A. Relevance [wc.254]

Historically, our society has demonstrated tendencies of exclusion towards those who misfit the norms. Whether in terms of age, gender, race, sexuality, or even ability, the non-conformity to society's embodiment of 'normative' has repeatedly resulted in the marginalization of those whose characteristics are not reflective of culturally valued traits[1]. While there may be innumerable factors that come into play in these scenarios, such tendencies of marginalization seem to hold a strong connection to aspects of the built environment. As one of the many standardized systems in our world, design and architecture follow guidelines that commonly comply with a 'one size fits all' approach[2], catering to a mainstream majority while disregarding individuals who misfit such standards. To many, it may seem surprising to imply associations between the architectural practice and social justice, but one must consider that the design of buildings is often neither passive nor value-neutral, in fact "the design of the built environment actively conditions and shapes the assumptions that the architects (...) hold with respect to who will (and should) inhabit the world"[3]. Whether consciously-driven or not, when designers overlook the needs of an audience deemed as 'abnormal', they actively promote values against the acceptability of human diversity. If products, services, and spaces aren't designed to cater to those deemed different it actively suggests that those who manifest human variation are unworthy of accessing these resources, after all "the shape of the shared material world we design, build, and use together both expresses and determines who inhabits it now and in the future."[4]

B. Problem Statement [wc. 1024]

These circumstances of exclusion through design are especially prevalent when it comes to bodily norms. As suggested by professor Aimi Hamraie, standards of design are largely dictated by a template that privileges the 'statistically average human body'[5], conditioning the exclusion of a range of physiological variations. In privileging the 'species-norm' of what are deemed as young and healthy bodies, design guidelines often disadvantage those who live with physical impairments, leading "many users [to become] excluded from using everyday products and services because they do not have the necessary functional capability to interact with them"[6]. Whether the inability to move a limb or simply poor coordination, in being limited by products and spaces that overlook their needs, physically impaired people often find themselves disabled by design. Other than contributing to their exclusion, the recurrence of designs that fail to consider qualities of human diversity also promotes the distinction of what is

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[1] Garland-Thomson, Rosemarie, 2017, "Eugenic World Building and Disability", (The Journal of Medical Humanities), p. 135
[2] Clarkson, John. "Inclusive Design : Design for the Whole Population" (London: Springer, 2003), p. 220
[3] Boys, Jos, "Disability, Space, Architecture:A Reader", (New York: Routledge, 2017), p. 79
[4] Garland-Thomson, Rosemarie, "Eugenic World Building and Disability", (The Journal of Medical Humanities, 2017), p. 134
[5] Meynell, Leola, "Aimi Hamraie Building Access: Universal Design and the Politics of Disability", (Genealogy,2019), p.1
[6] Keates, Simeon, and John Clarkson, "Countering Design Exclusion : An Introduction to Inclusive Design", (Springer, 2004), p.19

considered socially "normal" and how "normal people" should function[7]. In spite of such popular misconceptions of bodily norms, people who live with disabilities claim that "liberation from disability is about having choices, not about living life in conformity to some pre-defined notion of normality"[8]. Taking that into consideration, the disablement of individuals is largely influenced by their liberty of choices and availability of opportunities. Therefore, "whether or not [an] impaired capability gives rise to a disability is significantly determined by social and environmental factors, and importantly by the design of environments"[9] which shape their opportunities.

