

# Wheelchair Mobility and Mental Well-being

*How wheelchair use influences mobility and mental well-being for  
wheelchair users in the Netherlands*

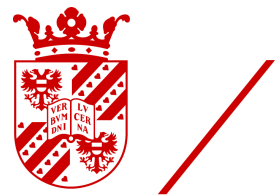
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## **Abstract**

This research explores the relationship between wheelchair mobility and mental well-being and the effects between the two. Wheelchair use as a concept and its accompanying spatial issues have been prevalent in society, but the public environment has not developed to sufficiently accommodate for this demographic. Wheelchair users could therefore experience difficulties, both in moving around, as well as their image within society, potentially influencing mental well-being. The effects of wheelchair use on mental well-being have been rather unexplored, prompting the question: “What is the influence of wheelchair mobility on mental well-being for people in the Netherlands, and how does spatial planning policy affect this?”. Through hybrid on-site and online in-depth interviews numerous stories, experiences and sentiments from current and past wheelchair users were obtained to answer this question.

The results show that the most significant spatial issues when using a wheelchair arise within the built environment, and in urban areas. Respondents experienced mixed mobility changes when using a wheelchair, with both positive and negative effects becoming evident. In terms of mental well-being while using a wheelchair, both positive and negative feelings were experienced. An important negative sentiment experienced was the image within and treatment by society, with being overlooked and ignored as main aspects. In conclusion, wheelchair mobility and mental well-being are closely related, and both spatial planning policy and society’s views are not yet up to standards to fully include wheelchair users within society.

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# Introduction

## Background

More and more companies and buildings are being made better accessible for wheelchair users, but unfortunately, not enough has yet been done to accommodate or facilitate basic, public or simple amenities (Evcil, 2009; Vincent & Chiwandire, 2017; Yaniv et al., 2010). Several institutional processes have been undertaken to raise awareness and combat insufficient accessibility of public and outdoor amenities. The most notable of these is the United Nations Convention on the Rights of Persons with Disabilities (CRPD), which entered into force for the European Union in 2011 (European Commission, n.d.). The purpose of the convention is as follows: “The purpose of the present Convention is to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity.” (United Nations Department of Economic and Social Affairs, n.d). This means that all people with disabilities, including wheelchair users, are entitled to sufficient accessibility to the public environment.

## Societal Relevance

Sufficient accessibility in the public environment for everyone is, as previously mentioned, a basic right. This means that it should always be guaranteed, and there should not be any limitations that diminish the ability to exercise this right. In general, the wheelchair-using population around the world is relatively consistent at about 1% of the population of a country (RIVM, 2002). One percent of the population might be seen as rather small, but looking at the fact that people with impaired mobility are substantially represented in the world, with for example 13.7% of the population of the United States of America having serious difficulty walking or climbing stairs (Centers for Disease Control and Prevention, 2020), wheelchair users are not the only people that require better accessibility. Despite this rather substantial segment of the population, it has however not managed to achieve the desired building accessibility that would satisfy them. This can lead to a decrease in both health and quality of life, as people may not be able to enter medical facilities to get crucial prescriptions (Trotter, 1985). It is therefore important that these issues are researched and addressed, so that measures to combat them can be taken

## Scientific Relevance

Current research within the subject has been focused on disability aspects and accessibility, and its effects within society (Amanze & Nkomozana, 2020). Previous studies have also researched the relationship between disability and well-being, but within the current academic spectrum, little literature mentions or researches the relationship between wheelchair use and well-being. It is therefore imperative that research is done on this, as mental well-being is an important part of a person's life.

## **Objectives and Research Questions**

To research the relationship between wheelchair use and mental well-being, the following central research question has been established, which this research will try to answer:

*“What is the influence of wheelchair mobility on mental well-being for people in the Netherlands, and how does spatial planning policy affect this?”*

This central question will be answered by answering three sub-questions that aim to look at and shed light on three important aspects of the research subject. The sub-questions serve to explore the reasons, factors and influences of wheelchair use on mental well-being. The sub-questions are as follows:

*“What spatial difficulties do wheelchair users experience while moving in a public environment?”*

*“How does the aspect of wheelchair use influence mobility?”*

*“What feelings and sentiments do wheelchair users experience while moving?”*

## Theoretical Framework

The mobility difficulties that wheelchair users experience in their daily life do not limit themselves to accessibility. There are five important factors that influence wheelchair mobility, which are: the user, the wheelchair, the environment, daily activities and social roles, and training received to operate the wheelchair (Routhier et al., 2003). In general, characteristics of the wheelchair are very important. According to Medola et al. (2014), specific aspects of a wheelchair and their configurations play a significant role in the mobility change of wheelchair users, and can therefore enhance a person's mobility performance to a great extent. With the wheelchair itself being vital, the environment arguably plays the biggest role, as the wheelchair operator is solely dependent on the potential that their environment has. A deficiency in opportunities can significantly limit the freedom of a wheelchair user, while there is next to nothing the person can do about it. Zooming in on the environment dimension, general mobility and transportation can be difficult, with rough and uneven surfaces being the biggest issues for wheelchair transportation (Hillman, 1994). It was also established that using a wheelchair over sand was virtually impossible. In both urban and rural areas, this could pose a serious issue, as streets and roads are not always smooth, resulting from the material used and/or soil subsidence.

