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Master's Thesis in Techno-Anthropology
Aalborg University Copenhagen

SENSING THE YOUNG CHILD

DESIGNING A MULTISENSORY EXAMINATION ROOM
FOR 0-1 YEAR OLD CHILDREN AT THE HOSPITAL

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AALBORG UNIVERSITY
STUDENT REPORT

English summary

This master's thesis is a study of which matters of concern parents and children visiting an outpatient department at a hospital have and how these can be addressed by making a design concept for a new examination room, building on principles from multisensory environments.

Our inspiration and motivation for this project has several points of origin. Firstly, an increasing amount of 0-1 year old children are treated in outpatient departments due to technological developments, which allow to screen, diagnose and treat children at a young age. Secondly we became aware that a surprisingly high percentage of the children visiting Rigshospitalet are 0-1 year old. Thirdly, a new Children's Hospital in Copenhagen (BørneRiget) is set to open in 2024. Fourthly, children at this young age understand the world through processing sensory stimuli, which made us wonder if the principles from multisensory environments could enhance the outpatient experience.

All of this sparked our curiosity and in collaboration with Children's Hospital Copenhagen we decided to explore what an outpatient examination room for 0-1 year old children could look like in the future. This was done by: 1) Exploring which matters of concern children, parents and staff have in relation to outpatient treatment, 2) Designing and exploring possible solutions with the relevant actors, 3) Testing a mock-up room, negotiating and developing the possible solutions, 4) Making a design concept.

We have used Actor-Network Theory and Participatory Design as framework for our research. We have immersed ourselves in the field of Rigshospitalet, making observations at their outpatient department, primarily in examination room 4, in which three different kinds of examinations are carried out; Multiple-Breath Washout examinations, semi-intensive examinations and regular examinations. Furthermore we have interviewed and played a design game with families visiting the outpatient department and staff.

We conclude that children aged 0-1 year, their parents and staff have matters of concern in relation to eight themes; proximity and safety, establishing relations, stimulation, a calm atmosphere, a homely atmosphere, informing and involving the parents, accessibility of equipment and temperature and lighting. We have translated the matters of concern into requirements and criteria and a design concept for a future examination room targeting 0-1 year olds and their families.

Dansk resume

Dette kandidatspeciale er en undersøgelse af, hvilke matters of concern forældre og børn har i forbindelse med ambulante behandlinger på hospitalet og hvordan disse kan imødekommes igennem et design koncept for et nyt ambulant behandlingsrum, som bygger på principper fra multisensorisk stimulation.

Inspirationen og motivationen for netop dette projekt udspringer af flere kilder. For the første er antallet af 0-1 årige børn på ambulante afdelinger i dag i stigning, på grund af teknologiske innovationer der muliggør screening, diagnosticering og behandling af børn i en meget tidlig alder. Dernæst blev vi opmærksomme på, at en overraskende stor procentdel af de børn der kommer på Rigshospitalet er 0-1 år. Ydermere står et nyt børnehospital - BørneRiget- til at skulle åbne i år 2024. Til sidst kommer, at helt små børn oplever og forstår verden gennem deres sanser, hvilket fik os til at undre os over hvorvidt principperne fra multisensorisk stimulation ville kunne forbedre den ambulante oplevelse.

Vi blev nysgerrige på alt dette og derfor besluttede vi, i samarbejde med BørneRiget, at undersøge hvordan et ambulant undersøgelsesrum kunne se ud i fremtiden. Dette blev gjort igennem følgende trin: 1) At udforske hvilke matters of concern børn, forældre og personale har i forbindelse med den ambulante behandling, 2) At udforske og designe mulige løsninger sammen med de relevante aktører, 3) At teste et mock-up rum og derved forhandle og udvikle de mulige løsninger, 4) At lave et design koncept.

Denne undersøgelse bygger på et teoretisk og metodisk fundament af Aktør-Netværksteori og Participatory Design. Vi har fordybet os i felten på Rigshospitalet, hvor vi har observeret på deres ambulante afdeling i undersøgelsesrum nr. 4. Der foregår tre specifikke undersøgelser i dette rum; Multiple-Breath Washout undersøgelser, semi-intensive undersøgelser og distriktsambulante undersøgelser. Derudover har vi interviewet og spillet designspil med flere af de familier der er tilknyttet ambulatoriet samt personale.

Vi konkluderer at 0-1 årige børn, deres forældre og hospitalets personale har matters of concern indenfor følgende otte temaer: nærhed og tryghed, barn-personale-relation, stimulering, en rolig stemning, en hjemlig stemning, lys og temperatur og tilgængelighed af udstyr. Vi har oversat deres matters of concern til kravspecifikationer og et design koncept for et nyt undersøgelsesrum til målgruppen 0-1 årige og deres familier.

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Table of Contents

INTRODUCTION	4
THE PROBLEM AT STAKE.....	4
<i>The birth of the project.....</i>	5
<i>History of young children at the hospital – From small adults to children</i>	6
<i>The former perception of young children’s sensory apparatus</i>	9
<i>The current perception of young children’s sensory apparatus.....</i>	9
<i>The sensory connection between young children and their parents.....</i>	10
<i>Multisensory environments – A way to support sensory needs.....</i>	11
<i>History of multisensory environments.....</i>	13
<i>Can multisensory environments be useful for young children?</i>	14
RESEARCH QUESTION.....	16
PRESENTING THE FIELD	17
CHILDREN’S HOSPITAL COPENHAGEN.....	17
THE OUTPATIENT WARD AT RIGSHOSPITALET	19
THE EXAMINATION ROOM 4	19
<i>Multiple-Breath Washout (MBW).....</i>	19
<i>District outpatient examinations (Regular examinations)</i>	21
<i>Semi-intensive outpatient examinations (Semi-intensive examinations).....</i>	21
THE RESEARCH DESIGN	23
THEORETICAL FRAMEWORK.....	23
<i>Actor-Network Theory - A world of networks</i>	23
<i>Hybrid Actor-Networks</i>	24
<i>Translations.....</i>	24
<i>Matters of Concern</i>	25
<i>The ANT branch getting intertwined with the design branch</i>	26
<i>Participatory Design.....</i>	26
METHODOLOGICAL FRAMEWORK.....	28
<i>Getting access to the field.....</i>	28
<i>Involvement strategy.....</i>	29
<i>Phase 1 – Exploring the field.....</i>	31
<i>Phase 2 – Designing with actors.....</i>	38
<i>Phase 3 – Testing a mock-up room</i>	47

ANALYSIS	50
PHASE 1: EXPLORING THE FIELD - MAKING THE MATTERS OF THE FIELD VISIBLE	50
<i>Proximity and Safety</i>	51
<i>Establishing relations</i>	56
<i>Stimulation</i>	59
<i>A calm atmosphere</i>	63
<i>A homely atmosphere</i>	66
<i>Informing and involving parents</i>	68
<i>Accessibility of equipment</i>	71
<i>Temperature and Lighting</i>	73
<i>Discussion</i>	77
<i>Defining requirements and criteria</i>	78
PHASE 2: DESIGNING WITH ACTORS - EXPLORING PARTIAL SOLUTIONS	80
<i>Proximity and Safety</i>	81
<i>Establishing relations</i>	83
<i>Stimulation</i>	84
<i>A calm atmosphere</i>	86
<i>A homely atmosphere</i>	86
<i>Temperature and Lighting</i>	87
<i>Accessibility of equipment</i>	89
PHASE 3: TESTING A MOCK-UP ROOM	90
<i>The mock-up room</i>	90
<i>Designing the mock-up room</i>	92
<i>Test output</i>	95
<i>Updating the requirements and criteria</i>	104
THE DESIGN CONCEPT	106
USER JOURNEY	108
HOW DOES THE DESIGN CONCEPT MEET REQUIREMENTS AND CRITERIA?	109
IMPLEMENTATION	112
CONCLUSION	113
PUTTING THE PROJECT INTO PERSPECTIVE	116
REFERENCES	119

Introduction

Today an increasing amount of children aged 0-1 year old are going to the hospital due to a fast moving technological development, which makes it easier to screen, diagnose and treat children in a younger age than before. But how do we create a good experience for these young children at the hospital? What kind of needs do they have and what about their parents? What could an examination room targeting this specific age group look like? The development of the new Children's Hospital Copenhagen (BørneRiget) set to open in 2024 gives rise to asking these questions, and answering them, in order to design a hospital that gives the young children and their families the best experience of the examination. For children in this age group, the world is primarily explored through the senses and therefore stimulation of the senses is of utmost importance to let the young children understand the world, they are in. In this project, we will investigate what kind of things that matter for young children and their families, when going to the hospital and involve them in designing an examination room for this specific age group. The empirical data is gathered at an outpatient department at Rigshospitalet, but the project is done in collaboration with the project organisation behind the new Children's Hospital Copenhagen, which will use the knowledge from this study in the process of designing the new hospital.

The problem at stake

In the following we will unfold the problem at stake in this project. Firstly we will present how the project was born. After this we will delve into the context of the project by investigating how it has been to be a young child at the hospital through times. Subsequently we will describe the sensory apparatus of 0-1 year olds and the role senses play in relation to the connection between child and parent. After this follows a presentation of multisensory environments, stating what they are and how they work as a way to accommodate and actively use this knowledge on the sensory apparatus. In this paragraph we will also look into how this group of 0-1 year olds can be likened to other groups, and how these other groups have benefitted from multisensory environments.

The birth of the project

The inspiration to this project originates among other things from a personal story told by a former nurse at Rigshospitalet, who is now employed in the project group of Children's Hospital Copenhagen as development nurse (hereafter: development nurse). She was visiting the Paediatric Emergency Unit at Rigshospitalet with her daughter in law and her 8-month-old grandson. The little boy was sick and had a high fever. In the following quote, she describes her experience:

"When we walked into the hospital room, the first thing I registered was a hospital bed placed in the middle of the room, which had nothing to do with a baby and then one uncomfortable chair next to the bed, which I ironically enough have been part of purchasing myself (...) A cold neon light shined from the ceiling and while the hours flew by more and more light was needed to light up the room. I just felt that nothing was working at all... As a parent the only place you could sit was at that stick (referring to the one chair in the room). They were so tired in the end and there was no place to lie down. My grandson should have drawn a blood sample. I told my daughter in law to breastfeed her son, because we (nurses) recommend that in order to get the child to relax, but then I realise she only had that uncomfortable chair to sit on. Then I tried to help her into the childbed, so she could lie down with him (...) The blood sample was drawn, and wow he was screaming! My daughter in law was totally sweaty and looked like she was going to pass out. One moment I thought it was worse for her than for the little child (...) It was just such a stupid situation and he has of cause forgot about that experience, so it is not the problem. I was just so embarrassed by how bad it was!" (Appendix, pp. 59-60).

This personal experience clearly touched her and she was embarrassed about being a part of giving young children and parents such a bad experience. Therefore she decided that something had to be done for these young children and their parents. The need for action increased further, when she and the rest of the team developing the new Children's Hospital Copenhagen came around some statistics, which showed the age group of children visiting Rigshospitalet today. These statistics showed a surprisingly huge representation of children in the age of 0-1 years old. The statistics showed that 43% of the hospitalisations at the paediatric departments was in the age between 0 and

12 months¹. Among the outpatient visits, 27% were children in the age between 0 and 12 months². These numbers surprised the group of BørneRiget and a gap in the knowledge about this age group suddenly became visible.

When studying a report (Juliane Marie Centret & ReD Associates, 2014) an anthropological consultancy bureau has made for Children's Hospital Copenhagen about the user experience at the new hospital, the gap became further visible. The report states the challenges, possibilities and five design principles for the new Children's Hospital Copenhagen. Going through the report we discovered, how many of the solutions and initiatives mainly were minded on the group from 2-3 years and up, rather than on the youngest children. The illustrations in the report showed just one picture of a baby, the rest were of children that were old enough to move freely around and speak (see picture 1). This gap, along with statistics and the personal experience, constituted the initial argument for setting up a project to gather knowledge about this age group.



Picture 1: 'Users of BørneRiget' without a picture of the young child, who is a frequent guest at Rigshospitalet.

In the following we will delve into the existing knowledge and the historical development of the understanding of this age group at the hospitals.

History of young children at the hospital – From small adults to children

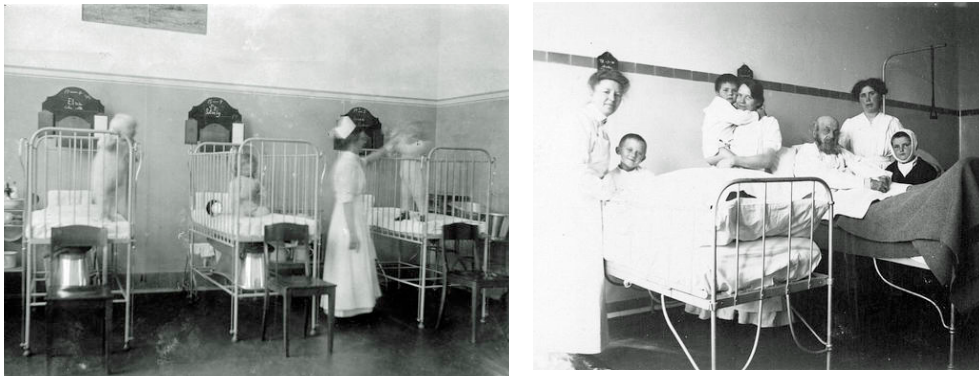
Being a young child in the hospital has been subjected to an enormous development during the past century.

In 1958 James Robertson, who is an English psychologist, publishes the book 'Young children in hospital', in which he demands a new praxis of nursing. In the book he describes how infants and young children experience psychological traumas from being hospitalised without seeing their parents for days and in general being treated as 'little adults'. The children could not be touched or held by their parents due to infection risk and their mothers could not be hospitalised with them, unless they could pay for it (Robertson, 1979). At this time knowledge on diseases and infection and economic

¹ In 2017, counted on number of discharges.

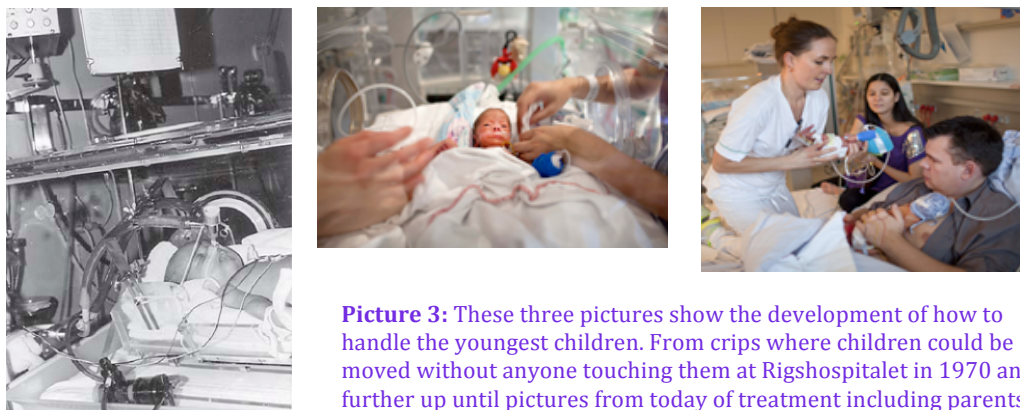
² In 2017, counted on number of treatments.

resources seem to be part of what determined how the child should be treated in the hospital.



Picture 2: The left picture is a Children's ward at Bispebjerg hospital in 1916. The right shows a child patient next to elderly patient at Esbjerg hospital 1910. Source: dsr.dk.

In the neonatal department at Rigshospitalet in the 1970'ies, we see how the paradigm of children and parents being separated, and children not being stimulated by touch and body warmth, still existed. Infants were lying in cribs in which they could be moved by pulling strings in the ceiling in order not to touch them (Mathiasen et al., 2008).



Picture 3: These three pictures show the development of how to handle the youngest children. From cribs where children could be moved without anyone touching them at Rigshospitalet in 1970 and further up until pictures from today of treatment including parents and with skin-to-skin contact. Source: rigshospitalet.dk.

It was still not possible for parents to be hospitalised with their children and if they where, they would be in different wards. Visiting hours were very limited, but during the 1970'ies it became increasingly widespread to have more parental access.



Picture 4: Mother ringing the bell to visit her child at Rigshospitalet in 1980. Source: rigshospitalet.dk.

