
The architectural challenge for physically disabled people

A RESEARCH THROUGH THE EYES OF THE PHYSICALLY DISABLED

31 januari 2023



Abstract

Currently people with physical disabilities do not have the option to be away from home for a short or longer period of time to relieve themselves from the medical situation at home. This creates a feeling that there is currently a building typology missing in society and forms a challenge to be further investigated. The objective is to gather knowledge about how physically disabled adults experience a place and in what way an architectural design can influence this in a positive way.

The focus for this research is on the physically disabled adults who live at home, are dependent on a wheelchair and daily care. The following main research question has been formulated to answer the problem statement above: *“In what ways can architecture overcome the limitations that adults with physical disabilities face in daily life?”*

To be able to answer the main research question literature research was carried out and interviews were conducted among 5 participants. Two physically disabled, one informal caretaker and two medical professionals. All these participants are representative for both the interview as well as physically disabled adults in the home situation. The interview responses showed that there are 4 main important themes: spatial, social, independence and healthcare. This indicates that these themes are important for all participants. To conclude, the current built environment is missing an accessible building typology, a place that provides care without feeling so for both physically disabled adults as for able bodied people to spend time away from home.

Based on this my advice for follow-up research would be how to create awareness among architects about the life of physically disabled adults and how they can design for them?

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Introduction

In the Netherlands there are 1,4 million people with a physical disability which limits them in performing general daily activities and taking care of themselves. There are no exact numbers, but from this 1,4 million there are approximately 250.000 individuals that are dependent on a wheelchair ('Factsheet Mensen Met Lichamelijke of Verstandelijke Beperkingen,' 2012). From the 1,4 million people with a physical disability over one-third hardly ever go out for a day or evening (HandicapNL, 2020). This big group of people is dependent on daily care provided by their informal caretakers or medical professionals. In most cases those informal caretakers are family members, friends or neighbours. The help that they provide ranges from emotional support and companionship to household support and even nursing tasks (de Boer et al., 2020). This has a direct impact on their living environment. Their homes are adapted to remain accessible and to create space for informal caretakers or medical professionals to provide them with the care that is needed. The accessibility of a building is also documented in the building regulations (Hoofdstuk 4. Technische bouwvoorschriften uit het oogpunt van bruikbaarheid | Bouwbesluit Online, z.d.). The height of ceilings, the width of doorways, the location of elevators are determined in this document. These laws force a designer to think about the accessibility of a building but at the same time does not challenge the designer to come up with new forms of accessibility as mentioned in the research of Boys (2017). This leads to buildings that are 'adapted to' disabled people but not to buildings that are 'created for' disabled people. Over the years the view on disabled people and their role in the built environment has changed in a positive way, but there is still room for improvement (van Trigt et al., 2017). A feeling that there is currently a building typology missing in society remains and forms a challenge to be further investigated.

The focus for this research will be on the physically disabled adults who live at home, are dependent on a wheelchair and daily care. The objective is to gather knowledge about how physically disabled adults experience a place and in what way an architectural design can influence this in a positive way. To design in a new and innovative way one must first understand what the current situation is in the built environment for these physically disabled adults. Considering that physically disabled people experience space differently than body abled people, this aspect needs further research. Thus formulating the main question: *"In what ways can architecture overcome the limitations that adults with physical disabilities face in daily life?"*

In the next section the theoretical framework that is needed to get a better understanding of the research will be further addressed. The section methodology will discuss the type of research and how this will be performed to answer the question. The results will be discussed in the third section. The fourth section discusses the conclusion of the study and will answer the main question. In the last section a critical evaluation of the study and results will be discussed which will validate the research and ending this paper.

Theoretical framework

There are many different types of disability. A disability can be classified as physically or mentally. Since this research focuses on the physically disabled adults, the mentally disabled will not be further researched. According to Sociaal en Cultureel Planbureau (2012) “a disability means that as a result of health problems, people have difficulty performing daily activities, e.g. household activities, getting from one place to another or personal care” (p. 1). Looking at physical disabilities there are three classifications, a motor, a visual and a hearing impairment. This research will focus on the motor impairment. A motor impairment means that an individual has difficulty with performing daily activities from the aspect of limbs or body parts that do not function as normal (HandicapNL, 2020). Therefore they mostly have difficulties, besides daily activities, with mobility and prolonged sitting and standing. For this research the motor impairment is defined as the physical disability.

As mentioned in the introduction this research will focus on the physical disabled adults that live at home and therefore are dependent on the care of informal caretakers and/or medical professionals. Whereas in nursing homes the care is completely provided by professional medical staff, the situation at home is very different. In most cases where an individual has a physical disability or develops one and remains at home, their immediate social circle may start to consist out of informal caretakers. Their direct family members are the biggest part of this group. In the Netherlands there are approximately 5 million informal caretakers from which 9.1% feels heavily burdened by the responsibility that they bear (de Boer et al., 2020). Their personal relationships can be strained by the care that the physically disabled need. A wife and husband might lose their intimacy when one becomes completely dependant on the other. This creates mental health issues for both the informal caretaker as the physically disabled where there are already enough health issues to worry about. There are places where the physically disabled adults can go to to relieve the informal caretakers. Such a place is known as lodging care (Ministerie van Volksgezondheid, Welzijn en Sport, 2021). Those lodging care places are in fact healthcare facilities where medical professionals take care of the physical disabled adults. Whereas this relieves the informal caretakers, the physically disabled adults themselves spend time in a hospital or clinical feel environment where they are still confronted with their disability. Besides most of these healthcare facilities are focused on the mentally disabled people (Sociale kaart Nederland, n.d.).

Currently people with physical disabilities do not have the option to be away from home for a short or longer period of time to relieve themselves from the medical situation at home. For the mentally disabled, or children with a disability, these places exist in abundance. Where there is a lot of literature focused on mentally disabled people and disabled children and what their needs are when away from home, there is not much literature on physically disabled adults. The definition of what such a place should be is left open during this research. The focus is on the perception of the physically disabled adults of a place without giving it a definition. The research of Heylighen et al. (2013) is a first good step in researching the perception of the physically disabled people and how architecture can fall short in this. Together with the research of Boys (2017) and Halder and Assaf (2017) there is a strong base for research into the wishes of the physically disabled adults themselves.