Another factor that plays a role in the environment of wheelchair mobility is society's attitude towards disabilities and accompanying aid devices. In general, the use of a wheelchair immediately influences the perception of the wheelchair user by society, often in a negative way, and it became evident that wheelchair users often think able-bodied persons hold more negative thoughts than they actually express (Furnham & Thompson, 1994). Additionally, wheelchair users can experience so-called "disability oppression", in which they experience both social and cultural exclusion as a consequence of promotion of oppressive stereotypes towards impairment, especially by media and literature within Western societies (Gleeson, 1999). These exclusions and stereotypes have also led to devaluation of impaired labor force, and even laws that restricted physically impaired people access from public spaces. One example of these laws is the Chicago ordinance, which once read the following: "No person who is diseased, maimed, mutilated, or in any way deformed so as to be an unsightly or disgusting object or improper person to be allowed in or on the public ways or other public places in this city shall therein or thereupon expose himself to the public view." (Gilderbloom & Rosentraub, 1990). This law thus acted intentionally and especially against any form of disability, which will not have helped both the image towards people with disabilities, as well as the inclusion of amenity accessibility for people with disabilities in spatial planning policy.

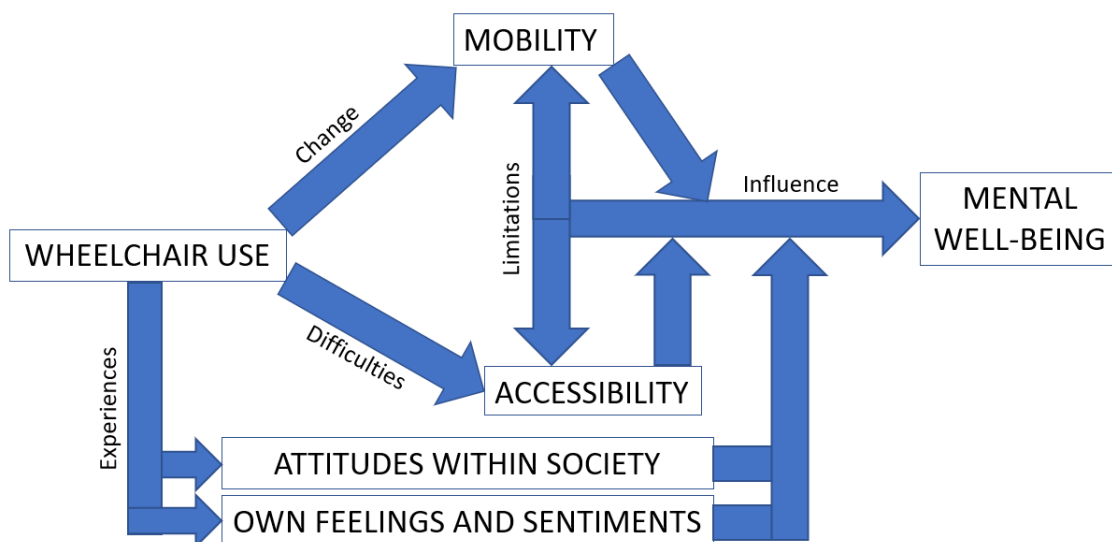
To research what the relationship is between wheelchair use and mental well-being, it first needs to become clear what the concepts surrounding this relationship are and what they mean. A list of concepts and theories that are relevant throughout the research:

- Mobility
- Accessibility
- Mental well-being
- Wheelchair use

The concept of mobility is defined as “the ability of moving by changing body position or location or by transferring from one place to another, by carrying, moving or manipulating objects, by walking, running or climbing, and by using various forms of transportation” (Van der Woude, 2010). Accessibility revolves around “the extent to which the transport system enables people to participate in activities” (Geurs & Van Eck, 2001). Mental well-being should be seen as “the state that enables the individual to live their life to the fullest, to actualize one’s growth potential, and to experience happiness and satisfaction along the way” (Fen et al., 2013). The concept of wheelchair use should not need additional clarification.

### Conceptual model

After connecting and relating the relevant concepts with the previously explored literature, a conceptual model for the relationship between wheelchair use and mental well-being was developed and constructed. Shown in Figure 1 is said conceptual model.



**Figure 1: Conceptual model of relationship between wheelchair use and mental well-being (Constructed by author)**

Figure 1 is built up from scratch, and tries to explain the connections between the different concepts that connect wheelchair use to mental well-being. As can be seen from the model, four factors arise from wheelchair use. Wheelchair use prompts a change in personal mobility, as there will either be more or less possibilities for a person once starting to use a wheelchair, depending on their current physical state. Wheelchair use will also cause difficulties with accessibility, because as mentioned previously, buildings and amenities are currently not all sufficiently accessible with a wheelchair. These two connections together result in limitations in both mobility and accessibility, which will both influence mental well-being. The lower half of the model goes into the lived experiences of wheelchair users, with their own feelings about themselves and society's view of them as phenomena. Both of these phenomena also influence mental well-being.



# Methodology

## Interviews

The original data collection plan consisted of performing moving interviews, where the interviewer would walk along with the respondent. During this walk, the interview questions would have been posed, along with follow-up questions and conversations. This interview method has been proven to be beneficial in gathering locally contextualized information and encouraging interaction between researcher and community, and community and research (Carpiano, 2009). The original plan also intended to interview only permanent wheelchair users, which meant that the respondents would have been people who rely on wheelchair use for general transportation. Unfortunately, the original plan did not work out. The chosen alternative was to change the target demographic for respondents to wheelchair users in general, which means that they did not have to be permanent users, as long as they currently own and use a wheelchair, or have owned and used one in the past. Using both Facebook-groups and personal networks (convenience), six respondents were found that were willing to participate in interviews. Because moving interviews were no longer the objective, the transition was made to a hybrid combination of both online and on-site in-depth interviews.

