical need, which would not require electronic control, i.e. a bionic hand. I intended to focus on Luca’s experience and the design culture even if it is a very interesting argument, I didn’t want to enter the discourse of cyborgs linked to the work of Donna Haraway’s “Cyborg Manifesto” this time (Haraway, 1987) which offers a feminist critique by analysing the integration of the cybernetic and the organic. While working with the cutter is a short-term usage, it is also a key aspect, differing from the classical long-term use of a prosthesis. The price range of a prosthesis might be between €5,000 and even millions. It was a criterion to craft a tool at a lower price. I used the desktop 3D printing technology to reduce the cost of the prosthesis designed to €20-50. Cost-efficient desktop 3D printers work with PLA materials that are creating a rigid object, but could be made flexible via shaping.

The primary concern focussed on the internal operation of the product:

- Function / usability – cutler use
- Timing – short term use
- Cost efficiency – 3D printing that uses rigid material led to shape the form of the object to be more flexible

THE SYMBOLIC AND VISUAL LANGUAGE THROUGHOUT THE OBJECT

When I realised the prosthesis in development is far from the anatomical hand, the first question of the procedure was how a prosthesis should or should not look like? Is it a usability question or is it a matter of aesthetics? What kind of message is transmitted by a new kind of aesthetic in a prosthesis? “The very distinction between aesthetics and usability can be questioned, as people's point of view is relevant to assess the aesthetics of an artefact (a book, a picture, or a building): aesthetics just is usability of an admittedly special kind" (Jauss, 1982). In sociology, psychology and anthropology, a prosthesis can function as a social symbol and a political emblem for oneself. "The design is a broad exploration of the problems of communicating information, ideas, and arguments through a new synthesis of words and images that is transforming the "bookish culture" of the past. An exploration of the problems of construction in which form and visual appearance must carry a deeper, more integrative argument that unites aspects of art, engineering and natural science, and the human sciences (Buchanan, 1992)". Thinking on Buchanan description, to transform the "*bookish culture*" and at the same time transhuman technological culture of prosthesis I needed to understand how the new visual aspect of the object can change the impact on a person and also the ones around.

Do I care more about social inclusion, or is it more important to sensitise the society? How should I eliminate the influence of stigma and divergence of the negative perceptions of difference (deviance) and their evocation of adverse responses (stigma)?

Based on Richard Buchanan's 'conceptual repositioning' theory, if I am changing the 'bookish culture' – in this case, the usual and expected shape of the lower arm prosthesis – it will communicate a new status. If the shape of the prosthesis does not follow the anatomy of the lower arm and the hand, and even differs from it significantly, it can emphasise the stigmatising expectations of the bystander. The important point in this context is that the expertise I was focussing on is a kind of knowledge that is practical and centred on Luca's experiences as the first person as a matter of principle. In this case, Luca's tacit knowledge guided the design, whereas I was in charge of transforming it to explicit knowledge so that it could be implemented. Her experience could also be called 'embodied knowledge' to emphasise the role of bodily abilities and capacities.

Figure 1: Right: Luca Szabados supporting a surface with her elbow stump. Left: The 3D printed prototype for prosthesis during the design process.

Considering the pattern to change the society's stigma can be found in a changing set of placements defined by shape, actions and thoughts. The shape of the prosthesis was defined by the actions for which it is being used for, which in the same time produces a placement in representation. The boundary of this placement gave me a context or orientation to thinking, and the application generated a new perception. A person with a prosthesis – the materiality of body – is invigorated in the given interaction. With further research I analysed the nature of human rationality, subjectivity and consciousness in the cross-disciplinary section of design culture and disability studies.