During the 90'ies and the 00'es Rigshospitalet started rebuilding wards in a way that was more patient- and family centred, meaning that rooms were made smaller and for less people, and that the parents were more included in everyday life on the hospital (Rigshospitalet.dk, 2018). The crowdedness is illustrated in picture 5, which is taken at the Neonatal department at Rigshospitalet in the 1990'ies.



Picture 5: Parents are now welcome at the ward, which makes it a bit crowded.
Source: rigshospitalet.dk.

The previously introduced development nurse explains her view on the former nursing principles:

"They (the children) were not physically warmed, consoled or stimulated or anything. On the other hand they were exposed to all kind of different needle procedures, which they of course still do today, because it is necessary to survive. But there are after all some entirely new ways of doing things: how to swaddle the young child, so it feels safe and warm and feel the physical contact with mom and dad. All those things are new, just like sound, noise, warm and the light of the circadian rhythm" (Appendix, p. 55).

In this way we see that the paradigm of young children in hospitals until recently has been that they were separate from their parents and it was not believed that touching the children and giving them skin-to-skin contact was a good act. Today this has changed completely; skin-to-skin contact is a highly recommended principle of care for neonatal and newborns (Roué et al., 2017). Parents and families are thought of as an integrated part of the young child's visit at the hospital. So the paradigm has gone from children as small adults, who are to be treated for their disease, into being young children who are to be treated for their disease, but also to be made safe, comfortable and stimulated right. This shift might be due to the rise of the welfare system making it free to be in the hospital, or due to the internal development of knowledge within the field of the young child or, most probably, a mixture of these things. We will not dig further into an analysis of this shift within how to treat children in hospitals, since this is not the focus of the project. What is interesting to notice about this historical context is that thinking of children as a special group of patients with special needs, and especially sensory needs, is not a very old thought and it is therefore something, which still needs to be worked with actively, in order to incorporate this new way of thinking into the design of the rooms and practices of the hospitals.

The importance of focusing on the children aged 0-1 years will only increase in the future. When speaking to a head nurse at the children's outpatient department at Rigshospitalet, she tells us that the number of patients aged 0-1 years is going to rise in the future, due to the fast moving development of screening technologies of newborn babies, which makes it possible to diagnose children in a much younger age than before.

The former perception of young children's sensory apparatus

Apart from the understanding of young children as small adults, there has also been a change in the knowledge of pain and the nervous- and sensory system of young children. The development nurse tells how she as a recently graduated nurse experienced horrible night shifts with children, who had had their hips corrected from hip dysplasia and were left crying all night with very little pain-relieving medicine:

"People simply didn't know enough about pain management. First of all, it was believed that children had less pain (than adults). I mean, all the way until the 70'ies newborn children would be operated in their chest without anaesthesia, because people thought they hadn't developed a nervous system yet! (...) Today we know that it is completely opposite; they are more sensitive (than adults)" (Appendix, p. 56).

This quote takes us from this chapter on former understanding of the young child to this next paragraph on children's senses and the role senses play.

The current perception of young children's sensory apparatus

The perception of infants at hospitals today is much more focused on, how the child is made safe and comfortable. Knowledge about senses is part of this development. The senses are a part of the nervous system, which consists of parts of the brain, the spinal cord and 12 billion neurons branching throughout the entire body (Ayres, 2009). There are two kinds of senses, the near senses and the distant senses. All senses are present, when a child is born, but the near senses are the most developed in infants.

The near senses consist of the vestibular sense, the proprioceptive sense and the tactile sense. The vestibular sense is activated by moving the head and registers the body's position in the world and gravity. For example it tells you if your body is hanging upside down, or makes you feel sick on a boat. The proprioceptive sense register position and movement of the body. It lets you know if your leg is stretched or bended.

The tactile sense registers touch and is situated in the skin, registering heat, cold, pressure, touch and pain (Snoezelhus.gentofte.dk, 2018).

The distant senses are senses that register things outside our bodies. There are four of them; the olfactory sense, the sense of sight, the hearing and the sense of taste.

The very first sense developed in the unborn child is the tactile sense (Ayres, 2009). Today we know that children already develop ears in the 16th week and thus already at this time start hearing its mother's heartbeat and the sounds of the uterus and loud sounds from outside the mother's body. Apart from hearing these sounds they can also recognise their mother's voices again after being born. The sense of taste is also present as an unborn child. While still in the uterus, the child can also sense light and darkness (Cooper, 2008).

Until the age of 7, the little child is primarily what Ayres calls a 'sensory processing machine'. Most things are perceived directly as sensory stimulations, without ideas or thoughts connected to it. The main activities are therefore not the mental. These first years of life are therefore called the senso-motor period (Ayres, 2009). Through the first year of life the sensory capacities develop a lot. A newborn child has a grasping reflex and will turn its head if you touch its cheek. Yet it can still only see 25 cm and have a hard time focussing on objects (Ibid.). At this stage of life, the primary senses are still the main way to explore and understand the world for the young child.

The sensory connection between young children and their parents

Senses are also part of the relation between the child and its parents. Already when being born, the child knows the smells of its mother and the taste of her milk (Ayres, 2009). A nurse from neonatal (hereafter: neonatal nurse) has also experienced how senses are important in the connection between parents and child:

"We see very clearly that as soon as they (the children) are put on top of their mom and dad you can reduce the oxygen and their breathing will be less paused, they will usually be more stable. So we know, and there is evidence, that this is of huge importance" (Appendix, p. 97). We ask her whether this is solely concerning the neonates, or if it goes for all children? *"Absolutely! (...) And when you are sick you are extra impressionable in your sensory apparatus and that goes just the same when you are 20 or 5 or 3 years old"* (Appendix, p. 99).

The sensory apparatus is thus also part of how the child and its parents are connected, a connection that is of great importance for the young child. Studies also show this connection: *"Synchronised brain scans of a parent and infant in close proximity show the right brain of the parent communicating with the right brain of the child - you share your brain."* (Mackenzie, 2014, p. 29) This close connection between child and parent almost make them into a unit. Therefore, you will also experience later in this report that the two actors are very closely intertwined and can -or should- not always be looked upon as two completely separate actors.

Multisensory environments – A way to support sensory needs

We have now seen how there has been a change within the hospitals towards and understanding of the young child as someone, who should not only be treated for their disease, but also should be stimulated to feel comfortable and safe. And we have learned that the child perceives much of its world as direct sensory stimulations. Therefore we will now look into multisensory environments – also called snoezel - which are principles of using sensory stimuli to relax and/or arouse the body and mind.

All human beings are constantly exposed to sensory stimuli. An employee at a Snoezel House Gentofte, told us, that we are only aware of 4% of the sensory perceptions, we receive. The remaining 96% are perceived through the unconscious mind. We are thereby exposed to much more sensory stimuli, than we are aware of. But if we are aware of it or not, these sensory stimuli affect our bodies and mind a lot, since we are constantly exposed to them through all our different senses. Therefore we can affect the body and mind through knowing how things affect our senses and use this knowledge in an intentional way. This is the principle of multisensory environments.

Snoezelen is a set of principles originally developed for people with disabilities. The term is combined by the two words 'Snuffelen' and 'Doezelen', which mean to sniff (seek and explore) and to doze (relax) in Dutch.

Today the principles are both termed snoezel and multisensory environments. The principles are to have elements of sniffing and dozing, where the senses can be aroused and relaxed respectively. The principles can be carried out in small scale as a box of multisensory elements and gear or it can be entire houses with rooms for different purposes, such as relaxing or exploring. The interior in these houses ranges from waterbeds, ball baths, hammocks, fibre optics, bubble tubes and interactive wall

panels etc. Through these things the senses are stimulated in a controlled and focused way. An example from a field trip to a snoezel house is 'the white room'. In this room everything is white and there are only very few things to look at, which move peacefully, like the lighted air bubbles you see on the picture below (Picture 6).



Picture 6: From left: Different kinds of weighted duvets, lighted air bubbles in water tubes, different textures to touch and a baby playing with fiber optics. All examples of some of the multisensory equipment, we have seen at the Helsingør and Gentofte Snoezel houses.

Then there is a big heated waterbed in the middle of the room, which will sweep around you and make you feel held and warm. Calm music is playing, which is connected to the waterbed, making it vibrate in the slow rhythm of the music. When lying down, you get a weighted duna, which also makes you feel held and swaddled. In this way, you are not just told in words to relax, but it is told to your body, through all your senses, stimulating the senses that calm you down and stripping away the things that could arouse or agitate the senses. This is an example a multisensory environment meant to make the user of it relax.

Multisensory environments also include a philosophy of empowering the disabled to make decisions for himself or indicate the sensory activity he wants. This might be expressed in small things, such as being able to push a green or a blue button in the ball bath, causing the light to change colour to green or blue. Furthermore mutual experience and equality are central terms. According to the employees at the snoezel houses we visited, the atmosphere and common sensory experience invite to a feeling of cohesion, enhancing the relation between the people participating in the same multisensory environment experience.

History of multisensory environments

People with mental and physical disabilities are deprived of adequate sensory stimulation, due to their handicap, which is why multisensory environments were developed. In the middle of the seventies a change in the view of people with mental and physical disabilities occurred in the Netherlands. Until then there had been a tendency to isolate this group of individuals in institutions, where the care was focused on their accommodation exclusively (Verheul, 2009). In the following paragraph Verheul, who worked as an occupational therapist at Centre De Hartenberg in the Netherlands, describes the view on residents with multiple disabilities, which existed at the institution in 1968:

“The residents with severe multiple disabilities stayed behind in their flats or the pavilion. There was always a reason why they couldn’t leave the building: One day it would be too warm outside or too cold or it would be too wet or too damp. Apart from making the journey to the necessary therapies or to a doctor, there was no reason to leave the house. The people with severe multiple disabilities were protected like porcelain dolls, a frail material that would become ill once it was exposed to the outside” (Verheul, 2009, p. 2).

Verheul uses the term protection to explain the reason for isolation of this group of individuals. It can be discussed whether the reason for isolation also could be found in the lack of knowledge about how to handle this group. Nevertheless a movement was started to activate people with mental and physical disabilities instead of just isolating them. From focusing exclusively on accommodation the staff began to develop ideas on how to activate the residents in order to support their personal development and quality of life (Verheul, 2009). The staff, the former presented Verheul and his colleague Jan Hulsegge, who was a music therapist, started testing several sensory activities for severely multiple disabled people at the institution. The activities included among other things music, massage, mobiles, colours and bubbles. By using different materials they tried to trigger interest and activate the disabled.

They experienced that the sensory stimulation activities improved the communication with the residents and changed their behaviour (Ibid.). Suddenly the residents no longer shut down for the sensory perceptions, because the stimulation was controlled and limited. The staff found, that it was possible to motivate the residents to feel, hear, smell and see. They started experiencing with “Sensory Cafeterias”, which

were places where residents could get their senses stimulated within demarcated frames. At a summer school at the institution of De Hartenberg in the Netherlands they experienced with different multisensory environments. At that occasion, it became clear that several institutions worked with some of the same principles and experiences were exchanged among professionals at different institutions. It was these experiences that laid the foundation for the concept of multisensory environments.

Can multisensory environments be useful for young children?

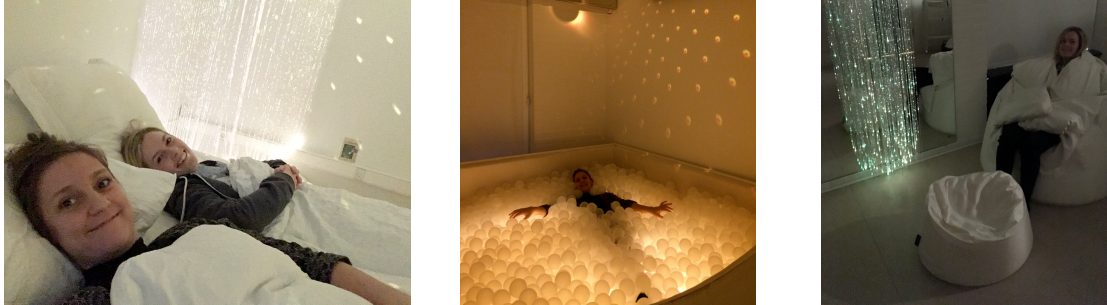
Multisensory environments have since the seventies been used by other groups of individuals with special needs such as dementia clients (Chung and Lai, 2002; Baker et al., 2001; Van Weert et al., 2005), neonates (Aspin, 2004), palliative day-care clients (Schofield, 2003), critically ill children (White, 1997), chronic pain sufferers (Schofield 1996) and people with autism (McKee et al., 2007).

To a certain extent, infants have some common characteristics with some of these groups of individuals. The diminished communicative ability is present for infants and people with dementia, autism or mental and physical disabilities. One of the advantages of multisensory environments is, that the use of these multisensory rooms does not depend on verbal communication. Instead it relies on being together and sharing an experience through other senses. This can be touch, motion, reactions and change in facial expression. This makes it useful for these groups of individuals with specific needs and who do not have speech as a primary ability or and ability at all.

Recent studies have experimented with the use of multisensory environments for individuals without specific diagnoses or specific sensory challenges. One of these studies is exploring breastfeeding women's perception of using a multisensory room during their postpartum hospital stay (Hauck et al., 2008) and another is studying the effect of a multisensory delivery room for women in labour (Hauck, Rivers and Doherty, 2008).

We have also experienced this on our own bodies. Being at the snoezel house we got to try everything ourselves (see picture 7). One of us immersed herself into a ball baths in an entirely dark room with a ceiling made of 'stars' and mirrors. This was instantly overwhelmingly relaxing. Afterwards we both tried the waterbeds in a room filled with warm light, fibre optics and weighted duvets above us. Even though our

senses work perfectly fine, these experiences were very relaxing and stimulating respectively.



Picture 7: We explored the multisensory equipment at the Helsingør and Gentofte Snoezel houses.

There is limited literature on the use of multisensory rooms for children at hospitals. The few studies we have found are focusing on children with multiple disabilities. During a visit in a snoezel house, we experienced how the multisensory environment concept was used to stimulate young, fit and healthy children. This house had specific classes for babies in the age 3-8 months, where they used the multisensory rooms to stimulate the babies both with the aim of making them relaxed and aroused. We experienced how the babies were obviously stimulated and affected by these multisensory environments (see picture 8).

Along with the literature on the use of multisensory environments for similar groups, this experience motivated us to investigate if principles from multisensory environments could be used to create a better experience of the treatment for children in this specific age group and their parents. To investigate this, we found it necessary to firstly examine how the children and their parents experience the examination today and investigate what



Picture 8: Two babies being stimulated by looking at the bubble tubes. The picture is from our field trip to Helsingør Snoezel house.

kind of concerns they have in relation to having a good experience at the hospital. These concerns will be the foundation for designing an examination room building on the principles from multisensory environments.

Research question

Which Matters of Concern do 0-1 year old children and their parents have in relation to their experience of the examination at an outpatient department? And how can we through the principles of Multisensory Environments design an examination room that meets these Matters of Concern?

Presenting the Field

In the subsequent section we will introduce you to the field we are working within.

Children's Hospital Copenhagen

In 2024 a brand new hospital is set to open in Copenhagen. It is the new family hospital named BørneRiget (Children's kingdom). Some of the reason for building a new hospital is the lack of space at the current old, worn down buildings, and furthermore the lack of coherence, which the families experience today, when being treated at Rigshospitalet. Today all children's wards are spread across the entire hospital, which means that some of them are placed right next to wards for adults. The vision with the new hospital is to unite all of these wards and create a more coherent and playful experience for the children and their families throughout the entire stay at the hospital. The new hospital is going to house all departments concerning children and pregnancy and will be in nine levels, formed as two hands crossing each other (see picture 9).



Picture 9: The new Children's Hospital Copenhagen.

A project group consisting of people with different competencies and professions is responsible of leading both the building process and the innovation projects in relation to the new hospital. An essential strategy during the design process has been to involve the users already in the early phases of the process. Already in 2014 the first users consisting of families and clinicians were involved in the initial steering group meetings to give their inputs to the design of the new hospital. Ever since users have been involved on different levels and in different settings in designing the new hospital.

A comprehensive feasibility study facilitated by the project group makes up the foundation for the design process. A part of this study has been the previously mentioned user-experience study, conducted by a consultancy company, specialised in qualitative research and social science (Juliane Marie Centret & ReD Associates, 2014). This study has resulted in five design principles (see figure 1), which have been guiding the whole design process both in relation to the construction of the building and the innovation projects.