At first, the moving interviews were to be done in unstructured fashion. When, however, it became clear that the transition to hybrid online and on-site in-depth interviews was going to be made, the interview took a shift to almost fully structured fashion, in which there was an interview guide with chronologic questions that aimed to specifically answer certain parts of the research sub-questions. Of course the interview guide did still allow for small detours or side conversations to take place, but this would only happen if the situation would give need for it, or if the respondent initiated it, and would thus not be forced. The eventual interview guide that was used for the interviews can be found in Appendix B. The interview guide is in Dutch, as the interviews were also performed in Dutch. Interviews took place on Wednesday, April 13; Thursday, April 14; Friday, April 15 and Tuesday, May 3.

The eventual interview respondents ranged in age from 37 to 60 years old at the time of interviewing. Three respondents identified as female, two identified as male and one preferred not to say. The distribution of types of wheelchairs was evenly distributed, with three manual and three electric wheelchairs. The types of impairments among the respondents, and thus the intensity of using a wheelchair was widespread, with both fringe and almost continuous use of a wheelchair being present among the respondents. An overview of the interview respondent sample can be seen in Table 1 and Appendix C.

**Table 1: Interview respondents**

Respondent	Age	Gender	Wheelchair type
1	53	Female	Manual
2	50	Female	Manual
3	60	Female	Electric
4	44	Male	Electric
5	45	Prefer not to say	Manual
6	37	Male	Electric

The gathered data from the interviews was transcribed and stored in multiple online locations, including both private and university servers, to ensure that the chance for it to get lost is kept to a minimum. The respondents all live in the north of the Netherlands, which includes the provinces of Groningen, Fryslân and Drenthe. As the interviews were either online or on-site, recording methods were either both a dictaphone and cell phone when on-site, or online recording programme Open Broadcaster Software (OBS) when online.

In terms of data reliability, validity, and trustworthiness, a couple of things can be said. Considering reliability, the interview questions were mostly clear, and negligible extra information or clarification needed to be given. All interviews were conducted with the same interview guide (Appendix B), and were conducted by the same person. There is thus no difficulties considering multiple variables in research, as the only variable in the data collection process was the respondent. There were however instances where some interview questions were not posed, either because the participant answered it within an earlier question, or if the participant did not want to answer the question. In the latter case, this has been fully respected. Looking at the validity of the research, the interview guide was constructed to answer the sub-questions of the research. Therefore, the questions targeted specific subjects, and in some cases, a sub-question of the research was almost literally asked within the interview. Because of this, the interview answers are direct and cover what is meant to be covered. Naturally, as the questions are of subjective nature, it is not guaranteed that answers are completely to your liking or expectations, but a sufficient effort was made. As for trustworthiness, the data collected in this research was not shared with anyone who was not supposed to see it, which in this case means it was not shared at all. Collected data was stored in both private as well as university servers, as to guarantee that the data was secure, both as in that it could not magically disappear, as well as that it could not land in the wrong hands.

### ***Research Ethics***

Throughout the research, the Netherlands Code of Conduct for Research Integrity (2018) was adhered to. The five leading principles of the code of conduct are: Honesty, Scrupulousness, Transparency, Independence and Responsibility.

For the qualitative data collection process, anonymity of respondents was secured. Considering the interview transcript, in the case that there would be street or place names that could lead to the respondent being traceable, these names were replaced by for example [STRAATNAAM]. Brand names, if not traceable to a person, were included in the transcripts, as these could prove relevant in the results, but were not explicitly named in the results. This shows the principle of honesty, since the interviews were performed and transcribed in accurate and suitable manner. Additionally, consent forms (Appendix A) were signed by the respondents in advance of the interviews, to guarantee that they agreed that the interview would be recorded, to later use the obtained data. This shows the principle of transparency, as the qualitative data using process was made fully clear to the respondents.

Moreover, the respondents have the right to withdraw their consent and subsequent data at any time, without having to give any reasons or explanations. Scrupulousness relates back to the previously mentioned methodology, as it is thoroughly explained what scientific methods were employed. Responsibility towards the respondents is acknowledged, and if there were specific wishes from the respondents, they were granted and respected. For example, one respondent went to drive their car during an online interview, and with their phone in the cupholder between the front seats, the interview continued, both lawfully and safely. Independence of the research shows through the fact that no financing or other funding through any organizations was received.

## Results

As for the data collected for this research, six in-depth interviews were conducted. The interview respondents were three females, two males, and one respondent preferred not to disclose their gender. The respondents were between 37 and 60 years old, and were recruited through social media and convenience. Out of the eventual respondent group two participants were selected through social media, and four through convenience.

The goal of the interviews was to ask questions relating to wheelchair use and mental well-being, to eventually establish a relationship between the two. The questions were aimed at different subjects concerning wheelchair use, and its effect on mental well-being. The questions that were asked can therefore be categorized into different subjects. The analysis will thus also take this form, in which important quotes and sentiments from the respondents on the same themes will be compared. To achieve this, the following themes were identified.