DISABILITY RESEARCH AND PARALLEL DESIGN STRATEGIES

Disability researchers state that the medical approach towards disability goes hand in hand with objectifying the body. Pathological judgement aims to change the person involved instead of changing the sociological context. In the medical view of disability, there are often two polar solutions: either preventing the possible disability or solving the existing one. "Disability is not a personal characteristic, but is instead a gap between personal capability and environmental demand" (Verbrugge & Jette, 1994). As disability became understood as a civil rights issue, the inclusion of users as authorities gained notability. Going from pathological view to a political model, reviews on disability researchers describe two simultaneous social model from Nordic countries and Britain. The Nordic model states that disability is in a proportional relation: if a disabled person cannot grab an object, it is the object that does not function well, not the other way around, which makes the socioeconomic organisation paralysing. This model does not demonise the society, its way of thinking is constructive, and suggests ameliorating. "Most Nordic Disability research has been practical empirical policy-oriented research" (Gustavsson, 2009). The Anglo-Saxon model communicates with a certain kind of activism, attacking the schemes of the masses. It supports subjective art by having critical and demonstrative attitudes. The political judgement of disability states that it is not the individual who is flawed, but the society. It strengthens the importance of belonging to a group – the unity of people with common determination. The social model of disability locates the changing character of disability, which is viewed as an important dimension of inequality in the social and economic structure and culture of the society in which it is found, rather than in individual limitations. In the 20th century, the dualist account of rehabilitation engineering versus universal design is an appropriate starting point for further investigations in the field of design. Rehabilitation Engineering and later Assistive Technology started as a modern rehabilitation movement in the beginning of the 20th century. "Emerged to cater for the return of thousands of disabled veterans during World War II. This modern rehabilitation movement, guided by surgeons, recommended multidisciplinary scientific and engineering endeavours in rehabilitation" (Brandt & Pope, 1997). The main characteristics that differ from my case study designing process is that they feature the strategy known as 'technology push'. "Efforts to improve prosthetics and orthotics resulted in a speciality that adopted scientific principles and engineering methodologies" (Tate & Pledger, 2003). The objects developed are almost always unaffordable without the help of government agencies or charitable bodies. The clients are rarely seen as customers because they neither paid for their equipment nor had a major say in the choice of the equipment purchased. "New inventions are pushed through medical research and development (R&D) without proper consideration of whether or not they satisfy a user need" (Gregor et al., 2005). For designers, it is highly important to consider the appearance of an object in a rehabilitation situation because the social welfare model based on pathology is deliberately labelling. The transcendent nature of shame is predominant when approaching disability from a medical aspect. The tyranny of 'normality' therefore offers an instant identity with an opportunity to exercise power. Universal Design in the second part of the 20th century was closely related with the social view of disability research. "Universal design became a general design approach in which designers ensure that their products and services meet the needs of the widest possible audience, irrespective of age or ability" (Story et al., 1998). There are critics on both design methods even if they have great accomplishments and are rooted in the opposite view of disability research. "Paradoxically, several studies on the field report also high rates of rejection and abandonment which can be caused by the lack of balance between people involved in creation (the designers) and end users (the nondesigners). The bottom line, however, is that both approaches have difficulties in incorporating the experiential knowledge of disabled users into their design process. The lack of contextual push calls for new types of research, such as cultural probes and generative tools which sketch out the user experience spectrum" (Stappers et al., 2009). While universal design addresses the needs of the widest possible audience in the mainstream, I was creating an object for a specific user in the design process on a very small scale of production with the possibility of open-source sharing of the data for further modifications, considering that disability is difficult to make uniform. "The universal design is based on the principle of economies of scale, which involves mass-production techniques and traditional design processes. Characterised by the 'market pull' strategy" (Vanderheiden & Tobias, 2000).