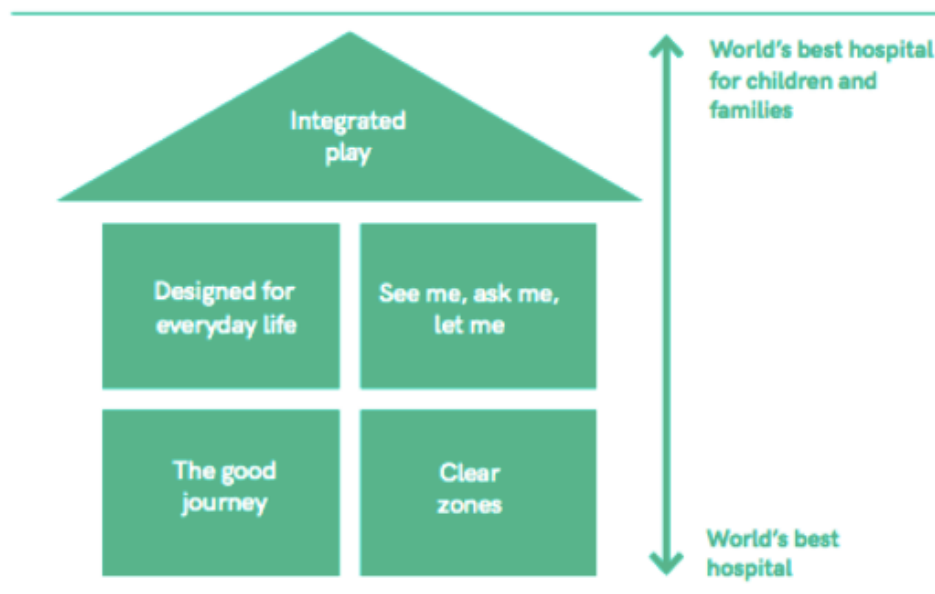


Figure 1: The five design principles of the new Children's Hospital Copenhagen. Source: Juliane Marie Centret & ReD Associates, 2014.

Within each of the five design principles several innovation projects have been facilitated. Our project can be seen as one of these innovation projects mostly within the overall design principle, which is integrated play. What is beneficial for these innovation projects facilitated by the project group is that the current children's wards and physical facilities can be used to do pilot projects for the new hospital. In this way the project group can test new innovative ideas at the current wards and start implementing it, if it works. Our project is one of these pilot projects, which is going to feed into the design of the new hospital, but building on fieldwork conducted at one of the current children's wards.

The outpatient ward at Rigshospitalet

The ward we have collaborated with is the outpatient ward doing ambulant examinations in the day hospital. This ward was interesting in relation to our project, because they treat a huge amount of children in the age of 0-1 year old, especially in one of their examination rooms at the outpatient ward called room 4.

The examination room 4

This was the room we got the possibility to use, as a test room, in our project. A picture of the room is shown at picture 10. The room is located at the children's outpatient department at Rigshospitalet, but is used to a range of different examinations. The main reason for choosing this room was that the amount of children in the age group 0-1



Picture 10: The examination room 4.

year old being examined in this room. Furthermore the room is used to do three different sorts of examinations. A room with such different patients and needs was relevant in the eyes of BørneRiget, because they are focused on designing flexible rooms, because of the uncertainties in relation to who the patients will be in 2024 and what kind of examinations that will be conducted at that point. Therefore we found it relevant to design a concept for a room that could be used broadly for several examinations. In this way we chose to focus on the following three sorts of examinations that currently are being completed in examination room 4.

Multiple-Breath Washout (MBW)

The first examination, which takes place in the room, is the Multiple-Breath Washout examination, from now on referred to as MBW, which is an ambulant examination that lasts for approximately 2-3 hours. The MBW is a lung function test for children diagnosed with Cystic Fibrosis (CF), which is a congenital chronically disease affecting

mostly the function of the lungs, but also some other organs. Today children born with CF can already be diagnosed shortly after their birth. The diagnosis is given on the basis of a blood sample drawn from the heel of the child 48 to 72 hours after their birth. The MBW examination is a relatively new examination, which is offered to the CF children already when they are two months old. Therefore this examination is often performed at children within the age group 0-1 year old. The aim of the examination is to test the child's lung function by measure their lung clearance index (LCI), which is a lung function parameter derived from the test.

The test is conducted by giving the child a breathing mask (see picture 11), which is connected to a sort of gas that through the mask is distributed in the lungs of the child. This phase is called wash in phase. When the gas has been distributed it is now time for the wash out phase, where the child has to breath through the mask, which makes is possible to measure the lung's ability to wash out the gas. From these measures the LCI is derived. This process has to be repeated several times to give the best result.



Picture 11: Breathing mask used in the MBW examination.

Due to the young age of the child it is difficult to complete the examination, when the child is awake. Therefore the child is sedated in order to make it sleep during the examination. The examination begins with the child getting the sedation through a nose spray by a doctor, while sitting at the lab of its parents. When the child has been sedated the staff, which consists of a doctor and two human physiologists, leave the room, while the parents stay with their child. The room is left with curtains down and the light turned off, in order to get the child to sleep. After approximately 20 minutes, the child is sleeping and placed at the bed. One of the human physiologists controls the test from a computer, while the other holds the mask over the child's nose and mouth. The test is now started and can last between 20 minutes and several hours depending on the quality of the data conducted and the child's ability to breathe through the mask. The test is completed in complete silence, due to the sleeping child. The parents either sit at a chair or stand next to the bed. When the test is done, the lights are turned on and the parents are asked to stay in the room until the child is entirely awake again. The staff leave the room, but a doctor is keeping an eye on the child during the awakening. When

the child is entirely awoken, the whole family can leave the hospital. The results from the test are given to the parents on another day.

District outpatient examinations (Regular examinations)

The district outpatient department uses the room for their ambulant examinations two days a week. These examinations are often a more regular kind of examinations of children in the age of 0-1 year, where a nurse measures the child's height and weight and the child is examined by the doctor while lying on the examination bed. From now on, when referring to the examinations in the district outpatient department, we will call it the regular examinations. The children, who are attending these regular examinations, are referred by their general physician to the hospital, with some minor health issues, which needs to be examined further. This can be issues such as blood in the faeces, abnormal head sizes, problems with moving their heads etc. Even though the reason for doing the examination can be different many of the procedures in the examination are the same. In all of the examinations there is a doctor and a nurse, and in some of the examinations we have observed a physiotherapist participate as well. The examinations start with the doctor asking some questions to the parents. Then the child is placed at the bed and gets undressed by the parents in order for the nurse to measure the weight and the height of the child. Afterwards the child lies in the bed, while being examined by the doctor. The doctor listens to the child through a stethoscope and examines it in different ways depending on the problem at stake. After the doctor's examination the doctor often leaves the room and then comes back after a while and give the parents the conclusion of the examination and ask if they have questions. These regular examinations are often lasting from 20 minutes to an hour.

Semi-intensive outpatient examinations (Semi-intensive examinations)

The semi-intensive outpatient department is a relatively new function, which has existed for only two years. The department completes ambulant examinations of children, who have been affiliated to the semi-intensive inpatient department. The children coming to these examinations have different diagnoses and therefore get different treatments, but what is common to them are that they all have or have had breathing problems, which requires assistance from an oxygen apparatus. The examinations are taking place in room 4 one day a week, and last for around one hour

each. The procedures completed during the examinations are very similar to the regular examinations with a nurse measuring the child's weight and height and a doctor examining the child at the examination bed and an ongoing dialogue between the staff and the parents about the child's condition. The way it differs from the regular examinations is the use of equipment. In these examinations they often make use of oxygen and monitoring equipment, which is shown in picture 12. Furthermore the children's conditions are worse in this department compared to the children in the regular examinations.



Picture 12: Oxygen and monitoring equipment.

The Research Design

In the following we will introduce you to the research design of our project. The research design consists of the theoretical and methodological approaches, we have used to investigate the field and answer the research question.

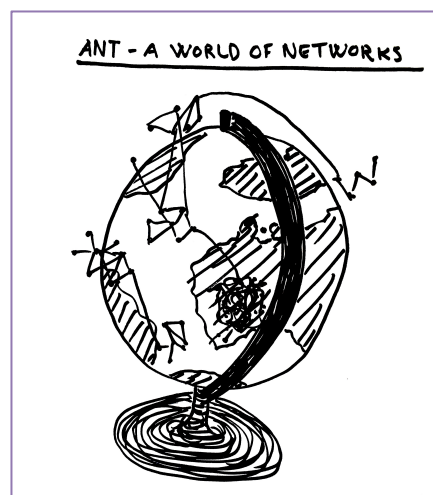
Theoretical framework

The subject of this thesis is how multisensory environments can support a better experience for young children and their parents during the examination. This subject gives the project an inherent premise of non-humans' capability to affect people and vice versa. Furthermore our role in this project is - amongst other - to be part of translating the practices and needs of the families and staff into a design concept for an examination room. This is why we have chosen to use Actor-Network Theory as a framework for our project.

Actor-Network Theory - A world of networks

Actor Network Theory, or ANT, is founded by Bruno Latour, John Law and Michel Callon in the 1980'ies (Callon & Latour, 1981; Blok & Jensen, 2009). ANT has a relational ontology meaning that it builds on the notion that the world is made of networks, which consist of actors and the interrelations and translations that are between them (Blok & Jensen, 2009). Looking at the world as made of actor-networks makes it a theory that can help us study, how actors relate to each other all together, contrary to a theory which cuts the network in pieces and allows us to put each relation in a box due to its specific characteristics. Working in a field where many different actors should have equal influence and importance we believe this to be a force. ANT is therefore not only a theory but also becomes a tool, creating a constant dialogue with our methodology.

Since it emerged ANT has never been constant. It is a constantly growing tree with

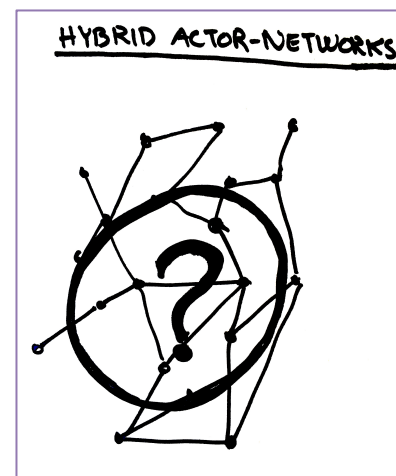


Picture 13: A world of networks.

wide-ranging branches and roots going to the directions of Laboratory Life and Politics of Nature (Ibid.). Small twigs and leaves have developed as thematic directions and sub-notions and terminology. In order to focus on the notions and terms that can help us explore and describe this particular field, we will only be sitting on one of these large branches, which grows in the direction of the design tree. We will get back to this later after having a closer look at the tree trunk - the actor-network.

Hybrid Actor-Networks

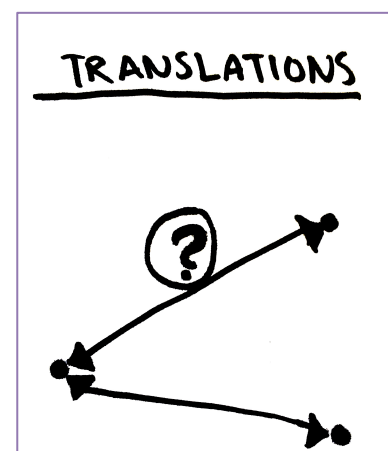
Networks are hybrid because they consist of both humans and non-humans. The ontology of ANT is that human and non-human actors are of equal importance and they all have agency (Jensen, 2003). This agency might change depending on the surrounding network and actors. The networks are shaped by the interrelation between these actors, which makes the theory a constructivist approach. This also means that the network stabilises or gets unstable according to the relations between actors. Furthermore interrelations are not just shaping the network but also defining every actor in the network since its position in the network establishes it (Ibid.).



Picture 14: Hybrid actor-networks.

Translations

Since everything is defined by its interrelations, action does not come from one place, but comes from the translations that take place between the actors (Jensen, 2003). Translations are when a claim is turned into another claim or an artefact. These translations are also what create allies within the actors, which is a way for the network to stabilise, meaning that the interrelations between actors are relatively constant. Through this approach the perception of actors is changing from being constant objects or people, into being something flexible or mutable objects and relations, exploring the process of translations (Shiga, 2007).



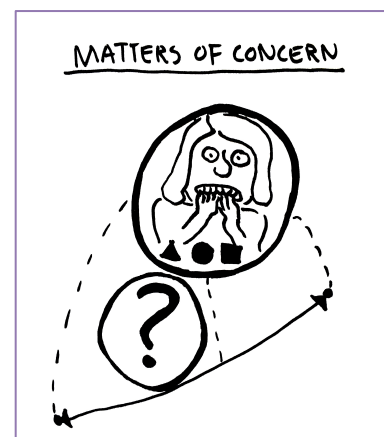
Picture 15: Translations.

In this project many translations take place, but one of them is e.g. the users' matters of concern into the design game we have made. In this way, translations cause that some actors talk or work on behalf of the other actors (Blok & Jensen, 2009).

Michel Callon also describes ANT as 'the sociology of translation' and he describes how the world takes form through translations and networks in this way: *"Translation is a process before it is a result (...) Translation is the mechanism by which the social and natural worlds progressively take form"* (Callon, 1986, p.19). He divides this process into four stages: problematisation, interessement, enrolment and mobilisation. This translation process is not just one linear process seen from one actor's point of view. Many translational processes are in progress at the same time. Some of them include all actors in a network, while others are just among a few. In this project we will mainly work with the idea of interessement devices, enrolment and mobilisation, when discussing our methodological approach. Interessement devices are devices that an actor uses to make another actor interested in their own project. In our project we both use it ourselves in getting relevant actors interested in our project by using interviews, design games etc., but we also see examples when observing the examinations, where some actors use interessement devices to engage other actors in their agenda. Enrolment is successful interessement. Enrolment entails negotiations of the roles in the network. When the actors are enrolled they begin to act in favour of the network. Mobilisation is what happens when one actor gets to act on behalf of another actor (they become allies), or on behalf on the network in general (Callon, 1986).

Matters of Concern

Matters of Concern is a concept within ANT. It emanates from Latour's 'Dingpolitics', which is interpreted by Blok and Jensen as a dual meaning referring both to the Ting, which is the Scandinavian word for parliament and to thing as matters, meaning that this is politics on things or matters. Matters of Concern (hereafter MoCs) are debated in this parliament of things. MoCs are the contrary to matters of fact. They are not fixed and indisputable but on the other hand complex and mutable (Blok & Jensen,



Picture 16: Matters of Concern.

2009). Studying MoCs is thereby a way to create room for debate and invite to negotiations instead of looking for matters of fact that fit into a consensus. In their book, Blok and Jensen argument that Latour says following on MoCs:

“...it is crucial that they are not treated as immovable objects but contrary exactly as matters of concern: as disputed and uncertain things around which divergent spokespersons gather in conflict, discussion and negotiation” (Blok & Jensen, 2009, p. 142).

This is what we try to do in our project and why we look towards MoCs as part of our research design. We believe that by looking for and studying MoCs, the concept will be more solid and durable, because we have investigated the actor's concerns and created room for possible contradictions and debates along the way. In order to create these spaces for debating MoCs we have looked towards design practices.

The ANT branch getting intertwined with the design branch

“In its long history, design practice has done a marvellous job of inventing the practical skills for drawing objects, from architectural drawing, mechanic blueprints, scale models, prototyping etc. But what has always been missing from those marvellous drawings (design in the literal sense) are an impression of the controversies and the many contradicting stakeholders that are born within with these” (Latour, 2008, p.12).

We believe that we get those controversies and stakeholders into our design by using ANT and MoCs. By this we mean, that instead of trying to create consensus we allow room for controversy by for example listening to and opening up conflicting MoCs. In this way we see ANT as the underlying philosophy, which we use participatory design to mobilise. Participatory design in this way becomes a natural next step in our approach.

Participatory Design

Participatory design is a design approach originating from the idea of involving actors who are going to use a product or a service in the process of designing it. The approach dates back to the 1970'ies, where there existed an increasing demand among people in western countries for getting heard in decision-making. The case of the introduction of computers at workspaces in Scandinavia formed part of the foundation of participatory design (Sandberg, 1979; Simonsen and Robertson, 2012). The workers feared that the

computer would replace the need for their labour, and therefore participatory design became a way of involving the workers in the design process and assist them in imagining possible work practices in the future.