- Spatial influence and difficulties caused by wheelchair use in public environment
- Influence of wheelchair use on general mobility
- Feelings and sentiments experienced through wheelchair use

Since the interviews were conducted in Dutch, the questions and all subsequent questions and answers have been translated to English in a way that resembles the original Dutch meaning in the best way.

### **Spatial influence and difficulties caused by wheelchair use in public environment**

Looking at the answers and stories within this subject, some interesting results were gathered. Answers surrounding the example of grocery shopping were pretty diverse, with for example 2 respondents saying they were still capable of doing groceries without a wheelchair, 2 respondents did their groceries with their wheelchair, and 2 respondents were not able to do their groceries using their wheelchair. An interesting notion made among multiple respondents was that shopping with a wheelchair in general is difficult, since there is a lack of reach and room in stores. Considering the lack of reach, it means that the position of products in stores are not accommodating of wheelchair users, since a lot of products are too high for wheelchair users to grab. Among the respondents, there was general consensus about these issues, with Respondent 2 explicitly mentioning lack of room in stores as one of the most memorable aspects of wheelchair use. The quote by Respondent 3 below highlights both issues.

*“I was in a clothing store once, and well, it gives me the feeling that I need to barge straight through all the racks, and that nothing is on eye level. Sometimes I can not reach the ATM, or there is a counter in the way. I still have the luck to get out of my wheelchair so that I can stand, but I think that if you can not do that, that would be very annoying. In some stores the aisles are very small, and you can not turn. Sometimes there are bumps, through which you just can not enter the store at all.” - Respondent 3*

In addition, two respondents explicitly mentioned the same pharmacy chain, to have unnavigable stores. This is in line with Trotter (1985), in that crucial medical facilities are not sufficiently accessible to wheelchair users, which could lead them to miss out on essential medication.

The end of the previous quote feeds well into the next part, surrounding the biggest difficulties experienced while moving in a wheelchair. This is important, as moving in a public environment is a basic right and something that every person should be able to do freely and independently. Therefore, wheelchair-related difficulties that are experienced through this are of great importance. Within the answers of the respondents, there were a few spatial aspects that prompted immediate difficulty. All respondents reported spatial issues, with five respondents especially mentioning sidewalks and elevation changes as a recurring issue. Additionally, obstacles like parked bikes or trash on the road or street, and uneven terrain, both paved and unpaved, were frequently mentioned.

*“Here in my own street, you can not go over the sidewalk, because there are bicycles parked. So there you have to go off the sidewalk and on the road, and the road is one of those sett roads, so yeah, it is also very difficult to go off the sidewalk, on the road, and back again, and that every five meters or so.” - Respondent 5*

The quote above illustrates a situation multiple respondents had come across while using wheelchairs. While there was consensus surrounding the issue of obstacles on the street, the individual views surrounding sidewalks were not always the same. In this case, respondent 2 argued that it was impossible for her to mount a sidewalk unless there was a ramp or a person to help, while respondent 4 said that it is dependent on equipment, which is in accordance with the findings by Medola et al. (2014). He also mentioned that there are specific wheelchairs that can handle elevation changes and bumps very well, but that these wheelchairs are less comfortable to sit on, so it is a bit of a trade-off. It should also be mentioned that these specific wheelchairs are not necessarily provided, and the person would have to buy it themselves.

Additionally, it was looked at if there were elements of roads or streets that the respondents would avoid at all costs. The results regarding this were quite dispersed, as half of the respondents reported that there were no features they would avoid, and the other half reported that there were specific aspects that they would avoid. Out of the group that does avoid certain characteristics, the issues of getting off and on sidewalks and the lack of room in stores was repeated and emphasized. The two quotes below show the contrast between the two opinions.

*“If I am driving somewhere where there is asphalt or a sidewalk, I will choose to ride on the street, but most often, I just drive on the cycle path.” - Respondent 6*

*“People are very cooperative. If you are standing somewhere, and you look up desperately, in a store for example, they will grab it for you, and if you stand desperately at some stairs, they will ask: ‘Oh, could we help you, could we do something?’, and nine out of ten times they can.” - Respondent 1*

Overall, taking into account the quotes and results, it can be said that the findings are in line with the paper by Evcil (2005) with regards to the state of wheelchair accessibility in public buildings, and that there are still major issues surrounding the accessibility of public buildings to wheelchair users. Regarding spatial features, Hillman (1994) emphasized rough and uneven surfaces as the biggest issues for wheelchairs. While they were found to be significant issues, the biggest issues among the respondents were sidewalks, obstacles and lack of room inside buildings.

To answer the sub-question: "What spatial difficulties do wheelchair users experience while moving in a public environment?" The most significant spatial difficulties experienced by the respondents were sidewalks, obstacles, and insufficient accessibility to stores, combined with not enough room inside of the stores.

### **Influence of wheelchair use on general mobility**

The respondents reported that they were relatively content with their current wheelchairs. There were sometimes small flaws, or aspects that could be improved for the future, but respondents generally viewed their wheelchairs as satisfactory for their current needs. The most interesting reaction in this regard was from Respondent 5, who said the following.

*"You actually do it the other way around, you do not adapt the wheelchair to your needs, you adapt your needs to what you have" - Respondent 5*

With regards to the effect of wheelchair use on general mobility, the outcome was four to two in favor of positive influence. The four respondents who associated wheelchair use with an increase in mobility highlighted the opportunities that it gave them, and the potential it had in undertaking activities that they could not participate in beforehand.