Methodology

The main question contains two important aspects who are interrelated: the physically disabled adults and the spatial elements. In the field of spatial studies there is already a lot of research that can be found. But the perspective of the disabled adult is a different story. The research-question *'In what ways can architecture overcome the limitations that adults with physical disabilities face in daily life?'* focuses on the personal experience of an individual, in this case the experience of a physically disabled adult. Experiencing a place is different per person, especially when the body functions differently than normal. To be able to understand their experience of a place there will be interviews held. The participants are aged 18 to 70 years old and have a physical disability. Because of their physical disability they are dependent on the use of a wheelchair, either electric or manual. They are also dependent on daily care from their informal caretakers or medical professionals. Besides the physically disabled adults themselves, the informal caretakers and medical professionals will also participate in the interviews. In total there are five participants, two physically disabled Gert-Jan and Ko, one informal caretaker Hans and two medical professionals Gitta and Dian. The interview is semi-structured with questions that will guide the conversation in the right way. The main focus is on the participant's personal feelings and experience connected to spatial conditions. Since the interview will be held with Dutch speaking participants the questions are formulated in both English as in Dutch. The questions are formulated as following:

1. Wanneer je naar een nieuwe plek gaat wat is dan het eerste waar je, praktisch gezien, op let? *When you go to a new place what is the first thing you pay attention to, practically speaking?*
2. Wanneer je naar een nieuwe plek gaat wat is dan het eerste dat je gevoelsmatig opvalt? *When you go to a new place what is the first thing you notice from your feeling?*
3. Wat zijn de meest voorkomende frustraties wanneer je naar een nog onbekende plek gaat? *What are the most common frustrations when you go to an unfamiliar place?*
4. Hoe zou jij jouw ideale sfeer omschrijven van een plek? *How would you describe your ideal ambience of a place?*
5. Wat zijn activiteiten die je graag onderneemt? *What are activities you like to undertake?*

The interviews with the physically disabled adults gives the opportunity to observe their living space. This observation is a secondary method as an addition to the interviews. This observation will be performed by sketching their living spaces. The way the physically disabled adults manoeuvre with the wheelchair and the use and position of furniture will also be observed.

Results

After analysis of the interviews the content can be categorised into themes. In total there are four main themes. These themes each focus on a different aspect that the participants have mentioned. The results are summarised per theme and the different point of views of the participants are discussed. The complete interviews can be found in appendix 1 to 5 and in appendix 6 the sketches of the living spaces can be found.

Spatial

The first theme that was most present in the interviews are the spatial elements. The participants all mentioned the same problem that they faced which are confined spaces. The biggest part of the conversation was about spaces that are too small or inaccessible because of stairs, thresholds and height differences. Small spaces causes wheelchair users not be able to manoeuvre in a comfortable way and the risk of bumping into walls or furniture damaging both the space as their wheelchair as mentioned by Hans the informal caretaker:

“There should be enough room to manoeuvre, so that you can turn without taking a piece of wallpaper with you.”

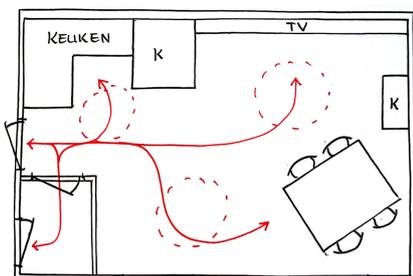


Fig. 1; Living room Ko

This lead to another big frustration, the building codes are too minimal. The building codes are focused on the dimensions of a manual wheelchair. These are much smaller than an electric wheelchair. Ko mentions this aspect as ‘a flaw in the design’. When looking at figure 1, Ko his living room, you can clearly see how much space he needs to move around in a wheelchair. There is a minimal amount of furniture present to create space.

Too often wheelchair users are confronted with an accessible toilet that is simply too small. When there is not enough room to close the door they are forced to use the toilet without privacy. Bathrooms where the shower has a basin which they cannot enter means that showering is not possible. When buildings have multiple floors wheelchair users are forced to use an elevator. In general this is not an issue but they still encounter a lot of elevators who are too small to enter. The dimensions are again based on the use of a manual wheelchair or the width of a stretcher. The electric wheelchairs are a lot bigger than the standard dimensions. Wheelchair user Ko specifically mentioned this:

“The dimensions listed in the building regulations are too tight, they are meant for a manual wheelchair.”

This adds to the general feeling that the architects, the developers and project managers have no sense of how wheelchair users move around. The built environment is mostly focused on the person who stands and walks around. Eye-level is the next big problem for wheelchair users especially in public places like museums. A lot of objects, windows or utilities are focused on a

general eye-level of 1,65m. The eye level of wheelchair users is approximately 1,25m (Haak et al., 1980). This creates a different experience of places and objects and therefore a frustration of the participants. The height of door handles and elevator buttons is also underestimated. The biggest desire of the participants is to be able to access all places that able bodied individuals can access and to be treated in the same way. Wheelchair user Gert-Jan mentioned this as his ideal ambience:

“... that you can access everything and that they just interact with you in a nice way.”

They want to reach everything themselves and they want to decorate their houses the way they want. Figure 2 shows the bedroom of Gert-Jan. All furniture is placed against the wall to create as much room as possible to manoeuvre. It still provides a challenge to move around without damaging both the wheelchair and the furniture. In most cases the basic Dutch family home is too small for a wheelchair user to live comfortably. They mention that they want their homes to be light, have a cosy feeling and to be in contact with nature.

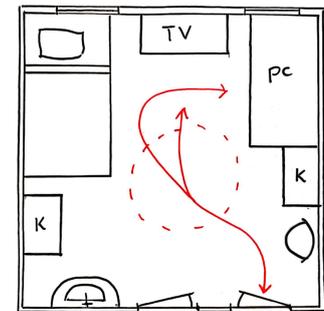


Fig. 2; Bedroom Gert-Jan

Besides buildings the participants also mention aspects of public space. Reachability is one of the aspects that is mentioned often. Getting from A to B still forms a challenge in a lot of cases, especially when using public transport. Getting on and off a train is quite often difficult because the platforms are narrow or crowded. This can cause stressing situations as mentioned by medical professional Dian:

“It was quite stressful to get in. I could not get next to him because the platform was too narrow. The ramp was very steep and he started to panic.”