Participatory design is based on a mutual learning process where users, stakeholders and designers are involved at different levels through the design process. An important aspect of participatory design is that it gives voice to users, without requiring that they have some specific technical skills or way of thinking (Simonsen & Robertson, 2012). By using materialities such as prototypes, mock-ups and design games, the knowledge of the users can be shared and translated in the design process. It is especially important to make the users' tacit knowledge come into play, and not just their explicit knowledge and competencies.

When different stakeholders are involved, different standpoints and interests accompany which can lead to conflicts and controversies. The aforementioned material objects can be a fundamental basis of negotiations among these actors and their different MoCs. In this way participatory design has many similarities to ANT, as they both deal with translation of knowledge and the use of materiality in this knowledge sharing process.

This leads to another important aspect of participatory design: democratisation (Pedersen, 2016), which as well is central in ANT. By including various stakeholders in the design process and making room for negotiations of interests the participatory design approach is focusing on creating a democratising design process. A focus on vulnerable actors is especially central and the participatory design approach strives to give these actors voice and thereby encourage participatory democracy (Ibid.). Participatory design involves users as partners in the design process instead of seeing users as an object of study. In other design approaches such as User-Centred design the designer is considered to be the expert, who studies the user in the beginning of a project and uses this knowledge to design a solution. In contrast, participatory design is focusing on involving various stakeholders, including the users, during the entire design process and get them engaged in ideating and conceptualisation.

Recent studies deal with the issues of doing participatory design with vulnerable actors such as people in developing countries and people suffering from dementia (Hirom et al., 2017; Hendriks, et al., 2014). These studies have found that various factors such as power hierarchies, mental conditions of actors, language barriers and

socio-cultural barriers can be challenges, which affect the facilitation of a participatory design process. In our project we are dealing with 0-1 year old children that in some ways are at similar communicative and cognitive mental stage as people with dementia. This is challenging in relation to their engagement in a participatory design process. To engage vulnerable groups require a special focus for the designers to facilitate and stage the design process. In a later section we will elaborate on what methods we have used to make sure the MoCs of the children have been represented through the design process.

From the beginning our approach has been to facilitate a collaborative design process by involving various actors in the design process. Instead of just engaging the children and their parents, we have given voice to other relevant actors such as doctors, nurses, pedagogues, experts within the field of sensory stimulation etc. In this way we have sought to facilitate spaces to negotiate the interest of the different actors in the design process. We will now move on to discuss the methods used in this project.

Methodological framework

In this project we have used a lot of different methods to investigate our problem. These methods will be introduced and discussed in relation to our project in the following. First we will introduce how we got access to the field and the development of our involvement strategy. Thereafter we will go through our design process, which can be divided into three phases. Within each phase the methods used will be presented and discussed.

Getting access to the field

During our last semester one of us has been in an internship in the project organisation building the new Children's Hospital Copenhagen. Through this contact to the project organisation, we became aware of a gap in the knowledge about the youngest children and their parents needs, when being treated at the hospital, which aroused our interest, but our general interest in this field was already established. In a previous study, we have been studying the experience of waiting time at a children's hospital in Odense. In this project we experienced, how the current physical surroundings limited the possibilities for making solutions that could give children and their parents a better experience of waiting. Therefore we found it interesting to make this design study of

which the results could feed into the building process and shape, how the rooms are build and thereby not be limited by the current old physical surroundings.

The fact that one of us already had established relations in the field made it easy for us to get in contact with relevant actors and get access to do observations and interviews in the field. The balance of having one of us, as an insider and the other as an outsider, has been fruitful in the process. The insider has been able to get access to situations, which otherwise would have been difficult to get into. The outsider on the other hand has easier been able to keep the critical distance and has observed and asked questions, which the insider has been too enrolled to register.

Involvement strategy

What characterises a participatory design process is that actors, who are going to engage with the product or service, are invited to participate in designing it. Therefore we found it relevant to involve parents and children in designing the treatment room, but also representatives from the staff group, which also are actors going to engage with the room. To be sure not to exclude relevant actors, we kept a door open for other relevant actors, we probably would meet during our fieldwork.

The next step was to decide, how to involve these actors and in which part of the process. In other words, we considered how to 'stage' the design process. According to Clausen and Gunn a participatory innovation process consists of several '*temporary spaces*' that include the involvement of different actors (Clausen & Gunn, 2015). These temporary spaces have to be staged. The term staging refers to the planning aspect of a design process such as who to involve, what kind of materialities should be involved and in what way (Pedersen, 2016). There is a political aspect of staging in relation to, whom to involve and in what part of the process. To accommodate this we developed an involvement strategy in the beginning of the project. We made a map of the actors of our field, and discussed how to interest, enrol and mobilise these actors in the design project. In the involvement strategy we defined who we ideally would involve, why we wanted to involve them, how to involve them including choices of methods and interessement devices and lastly when in the process. This worksheet assisted us in the process of staging the three phases (temporary spaces) of the design process.

On the basis of our involvement strategy we chose to use a variety of different methods - a so-called *mixed-methods design* (Frederiksen, 2015). Among these methods

are observation, interview, design game and mock-ups. The choice of these different methods is based on the idea that knowledge derived from one method can complement the use of another method and shed light on the problem from different angles. The methods we have chosen complement each other in the way that knowledge from our observations has been included in our interviews and knowledge from this have furthermore been included in designing the design game and further on the knowledge from the design game has been used in designing the mock-up setup. This sort of research design is also called an *iteration design* (Ibid.).

Figure 2 illustrates our design process, divided into three phases, which each will be introduced more in the following.

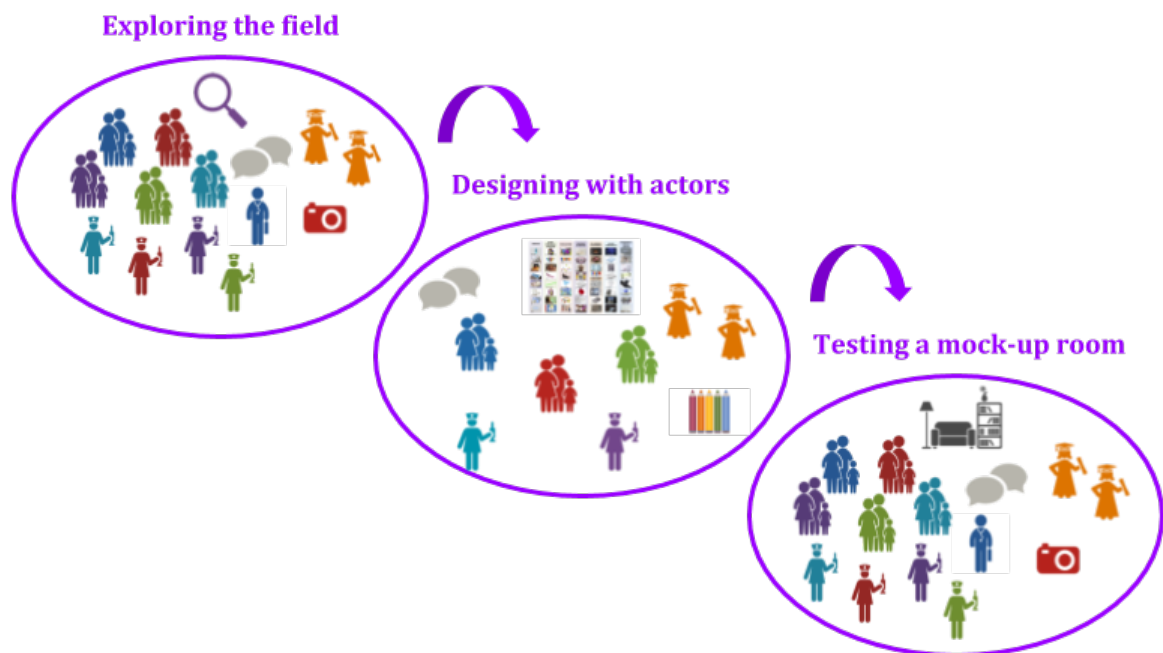


Figure 2: The three phases of our design process.

Phase 1 – Exploring the field

In the introductory phase of the design process we approached the field explorative. Apart from studying examinations of 0-1 year olds we therefore also brought in knowledge from the world of multisensory environments and from the parts of the hospital that is not directly part of room 4, but which still are part of the same network surrounding 0-1 year olds in the hospital.

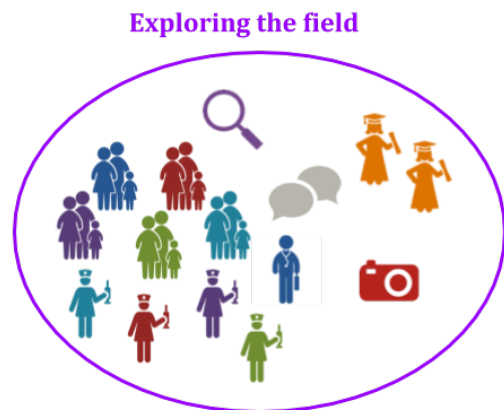


Figure 3: The design space of the first phase.

Participatory observations

We have used participatory observation as one of our methods in order to get physically into the field and see and feel for ourselves as empathetic observers, in order to get as close as possible to experiencing what the children and parents are experiencing. Our observations are taking place in two different outpatient departments at Rigshospitalet and at field trips outside the hospital, such as the snoezel house. We observed only in the examination rooms and not in waiting rooms and hallways. In this phase we had a broad focus on the experience of the families and their interrelations with each other, the room and the staff.

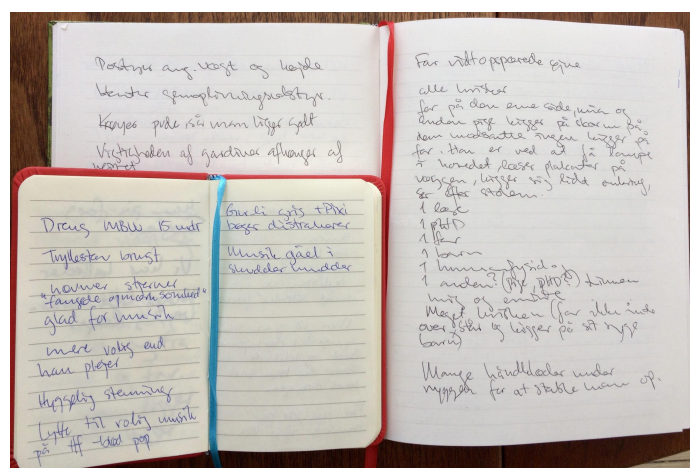
A specific purpose for using this method was to enable ourselves to not just understand the children through their parents' verbal descriptions of situations, but to see their own body language, behaviour and interrelations with other actors as well (Riis, 2005).

During the observations we have been in different parts of the participating/observing scale. At some examination we have been highly observing, sitting in the corner of an examination room trying to make ourselves invisible due to an already high number of people in the room interacting with the child. At other times we have been much involved e.g. at an MBW examination where we were asked by the nurses to keep an eye on the blood pressure monitor, while she left the room and we talked with the parents. Regardless which role we had, we never considered ourselves

as objective viewers from a distance, but acknowledge that we too have agency and prior understandings, which we also have touched upon in paragraph of 'getting access to the field', discussing our roles as 'the insider' and 'the outsider'. A part of being conscious of our own roles is also to get the right balance between watching from a distance and studying something so closely that you *go native*. If you are too close to what you study, it might be difficult to see it because it seems like a natural matter of fact, whereas if you are too distant you can not say much because you simply can not get a grasp of what is going on in front of you (Sunstein & Chiseri-Strater, 2012). On this matter we have also used the fact that we were two researches, allowing one of us to sometimes step back to take notes or watch more quietly or the other way around.

Field notes, thick descriptions, photographs and scenarios

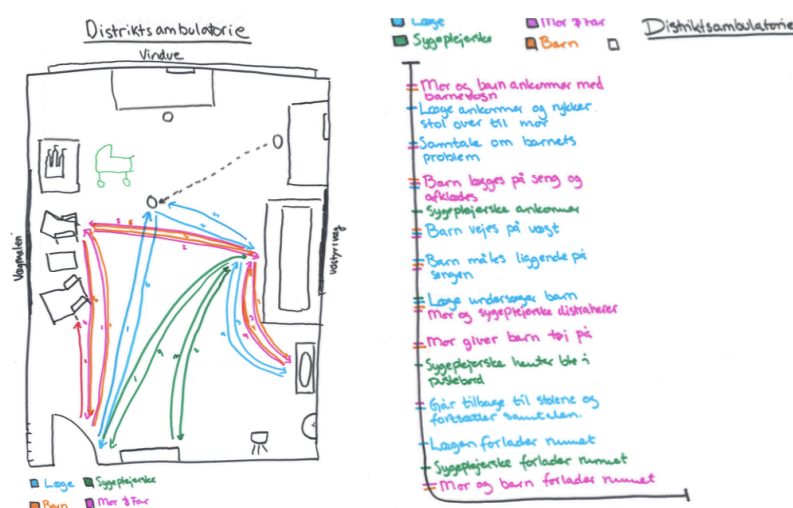
During our fieldwork we continuously made field notes (see picture 17). When returning from the field we would make these notes into thick descriptions (Geertz, 1973). The thick descriptions were made by questioning our field notes; asking ourselves what surprised or intrigued us in our notes. (Sunstein & Chiseri-Strater, 2012) Another part of the thick descriptions is to write up all the nuances our senses have caught: smells, sounds or a gut feeling. Furthermore, thick descriptions also contain all the nuances that are cultural, so instead of just describing that a person puts their hand in the air and wave it back and forth, a thick description of this is to describe how the person is doing this with his hand in order to greet someone. All together things, which makes the description rich and which enables us to translate the culture of what we experienced into something readable to others and ourselves. Making the thick descriptions helped us clarify and verify the events and afterwards they helped us maintain a detailed memory of the given situations. We have chosen to change all names to alias in all our data.



Picture 17: Field notes before they become thick descriptions.

We have also made use of pictures as part of our empirical data. During our fieldwork we have had some ethical reflections concerning taking pictures at the examinations. In some of the examinations we assessed that asking the parents for permission to take pictures would be too intimidating for them, which have implied a lack of pictures visualising the examinations. Instead we have tried to visualise some of the situations with sketches, to give you a visual experience of some of the situations, we describe.

As part of getting an overview of our data and understanding each examination we made scenarios and flow drawings, which you can see on picture 18. This consists of taking an example from each of the three types of examination and carefully follow the actors (Latour, 2005), by writing up their actions chronologically through the examination and drawing how these actions made the actors move around in the room. This allowed us to get a better understanding of their use of the room and the actions and interactions of each type of examination.



Picture 18: Flow and scenarios drawings.

Interviews and informal talks

We have been interviewing both parents and staff in this initial phase. The interviews were used as interessement devices to interest relevant actors in the project. All of the interviews were semi-structured interviews for which we had made interview guides (Kvale & Brinkmann, 2009). How strictly we followed this guide depended on how the conversation unfolded and what the staff or parents told by themselves. With parents we have generally had informal, on-spot interviews, which sometimes started a bit along the examination if there were breaks, e.g. waiting for specialists from the hospital

to appear. This also helped it become less formal, when we sat down to talk after the examination, which made the parents speak frankly and open hearted to us and the situation more relaxed. When interviewing or observing families we always handed out the note shown on picture 19, explaining who we were and giving contact information. In this way our intentions were laid out openly and the parents where free to contact us afterwards. In the interview guide for the parents we had three main areas with sub-questions, which we would touch on if the conversation did not automatically go there. The areas were:

- Their experience of today's examination.
- Their general experience of the examinations at Rigshospitalet.
- Their thoughts and ideas for improvement.

In all of the areas we would ask the parents both of their own experience and how they believe their child experienced it.

In relation to the staff, we interviewed both some who used the room 4 and some other staffs, who work with children aged 0-1 year at the hospital, but does not use this particular room and who are from other departments. To the staff the different areas in question were:

- Their practices within their specialities.
- Their experiences of treating this age group.
- Their knowledge about special initiatives for enhancing the experience for 0-1 year olds and their parents.