*"You can do things again that you could not do beforehand. We have a famous body of water here that I had never been to. I can go there now and do a lap around it with the dog and the kids." - Respondent 4*

On the contrary, the two respondents who associated wheelchair use with negative effects on mobility quoted how the possibility of using a wheelchair, and everything associated with it limited them in undertaking activities that they were previously able to do.

*"It works a bit braking, because if you have to go away with that thing, you would rather not go. If I really have to, I will do it, but it does work a little halting." - Respondent 5*

A potential reason for this could be that in the scenario where a wheelchair is not fully necessary, the effect that a wheelchair has feels different, because you still have the feeling you could do anything, and you do not want to give up your possibilities.

To answer the sub-question "How does the aspect of wheelchair use influence mobility?" It can be said that the influence of wheelchair use on mobility varies per person, and by their stage in the life course, as well as their degree of necessity. People who are dependent on using a

wheelchair experience positive change in mobility, while people who can still walk sometimes experience negative change in mobility through using a wheelchair, and may even see it as a limitation.

### **Feelings and sentiments experienced through wheelchair use**

In terms of general mental effects, four respondents associated wheelchair use with negative feelings, one respondent experienced positive mental effects, and one respondent was neutral. The contrast between the positive and negative experiences can mostly be seen in the self-image and resilience of the person. The aspect of not wanting to be seen in a wheelchair was prevalent throughout the negative effects narrative.

*“Well, I always find it a challenge to go in the wheelchair, and that is I think because I do not need it all the time. So I need to always convince myself to go sit on it.” - Respondent 3*

Opposite to this sentiment was Respondent 1, who explained the reason why she experienced positive mental effects from wheelchair use, highlighting the length of the entire process as one of the most important factors.

*“I also saw that I walked badly, and I actually was a bit ashamed of that, so I found that very unpleasant. I have also, for 20 years, not looked into windows how I looked when I walked past. And a prerequisite for a wheelchair was that it should look good, and when that was achieved, I was totally fine with it.” - Respondent 1*

The quote above shows that the mental effects experienced through wheelchair use can differ through both length of the issue which requires use of a wheelchair, as well as the degree of dependency on a wheelchair. This means that context and the person's life course are both important here.

Regarding the respondents' experiences with interaction with other people, the results were overwhelmingly similar. All respondents gave almost the same answer which follows the same general narrative. The experience that all respondents had while interacting with strangers while in a wheelchair, is that they are viewed as mentally incapable, just because they were in a wheelchair. This led to awkward situations where they felt they were 'literally overlooked' and ignored by society, which in turn gave them negative feelings.

*“That as soon as you look different or are impaired, that people think that there is something wrong with you mentally as well. Because when I went shopping for presents with my husband, they never asked me if I would pay. And then I handed the presents over, and the cashier did not even look at me. The conversation went immediately to my husband. And I was like: ‘I’M SORRY? HELLO?’ And then the cashier went awkwardly ‘oh yeah, well, I assumed you couldn’t do it’ or something like that.” - Respondent 2*

Situations like this emerged throughout all respondents. Like previously, the duration of using a wheelchair is relevant in this, with both Respondents 1 and 5 explaining how they found ways to deal with these kinds of situations over time, by either messing with people, or creating a situation where other people can not possibly ignore you. This shows that there are ways for people to deal with these negative feelings, but that it depends on the wheelchair user's resilience, and that it is not a solution to the bigger issue. The paper by Furnham & Thompson (1994) holds in this situation, as the respondents expressed enough situations where they felt people intentionally ignored and overlooked them, as to prevent confrontation and possible awkward situations or remarks, and the "disability oppression" as shown by Gleeson (1999) might well still be around..

At last, the respondents were asked to grade their life both considering a life with and without a wheelchair. Five of the respondents gave their life with a wheelchair a higher grade than without one, thus generally associating wheelchair use with an increase in quality of life. This may again be explained because of the varying necessity of using the wheelchair among the respondents and the aforementioned 'limiting factor'.

To answer the sub-question "What feelings and sentiments do wheelchair users experience while moving?" The results show that people generally experience negative mental effects through using a wheelchair, mostly because of their outside environment. They also experience exclusion effects by society, which are accompanied mostly by bad feelings, but in some cases, the respondents showed resilience in dealing with these issues.



## Conclusions

The three sub-questions for this research were:

- “What spatial difficulties do wheelchair users experience while moving in a public environment?”
- “How does the aspect of wheelchair use influence mobility?”
- “What feelings and sentiments do wheelchair users experience while moving?”

Through the qualitative data analysis it was found that the biggest difficulties for wheelchair users in a public environment were sidewalks, obstacles on sidewalks and roads, accessibility to stores and moving inside stores. Most of the respondents also generally experienced an increase in mobility when starting to use a wheelchair. It was established, however, that type of equipment plays an intrinsic part in this. Looking at feelings and sentiments experienced, the respondents experienced mixed, but generally negative mental effects through wheelchair use, and explicitly mentioned feeling ignored and overlooked by society.

To answer the main research question “What is the influence of wheelchair mobility on mental well-being for people in the Netherlands, and how does spatial planning policy affect this?” It can be said based on the sub-questions that wheelchair mobility plays a significant role on mental well-being for people. Through different aspects, all respondents experienced the influence of wheelchair mobility on their mental well-being. The aspect of spatial planning is also very prevalent, with the built environment playing a crucial role in the relationship between wheelchair mobility and mental well-being.