CO-DESIGN METHOD TOWARD CO-ABILITY

In the case study about co-design development, the research I processed can be understood as a social activity, something done by more than just one investigator. We worked in discursive evaluation done by the embodied knowledge holder and myself the academic researcher (Denzin & Lincoln, 2011; Silverman, 2011; Flick, 2013; Bryant, 2017). It was a novel process to the way of doing research through design that offered a different outcome. During the prosthesis design process with Luca Szabados, co-design was the tangible pragmatic approach that also represented our co-Ability during the work. Although a comprehensive review of co-design is beyond the scope of this paper, it is important to illustrate the main, related characteristics of the co-creation processes to support deeper analysis and reflection. "Co-design can be used as a set of iterative techniques and approaches that puts users at its heart, working from their perspectives, and engaging latent perceptions and emotional responses" (Hoftijzer, 2009). We started with Luca's declaration, which states that she has no need for a prosthesis. Her experience with this kind of objects is not entirely positive, and she can solve almost all problems she is facing on a regular basis. "Collaborative design attention is most needed where the probability of harm is increased by poor design decisions. We need new ways to learn, think, and work quickly to make sense of the human, system, and organizational problems that co-occur every day in the morass of disability. Co-creation stands for the active involvement of the user during the development of a product" (Hoftijzer, 2009). After a certain amount of trial and error to untangle possible solutions, we built our knowledge collaboratively on what an ideal prothesis means for her. For example, Luca preferred short-term usage that can be from five minute to an hour long, but no scenario proved the need of an all-day prothesis.

Design and Disability culture need to capitalise on the different strengths to develop shared knowledge and practices to deal with the complexity of problems. For a successful collaboration, it is necessary to have a common understanding of the fundamental knowledge of a foreign discipline or a person's individual experience. The embodied knowledge of the disabled participant brought forward the process as much as the designer's knowledge of using a desktop 3D printer, which reduced the creation time in prototyping and the cost as well. Co-design assemblages allow us to ask important questions about power, authority and resistance. However, while the co-design process assembles a multi-componential model with a design goal, it also represents a formally unstructured attitude that is instead managed by a shared philosophical understanding. Co-Ability is a new concept and new productive ethical relation that is not a definition of how people work together with others towards a shared goal – instead it offers an interpretation of how do we, biological/artificial, human/nonhuman, elements/networks become relational in a complex manner that connects us to the multiple. In this condition, shared competence is a distributed phenomenon rather than an individualised trait. Our understanding of the actors involved in design practice will deepen if a normative power is not exercised. The understanding of co-Ability is grounded in the posthumanist philosophy and critical disability outlined by scholars such as Rosi Braidotti (2013) (2017); McRuer (2016); Goodley (2014) (2017); Goodley & Lawthom (2009); Campbell (2012); Wolfe (2009); Meekosha and Shuttleworth (2009); Shildrick (2009) (2015); Liddiard (

2014); Mallett & Runswick-Cole (2014); Ranisch & Sorgner (2014). The term co-Ability isn't the opposite of the term "disability" nor the contradiction of ability. This term applies to the relation matter of our world. Many posthuman transformations are already occurring everyday across the globe since our life is technologically mediated every day. Our physical spaces and also the social spaces liaise by networked computational media.

BODY REPRESENTATIONS, BODY IMAGE AND BODY SCHEMA

In the first part, the prosthesis design for a person with lifelong disability outlined important questions about the image of the body that communicates to us by recalling our perception on norms. The following question rose: How did the stable body image of Luca, and the embodied experience in self-recognition contributed to the research?

Everyone will be disabled at some point, disability is not a condition of a minority market (Davis, 1995). In human life span, ability as such is continuously changing – we all go through the process of gaining abilities in early ages and experience losing them in a late age. Also, there are many instances for a short-term ability loss. So why do we think there is a dominant, 'normal' human?

We have a radical recognition of bodily functions (e.g. health span, longevity), cognitive and emotional capacities (e.g. intellect, memory), physical traits (strength, beauty), and behaviour (e.g. morality). On the basis of the affirmation of specific traits, there is the relational matter of considering another person or our self. Since 1905, when Bonnier first introduced the term "schema" to refer to the spatial organisation, almost all neurologists have agreed on the existence of mental representations of the body (Vignemont, 2010). Body image defined as "a set of perceptions, affections and ideas that an individual attributes to their body through their personal history and the attitudes of the general public" (Mattei et al., 2015). Body image is described as the way in which the individual experiences and considers their body, a model to which all affective cognitive type elements linked to the body can be traced (Molinari and Riva, 2004). In addition, Vignemont (2010) says that the body image can be applied both to one's own body and to someone else's body. I would suggest that the body representations are actually linked to the understanding of the bodily experiences of an individual, and it leads me to think it can be a description of primary understanding of the world as well. As the philosopher with his pioneering work in somaesthetics, Richard Shusterman in pragmatist philosophy and phenomenology points it out: "the body is our basic medium of perception and action" (Shusterman, 2008). The understanding of both the scientific and phenomenological details of embodiment also means exploring how the different modes of somatic consciousness can be related and collaboratively deployed to improve our somaesthetic essence in societal challenges.