Public spaces like parks can be difficult to access when there are no paved walkways. Surfaces such as grass or dirt are bumpy and in some cases create unsafe situations. Also paved roads and walkways need to be even and without sagging clingers. The landscape is of great influence for the experience of a place, slopes can be difficult to handle for manual wheelchairs.

Social

The next theme that was often mentioned is about the social aspects of being a wheelchair user. In a lot of situations wheelchair users are accompanied by somebody that is able to walk. What is mentioned a lot is the situation where people avoid contact with wheelchair users, instead they talk to the person that accompanies them. Wheelchair user Gert-Jan mentions this from experience:

“And an important thing, a classic I would almost say, that they talk to me and not about me. That still happens quite often.”

It shows how people approach wheelchair users, looking them in the eye and talking to them is described as a basic need. They are the same as any human being and want to be treated the same way. The lack of knowledge about disabilities among people and afraid of embarrassment is mentioned as the cause of this mistreatment. Whereas one person might ignore the wheelchair user,

the other might treat one in a childish way. The social interaction can make big difference whether the wheelchair user feels welcome in a place. But there is also a difference among wheelchair users. For example Ko does not want special treatment, just to be treated as if he was not in a wheelchair. Gert-Jan on the other hand mentions that he prefers it when people pay extra attention to him and his disability. The same difference among wheelchair users is also mentioned by Gitta, a medical professional:

“There are of course people who enjoy talking to other wheelchair users, but there are also those who have absolutely no desire to do so.”

Overall the participants mention that the social interaction in a lot of situations can be offensive. Even after explanation of someone his situation there is still a large group that does not feel fully understood.

When talking about social relations the aspect of social circles is also mentioned in the interviews. A person's social circle is very dependant on the individual, their characters but also on their disability. Gert-Jan his social circle exists out of other wheelchair users, in this case being disabled strengthens their friendship. Ko does not have a lot of wheelchair users in his social circle. Hans talked about his perspective from the partner and the caretakers point of view. He mentions that in some cases the disability limits someone in their social contacts. Dealing with a disability can be exhausting causing one to have limited energy and therefore limited social possibilities. For the informal caretaker it is a challenge to maintain their own social circles, to avoid that their life completely evolves around the person in the wheelchair.

“That I could maintain my own social life as far as I could. ... That has been my personal challenge as an informal caretaker as well.”

Independence

When talking about life as a wheelchair user the theme independency plays a big role in daily activities and routines. Especially the word ‘planning’ was mentioned often. Because the participants use a wheelchair they are mostly dependent on a caretaker or friend to accompany them. But even then they cannot just go out and can undertake something spontaneous. Everything that they want to do needs to be carefully planned. This is mainly because of transport, by car, train or even when by foot, needs to be planned ahead. Not all wheelchair users have the financial resources for a modified car or van. This form of transport gives the most freedom. They are not bound to arrival and departure schedules and they can travel comfortably. When using a taxi this freedom is more limited, they require booking at least a day ahead. With public transport there are more limitations. When traveling with an intercity the entire trip needs to be planned and booked, both outward and return trips, because of the needed assistance as mentioned by Ko:

“With the sprinter it can be done spontaneously. But with the intercity you can't do that, you have to request assistance far in advance. You definitely have to plan, it takes the spontaneity out of it.”

When using the sprinter this is not necessary but it takes a lot longer to get somewhere. Spontaneous activities are ruled out because of this. Wheelchair users always know where they are going, also because of practical reasons like if the wheelchair fits through the entrance. When travelling somewhere wheelchair users also need to be prepared for unforeseen things and therefore need to plan the trip with some spare time to avoid stressing situations. This is where communication plays a big role. They need to inform themselves by calling, emailing or looking up websites. This is a big frustration, especially when websites do not provide a lot of useful information. In most cases wheelchair users inform themselves well but upon arrival the facilities do not meet the expectations. This causes them to be more critical in choosing where to go or what to do. Not all activities are suitable when in a wheelchair. All this planning can give stress and can take the fun out of undertaking something. Even when a trip is completely planned there will always be unforeseen things. The biggest frustration that the participants mentioned are facilities that are out of order. Elevators are of great importance, especially with public transport. Ko once stranded on a train platform because of this:

“... there the elevator was broken and I couldn't get off the platform. Then you have to get back on the train to another station.”

This can also create unsafe situations where there are no escape routes for wheelchair users. The feeling that ‘the world needs to be accessible’ was mentioned often in the interviews. Being dependent on the wheelchair and its batteries is also something that they always have to keep in mind. Because of this they want to be as independent as possible concerning all the other factors in daily life. To be able to make their own decisions in daily activities, not the medical professional or care takers that make the decisions for them. Adaptations to their homes can provide this independence in a lot of ways. An adjustable countertop in the kitchen, electrically operated curtains or electrical doors are examples of what is possible at home as mentioned by Gitta:

“I think it's important that it's set up in such a way that such a client can also do a lot themselves. ... operate the doors themselves, switch the lights on and off, take things out of the fridge themselves.”

But outside they will always, to a certain level, be dependent on others to function in society. The different types of disabilities determine how independent an individual can be. When the disability drains a lot of energy it limits someone to be independent. This also has a direct effect on the experience of an activity.

Healthcare

Being dependent on a wheelchair in most cases means that there is a form of disability present. The kind of disability and the degree differs per individual but in all cases means that there is a dependency on healthcare. Therefore this theme played a big role in the interviews. Where other themes showed a lot of similarities between participants, this theme was viewed differently. The wheelchair users focus more on the activities that make them forget about the care that they need. Hans mentioned the importance of others that can take over:

“Life apart from being an informal caretaker, thus your respite care. That someone else takes over your care so that you can relax.”