### Further research and limitations

In terms of future research and limitations, there are a few things to be said. The sample size of six interview respondents was relatively small, but saturation of information has been achieved. The initial recruitment phase proved some difficulties, but through swift adaptation and coordination the qualitative data collection process could be finalized. Two things that future research may benefit from are on the one hand, a bigger interview sample, preferably with around ten or more interviewees, and on the other hand, a more homogenized tendency and necessity of wheelchair use, as the time and amount of wheelchair use in this sample was quite widely distributed. Further research should focus on the specific mental well-being in different wheelchair-using categories, as well as wheelchair use in diverse landscapes and environments, to gain a better idea of the bigger picture.

### Policy Implications

Looking at the implications of this research, and the policy measures that could be taken from it, it should be noted, as stated in the results, that accessibility standards of buildings are not up to an acceptable standard for wheelchair users, despite numerous programs and institutional processes that have been undertaken. An additional aspect that should be looked at is the layout of streets and sidewalks, as these have been proven to be a significant issue. One

example that might be looked at within the Netherlands is the city of Breda, where the street layout and the inner city have been changed to accommodate wheelchair users and their mobility, making it the most accessible city in Europe, and gaining it the 2019 Access City award (The Guardian, 2019). These two aspects are to be looked at within a spatial planning context, and together with raising awareness for the social position and role of wheelchair users, and not overlooking or ignoring them, improvements can be made that greatly improve the quality of life for both wheelchair users and society.

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# Appendix A: Toestemmingsverklaring (Empty Consent Form)

## Toestemmingsverklaring

*Toestemmingsverklaring voor onderzoek: 'Influence wheelchair mobility on mental well-being'*

Ik begrijp het onderzoek volledig. Ik heb genoeg tijd gehad om te beslissen of ik mee wil doen aan het onderzoek. Ik heb de kans gekregen om vragen te stellen en mijn vragen zijn duidelijk beantwoord. Ik begrijp welke gegevens worden verzameld in dit onderzoek.

Ik begrijp dat alle persoonlijke gegevens niet te herleiden zijn tot mij als deelnemer. Verder begrijp ik dat de data geanonimiseerd wordt.

Ik weet dat mijn deelname vrijwillig is. Ik begrijp dat ik mij terug kan trekken uit het onderzoek op elk moment, zonder een reden te hoeven geven.

Ik geef toestemming om de interviewgegevens te verwerken en gebruiken voor educatieve doeleinden.

Ik verklaar hierbij dat ik mee wil doen aan dit onderzoek.

Naam en Handtekening van deelnemer:

Datum:

### *Verklaring Onderzoeker*

Ik verklaar dat ik de deelnemer volledig geïnformeerd heb

Als er meer informatie naar voren komt tijdens het onderzoek die invloed heeft op de toestemmingsverklaring van de deelnemer, breng ik die tijdig op de hoogte.

Naam en Handtekening van onderzoeker:

Datum:

## Appendix B: Interview Guide

### Sub-vragen:

- Welke moeilijkheden ervaren rolstoelgebruikers tijdens het bewegen in de publieke omgeving?
- Wat is de invloed van rolstoelgebruik op het persoonlijke mentale welzijn, en wat zijn hier de oorzaken van?
- Wat is de invloed van het gebruik van een rolstoel op algemene mobiliteit?

### Introductie:

#### (1) Heet de geïnterviewde welkom

- Hoe gaat het met je?
- Introduceer jezelf en het onderzoek (Naam, Studie, Vak)
- Teken en van de toestemmingsverklaring (Al gedaan/nog te doen)

#### (2) Openingsvragen

- Wat is je leeftijd?
- Hoe identificeer je jezelf qua geslacht?
- Wat voor rolstoel gebruik je of heb je gebruikt?

### Kernvragen

- Is/was je rolstoel geschikt voor je behoeften?
  - Als nee: Wat zou je graag verbeteren?
- Hoe doe/deed je boodschappen met de rolstoel?
- Wat zijn/waren de grootste moeilijkheden die je ervaart/ervoer tijdens het voortbewegen op de rolstoel?
- Zijn/waren er eigenschappen van straten of wegen die je bij voorbaat altijd ontwijkt/ontweek?
  - Als ja: Wat zijn deze eigenschappen en waarom ontwijk je ze?
  - Als nee: Zijn er eigenschappen die je minder fijn vindt, en als die er zijn, wat zijn ze?
- Voelde je dat je mobiliteit beter werd toen je begon met het gebruiken van de rolstoel?
  - Kan je uitleggen waarom wel of niet?
- Heeft het gebruik van een rolstoel je beïnvloed op mentaal vlak, en hoe merkte je dit?
- Heb je ervaren dat mensen je anders behandelen wanneer je op een rolstoel zit, en wat zijn je gevoelens hierover?
- Wat voor cijfer geef je je leven nu/gedurende de tijd dat je een rolstoel gebruikte?
  - In hoeverre speelt rolstoelgebruik mee in dit cijfer?

### Afsluiting:

- Zijn er nog dingen die je kwijt wil, of aan mij wil vragen over het onderzoek?
- Bedankt voor de deelname aan het onderzoek!