One of the main interpretations of body representation is a dualistic view that can bring us towards exploring the co-Abled formations. There is a distinction between the body image and body schema (Gallagher, 2005). In the well-grounded theory of the Perception–Action model of Ungerleider and Mishkin (1983), Paillard first suggested distinguishing "*the identified body*" (le corps identifié) and "*the situated body*" (le corps situé) (Paillard, 1991). The body image is dedicated to perceptual identification and recognition (e.g., body part judgments) and the body schema is dedicated to action (e.g., information about what is necessary for body motions such as posture, limb size, and strength) (Dijkerman & de Haan, 2007). The body image is visual, perceptual, conceptual and contains information on the organisation of the body parts that are structural and relatively stable. Action-oriented body representation is constantly updated by action and it can be specifically impaired in situations, while body image is preserved even when a situation is changing the actual body (Vignemont, 2010). In other words, there is an existence of 'online' and 'offline', or a conscious–unconscious representations of the body (Carruthers, 2007).

It is important to understand how the body image is related to the body-centred human norms in society. Ideals of bodily appearance that are impossible for most people to achieve are cunningly promoted as the necessary norm, thus condemning vast populations to oppressive feelings of inadequacy that spur their buying of marketed remedies (Bordo, 1993). Disability is neither homogeneous nor static, the conditions restricting everyday activities are different and continuously changing. Opposing the human norm, the idealised normative body is quite preserved in time and it is relatively stable. I suggest the idealised view of norms are closely related to perceptual identification and recognition of body representation called body image. The desire of being normal is related to our assessment of body image and its disorders. As Rosi Braidotti says, the human normative convention is not inherently negative, just highly regulatory and hence instrumental to practices of exclusion and discrimination. Humanism, she acknowledges, has supported liberal notions of autonomy, responsibility, self-determination, solidarity, community-bonding, social justice and principles of equality. These practices remain important. We organise our value systems around the normative human view while the self-centric elements are causing societal challenges in many cases nowadays. We have entered, Rosi Braidotti suggests, the epoch of 'panhumanity' where everything is technologically mediated. Posthumanism is not the opposite of humanism; it doesn't mean posthumanism goes after humanism in the timely manner. If humanism, as the dominant normative attitude, is connected to the structurally organised body image, then the relation between humanism and posthumanism can be understood by exploring the relation between body image and body schema. It also means the two pathways do not work in isolation; on the contrary, they are continuously interacting. Informed by both philosophical theory and scientific evidence, I address the possible parallel existence of the dominant human normative convention and the posthuman transformations in society.

I suggest that the process of interaction in the morphology of the co-Abled assemblage is not hierarchically organised, there is no caring confidence in the choice of roles. The value is rooted in the focus on understanding the relation between entities (conscious–unconscious). Design practice adds a reflective and philosophic dimension to understand the unconscious elements in posthuman transformations. My intention at the beginning was to articulate the co-design assemblage in layers of theories, competence and body of entities (see Figure 2) that establish a principle of relevance for knowledge.

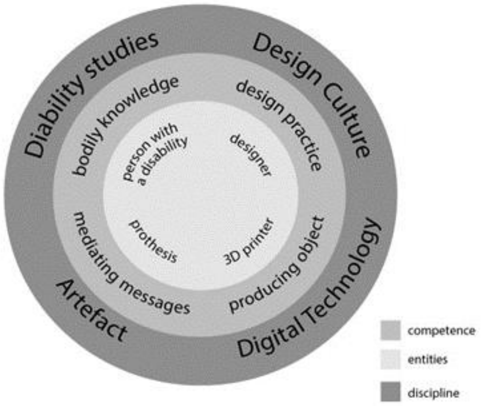

Figure 2: Co-design assemblages in levels of theories, competence and entities.