For both the wheelchair users as the informal caretakers, arranging the needed care takes a lot of effort. Especially in the situation where the wheelchair user lives at home. For the medical professional this aspect is seen as work and holds different factors. What is similar among the participants is the large amount of healthcare supplies that is needed. Also here the exact amount differs per person and per disability. Electrical beds, patient hoists, wheelchair for in the shower and medications are a few examples of the basic needs. Bandages, gauzes and plasters belong to the smaller necessities. All these medical needs together easily fill up a large closet and take up a lot of space. Having all the supplies in stock is of great importance, ordering everything is a time-consuming job. Besides the supplies, a safe place to perform medical treatments is also necessary. In most cases the homes of wheelchair users are set up in such a way that this is made possible. In public places the accessible toilet can function as a space where small medical treatments can be performed. But, as mentioned before, when such a toilet is too small this is not possible and can cause frustrating situations. The need for medical care means that there is a need for medical professionals. They play a big role in the life of a wheelchair user. This is also the reason why the participants attach a lot of value to the fact that they can choose their own medical professionals. They want not only someone that can perform the medical treatments but also someone with whom they can get along with. This works both ways when they spend a lot of time together. Dian, the medical professional, mentions this but also mentions the separation between work and private.

“A client once said to me we are out as friends. I said no this is my job, and it was. I am constantly working to make sure he could relax.”

When at work they bear the responsibility of the client. They have to be able to look through the eyes of their client, always pay attention and they cannot always show their own emotions. Especially in stressful situations the medical professional cannot show their own stress. Since the need of care for wheelchair users is something that they cannot get away from it is important that the care must remain as lighthearted as possible Dian mentions:

“I thought it was important to keep it light-hearted and relaxed anyway. Even when there are frustrations, I try to keep it in perspective.”

All these elements are also what makes it difficult for wheelchair users to spend time away from home. The participants mention ‘the hassle’ to have everything in order as stressful or tiring. It can keep them from wanting to be away from home. They do mention that if practically everything would be in order they would want to bring their own medical professionals, friends or informal care takers with them. Unfortunately there are disabilities that cause people to further deteriorate. This means that the needed care is becoming increasingly intensive and with that their limitations in daily life. Hans:

“... Eugenie her dependency on care that was increasing. The care was getting more and more intense, especially in the last few years.”

Conclusion

The goal of this research was to get a better understanding of the life of physically disabled adults. The research question was as follows: *In what ways can architecture overcome the limitations that adults with physical disabilities face in daily life?* This research shows that there are four main important themes: spatial, social, independence and healthcare. Although all themes are important for the physically disabled adults, not all themes can be equally addressed by the architect. One of those themes that cannot be equally addressed is the social theme. Limitations that were mentioned are the lack of knowledge about physical disabilities, minimal social circles, limited social possibilities and unpleasant treatment by able bodied people. Besides the social theme, the theme healthcare can also form a challenge for the architect. The dependency on healthcare of physically disabled adults and the amount of healthcare supplies that is needed were mentioned as important limitations. The need for medical professionals, the tension between work-life relationships, and different views between the physically disabled adults and the medical professionals became clear during the interviews. The general feeling that with healthcare always comes the hassle of arranging things was mentioned often by all participants. An easier theme to address for the architect is the theme independence. No spontaneity was one of the main things that was mentioned besides the need to plan everything. Lack of information, facilities that are out of order thus creating unsafe situations and adaptations to their homes are also of importance. The theme in which the architect can play a decisive role concerns the theme spatial. Spatial elements like general spaces and doorways that are too small and obstacles such as thresholds and stairs are mentioned as the main limitations in daily life. Spaces that are mainly focused on a regular eye-level and poor reachability add to the list of main limitations.

To conclude, the current built environment is missing an accessible building typology, a place that provides care without feeling so for both physically disabled adults as for able bodied people to spend time away from home. All this while taking into account the just mentioned limitations.

Architects often have no idea what it is like to be in a wheelchair. As a result, the design goes wrong at the very first step. All in all, there is still a lot of work to do.

Discussion

For this research two different methods have been applied to answer the main research question: *In what ways can architecture overcome the limitations that adults with physical disabilities face in daily life?* These methods that were involved are literature research and interviews. For the literature research different types of sources were consulted. Here the focus was on the perception of the physically disabled adults of a place. For all these sources, the most recent studies in this field have been used. As all sources are well aligned with the research question and are recent, it can be said that the study was conducted with valid sources and is therefore valid. The other method that was applied for this research were interviews. These were conducted with five participants of which two are physically disabled adults, two medical professionals and one informal caretaker. All these participants are representative for both the interview as well as physically disabled adults in the home situation. Therefore can be stated that due to the combination of the participants and the relation with the main research question, the performed qualitative research is valid. However because there was relatively limited time for the study and only five people could participate as a result, a more extensive interview can provide a more complete and comprehensive answer.

The expectation of the research was that there would be two different opinions from the interview, those of the physically disabled adult and of the medical professional. However, the results of the interviews showed that the physically disabled adults and the medical professionals shared the same opinion on almost all themes. The theme healthcare was viewed differently among the participants. A possible explanation for this is the fact that in the interviews medical professionals mentioned that they should be able to see through the client's eyes.

The current research is therefore an addition to the existing literature where this can serve as a supplement for architects to take into account when designing. Based on this research, architects should be able to improve their ability to translate the wishes of wheelchair users into a design in the future. Where medical professionals can see through the eyes of physically disabled adults, architects currently cannot or will not. This is something that requires change in our society.

My advice for follow-up research would be how to create awareness among architects about the life of physically disabled adults and how they can design for them?