When looking closely at scenarios in which the capabilities of people with impairments are challenged, it is noticeable that many of those difficulties are caused by design decisions made without consideration of the capability demands of specific users[10]. While conventional and legislative terms may view such barriers of capability as a disability, one could argue that the disablement of the physically impaired is not necessarily determined by their physical attributions, rather by a misfit between their needs and given environmental options to fulfil these needs[11]. As mentioned before, incomprehensive designs may often lead to the exclusion of the physically impaired, but aside from that exclusion these circumstances may also enable systematic ableist tendencies that deprive them of life-changing opportunities. Those circumstances are exemplified in processes of employment, where one's employability is often defined by assumptions of productive bodies which "marginalise the more fragile and vulnerable as non-productive and thus without value"[12]. In other words, these misconceptions of inferiority not only affect their opportunities for social integration, but also deprive them from potential employment and financial stability. While this may seem like a problem unaffecting a grand majority of the population, "ignoring such an extensive resource of people with the potential to contribute productively to society is both morally and financially irresponsible"[13]. Furthermore, while these barriers may seem strictly applicable to current generations of people with impairments, it's important to note that the amount of people facing disabilities is expected to increase. Due to current demographic patterns, "as life expectancy in Western world rises, these additional years of life might often be accompanied by an increased risk of disability and functional limitations"[14]. While associating disability with the elderly may be largely frowned-upon, their exposure to accelerated physiological changes is indisputable, and those changes are rarely considered in existing design standards. Regardless of underlying conditions or disabilities, everyone eventually faces the physiological effects of aging, after all "as people grow older they are subject to subtle and often progressive changes in their physical shape,

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[7] Albrecht, Gary, "Handbook of Disability Studies", (SAGE Publications, 2001), p. 431

[8] Burchardt , Tania, "Capabilities and Disability: The Capabilities Framework and the Social Model of Disability", (*Disability & Society*, 2004), p. 742

[9] Keates, Simeon, and John Clarkson, "Countering Design Exclusion : An Introduction to Inclusive Design", (Springer, 2004), p.217

[10] Keates, Simeon, and John Clarkson, "Countering Design Exclusion : An Introduction to Inclusive Design", (Springer, 2004), p.31

[11] Mollenkopf, Heidrun, "Quality of Life in Old Age", (Springer, 2007), p.104

[12] Boys, Jos, "Disability, Space, Architecture:A Reader", (New York: Routledge, 2017), p. 79

[13] Keates, Simeon, and John Clarkson, "Countering Design Exclusion : An Introduction to Inclusive Design", (Springer, 2004), p.21

[14] Palgi, Yuval, Shrira, Amit, Zaslavsky, Oleg. "Quality of life attenuates age-related decline in functional status of older adults", (Qual Life Res. 2015)

performance, and other functional capabilities"[15]. Whether speaking of minimal incapabilities or significant impairments "these changes nevertheless become problematic when they are overlooked by designers"[16] and create imminent barriers to those transitioning into older age, consequently leading them to become too disabled by design. This foreseeable impact of design exclusion reiterates the effects of the built environment, and the urgency to adapt standards that disregard qualities of human diversity.

With that being said, while today's architectural standards may have adopted values of barrier-free design, a multiplicity of other barriers still bars individuals with physiological variations from a range of opportunities. It would be untrue to say that architectural standards have not evolved to become more inclusive in the past few decades. However, while the right to accessibility may have been gained through policies and legislations, such "guidelines make very general suggestions which relate to very broad categories of disability or ageing"[17] and consequently overlook specific user needs. Regardless of the efforts of disability advocates to influence the "positive recognition of disability as part of the inescapable human diversity that so enriches our life experience and our society"[18], disability still seems to be the last frontier of justifiable human inferiority. Through acts of design exclusion, individuals with such bodily variations are not only deprived of participation in mainstream society, but also robbed of potentials that they could otherwise attain. In this context, the factors which cause such deprivation of opportunity are defined as 'capability barriers'. The capabilities that such barriers obstruct are not referent to skill nor competence, but rather to "what people are able to do or be as a result of what they're provided with"[19]. Therefore, when considering that one's capabilities are reliant on the resources they're supplied with, the disablement that is commonly experienced by the physically impaired does not result from their capability to function, but rather the opportunities that external factors deprive them from. In fact, barriers to their capabilities are precisely what disables them, since after all disability is situation-specific and resultant from the interaction between the individual and their environment[20]. With that being said, it's possible to say that incapabilities associated with physical impairment - whether from age or other factors - aren't as much of a concern as the built environment that aggravates them. Taking the above examples into consideration, the primary problem to be addressed in this research is the disablement of those who may be disadvantaged by standardized built environments which disregard their needs. Although other forms of impairments such as cognitive or psychological may also face barriers of flawed design, the primary concern to be addressed within this framework is the capability limitations imposed specifically on individuals with physical impairments.