The staff we interviewed, who were not directly linked to room 4, were people who we believed to have expertise insights regarding the 0-1 year olds, and whom we would like to talk to in order to gain a broader context of the field and to get knowledge to build on in our iterative design process. These were the development nurse from the project



Picture 19: Information letter to the parents.

group of Children's Hospital Copenhagen, a specialist nurse from neonatal, two pain specialist paediatric nurses and a hospital pedagogue, who unfortunately cancelled the interview. We interviewed these persons more generally on their experience and initiatives with the 0-1 year olds.

All of these interviews gave us a broad insight in the different approaches and departments dealing with 0-1 year olds at Rigshospitalet. Furthermore it provided us with knowledge that enabled us to make informed decisions on how to stage the next phase of the design process.

Field trips

As a part of our initial, exploratory phase we went on three field trips. We visited two snoezel houses and a care home with focus on welfare technology and multisensory environments. At the first snoezel house we were showed around and got to try all the facilities for ourselves. In the second one we participated on a multisensory class for young children, also called 'stimulastic' (stimuli and gymnastics) with an instructor and three children and their mothers. At this class we did not really know if we would just be observing from a corner, but when the class was about to start the instructor gave us each a stuffed animal and asked us to join the group, as you can see in picture 20.



Picture 20: Doing participatory observation in a 'stimulastic' class with our own animal babies.

This allowed us to get much more feeling with what the class was about. Joking about the slight silliness of us making exercises with 'fake babies' (stuffed animals) was a good kick-starter for talking to the mothers about coming in the snoezel house and it also

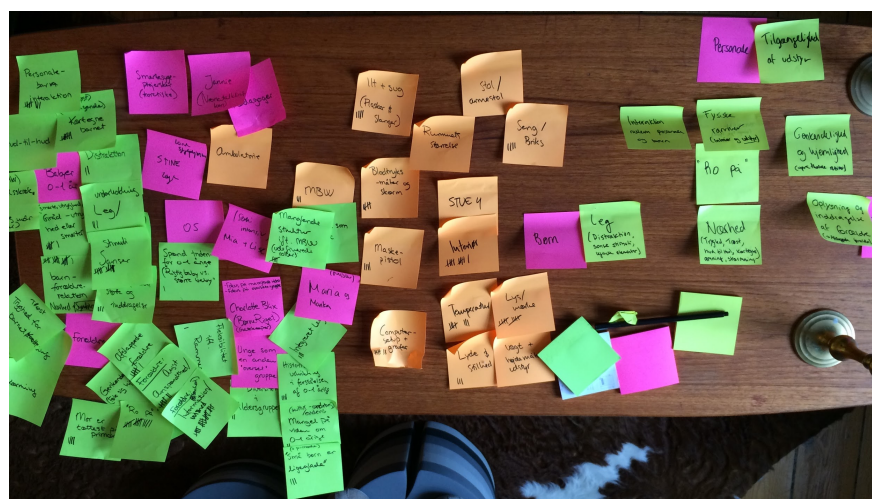
allowed us to go a step closer when the mothers and children were doing exercises together. Even though we could not feel the stuffed animals getting relaxed it was clear to see how the children were first stimulated and aroused and afterwards relaxed and absorbed by the fibre optics and waterbed. Afterwards, when the children and their mothers had left, the instructor facilitated for us to try all the facilities ourselves. Lying in the waterbed with a weighted duna, white soft fabric ceilings and calm music enabled us to really feel on our own bodies what the multisensory environments could do. We were both instantly relaxed.

We also visited a care home that has a multisensory room. We got to try the facilities for ourselves and to observe a resident being treated in the multisensory room. Even though the resident did not have a spoken language it was clear that his body was more and more relaxed throughout the session in the multisensory room.

Apart from letting us feel what multisensory environments could do on our own bodies our field trips also allowed us to validate some of the things we had seen at the hospital and heard in our interviews.

Coding our data

When we had finished all our initial, exploratory work observing and interviewing we coded our empirical data and thereby got a more organised and deeper understanding of what was at stake in the field. We read all our interview transcriptions and thick descriptions and looked at the pictures we had taken. We tagged every pieces of text with words summing up what the piece was about (see picture 21). The pink notes are human actors, the orange are non-human actors and the green are discourses/themes.



Picture 21: Overview of the tags and notes in our coding process.

When everything was read through and tagged up, we went through all the sticky notes and piled the ones that were closely connected and put aside those that were too far from the problem we work with in this project. We looked at the piled notes and found the common theme for these, which became yellow notes, see picture 22.



Picture 22: Sorting our notes.

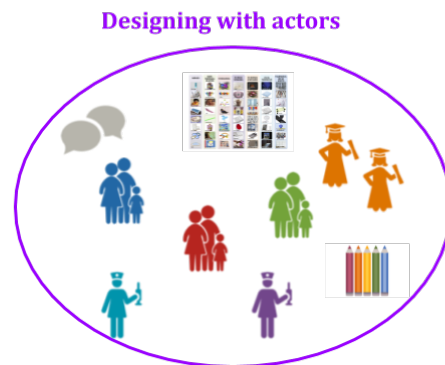
When all the piled notes had become themes on yellow notes we put away the rest and we now had eight themes left, which formed the basis for the first chapter of our analysis, in which we analyse the MoCs of the actors.

Requirements and criteria

When the first part of our analysis was written and we had the details of every MoC and actor in letters, we translated this knowledge into requirements and criteria, in order to make a functional and applicable concept. Requirements and criteria are everything that a system or a concept needs to fulfil, formulated in a neutral language. We translate the needs and MoCs of the different actors into a written specification that we use as a dialogue partner throughout the process, holding possible solutions and ideas up against it and using it to steer the concept the right way. Furthermore the requirements and criteria function as intermediaries that translate the knowledge from phase 1 into phase 2. The requirements are things that *have* to be in a certain way, whereas criteria are nice to have, but not crucial for the concept. Requirements are something that can be measured or which we can say 'yes' or 'no' to, whereas criteria can be slightly more fluffy in their formulation. As you will see in the report the constant dialogue between the requirements and criteria and our empirical data creates a continuous refinement and change in the formulation of the requirements and criteria specification.

Phase 2 – Designing with actors

The second phase is about conceptualisation. In this phase the aim has been to create a space for negotiating possible sub-solutions with different actors to accommodate their MoCs in a concept. We developed a design game, which we used as a medium to create this space for co-creation among actors and get already interested actors enrolled in the project.



Picture 23: The design space of phase 2.

Design games

A design game can be a useful framework to help organising participation in a way that makes it possible to bring in competencies of different actors and make room for everyone to make design moves and negotiate their views (Brandt, 2006). According to Brandt, Messeter & Binder (2008) a design game can be defined through these five elements:




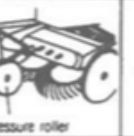

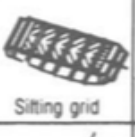




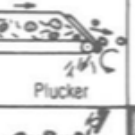



- A diverse group of players are gathered around a collaborative activity guided by simple and explicit rules, assigned roles and supported by pre-defined gaming materials.
- The game materials typically point to either or both existing practices and future possibilities.
- The games are played within a confined and shared temporal and spatial setting often removed from the everyday context of the players.
- The purpose of the game is to establish and explore novel configurations of the game materials and the present and future practices to which these materials point.
- At the end of the game, the players will have produced representations of one or more possible design options. (Brandt, Messeter & Binder, 2008, p. 54)

A design game consists of different gaming materialities for example a game-board, game-pieces, pictures etc. The importance of involving different game materials is to create a common ground, which everyone can relate to (Brandt, 2006). The materials can work as 'things-to-think-with' in such way they assist the actors in communicating their interests.

We found this method useful to create a space for the actors involved to negotiate their MoCs and enable them to engage in designing possible concepts for a treatment room.

Morphology chart

In the process of designing our design game, we have been inspired by a method used within engineering design called Morphology chart. Nigel Cross describes the aim of this method as follows: *“The aim of the chart method is to generate the complete range of alternative design solutions for a product, and hence widen the search for potential new solutions”* (Cross, 2008, p. 126.). The chart consists of a scheme with sub-functions for a specific product and different possible solutions to achieve each of these sub-functions (see picture 24). The idea is to identify different combinations of solutions. This is done by choosing one solution within each of the sub-functions, which then will constitute a concept of the product. In picture 24 the grey squares together constitute one concept.

Solutions		1	2	3	4	...
Sub-functions						
1	Lift	 and pressure roller	 and pressure roller	 and pressure roller	 Pressure roller	...
2	Sift	 Sifting belt	 Sifting grid	 Sifting drum	 Sifting wheel	...
3	Separate leaves	 Plucker	 Plucker	 Plucker
4	Separate stones	 Tipping hopper	 Conveyor	 Sack-filling device
5	Sort potatoes	by hand	by friction (inclined plane)	check size (hole gauge)	check mass (weighing)	...
6	Collect	Tipping hopper	Conveyor	Sack-filling device

Picture 24: Morphology chart. Source: Cross, 2008.

As we in this project do not strive to design a specific product, but a concept for a whole room, we have based our design game on some of the elements from this morphology chart, but further developed it to match the aim of our project. This means that instead

of having solutions to specific sub-functions of a product, we have designed it with solutions to achieve more general themes.

Our design game

Picture 25 illustrates our design game. In the following we will introduce you to our process of developing this game.



Picture 25: Our design game. The themes from left: Proximity and safety, establishing relations, stimulation, a calm atmosphere, a homely atmosphere, temperature and lighting, accessibility of equipment.

The themes

The different coloured boxes are the themes derived from the first part of the analysis of the different actor's MoCs. Under each theme 8 sub-solutions are presented.

The sub-solutions

The choice of sub-solutions within the themes is the result of a process with several steps. First of all we made a brainstorm session on each of the themes, where we generated ideas on things associated with the theme (See picture 26). The brainstorm

Each chosen solution was represented with a picture and a text in the design game as shown on picture 25. The pictures were a mix of photos we have taken ourselves and pictures found by searching at the Internet. It is important to underline that these solutions not were settled as the only final solutions, but were to be seen as representations of possible solutions that should catalyse a conversation around solutions to accommodate the different MoCs. This, together with the game rules, was introduced to the actors before we played the game with them. Some of the solutions were not just solutions to one theme, but across themes.

The participants

We had many considerations about who to involve in the game. Due to our focus on designing a treatment room that accommodate the MoCs of the parents and children, they were of course relevant actors to involve. We knew from the beginning that the children would not be able to play this game due to their lack of language and therefore the parents became representatives on behalf of the children for a while. To make sure the children's MoCs were represented we kept asking the parents to reflect on how the solutions would work for their children. Besides the parents and children we also found it relevant to play the game with the staff. The staff is also users of the room and therefore we will argue that they should be part of designing it. Furthermore we have experienced how the staff plays a central role in facilitating the use of the room. We have observed that the parents do what the staff tells them to do, so if we want the families to use the room, we need to have the staff mobilised in the project. Finally we are interested in designing a treatment room that does not conflict with the treatment process and therefore we found it relevant to include the staff.

There is a need for flexibility in the treatment room, both in the current examination room 4, where three different examinations are conducted, but also at the new Children's Hospital Copenhagen, where all the rooms have to be flexible due to the unknown situation in 2024. Because of this need for flexibility in the design we chose to play the design game with representatives from the three different examinations taking place in examination room 4. We played the game with three families, one from each of the three examinations. Two of the families were some of the families, who's examinations we had observed in the beginning of the study, while the last one was a family, who often comes to examinations in room 4. The willingness of the families from

the previous phase, to participate in the design games, shows that we succeeded to interest them with the interview and they have become enrolled in the project. In relation to the staff we played the game with a nurse from semi-intensive unit and a human physiologist from the MBW examination. Both of them had participated in the examinations we have observed previously in the design process. We had an appointment with a doctor doing regular examinations, but she cancelled in last minute and we were not able to get a new appointment. The fact that we included participants from all three examinations turned out to be useful. When playing with a nurse from semi-intensive unit, she pointed at the waterbed and said: *“That is just not so good, if the child gets a heart attack. That is the way we think in this department”* (Appendix, p. 130). She explains how they quite often have to deal with children, who get a heart failure and have to get heart massage and be resuscitated. In such a situation a waterbed would not work, because the child would be swallowed by the soft surface and it would be impossible to complete a heart massage. None of the other staff mentioned this. This illustrates how the different examinations have different needs and thereby it was important for us to get representatives from all of the examinations to play the game.

The game was played with one family/staff at a time. We gave the families and the staff the choice of either playing the game at the hospital or in their homes. Many of the families explained that they were not going to the hospital in the near future, so it was easier for them to meet in their homes. The staff found it easier to meet at the hospital.

The game rules

The participants were asked to draw three concepts, each consisting of a solution within each of the themes. They were allowed to choose the same solution for more than one concept, if they found it relevant. An example of three concepts is shown in picture 28, where each colour indicates a concept. They were asked to think aloud, so we could hear their reflections behind their



Picture 28: The design game board with three concepts.

choices. As mentioned before we told the participants that the sub-solutions not were settled, but more functioning as a framework to facilitate a dialogue about possible solutions. Therefore we also brought sticky notes, on which they were told to write down new ideas or solutions, if they had some. As you can see on picture 28 one of the nurses made use of this function and wrote a sticky note, within the theme accessibility of equipment, about having a permanent set of equipment always accessible in the room. This function enabled the participants to think beyond the solutions at the game board.

Our role in the design game was a mix of being facilitators and observers. We introduced the game rules and asked questions to their choices of sub-solutions. All the sessions were videotaped, so we could go back and see their choices and hear their reflections in the data analysis process.

Our experience of the game

We experienced that the game worked well as a medium to create a space for discussing possible sub-solutions. Often the families were focused on the different solutions at the game boards, but they were able to make their own interpretations of the solutions and further develop them. An example is a father who chose the nursing chair with the following argument: *“Now it says nursing chair, but that kind of chair would be nice for me as a father as well (...) A rocking chair with springs. The way it moves makes him calm, you see. We do the same at home”* (Appendix, p. 140). Even though it is named nursing chair at the game board, which relates to using it to breastfeed, he saw a potential use for him as a father as well. In this way, he ignored the name at the game board and made his own interpretation of the chair. A mother from one of the other families also reflected on how some of her thoughts about the solutions changed during the game, which she found interesting.

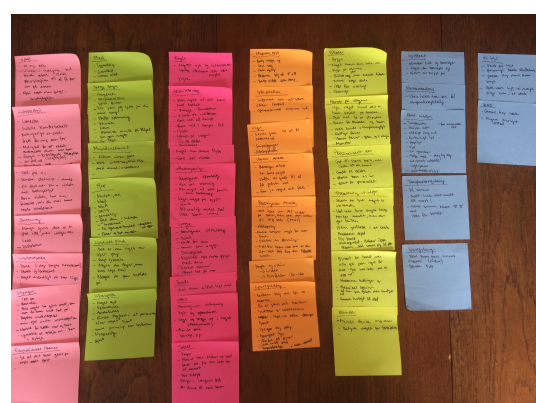
We did not make rules for how the three concepts should differ before we started the game. We wanted to see, what made sense in the situation and left it for the participants to be part of deciding the rules. When playing with the first family, the father suggested, after having made the first concept based on the current age of their son (6 months), to make the second concept based on a future scenario, in which their

son was 1 year old. This gave us a good discussion on the kind of solutions that works for them now compared to what they think might be useful, when he gets a bit older.

Before playing the game with the families we considered if it would be best to let the mother and father make the concepts together or separately. We agreed that doing a concept together could contribute interesting discussion and reflections. Therefore they were asked to do the first concept together. Playing the game with the first family we realised that making them do the first concept together entailed a good dialogue about the different solutions, but the dialogue also revealed that they disagreed on some of the solutions. We found it interesting to let them make some of the next concepts separately to see if they would choose differently. It turned out that they did choose some quite different solutions, which brought new insights. We realised that the balance of making a concept together and one separately entailed different perspectives, which were fruitful for the discussion and MoCs were negotiated. Therefore we decided to apply this strategy when playing the game with the two other families. When playing with the second family only one parent was participating for the entire game, because the other had to keep an eye on the children and therefore only participated partially. It was only the mother, who was present, when we played the game with the last family. Because of these unforeseen circumstances in relation to the participants, the roughly defined rules were useful.

Coding process

After playing the game, it was time for processing the data. We did this by watching all the videos taped and write down their comments to each solution at sticky notes (see picture 29). Furthermore we counted the circles around the different solutions, in order to get an overview of which sub-solutions have been chosen the most (see picture 30)



Picture 29: Coding our data from the design game. Each color is a theme and each sticky note a solution.