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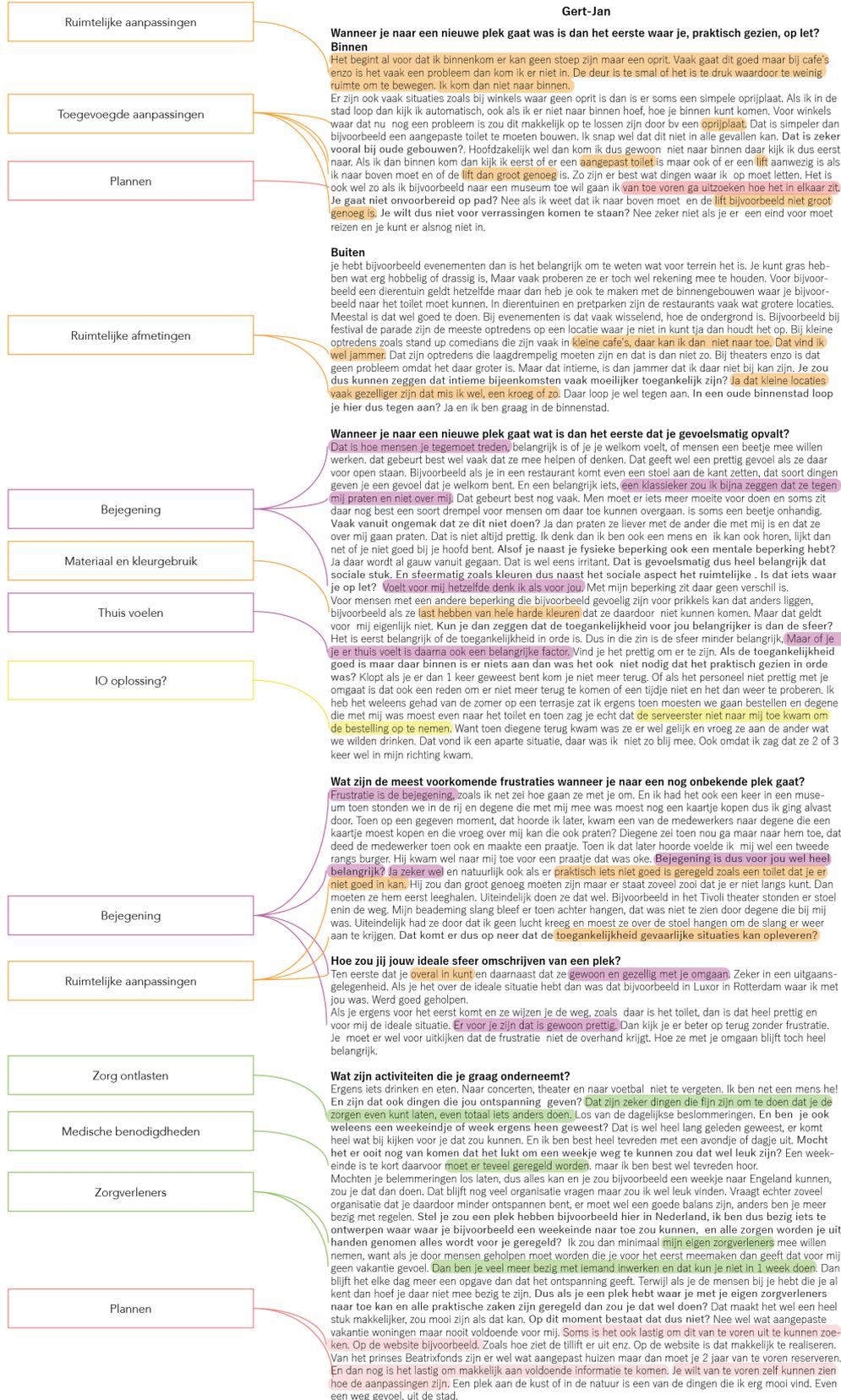
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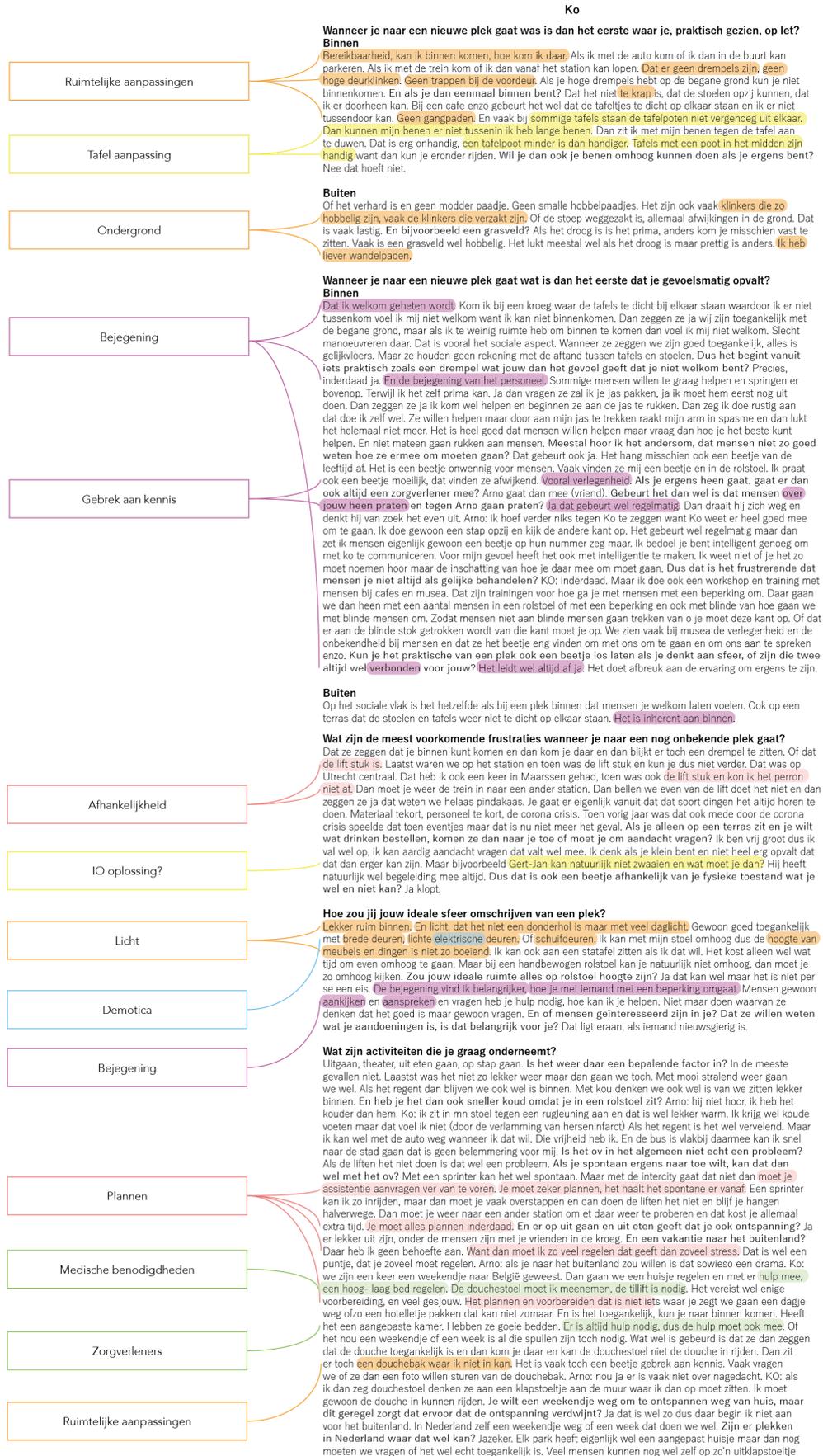
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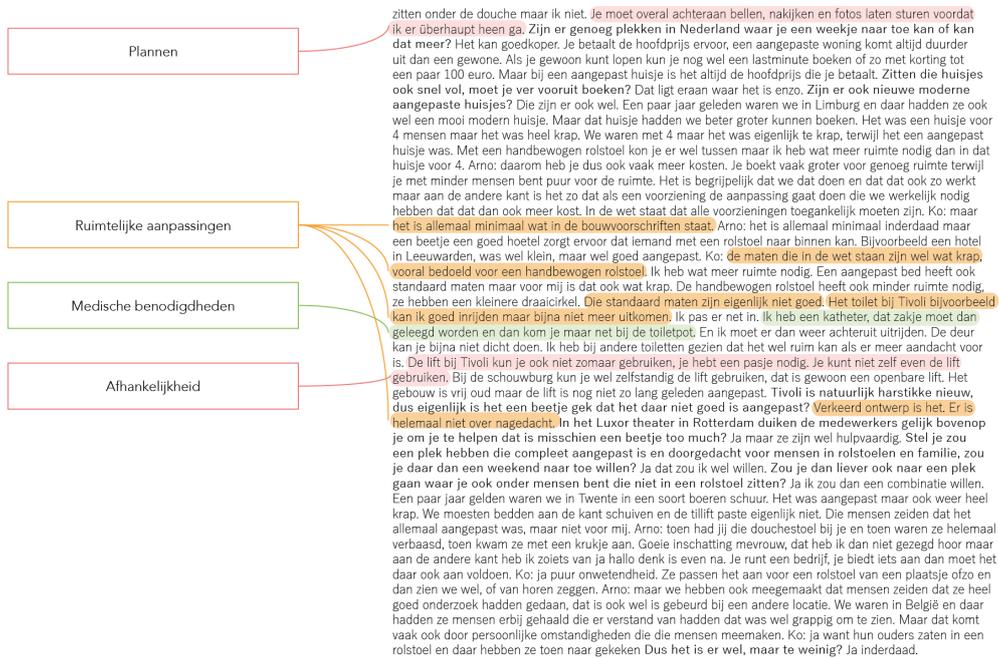
Appendix