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[15] Coleman, Roger, and Royal College of Art. *Designing for Our Future Selves*. (Royal College of Art, 1993)
[16] Ibid
[17] Nicolle, Colette, and Julio Abascal, "*Inclusive Design Guidelines for Hci*", (Taylor & Francis, 2001), p.29
[18] Terzi, Lorella. 2005. "A Capability Perspective on Impairment, Disability and Special Needs: Towards Social Justice in Education." (*Theory and Research in Education*, 2005), p. 198
[19] Robeyns, Ingrid, "The Capability Approach", (*The Stanford Encyclopedia of Philosophy,* Fall 2011)
[20] Nicolle, Colette, "Inclusive Design Guidelines for Hci", (Taylor & Francis, 2001), p.144

C. Research Question

To what extent can the <u>built environment</u> as a tool for <u>human enhancement</u>?

Primary Sub-questions

How can capability barriers be minimized through values of adaptable design?

Secondary Sub-questions

-What are capability barriers and which audiences face them more often?
-To what extent may incomprehensive design aggravate barriers to one's capabilities?
-How may standardized designs impose ideals of normalcy that further exclude minority groups?

D. Hypothesis and Goals [wc.544]

While the current mainstream standards of the built environment may negatively contribute to the further impairment of incapabilities, one could question whether the built environment could also serve for the opposite effect. After all, "if people can be disabled and excluded by design, they can also be enabled and included by thoughtful, user-aware design"[21].Through this perspective, in realizing that overlooked groups - such as the elderly - are being disadvantaged by their environments, the modification or adaptation of their environment (rather than the modification of the individuals themselves) seems like an indisputable approach. Of course, legislative initiatives already enabled the rise of barrier-free architecture that paved the way for this mentality, however, while the removal of barriers may improve accessibility it doesn't necessarily improve or enhance user capability. Perhaps, beyond the avoidance of spatial barriers, the built environment could adopt concepts of assistive technology that not only include the needs of groups who are commonly overlooked in mainstream design, but also serve to maximize their abilities and opportunities. When taking the concept and role of tools of human enhancement into consideration, the possibility of their application within and as part of the built environment may be the ideal alternative for the removal of capability barriers faced by physically impaired people.

Human enhancement is known "as an improvement to or within one's body or mind that enables one to exceed species-typical functioning in some respect"[22]. Within the realm of disabilities studies, however, the term refers to tools that may facilitate one's impaired capabilities, whether regaining normative function or learning adaptive alterations of it. When one faces impairments - whether cognitive or physical - "there is a choice between training that improves an impaired species-typical function and training that circumvents it by the use of unimpaired functions and assistive devices"[23]. In other words one will either learn how to fulfill an activity in the manner that is considered "normative" to able-bodied people, or they will learn an adapted way to fulfill such activity atypically. The latter approach is reflective of human

[21] Clarkson, John. "Inclusive Design : Design for the Whole Population" (London: Springer, 2003), p.1
[22] Ibid
[23] Flanigan, Jessica. *The Ethics of Ability and Enhancement.* (Palgrave Macmillan, 2018)

enhancement, proposing to individuals the possibility to regain or facilitate previously impaired functions. Assistive technology and aids exemplify these concepts, where either internal or external tools - such as walkers, wheelchairs, prosthetic limbs, even brain computer interface, or even glasses - enable individuals to find adaptive ways to restore previously limited capabilities. This investigation foresees and aims to explore the possibility of the built environment as a tool for human enhancement. Concepts such as barrier-free and universal design have already paved the way for more accessible environments that cater to a broader range of audiences. However, what if there's the possibility to go even further? Perhaps, the removal of architectural barriers may give rise to a new form of design that is not only receptive to physically impaired audiences but also a tool to maximize their capabilities. The objectives of this research caters precisely to that possibility, relying on the belief that those who are disabled by design may rather be enabled by it. If this approach is successful, current concerns of design exclusion hold the possibility of reshaping into designs of social integration. The same applies to generalized architectural standards, which could redirect focus from mainstream society in acknowledging the importance of the many qualities of human diversity.