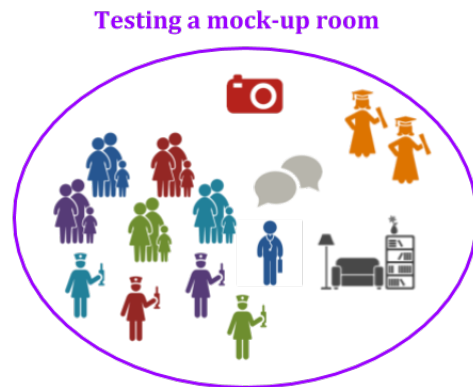


Picture 30: Coding our data from the design game. Counting choices of solutions.

Ideally we wanted to test minimum one solution from each of the themes. Our decisions on what to test have been a combination of the amounts of circles within each theme and what the participants have said about the solutions. On the basis of this we developed two documents; an ideal test setup and a realistic test setup, considering our time frame and resources. In the following we will present the methodology behind making the mock-up.

Phase 3 – Testing a mock-up room

The specific mock-up we tested will be stated in our analysis. The mock-up was a translation of the knowledge that emerged in the design game, into a test setup consisting of different sub-solutions.



Picture 31: The design space for phase 3.

Designing the mock-up

A mock-up is a kind of prototype, on which Preece, Rogers and Sharp say: “A *prototype is a limited representation of a design that allows users to interact with it and to explore its suitability*” (Preece, Rogers & Sharp, 2002, p.241). We have used a mock-up of the design concept as part of this iterative design process for several reason: 1) As a space staged by us for further negotiation of the sub-solutions and the MoCs. 2) As a space for all actors (including ourselves) to share knowledge and learn. 3) In order to involve the children more directly with the sub-solutions. In the design game parents and sometimes the staff spoke on behalf of the children, but by making a mock-up we could actually try to see how the children interacted with the different sub-solutions.

Brandt argues that Preece, Rogers and Sharp divide prototypes into low-fidelity and high-fidelity prototypes (Brandt, 2007). High fidelity prototypes are typically made of some of the same materials, as the final design is supposed to, and it looks much like a final product. The low fidelity mock-up or prototype is made from cheaper materials such as paper or the like and it is often made in short time and not suitable for the final design. At this point of our design process we strived to make a mock-up that was high-fidelity to facilitate a more focused and detailed dialogue about the solutions, whereas our design game functioned as low-fidelity prototype to facilitate a more abstract and general dialogue about possible sub-solutions. However, when designing our mock-up it turned out that we had to test some of the solutions in a low-fidelity version. As you will see in our mock-up room it ended up being a mix of high- and low-fidelity solutions. For instance we tried to make the room more colourful by sticking gift-wrapping paper around a changing table, which is a low-fidelity solution, whereas the ceiling decoration was a ready-to-install product we have borrowed from a company and it is therefore

high-fidelity. The reason for this was that some of the solutions we wanted to test would be too much of an intervention, such as painting the walls and therefore we had to find alternative low-fidelity prototype to test these elements.

All of the elements in the mock-up are tangible, which Bødker and Buur stress as important, in order for people to be able to actually interact with them by touching them, taking them in their hands or placing them somewhere (Bødker & Buur, 2002). We have also found this very important, since it first of all is impossible to make a child imagine something by looking at a drawing and also when it comes to multisensory environments and sensory stimuli we will argue that this is best tested through actually experiencing it and interacting with it through all your senses and not just one sense, which would typically be the sight.

Testing the mock-up

We set up the mock-up in room 4. We tested the mock-up for three days, in which we were observing how staff and families used the room and talked to them during and after examinations. During the three days there were: one day of regular examinations, one day of MBW examinations and one day of semi-intensive examinations.

Before each examination day was to start we talked to the relevant staff, which were to use the room that day, and showed them the different elements of the mock-up and explained how they were turned on/off etc. When the families arrived we told them about our project and asked permission to observe their examination. We did not introduce the mock-up in details, as we did not want to affect their experience too much. During and after each examination - depending on what was suitable - we tried to talk to both staff and families on how they experienced the mock-up room.

We had planned to be part of all three days, but when we showed up to observe the MBW examination, they had started a long time before scheduled, so the child was already asleep and the examination had begun. As we did not have permission from the parents to be part of the examination and the child was sleeping, we assessed in unison with the staff that it would be too interrupting to walk into the room. We stayed outside and talked to them when the child woke up.

It was clear that the mock-up entailed both enrolment and mobilisation for some of the actors. The already enrolled nurse from semi-intensive department for example got very excited by seeing some of the things, she had talked about in the design game,

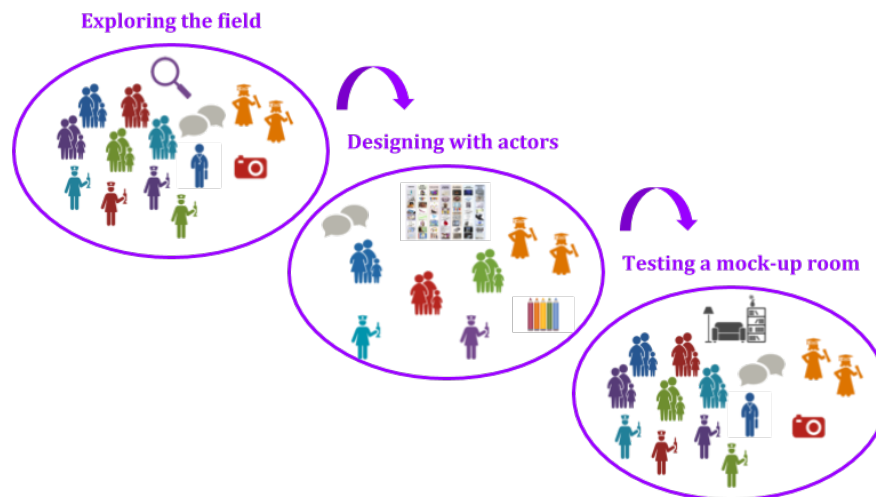
and she was very eager to use the new things in the room and engage the families in using them. Showing ownership of the project tells that this nurse has been mobilised by representing the agenda of the project. Another nurse, who has been less engaged in our project, suddenly took a lot of ownership and started using the room and the elements actively in her interaction and treatment of a young boy.

The families, who were examined in the mock-up room, had not heard about our project before going to the examination. They all actively started to use the room and its elements for themselves or for their children, and thereby got interested and afterwards told us about their experience and discussed the elements in the room, which made them enrolled in the project.

To make a mock-up, instead of making a design concept of the room straight after playing the design game, was of great value to the project. This allowed us to let the families and staff use the elements in the examination room and try out what actually worked and what did not. Furthermore it allowed us to talk about and see what characteristics or abilities that made the elements work or not work, and it allowed the staff and families to express what they experienced to be the most important parts of the concept, when they felt it on their own bodies.

Analysis

The analysis is divided into three phases, as described in our research design. We will start by gaining an understanding of the field and the MoCs of the actors (phase 1), on top of which we will design possible concepts with actors (phase 2) and finally test the solutions in a mock-up, which will result in a design concept (phase 3).



Picture 32: The design process of the project.

Phase 1: Exploring the field - Making the matters of the field visible

In the first phase we will analyse what is at stake in the experience of being in an examination room for parents, children and staff. Through observations at examinations and snoezel houses and interviews with parents and staff we have gained experience and empirical data, which we have questioned and thereby found recurring MoCs across actors and different examinations. The results are the following eight themes: *Proximity and safety, establishing relations, stimulation, a calm atmosphere, a homely atmosphere, informing and involving the parents, accessibility of equipment and temperature and lighting*. Under each theme we will elaborate on the different MoCs at stake for the different actors. Afterwards we will discuss how the themes interact or conflict and how this can be used in the further development of using multisensory environments in

order to create a better experience for children and parents. Finally these MoCs will be translated into requirements and criteria, which will be brought into the next phase.

The figure below visualises the eight themes at stake in phase 1.



Figure 4: The eight themes elaborated in phase 1.

Even though the themes are visualised as eight different themes it is important to underpin that these are not autonomous of one another. They are part of a common network, which forms the experience for the children, parents and staff. If one of them is pulled in one direction or taken out of the network it will affect the rest of the network and thereby change the experience. Not all of the themes are an issue to all actors. Some are mainly a concern to staff or children or is a link between two actors.

Proximity and Safety

A theme that remains present in almost all of our empirical data is proximity between parents and child. Proximity meant as both physical intimacy and in terms of relational closeness. Through almost all our observations, the children are sitting at their parents' lab, lying in their parents' arms or, if they lie on a bed, a parent is standing next to them, caressing their little hand or bending over them, making smiley faces, funny sounds or babbling with them.



Picture 33: Proximity and safety.

“We just have to be there”

The parents have several different MoCs related to giving their child the best experience, but what is most important is to be present or to make sure to be within the child's sight.

When we spoke to the parents of Simon, who is 4 months old and just had had his second MBW examination, we asked what they do in order to make their son relaxed while being at the hospital. To this, the mother replied:

“Often we have carried him -like when we just arrived now- we’ve carried him in a carrying sling on the stomach, or in a baby wrap when he was smaller. So having him close and letting him know that there is peace being there with us. And that he will return there (to the sling) when all the bad stuff is over”. The father supplemented: “We make sure to be close to him all the time, so that he can see and hear us”. In extension to this the mother said: (...) Being near to us. I think that is what makes him relax the most and get the best experience with it (visiting the hospital)” (Appendix, pp. 70-71).

Simon’s parents mentioned several things, but they highlighted these as the most important, in order to make it a good experience for him. We also observed this during Simon’s examination. We wrote in our field notes:

The mother is sitting in a chair close to the boy and the father is sitting in a chair up against the wall by the foot of the bed. The father is mainly scrolling on his phone, while the mother is watching the boy and caressing him a bit. They are both sipping on their to-go coffees. The sandwiches are left untouched in a bag on the ground. Simon is often coughing a little and waking up a bit; then the mother gets up and caress him until he sleeps again (Appendix, p.31).

When we spoke to the parents of the twins August and Adam, who are 11 months old and just had been at regular examinations, their experience was the same. We wrote in our field notes: *When we ask about their most important experience with getting a good experience at the hospital, the answer comes promptly from both ‘we just need to be here, both of us’. It is important for them to be there in order to take care of the children and be able to give them both care and attention (Appendix, p.44).*

Just the very act of being there is important. Being there and being near. The mother of Oliver, who is 2 months old and just had been at a regular examination, also shared this experience. The following is an extract from our field notes: *We asked her what she thought it took for her son to get a good experience. She replied that the most important thing was that she stayed close by all the time, so he could see her. Recently she had read that small children were likely to think that their mother disappeared forever if she was out of sight and therefore she was very focused on being close to him all the time, holding his hand (Appendix, p. 40).*

Apart from being a MoC to the parents, we have seen many examples of this being a MoC to the children as well. We have observed several examinations with children who sat on the scales to be weighed or lay on the bed to be measured, while

screaming and crying, but as soon as they got into the safe comfort of their parents' arms they stopped. Or as in the example above, where a caress from his mother put Simon quickly back to sleep.

Shielding and breastfeeding

Apart from this general proximity, consisting of feeling safe and calm through caress and being able to see and feel each other, there are other elements to proximity as well. At some of the examinations the children were too upset to be calmed down just by coming back into the arms of their parents. The following are notes from the examination of 3-month-old Erika, who was having an injection, which should hurt a lot according to both parents and nurses:

The little girl is about to get an injection in her thigh. The nurse shows the mother how to best sit and hold her in a vice like grip, with her thigh ready for injection. The little girl cries and is consoled by her mother's soothing words and a dummy. 'Basta, basta, basta', she says whispering. She holds the girl over her shoulder and takes her a bit away from the others and stands at the examination bed consoling her (Appendix, p.35).

The mother comforted her daughter by shielding her from too many impressions, by using her voice and body and by using the calming effect of the dummy, simulating the mother's breast.

Other mothers created proximity and calm through breastfeeding as well. We were observing the family of Simon, who was about to start an MBW examination: *The dad asks if Simon should be fed before. They are a little hesitating and ask the human physiologist if there is time to feed him. There is, so the mother sits down in one of the armchairs and breastfeed him. She puts a cloth over his head (Appendix, p. 30).* When we interviewed her afterwards, she told that she put the cloth over his head in order to let him concentrate, because he was looking too much around. She also told about the last time they were at the MBW examination:

"I believe I breastfed him and then he fell asleep and was halfway asleep when they gave him the sedation or that calming thing". And the father added: "Yeah, at that time they actually only gave him that (the sedation) in order to make sure he didn't wake up along the way. But he wasn't very big at that time. Very small" (Appendix, 68).

Breastfeeding is of course a way of giving the child food, but also a way to reduce pain and make the child calm and safe. This is well known to the paediatric pain nurses.

When we interviewed them, they told us how studies have shown the effect of breastfeeding as a pain reducing procedure for small children (Shah et al., 2012). Therefore they recommend parents to breastfeed children younger than 1 year during procedures. They showed us a video of a child being breastfed while getting a placement of i.v. injection. The child was silent all along. Furthermore the nurses pointed to the importance of letting the children sit at their parent's lap while being examined *"It is easier to complete the procedure, if the child is sitting safely at their parent's lap"* (Appendix, p. 124). This shows us that the nurses have a MoC related to letting the child complete the procedure easier by being close to their parents and being breastfed while going through painful procedures.

Apart from breastfeeding, Simons mother also mentioned how she puts a cloth on his head in order to make him concentrate. This need for shielding the child is also a part of the parents' and child's MoC of creating proximity and a safe feeling. When we talked to Simons parents about what they do if Simon is upset, the mother said: *"Well then one of us is taking him up and then goes a bit away from it all, shielding him a bit"*. We asked what they shield him from, and she answered: *"Well, it is just sort of everything. Just in a way that we look into a white wall, just the two of us, so there is nothing to relate to"* (Appendix, p. 79). In this way, they seek to make room for proximity between the two of them and shielding the child from other stimuli, just being the child and its parent.

Making the child feel safe at the examination bed

Being in close proximity is one way for the children to feel safe. According to a doctor at a MBW examination another way is to swaddle the child in a blanket instead of putting it directly onto the examination bed. The doctor shares this view with two nurses from semi-intensive, who also think that the young children should not be put directly on the examination bed. They have several examples of young children who dislike being put on the examination bed and they told one of them in an interview:

"Sometimes, if we are to draw a blood sample on them... Like the boy who just died the other day (...) we had to take his blood pressure in a special way, which requires that the patient is completely steady and in his situation it was really important that he also sat still for a while before we took the blood pressure in order to get it absolute correct. For this we let him sit in his pushchair (...) Because we just knew that as soon as we would try

to take of his clothes or move him up here (on the bed) he would start!" (Appendix, p. 117).

In order for the boy not to flip out they let him sit in his safe and well-known pushchair with most of his clothes on. Which part of being moved to the bed that exactly triggers each child is difficult to say, but the issues that the nurses have observed about the bed is that it is cold, that they roll around on the paper (put there for hygiene) which according to them is noisy and uncomfortable to lie on. This example illustrates that the nurses have a MoC about making the child feel safe, but it also shows that they have a MoC related to getting easy access to examine the child and make the examination easy for them to complete. They suggest wrapping clothes or the like, in order to make the children feel more swaddled and warm, just like the doctor proposed.

We have observed several situations, in which children got sad when they were placed at the examination bed or at the weight. On the basis of our observations solely it is difficult to decide the exact reason for the children's dissatisfaction. It could be due to the temperature, which is one of the nurse's explanation, but it could also be due to the fact that they are leaving their mother's arms and thereby do not have physical proximity anymore. Nevertheless we can conclude that the children have a MoC about being dissatisfied when being placed at the examination bed or the weight. Furthermore we have experienced how some of the nurses try to speak on behalf of the children. One of the paediatric pain nurses told us in an interview how pain and discomfort cannot be separated for young children. The children can find it just as uncomfortable to be injected with a needle as to be put onto a bed, because the physical and mental pain can not be separated: *"To the young child it is an insecure and unaccustomed situation to lie stripped and exposed instead of curled up, warm and safe. The young child doesn't know what is going to happen now and whether it will die from this"* (Appendix, p. 126), the nurse explained. This quote illustrates how one actor tries to represent another actor and their MoC. Due to the children's inability to express their feelings with words, we do not have a clear explanation of why they are dissatisfied when placed at the examination bed. To bring the children's MoCs more into play would require some specific tests and interventions at the examination bed.