Appendix 1. Interview Gert-Jan

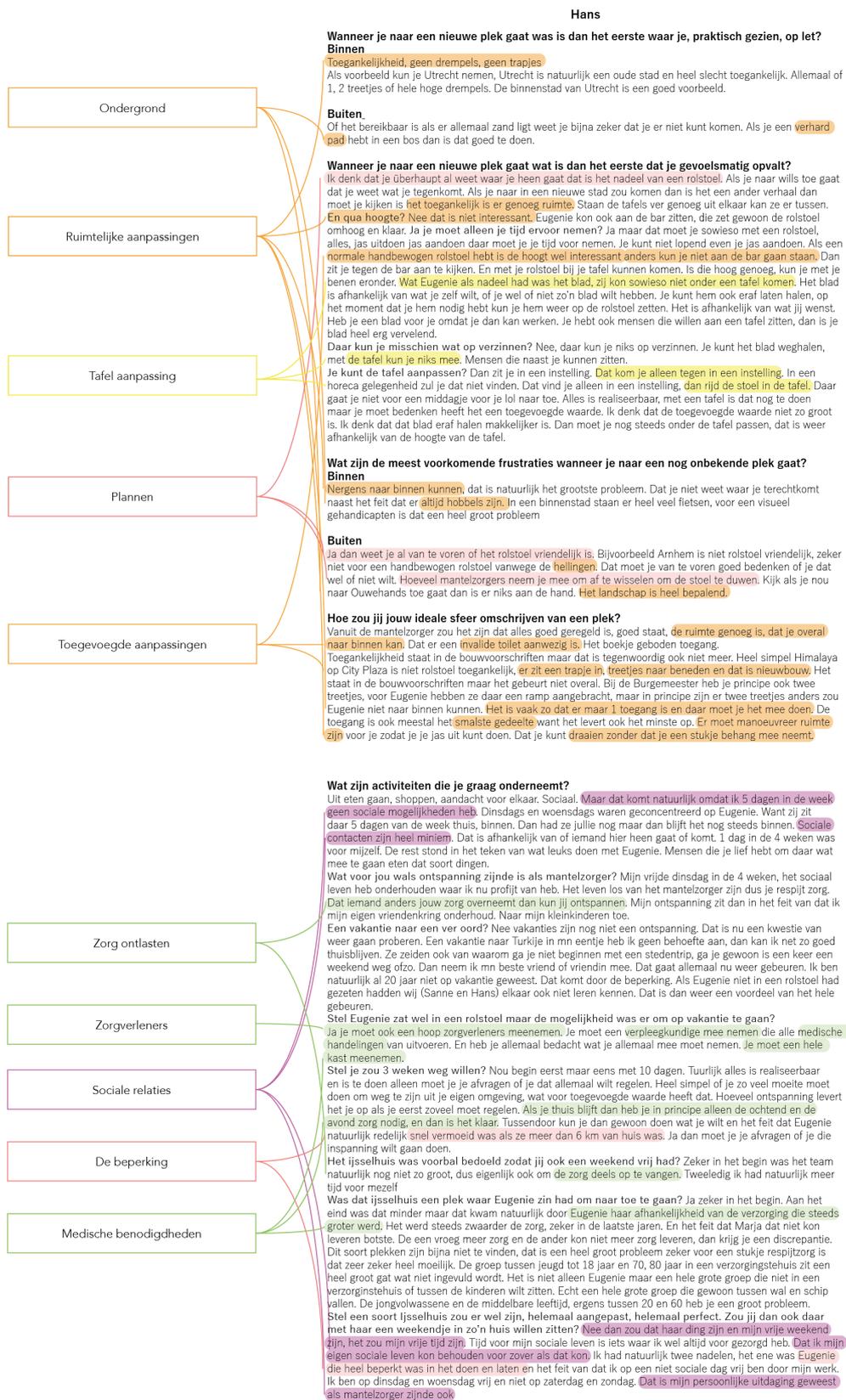


Appendix 2. Interview Ko



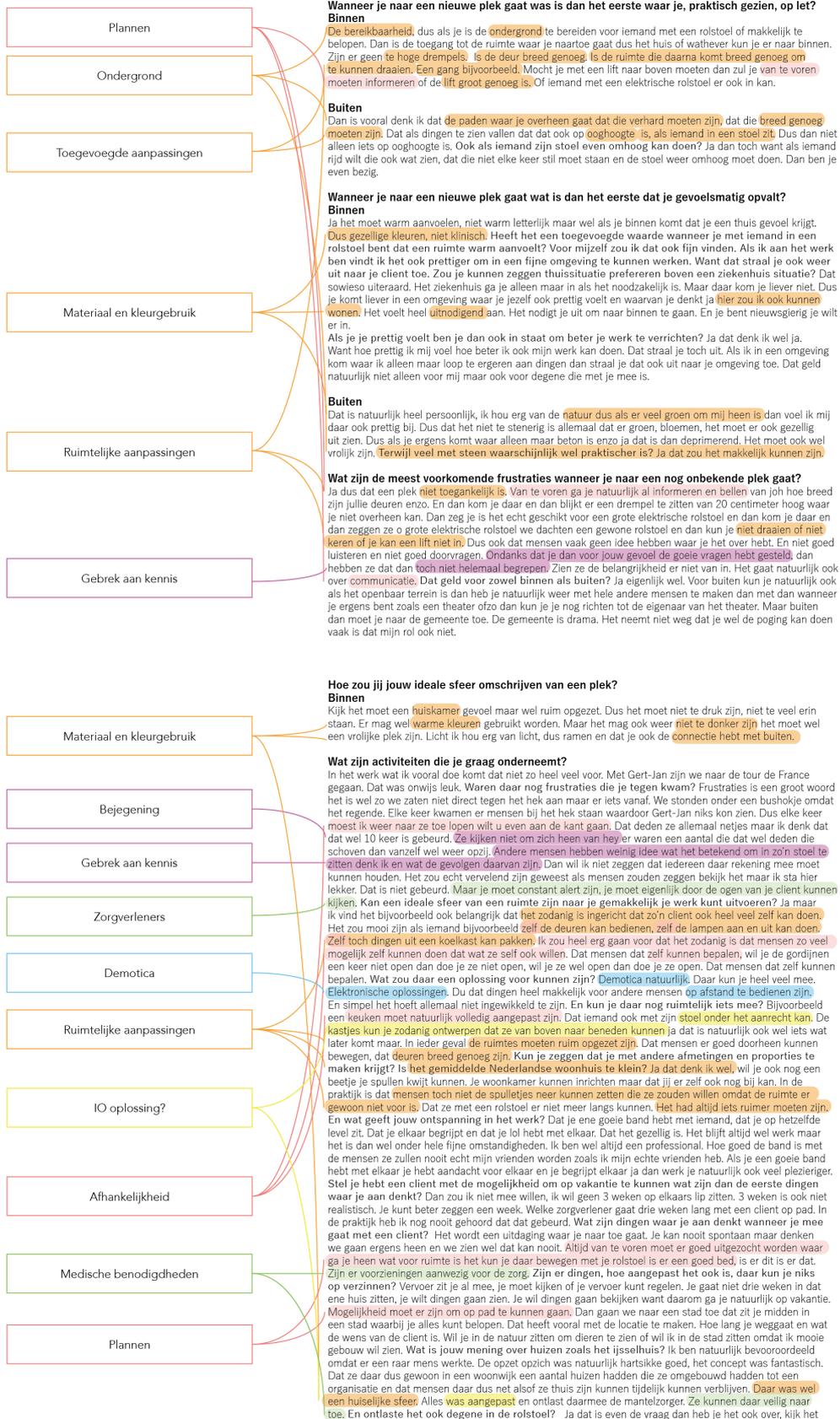


Appendix 3. Interview Hans