## Appendix C: Table with interview respondents and basic data

Respondent	Age	Gender	Wheelchair type
1	53	Female	Manual
2	50	Female	Manual
3	60	Female	Electric
4	44	Male	Electric
5	45	Prefer not to say	Manual
6	37	Male	Electric

## Appendix D: Example of an interview transcript used for the research

### Transcript 1 - Interview 1

G: Hallo en welkom bij het interview over mijn bachelorproject. Zoals je misschien al wel weet ben ik Gerben Steringa. Ik studeer Human Geography & Planning aan de Rijksuniversiteit Groningen. Heel erg bedankt van tevoren dat je mee wil doen aan het onderzoek. Hoe gaat het met je?

1: Uhm, nou ja, naar omstandigheden wel goed. Ik ben een beetje grieperig, maar dat heeft wel zijn weerslag op van alles, heb net een weekje geskied, en dat was helemaal top! Daar krijg je een heleboel goede energie van, en dat past ook wel een beetje in dit onderzoekje denk ik. Dat er veel meer mogelijk is dan je altijd denkt.

G: Oké, je weet ook al voor een deel waar het onderzoek over gaat natuurlijk, en je hebt de toestemmingsverklaring al ondertekend, dat is heel mooi. Dan kunnen we beginnen met de openingsvragen. Wat is je leeftijd?

1: Uhm, even zien, 53.

G: Oké, en hoe identificeer je jezelf qua geslacht?

1: Als vrouw.

G: En wat voor rolstoel gebruik je?

1: Een hoge actief rolstoel, lichtgewicht.

G: En zitten er elektronische...

1: Nee, het is een handbewogen rolstoel

G: Dan kunnen we nu naar de kernvragen gaan. Is je rolstoel geschikt voor je huidige behoeften?

1: Voor... ja zeker

G: Je kan er alles mee doen wat je zou willen?

1: Eh, ja ik heb hem net nieuw sinds februari, dus hij voldoet op dit moment helemaal prima. Hij zit goed, rijdt goed, hij is mooi licht.



G: Oké, er is niks wat je eventueel zou willen verbeteren, of wat je eraan zou willen doen?

1: Uhh, ik zou er nog wel een soort FreeWheel\* voorop willen hebben, zodat je makkelijker over oneffenheden kunt rijden, dus zeg maar over zandpad of over een klinkerweg of zo. Dat is heel naar met die kleine wieltjes, en met zo'n FreeWheel, die monteert je dan zeg maar voorop, en dan komen die kleine karstel wieltjes van de grond, en eh, daar kun je makkelijker mee voort. Dat zou kunnen, of wil ik wel graag.

G: Juist, dan de volgende vraag, hoe doe je boodschappen met de rolstoel?

1: Uhm, ik uhm, ik heb een rugtas die kan ik over de leuning heen slaan, ik moet er alleen voor zorgen dat die niet te zwaar wordt, anders klap ik achterover, en dat is niet fijn.

G: Dat is inderdaad een goede factor.

1: Ja, nou ja, achterover vallen, dat vinden omstanders vaak erg, nog meer dan jezelf, dus ja, dat is maar net waar je aan gewend bent.

G: Is het dan ook dat, want bijvoorbeeld de eerste keer dat dat gebeurt, schrik je er zelf dan heel erg van?

1: Eerste keer toen dacht ik wel van, nou dat was niet zozeer met boodschappen, maar toen had ik er iets zwaars in, en toen ging ik opstaan, en toen klapte de rolstoel achterover, en ik denk: "hè, waar is die nou gebleven?", en toen dacht ik van, oké, nu heb ik er best wel veel zwaars in.

G: Oké, dan...

1: Maar dat wil wel heel goed, dat zie je eigenlijk ook iedereen wel doen hoor, een rugzak over de stoelleuning.

G: En dat gaat het grootste deel van de tijd goed?

1: Ja

G: Oké, dat is mooi in ieder geval. Dan een beetje daaropvolgend, wat zijn de grootste moeilijkheden die je ervaart tijdens het voortbewegen op de rolstoel?

1: Uhm, de grootste moeilijkheden, is uhm, als een, bijvoorbeeld uhm, wel een helling is, maar die is net iets te steil voor leuk, of er zitten net iets te hoge drempels in waar ik niet goed met mijn trucjes overheen kan.

G: Oke, en uhm, als je bijvoorbeeld dingen op straat tegenkomt, waar je het moeilijk mee hebt, zijn dat vooral, ja, ik zou het zelf institutioneel noemen, zijn dat dingen die in de openbare ruimte zijn, of zijn er ook in privé gebieden lastige dingen?

1: Nou ja, in beide eigenlijk wel. Wij hebben vrienden, die hebben nu een nieuw huis, en dat is "split-level", en dat is heel leuk (**sarcastisch**). Nu red ik me daar ook wel mee, want ik kan wel een paar pasjes lopen, maar je bent eh, je moet je wel afhankelijk opstellen in die zin, en, nou, bij de een is dat wat makkelijker als bij de andere.

G: Aja, en zijn er dan eigenschappen van straten of wegen of huizen bijvoorbeeld die je bij voorbaat altijd ontwijkt, of niet eens probeert te nemen?

1: Uhm, nou als ik eh, even kijken, nou... eh... nee eigenlijk niet, want weet je wat het is? Mensen zijn heel bereidwillig altijd. Als je ergens staat, en je kijkt wanhopig omhoog, in de winkel bijvoorbeeld, dan pakken ze het, en als je wanhopig bij een trap gaat staan, dan vragen ze ook van: "Goh, kunnen we ook helpen, kunnen we ook iets doen?" en eh, nou ja, negen van de tien keer kan dat.