To sum up this section, it is a MoC to the parents and to the young children to be in physical and relational proximity to each other. This consists of caress, comfort, safety, shielding, breastfeeding and consolation. The nurses have a MoC related to

making the child stay in close proximity to the parent and enable breastfeeding, because it makes it easier for them to do their job. In addition the staff have a MoC about making the child feel safe at the examination bed, which also makes it easier for them to complete the examination. The children have a MoC about being placed at the examination bed, which make them unhappy.

Establishing relations

“To establish relationships is difficult, but nevertheless a condition when you work with children” (Appendix, p. 127). This quote is from a paediatric pain nurse we interviewed. During our stay at the hospital, we have found that establishing relationship is a central part of the daily practices and a central MoC for several actors including the parents, the children and the staff. In this paragraph we will focus on the importance of establishing relations between staff and children, although it in some situations is entangled with establishing relations between parents and staff as well.



Picture 34: Establishing relations.

The third actor

We have seen many different ways to accomplish this establishment of relations between children and staff. The staff uses the establishment of relations to get close to the children and make them feel safe. If the child is safe it is easier for the staff to examine the child. Therefore the staff is interested in establishing a good relation to the child. An example of such a situation is described in this extract from our field notes from the examination of Hubert who is 11 months old and was at a regular examination:

The doctor quickly registers that the little boy needs to be stimulated. Something has to happen. She grabs a pen from her pocket and clicks on it, while passing it to him. ‘Will you look at this?’, she asks him. The boy is looking at the pen. The doctor squats down in front of the child, who stands upright at the floor. She gives him her stethoscope. First she shows him the heavy metal head of the stethoscope. He looks at it and places it at his ear. Then she takes it and listens to him on the outside of his shirt and afterwards

underneath. She plays with the child and distracts him at the same time, while also examining him. I do not think he knows that he is being examined (Appendix, p. 45).

In this situation the doctor used a third actor, which is a material object (the stethoscope), to support the process of establishing the relationship with the child and get close enough to examine him. The stethoscope is in this case functioning as an *interessement device* used by the doctor to interest the children in her and in the upcoming examination. We have experienced several similar situations, where material objects have been used in the process of establishing relations between children and the staff. In the following extract from our field notes one of the paediatric pain nurses explained, how she uses different objects:

‘Take a look at my shoes’, she continues. We all look down at a pair of clogs, where the front body of a little sausage dog is shown on the right shoe and the rear body on the left in extension of the right. The other nurse continues: ‘It is about figuring out what is working for the child in question. Therefore you need a wide range of things, which enables you to establish relations through remedies’, she says. She shows us a green laser pen, which she points towards the floor, and while she turns the top of it some green dots jump around the floor in different patterns (Appendix, pp. 127-128) (see picture 35).



Picture 35: Laser pen used to establish relation to the child.

The remedies used to establish relations and catch the child's attention varies according to the age of the child and it does not always have to be an object. The other paediatric pain nurse explained how she always wears red lipstick and lots of make up to catch the attention of the youngest children, when she bends over them and talk to them. This leads us to the next method used to establish relations, which is to talk to the child and indirectly to the parents as well.

“Hey superman! You look strong”

In many situations we have observed how the doctor talked a lot to the child during the examination: *“You are certainly a true gentleman! A happy and healthy little boy”* (Appendix, p. 39) one doctor said to 2-month-old Oliver while she patted his hand and made sounds with her mouth. A nurse at a MBW examination told 4-month-old Simon

about his condition: *"It looks very fine! You have a lot of oxygen in your blood"* (Appendix, p.29). One of the paediatric pain nurses told us that talking to the child can be an effective tool to calm down the child, but also the parents. She explained, how she often talks or prattles with the child, but the things she says are primarily directed at the parents in order to calm them down. She gave us a few examples of things she says to the child: *"You are certainly a beautiful and lovely baby"*, *"what a lovely mom you have"* or *"what a wonderful child you are"* (Appendix, p. 125). The nurse experiences that talking in this indirect way to the mother has a positive effect and makes the mother calm down. She said: *"The stuff I am saying is about making the mother realise that she is a good mother, and that the staff and the parents have the same goal and they need each other to reach it"* (Appendix, p. 125). As described previously there is a tight connection between the mood of the parent and the child, so it makes sense that if they succeed in getting the parent to calm down it will affect the child's mood. Besides the nurse's description about this strategy we also observed the effectiveness of the strategy in practice. This is an extract from our field notes from a semi-intensive examination of 10-month-old Jonas:

The nurse sits at a chair in front of the computer, the father stands at the end of the bed, the doctor stands in the middle in front of the bed and at her right side the mother stands. A lot of the information from the doctor is directed to the father with her back turned away from the mother. They talk about how it is generally hard for children in the winter, and that they will probably be better just because the spring is coming. I observe the mother's cheeks turn red and her eyes get wet. It seems like the doctor suddenly sees it too and turns her body more against the mother. The doctor begins to talk and prattle to Jonas again and says 'Wow, you look beautiful. He is prattling as well, that is good. It means he also has a good time'. The boy is playing with some cables from his oxygen breathing apparatus. The mother gets more involved in the conversation now (...) The mothers red colour in the face disappears again and she smiles, while the doctor keep talking to the child (Appendix, p. 49).

In this situation, the mood of the mother shifted from sad to smiling. It is hard to say if the shift was due to being indirectly calmed down through talking to the child or the more direct involvement of the mother, but nevertheless the doctor reacted upon her sadness by starting to talk to the child.

The following dialogue, between the parents of the 4-month-old MBW patient Simon, shows that talking to the child has an indirect effect on the parents:

Mother: *"The best thing is, when we step into the room and they (the staff) are saying 'Hi' and can remember his name. It feels like home, when you are welcomed like that"*

Father: *"Yes, they are saying 'Hi little Simon, look at you, you have grown'"*

Mother: *"Yes, and even though it is not the staff we have an appointment with, they come and say hi."*

Father: *"They are good at making it cosy even though it is not always really nice to be here."*

Mother: *"Yes, and I also think he likes seeing the same faces each time."*

Father: *"When he sees [nurse name] and [doctor name], he smiles. It is like he recognises them"* (Appendix, p. 71-72).

In this case the mother and father associated the staff talking to their child with a comfortable feeling. Furthermore they expressed how it seems like their boy associates it with joy.

To sum up the staff has a MoC relating to establishing relationships to both the child and the parents. They are trying to achieve this by using different interessement devices to catch the attention of the child or by talking directly to the child and indirectly to the parents and thereby calming down both of them. The parents do also have a MoC about establishing a good relationship between their child, themselves and the staff. Lastly the child has a MoC about being seen and talked to.

Stimulation

Stimulation is an important part of children's development. It is through the senses the youngest children discover the world and learn how to be in it. One of the ways young children can be stimulated is through play, but what is play for them? According to a researcher in play Jørn Martin Steenhold, very small children do not play, but they work hard to explore the world and therefore play for them is closely connected to stimulation of the senses (Steenhold, 1999). The



Picture 36: Stimulation as distraction.

beginning of a child's life is about exploring one thing at a time. It can be overwhelming for the child if it is exposed to too much sensory stimulation at a time. The main activity for the youngest children is to stare at things. Later on the child begins to grab, throw and shake things and move them from one hand to the other. After three months the child begins to play more through tumbling. In all of these playing activities the senses are stimulated. On this basis we will argue that play and stimulation are two inseparable terms, when dealing with 0-1 year old children. We will use stimulation as a general term covering both terms. For children stimulation is a central MoC that is necessary for them to learn how to live in this world. During our fieldwork at the hospital, we have observed how stimulation of the child also can be used to achieve different purposes in relation to the other actors' MoCs.

Stimulation as distraction

Distraction is a well-known strategy to apply to children, when they are going through procedures at the hospital, but the strategy can cover different purposes.

We have observed situations where the staff used stimulating activities to distract the child with the purpose of getting easier access to examine the child and complete the procedure faster. In the following situation the doctor used an inflated rubber glove to distract 11-month-old Hubert when she tried to weigh him:

Already when the mother tried to place him at the scale, his legs were crawling up in the air just like a cartoon character. He did not want to sit in the bowl that was part of the scale. The boy gets sad and keeps his arms around his mother's neck (...) The doctor tries to remove the boy's arms, so he can sit by himself at the scale for a moment. The doctor looks around and spots a blue rubber glove placed at the wall on her right side. She catches one of them and begins to inflate it. The boy gets distracted and reaches out for the inflated rubber glove, which the doctor has tied a knot on. The doctor gives him the glove. The doctor walks around the mother (...) and is now able to read the weight of the little boy at the scale (Appendix, p. 46) (see picture 36)

In this situation the doctor used the rubber glove as a medium to stimulate and thereby distract the child, so she could weigh the child. Later in the examination the doctor had to talk to the mother, but Hubert kept searching for his mother's attention, which disturbed the conversation between the doctor and the mother. The situation is described in this extract from our field notes:

The boy cannot sit still for five minutes. The doctor is looking around in the room and takes a little plastic man out of the pink dollhouse (see picture 37), which is the only toy in the room, besides a Barbie book laying at the table. The little boy gladly grabs the plastic man and puts it in his mouth. The mother and the doctor can now peacefully speak to each other, while the boy investigates the plastic man and glances at us (Appendix, p. 47).



Picture 37: Dollhouse in the examination room.

In this situation the doctor used the plastic man to distract the child to be able to talk to the mother without disturbance. In this way the staff has a MoC about distracting the child as a medium to easier examination.

Distraction can also be used with the purpose of giving the child a better experience of the examination. The parents of 4-month-old Simon told us about how a hospital clown made the experience easier for their child last time he should have drawn a blood sample:

Mother: *“The hospital clown, who played guitar while a blood sample was drawn from him, that was nice! (...) He likes music”*. The father added: *“The last time a blood sample was drawn from him, he really didn’t find it funny. This time it was good that the clown was there. He was blowing soap bubbles, it was really nice”* (Appendix, pp. 72-73). The parents describe how the clown in their eyes had a positive effect on the child. They have a MoC about giving their child a good experience, which stimulation can be a medium to reach. The clown used soap bubbles and music to stimulate the child and thereby distracted him during the blood sample procedure. It can be discussed whether the clown distracted the child with the aim of creating a better experience for the child or with the aim of making the blood sample procedure easier for the staff. Probably the answer would be a combination of both, which lead us to the following conclusion: distraction through stimulation can be useful for the child, the parents and the staff during an examination and thereby distraction through stimulation can be a medium to accommodate several of the actors’ MoCs.

Age-specific stimulation

The type of stimulation can vary a lot depending on the age of the child. When we asked the mother of 13-month-old Ida, how she handle situations when her daughter gets sad or scared or something is hurting, she answered:

“Either I take her up or otherwise she gets her dummy or some kind of toy, and then everything is good again (...) Last time she was in that major examination room and there was no toy at all. So I had to go out and get that box with toys, which you are not allowed to take into the examination rooms, but I had to, so she had something to play with. Otherwise there was just this room with tubes at the wall and that was it (...) There was nothing in there. This time she went to the dollhouse and played with that” (Appendix, pp. 86-89).

This mother explained how she missed some toy for her child to play with. In this case it is a 13-month-old girl. In the aforementioned situation, it is an 11-month-old boy who gets stimulated/distracted by toys from the dollhouse. We have found that this need for toys not is present in the same way for the younger children. The following quote is from the mother of 4-month-old Simon. She was asked if they used anything to distract him, when he was going through unpleasant procedures: *“We have not done that yet, but it can be relevant with some toys, when he gets a bit older, I could imagine”*. The father added: *“Today we are just talking to him, making funny faces or silly sounds or stuff like that”* (Appendix, p.72).

There is clearly a difference between the types of stimulation the parents of the 4-month-old child uses to calm down the child compared to the parents of the 11-13 month old children. One of the differences is that the older children are more likely to be stimulated by objects, where the stimulation of the younger ones is more focused on sounds, colours or facial expressions. In the interview with the two nurses from the semi-intensive unit, one of them expressed how she missed some different age-specific toys in the room: *“It would be nice with some other types of toys, so you got some toys that matched the child’s age. The dollhouse there, it doesn’t match a child under a year old. That is more stuff like, you know, rattles or something like that. That is really good, because it distracts with sounds and colours, right”* (Appendix, p. 107).

According to this nurse toys are also relevant for the youngest children, but just not a dollhouse. The toy for the youngest should be more stimulating by making sound

or having colours. Furthermore she explained how these kinds of tools are good at distracting, which again underline the staff's MoC about distracting the child.

We can conclude that children have a MoC about being stimulated. The staff has a MoC about distracting the child as a medium to easier examination and stimulation can be a way to achieve this. The parents have a MoC related to giving their children a good experience of the examination, which stimulation can support. Both the parents and the staff point to the importance of using age-specific tools to stimulate the children.

A calm atmosphere

Going to the hospital can be a chaotic and uncertain experience for parents and their children. To find the right ward, be there in time and be installed in a waiting room with the uncertainty of how long time you will wait for the doctor and a child that is isolated from its usual surroundings and still needs food, sleep and stimulation. It is exactly this chaotic feeling many of the families want to avoid. During our



Picture 38: A calm atmosphere. Take the time needed.

fieldwork both parents and the staff have emphasized the importance of creating a calm atmosphere to get a good experience of the treatment.

Do not stress - take the time needed

One of the things the parents associate with a calm atmosphere is that the staff is patient and takes time to them and their child. The mother of Ida who is a 13-month-old MBW patient, described a situation, which she found calming:

"Today a doctor came into the room. My daughter sat at a chair eating her biscuit, and he sat down waited for her to finish her biscuit and gave her a glass of water to down the biscuit, so she did not had to sleep with a biscuit in her mouth (...) then he gave her the sedation and that was it and he left the room again. It was really nice." (see picture 38)

When we asked if she thought it affected her child as well, she answered:

"I can also tell that it affects her because we have also seen some (doctors) where it is just in and out. Those who take their time and talk to her and look at her and take time and

sort of try to catch her attention, even though she doesn't really want to, I think it is really nice when they do that" The grandfather commented *"Taking time and having slow movements is the most important"* (Appendix, pp. 88-89). Even though the mother answered from her own point of view instead of answering whether it affected her daughter, it is clear that to her it is important that the staff takes time to the child. When we asked Simons family about their experience of the MBW, they also pointed to a positive experience of a calm atmosphere: *"Well it was rather quiet and the atmosphere was good in the way that they just did it (the examination) slowly and quietly, when it was appropriate. That was nice"* (Appendix, p. 67). Both of these examples illustrate that the parents have a MoC concerning the staff taking time for their children.

The neonatal nurse also found it important to slow down and thereby contribute to create a calm atmosphere in order to give the children a good experience:

"Just to do things in a slow pace, so the child is able to keep up with what is going on, have an enormous importance for how the child is experiencing this. It is all about making a calm atmosphere before something unpleasant happens. If you are going to be stuck with a needle, then you have to sit at your parent's lab (...) When you are going to handle a child, you should do it in a slow pace and try to avoid disturbing them all the time" (Appendix, p. 99-100).

The tempo is central for both the parents and the nurse. Therefore the staff shares the parent's MoC of making time for the child. The slow pace is not too unfamiliar for us. It is a central part of the principles from multisensory environments and also something we encountered in the Snoezel house, we visited. Here is an extract from our field notes:

The pace is slow. Everybody is moving slowly. Much slower than you see out in the streets. The babies are lying at the waterbed and looks curiously around in the room. The instructor tells us that the first time the babies entered the room they needed some time to get used to being in the room, but she could definitely see a difference in the way they reacted today. The babies were much more calm in the room today than they were the first time (Appendix, p. 26).

Information creates calmness

Another way to create a calm atmosphere relates to one of the themes, we will describe later on, namely information and involvement. Again it is both the parents and the staff

arguing that involving the parents and giving them updates regularly can help making the atmosphere calm. In an interview Simon's father told us how he acts to make Simon feel safe:

"Well we can not really do anything to avoid the things that really hurts him, because it is going to hurt no matter what. But when he is going to have done a suction procedure or similar semi unpleasant procedures, then we just have to stay calm and think 'we have to overcome this, and it only takes a couple of seconds, and then it is done' and then he cries a bit after and that is just the way it is. I just think that the tactic is, that we get to know what is going to happen and what is necessary and then stay calm" (Appendix, p. 70).