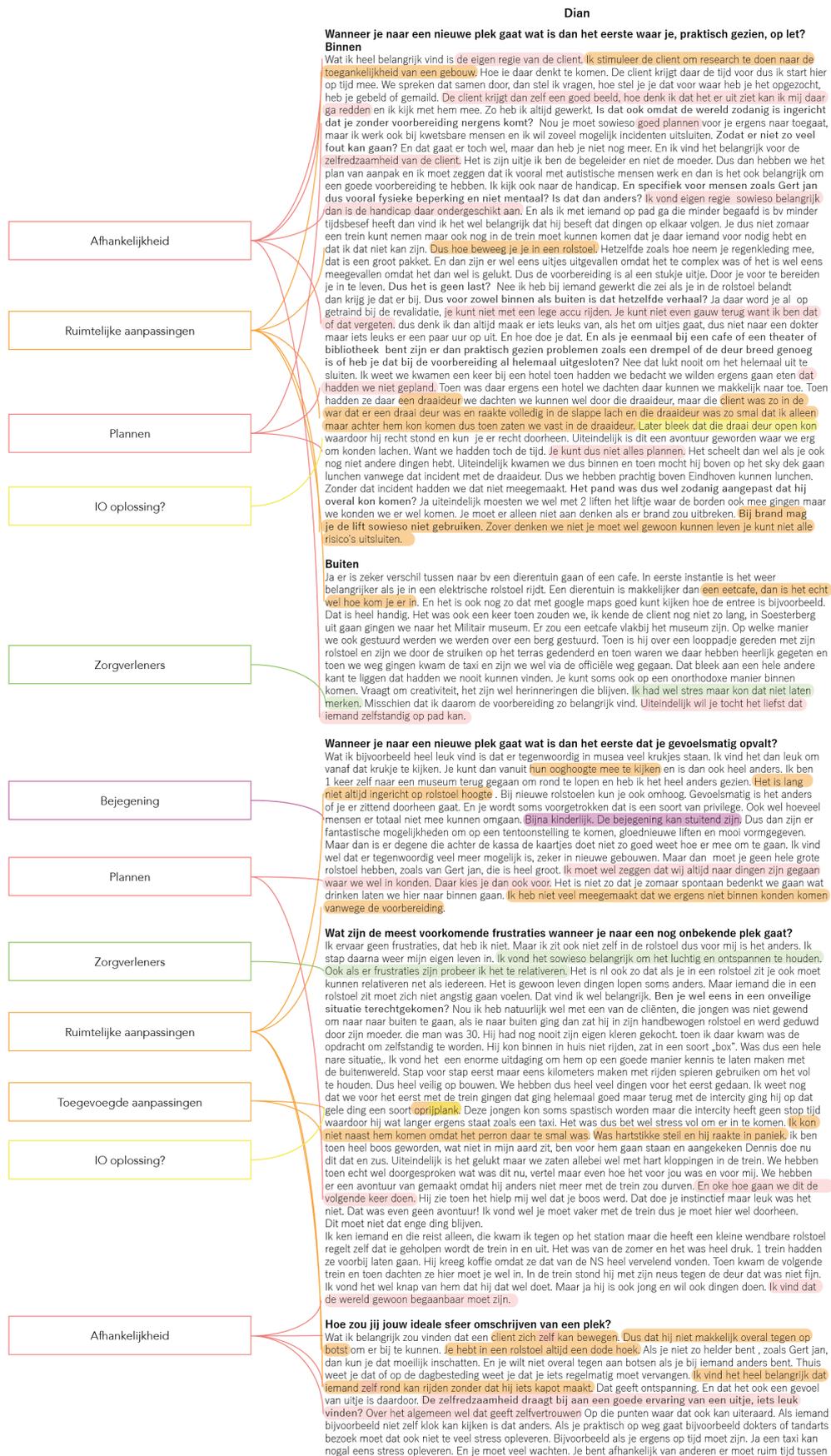
Appendix 4. Interview Gitta

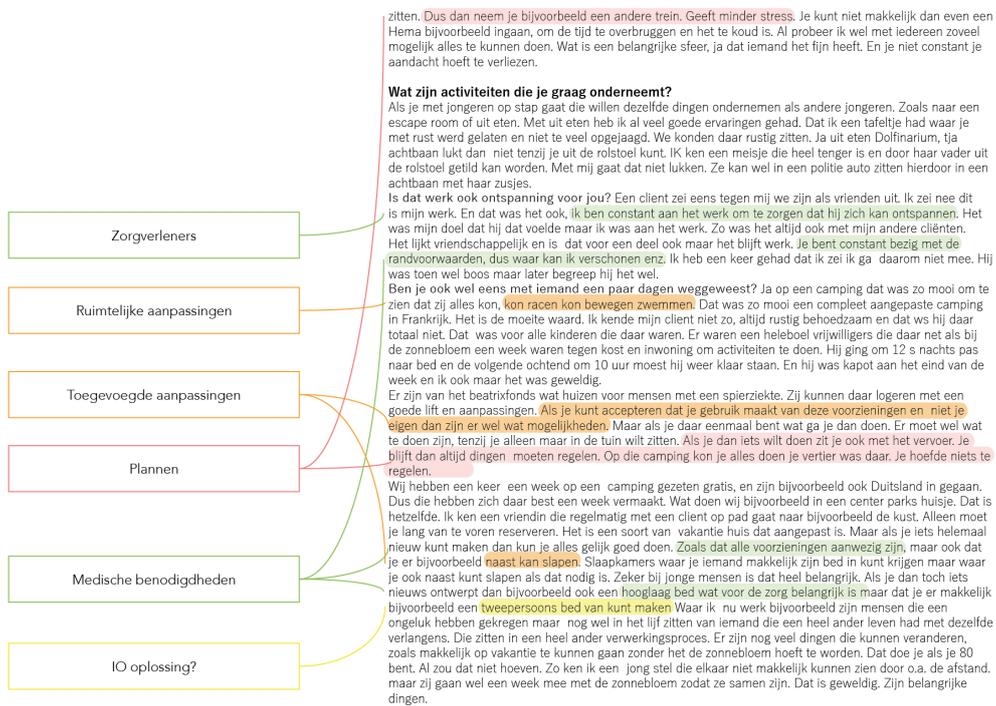
Gitta





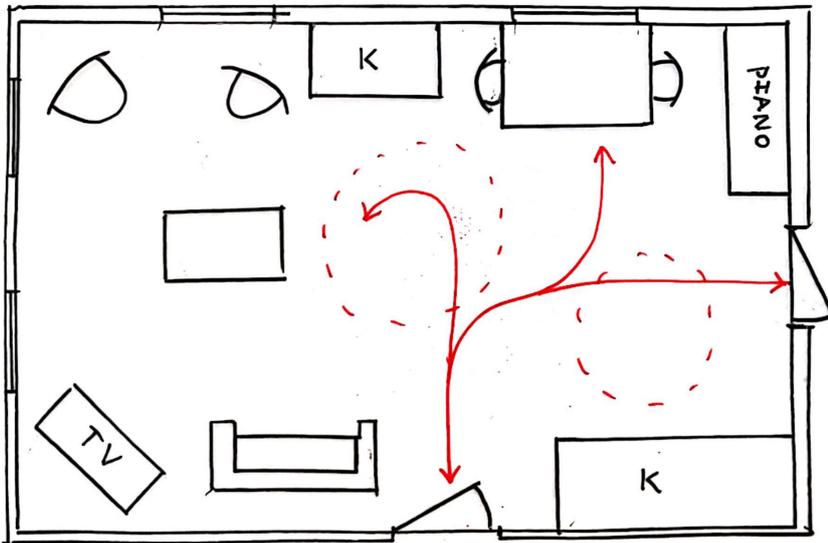
Appendix 5. Interview Dian



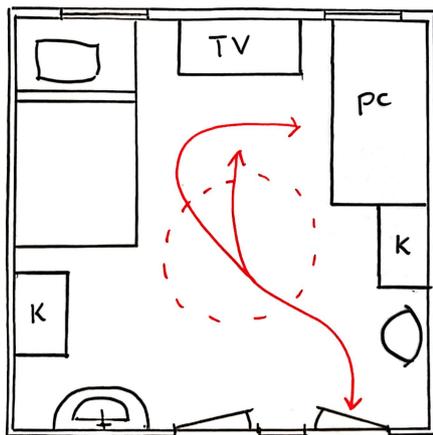


Appendix 6. Sketch living spaces

Living room Gert-Jan



Bedroom Gert-Jan



Living room Ko