E. Research Methodology [wc. 645]

To organize and facilitate the research process, this investigation will be separated into three themes which also designate three different phases of exploration. The first phase focuses on the topic of capabilities and seeks to identify the external factors which may limit them, therefore aiming for a more specific definition of real-life manifestations of capability barriers. The second phase involves the built environment, and precisely the role of its design as an instigation or influence of capability barriers faces by the physically impaired. This portion will explore a wider understanding of spatial manifestations of capability barriers, and seek architectural examples that may reflect its effects. Lastly, the third phase will consist of a design process which addresses the concept of human enhancement, and aims to explore potential alternatives that may solve the many concerns related to capability barriers in the built research methods, all of which are delineated in the text below:

> **Phase 1: Capabilities** [problem identification]
> This phase seeks to identify capability barriers and understand in which occasions or activities the physically impaired may be restricted by such impositions
> - Part 1A: Fieldwork
>   Mapping of real-life manifestations of capability barriers experienced by the physically impaired. [*Note: this portion of the research has been partially completed through the fieldwork analysis of Huis Assendorp, in Zwolle, conducted in October 2021*]
> - Part 1B: Survey
>   To compliment the fieldwork findings, a survey will be sent to the target audience in order to grasp a direct understanding of their perception and experiences of barriers of capability. [*Note: this survey has already been developed, will soon be reviewed and delivered to target groups*]
> - Part 1C: Literature

Exploration of literature that may support the findings of the fieldwork research, and enable the further understanding of its findings.[*Note: this portion of the investigation is already largely completed, but may require further development for the analysis of survey results*]

Phase 2: Built Environment [problem source]