G: Aja, nu skip ik even een paar vragen, omdat het er mooi op volgt, heb je ervaren dat mensen je anders of vreemd behandelen wanneer je op een rolstoel zit?

1: Ik ben me er wel van bewust dat mensen dat doen, maar ik probeer wel, ik probeer zo'n houding uit te stralen dat ze niet om me heen kunnen.

G: Oké, en wat voor gevoelens roept dat vaak op bij jou?

1: In het begin vond ik het wel heel moeilijk, maar alles went, en uhm, nu vergeet ik soms zelf dat ik rolstoelgebruiker ben en daardoor misschien anders bekeken wordt. Dus ik denk dat ik eh, ja, over het algemeen zijn mensen toch wel heel eh, heel sociaal hoor, valt me niks tegen.

G: Oké, en dan, voelde je dat je mobiliteit beter werd toen je begon met het gebruiken van een rolstoel?

1: Ja

G: En kan je ook uitleggen waarom dat is, en hoe dat voelt?

1: Je hebt, eh, nou, tijdens het lopen heb je tijd weer om te praten, je kunt weer om je heen kijken, zonder dat je alleen maar gefocust bent op hoe je loopt en waar je loopt, en je houdt meer energie over. Andere mensen die zeiden ook tegen mij: "Goh, dat had je veel eerder moeten doen, want wij vonden het heel eng zoals je liep en voortbewoog, en uhm, het gaat veel sneller, en de actieradius wordt veel groter. Het levert je echt eh, ja, ik had het best wel jaren eerder kunnen doen zeg maar.

G: Aja. Oké, en uhm, heeft het gebruik, of het beginnen van het gebruik van een rolstoel je beïnvloed op mentaal vlak, en als dit zo is, hoe merkte je dit?

1: Nou, ik zag ook wel dat ik heel slecht liep, en daar schaamde ik me eigenlijk wel een beetje voor, dus dat vond ik heel naar om te zien. Ik heb ook, nou jaren, wel 20 jaar niet in ramen gekeken hoe ik eruit zag als ik voorbij liep zeg maar, dus en eh voorwaarde voor een rolstoel was dat hij er goed uit zou zien, en eh, toen dat is allemaal, toen dat is gelukt, toen vond ik het helemaal prima. Toen eh, mensen zien me lopen, en die zien ook wel, er is iets aan de hand, maar wat? Het kost me heel veel gedoe, en als je dan toch een rolstoel hebt, en hij ziet er goed uit, nou, dan is het prima.

G: Dus in zekere zin voelde je je eigenlijk beter toen je een rolstoel begon te gebruiken?

1: Ja, nou ja, goed, je ziet jezelf niet meer lopen gewoon.

G: Ja, oke, dat is een goed punt. En wat voor cijfer geef je je leven nu?

1: Ja, gewoon, ik denk wel een 8.5 of een 9.

G: En hoe zou dit anders geweest zijn als je geen rolstoel gebruikt zou hebben?

1: Ja, dan denk ik dat het wel een onvoldoende was geweest, zonder was ik echt wel eh, dan had ik niet meer kunnen winkelen zeg maar, dat was, ja, dat was wel mijn grootste pijnpunt, dat je gewoon niet de stad in kunt, en kunt gaan en staan waar je wilt, ik kan nu eigenlijk gewoon weer alles doen wat ik wil.

G: Dat is mooi in ieder geval, dan zijn we eigenlijk al redelijk aan het einde gekomen, zijn er nog dingen aan de hand van deze vragen die je kwijt wil, of aan mij wil vragen voor het onderzoek?

1: Uhm, wat ik nog vergeten ben te melden is dat uhm, dat je zei van in de openbare ruimte en zo, als wegen heel lang heel schuin lopen, dan is dat ingewikkeld voor een rolstoelgebruiker, plus als je een enorme holling in de weg hebt, en je moet aan de zijkant, dat is echt heel zwaar. En, uhm, wat je niet hebt gevraagd is eh, dat had ik eigenlijk wel verwacht, van uhm, als je rolstoelgebruiker bent, dan wil je niet allerlei kunstgrepen uithalen om hier of daar te kunnen komen, en het belangrijkste is het toilet. Dat is echt heel stom dat dat een ding is, maar dat is het eigenlijk wel. Stel een restaurant is leuk toegankelijk, met een oprijplaat en zo, maar ze hebben een toilet boven met een trap...

G: Aaah, daar had ik inderdaad niet over nagedacht, ik zal het met de volgende mensen erover hebben, kijken of zij dat ook zo zien.

1: Maar als ik bijvoorbeeld een restaurant bespreek, of ergens koffie ga drinken, dan kijk ik altijd van: hey, is het toilet, is er een toilet waar ik met mijn rolstoel kan komen, en als het niet kan, dan ga je naar een andere plek.

G: Daar had ik zelf nog niet zo over nagedacht, maar dat is goede informatie.

1: Ja, dat is heel stom, dat is eigenlijk wel een van de voorwaarden nummer één. Als dat niet geregeld is, dan begin je niet.

G: Oké, wil je nog andere dingen zeggen, of was dat het?

1: Nee, dat was het.

G: Oké, bedankt voor deelname aan het onderzoek!

1: Graag gedaan!

\*FreeWheel: additional construction attached to the front of a wheelchair, picture for illustration.