Art and design similar to social science accept the change of the context in which they operate. It involves 'ontological politics', a concern with what is being made (Gaver, 2012). The translation that the research made during adapting the inspirational borrowed theories from posthumanism and critical disability studies ultimately arises a new concept. During the design process observed, the co-Ability of each level participated is morphologically changed by the time, while the characters of the co-design assemble did not change (see Figure 3). With this generative and dynamic model of co-Ability, I do not present to illustrate critical disability studies or design approach, or to justify any of it. I merely wish to build an understanding of the unconscious representations of practice occurring in relational life situations. My interest is in understanding what could happen if cultural artefacts were produced by those no longer invested in maintaining human superiority in culture and politics. I consider that design – and research through design – is a generative method, and I do not wish to make a statement that cannot ever be refuted. I am more concerned about giving possible answers, or as in Zimmerman et al.'s (2007) formulation, doing the 'right thing'.

CONCLUSION

The research I present does not apply exclusively on the situation of '*design for care*' – probably not even solely on design practice. Instead it challenges the image of an anthropocentric society. A critical and novel approach to prosthetics leads to a more complex comprehension of the human body and the role of culture and politics. In this paper, I have explored how disability politics allows us to re-think what we know about our relations and our everyday politics. I have analysed the similarity between the normative image of human body representation and the traditional classical humanist conception of what it means to be a human. With the methodological approach of research through design, I point to the junctures where technology, bodies, and cultural theory intersect. I suggest to consider a possible account of co-Able relation between posthumanism and humanist subject that offers cultural analysis beyond inherent anthropocentrism to address our societal challenges and daily interactions.

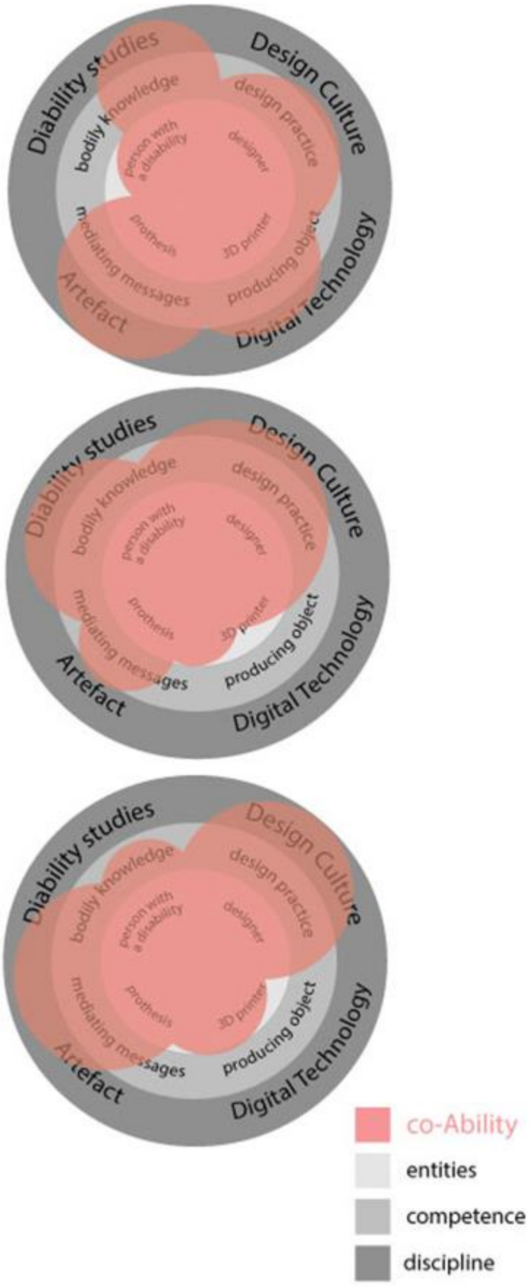

Figure 3: Co-design assemblages in grey, co-Ability morphologically changing aspects in pink

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