This portion of the research focuses on capability barriers and their spatial manifestation. Ideally, this process will reveal examples which reflect a strong correlation between deprivation of capabilities and aspects of incomprehensive architectural practices.
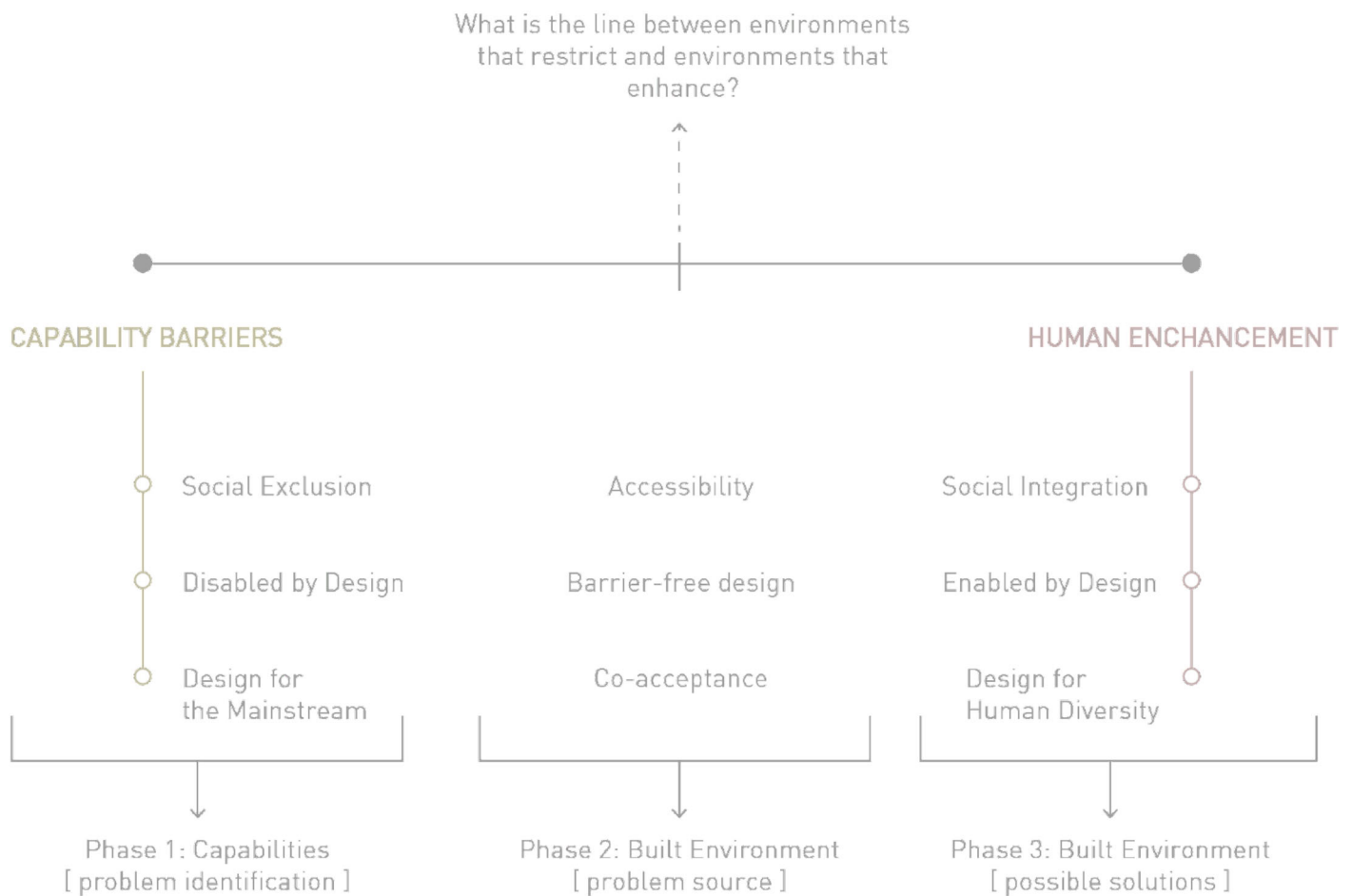
- Part 2A: Case Studies
  In-depth analysis of examples of similar programs and projects, which will allow the investigation of specific design choices that impose - or do not impose - capability barriers.
- Part 2B: Comparative Study
  Comparative analysis of case studies, to reveal positive and negative aspects of existing approaches to design exclusion. Through comparing examples of regularized design versus barrier-free or universal design, important aspects of accessibility and user inclusion should be revealed.
- Part 2C: Literature
  Exploration of literature that may support the findings of the comparative case studies, and enable the further understanding of such findings.

Phase 3: Human Enhancement [possible solutions]

After understanding the presence of capability barriers, this additional phase will aim to find possible alternatives that offer solutions to this concern. As is expected, this portion will consist mainly of design processes that result from the research conducted in the previous phases.

- Part 3A: Literature
  This first step will involve the comprehensive studying of the concept of human enhancement and its many tools. An important aspect of this portion will be understanding the varying scales of such tools, in order to rescale them into an architectural reiteration.
- Part 3B: Design Development
  This portion of the research is the first creative step of the design process, and will focus on possibilities of ways in which tools of human enhancement could be reiterated in spatial form, as part of the built environment.
- Part 3C: Toolbox
  This part will seek to create unique guidelines for utilizing the built environment as a tool for human enhancement. Ideally, this will result in two toolboxes, (i) a macro-scale toolbox involving the building as a whole and its relationship to surroundings (2) micro-scale toolbox involving interior qualities and smaller details experienced directly by users (windows, doorknobs, stairs, etc).

The diagram on the below provides a visual representation of the research structure:

What is the line between environments
that restrict and environments that
enhance?

CAPABILITY BARRIERS   HUMAN ENCHANCEMENT

Social Exclusion   Accessibility   Social Integration

Disabled by Design   Barrier-free design   Enabled by Design

Design for   Co-acceptance   Design for
the Mainstream   Human Diversity

Phase 1: Capabilities   Phase 2: Built Environment   Phase 3: Built Environment
[problem identification]   [problem source]   [possible solutions]

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