The father pointed to the importance of him staying calm, when the procedure is carried out. And in order to do this he needs to know what is happening. One of the paediatric pain nurses also highlighted the interrelation between information and a calm atmosphere:

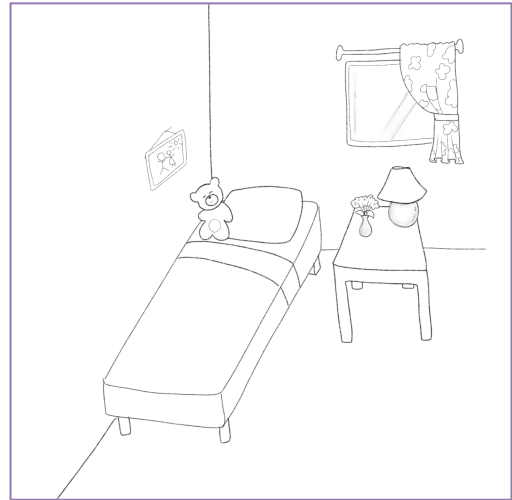
The pain nurse explains how it is important to create a good room for the parents. Not only the physical room, she explains, but also the intimate and small room that occurs between 2 or 3 people. She is putting her arms into a circle in front of her; 'like this!' she says. 'Then the other things don't matter, if we just creates this good room between us'. The parents have to be informed and feel shielded in this little room, which the staff creates for them. The nurse explains that this small, quiet room is created through information and the feeling of safety (Appendix, p. 125).

The nurse acknowledged that the staff needs to inform the parents in order to make them feel informed and safe. In this way the staff and the parents share a MoC about getting information in order to promote a calm atmosphere. We will get back to this MoC later in the analysis, when we discuss information and involvement as an isolated theme.

Both the parents and the staff agree on the importance of creating a calm atmosphere, which benefits both the parents and the child. One of the MoCs they share is on making time for the child and not to stress through the consultation. Another MoC is related to giving the parents information, which makes them relax and creates a calm atmosphere.

A homely atmosphere

“The most important thing for me is that the environment is homely, bright and not too hospital-like” (Appendix, p. 43). The quote is from the mother of the 11-month-old twins August and Adam. The mother told us, how her children in the past week had been to several consultations first at a chiropractor, then a prosthetics and then at the hospital: *“In all three situations, when we enter a room that seems clinical with white walls and white coats, both children but especially one of them freak out and*



Picture 39: A homely atmosphere.

start crying regardless of the procedure they are going through” (Appendix, p. 43). This mother saw a clear correlation between how her children experience the surroundings and their mood. Another mother pointed to a similar correlation: *“At the very first step into the room and the sight of someone in white coats, she gets extremely mad”* (Appendix, p. 87). Her daughter is the 13-month-old Ida. The age of the child does definitely play a role in this case. It is questionable whether a two month old child would have the capability of recognizing a white coat and react upon it, just as these older children did. In addition it can be discussed whether it is the specific white coat, the atmosphere, the white walls or maybe the mother’s discomfort that makes the children react in the two aforementioned cases. No matter what it is interesting that both mothers in the two cases point to the white coat as a thing their children react upon. Another interpretation could be that the mothers are using the white coat more as a symbol of a clinical environment.

All things considered the mothers clearly have a MoC about the current clinical physical frames and the white coats. They share this MoC with some of the staff. A nurse from semi-intensive said: *“Look at these waiting rooms at Rigshospitalet (...) it is terrible (...) The rooms have these scary walls and then suddenly some anonymous people in white coats enter the room and stick things into your body (...) And white clothes is just so scary”* (Appendix, p. 109-112). This quote illustrates how the staff also associates the white coats with scariness and anonymity. The same nurse told us about her experience at a

hospital in England: *"I was in Great Ormond Street in England to hand over a child, and at this place the staff did not wear white coats (...) Here they were wearing blue and bordeaux coloured clothes. It was just much less scary! (...) The mother actually noted it as well, it was just much more cosy to be there"* (Appendix, p. 13). Again the colour of the coat plays a central role.

The mother of August and Adam was convinced that her children would benefit from a more homely atmosphere. But what does a homely atmosphere consist of? When we asked her, she pointed to paintings at the walls, more colours and just avoiding a clinical look. One of the nurses from semi-intensive also mentioned the homely atmosphere, when we talked about how we could improve room 4:

"Well this room should preferably be like entering their own living room (...) Many parents are saying 'Oh if it just could be like something we already know'. The children we treat, they are familiar faces and all of them have been hospitalised before, so they are used to this environment, but on the other side it would be more cosy, if we could make it more like the child's own living room or home. For example, I know we are not allowed to do it, but some sort of flowers that could do something with the room. Even, if it is a plastic flower. It does not matter. It just creates a completely different environment" (Appendix, p. 110).

According to this nurse flowers could be one element to support a more homely atmosphere. Based on the quotes in this paragraph we can argue that both the parents and the staff have a MoC about the current clinical environment and a MoC about getting a more homely atmosphere. We will argue that these two MoCs are closely linked. In several at the examples the clinical environment and the homely atmosphere have been described as two opposites. A less clinical environment will give rise to a more homely atmosphere.

Informing and involving parents

Being informed about what is going to happen is a MoC to the parents. Not knowing what you are supposed to do or what will happen to your child causes anxiety to the parents. In the following situation we were at the first MBW examination of Albert who is 16 months old and accompanied by his father:



Picture 40: Informing and involving parents.

The father neither received any information on the examination when he entered the room. He was simply placed in the chair right away and then they started. The human physiologist had told me that a doctor called the parents a couple of days before the examination and told them about the examination. But I still think it seems a little rushed and weird not to give the father just a little information on what is about to happen. I think to myself that the lack of information to the father and the confused situation might have rubbed off on the little boy. At any rate the father couldn't tell the boy what was to happen. It wasn't until the heart rate monitor was put on, that the father was told that it was a heart rate monitor and that he was just supposed to make sure it didn't come off. (...) What happened from this moment on I believe only the human physiologist, the PhD and the master student knew. The child was breathing through the mask and the human physiologist saw something on the computer. The PhD's communication with the human physiologist was limited because he was wearing a mask and furthermore had to whisper. The human physiologist and the master student whispered to each other as well, as their shifty eyes went from the computer screen to the boy and then to the PhD. I have rarely tried knowing so little about what was happening and whether things were processing as planned. I was observing the father. His widely dilated eyes shifted seekingly from staff to staff. It was obvious that he was looking for some sort of answer or just some sort of indication, letting him know if everything was all right, but the staff were too busy conducting the test (Appendix, pp. 7-9).

This situation continued for half an hour and during this time the father's eyes kept shifting around in the room, looking anxious. After the examination we talked to him and he told that he was a little confused about the results and whether the staff got

anything out of the whole examination. The entire atmosphere at this examination was very intense because the staff was so concentrated on conducting the test and, to us, also intense because of the fathers agonised face. Being anxious while your little child is sedated and examined is never a good experience. But comparing this examination, with its lack of information or any communication with the father at all, to the next situation, makes a clear indication that being informed can ease the situation. In the following piece from our field notes we were at a MBW consultation with 4-month-old Simon and his parents:

He is asleep now, so we tiptoe into the room. There is only one extra chair so I go stand in the end of the room where the nurses are. In this way I stand opposite the side of the bed where the mother is sitting, which allows me to see her and the child's face. There is an entirely different atmosphere than the last time we observed an MBW examination. Even though it is still intense you can tell that the parents are more relaxed. The mother is sitting in a chair close to the boy and the father is sitting in a chair up against the wall by the foot of the bed. The father is mainly scrolling on his phone, while the mother is watching the boy and caressing him a bit. They are both sipping on their to-go coffees (...) The only thing to really look at in the room is the little screen with some large numbers, showing the boys' blood pressure (...) The dad looks up at the screens once in a while. The mother looks at it a little more often. The two nurses are whispering quite a bit to each other (...) The mother doesn't seem worried about their whispering. One of the nurses leans over and whispers something to the mother and they laugh under their breath" (Appendix, pp. 30-31).

This was a completely different experience, with the parents being much more relaxed. Even though the conditions were the same, with whispering and a sedated child. But at this examination we saw the parents smiling and laughing from what the staff told them. When we asked the parents how they experienced the examination, the father replied: *"We had tried it before so we weren't anxious about it. We were anxious the first time because nobody knew what was going to happen, because it was sort of a learning situation to the others in the outpatient department as well right. So... today felt quite nice and easy"* (Appendix, p. 67)

When asking how they experienced the first time they were at the MBW consultation the mother answered:

“Both today and last time they were really good at telling us what they are doing. Like why the machine didn’t work for a long time and such things you know? (...) They sort of whispered what is happening along the way. So you don’t just sit there and think ‘is he breathing or what is going on? [laughing] or if they are holding his nose!” (Appendix, p. 69).

In this situation the parents were very relaxed and able to laugh about the situation. But as the mother stated; if she had not been informed along the way, she might have been thinking more about, whether he was breathing or what they were doing to her child.

When we asked the mother of Ida, another MBW patient, how she experienced the examination, she highlighted the lack of information: *“They were very kind and welcoming. I didn’t receive a lot of information at the beginning, but apart from that, I got the rest today”*. We asked her what she meant by not receiving information, to which she replied: *“They had told me over the phone that they would like to do this examination. And when you are just a normal person you don’t understand their physician language. So I believe it was a busy day, which means I got it on ‘physician’ instead of Danish.”* (Appendix, p. 81)

When asking the mother how she had experienced the examination, the first thing she thought of, was the lack of understandable information. This told us that information was a central need for this mother. She believed that she could have been better prepared for what she was about to be a part of.

Asking and reminding parents how they take their coffee

Feeling informed and involved is not only through one-way communication in which the staff let the parents know about the process. It is also about asking questions and listening to the parents, letting them play an active role and making use of their knowledge about their child. Speaking about how to best distract or ease the child the paediatric pain nurse told us about the importance of the relation and of helping the parents remember what they do at home and who they really are. Many parents have just gone through a shattering process suddenly having an ill child. The paediatric pain nurse put it elegantly in an example of coffee:

“We often ask them what they usually do at home. In this way we involve them as parents, in order to not simply reduce them to someone, who are coming along to the

hospital, but instead giving them an active role and to make them feel like their child's parents. But we have to remember that some parents are recovering themselves. I remember a parent once telling me 'I don't even know if I take milk in my coffee'. So we need to remember that it is also our job to help them remember whether they take milk in their coffee" (Appendix, pp. 126-127).

The nurse clarified the importance of letting the parent not just be a person, who stands in the room fulfilling the task of taking the child back and forth to the hospital, but be an involved person. As we also have seen during the different examinations, children react differently to different things. So by asking the parents what normally works at home is doing the children a favour, but also a strategy to involve parents. And to those parents who have almost forgotten who they are, it is a strategy to start reminding them this. In this way information also becomes a MoC for the staff. From this paragraph we can conclude that information is a central MoC for both the parents and the staff.

Accessibility of equipment

In all of the examinations we have observed the staff use different kinds of tools to examine the child. Among these are stethoscopes, scales, oxygen breathing apparatuses, masks, medicine, computers etc. Some of the equipment has been brought into the room by the staff, while others are installed permanently in the room. We have identified a MoC for the staff about having easy access to the equipment. When interviewing her a nurse from semi-intensive explained her need for having the equipment within range:

"It would be nice with some kind of locker in here, where you could store the most important stuff, such as spirit, needles, patches and stuff like that. At half of the examinations, I am using one third of the time on running around to find the stuff needed, and it is absolutely not smart. We know, what we need for these kids, but we just can find it here, and then we have to run over to our own department. All that stuff should of cause be in a locker, so you could find it" (Appendix, p. 107).

In this quote the nurse used the waste of time as an argument for having the equipment accessible in the room. In another example a nurse from semi-intensive pointed to the child's security, as an argument for moving the equipment:

"We have a respiratory function, which can imply performing suction or tube shift (...) That suction thing up there [point at the wall with equipment], it has to stay at the

floor, because if we are in an unfortunate situation, it all will drop down over the child, who is lying in the bed right beneath. It is not permitted to be placed there” (Appendix, p. 105-106).

When observing the nurses use the equipment-wall including the oxygen breathing apparatus they had difficulties reaching the apparatuses, because the bed was placed just in front of it (see picture 41). During a regular examination, we observed a similar need for accessibility of equipment. The situation is described previously in the paragraph about stimulation as distraction, but the same situation illustrates the need for easy access to the material used to distract. Here is an extract from our field notes:



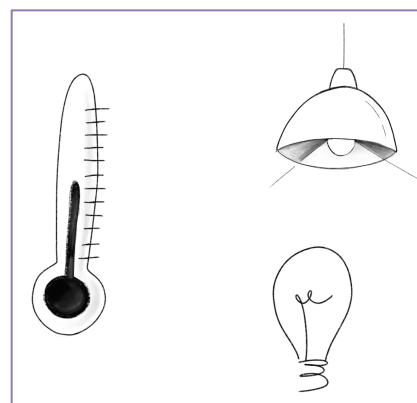
Picture 41: Examination bed and medical equipment.

Already when the mother tried to place him at the scale, his legs were crawling up in the air just like a cartoon character. He did not want to sit in the bowl that was part of the scale. The boy gets sad and keeps his arms around his mother's neck (...) The doctor tries to remove the boy's arms, so he can sit by himself at the scale for a moment. The doctor looks around and spots a blue rubber glove placed at the wall on her right side. She catches one of them and begins to inflate it. The boy gets distracted and reaches out for the inflated rubber glove, which the doctor has tied a knot on. The doctor gives him the glove. The doctor walks around the mother (...) and is now able to read the weight of the little boy at the scale (Appendix, p. 46).

This situation is similar to a previously described situation, where the doctor used her pen and the stethoscope to establish relation to the child and distract him. In both of these situations the doctor used remedies that are just within a short range. This shows us that the staff has a MoC about having easy access to the equipment both in relation to the medical tools used to examine the child, but also in relation to tools that can function as playing elements to distract the child.

Temperature and Lighting

Physical surroundings affect our experiences. Even though it is not always something we realise or think about, temperature, lighting, sounds and general interior interfere with our physical and mental state. Two conditions relating to the physical surroundings have throughout our fieldwork been central to the actors involved. These are temperature and lighting. In the following we will present some of the MoCs related to these two conditions.



Picture 42: Temperature and Lighting.

Temperature

In an interview with two nurses from semi-intensive, temperature was the very first thing they started to talk about, almost before we got to ask them a question:

“First of all it is always chilly and we need to take of the children’s clothes when we weigh them and do all kinds of things or give them a vaccine or something like that (...) It would be nice with a suitable temperature in here so the child wouldn’t go berserk when you move them around in here. It is simply too cold when you have to take of their shirts” (Appendix, p. 117-118).

We talked about the temperature in the room, which the two nurses thought was very problematic, both to the practicalities of their work, but also in regards to the wellbeing of the child. They told that the radiators in the room either make it burning hot or rather cold. They talked about the possibilities of a heated mattress:

Nurse 2: *“It is an actual problem. When you take the clothes off babies, or in general if they come here and it is cold (outside), then when you want to draw a blood sample you have to inject them in the finger. Then we take a rubber glove and fill it with warm water and ask the parents hold it onto their hand for a while before blood circulation starts (...) They get so cold that if you sticks them and their hand hasn’t been warmed up first, then nothing comes out and you have to do it again. It is really awful.”*

Nurse 1: *“Really embarrassing”* (Appendix, p. 111).

The nurses described both how the children could be cold from the weather outside, but also from having their clothes taken off in an examination room that is cold. This is a MoC to them because it complicates their work with drawing blood samples,

but they also think it is embarrassing and awful, which seems to be in relation to the children and their parents. They are aware that this is making the experience worse than it has to be, which is not a problem to their specific work tasks, but conflicts with their professional pride.

They continued by telling that in a lot of the consultations many different professionals, such as dieticians and physiotherapists come by to see the child, which makes it even more important to be able to keep the child warm without putting the clothes back on. It is not just the staff, which has a MoC about regulation of the temperature. At a couple of examinations we have experienced parents asking the staff if they could put the clothes back on their child or if they could put just some of it on again. We had this experience with a family visiting the outpatient department for a check up on their 3-month-old girl Erika. The situation is described in our field notes:

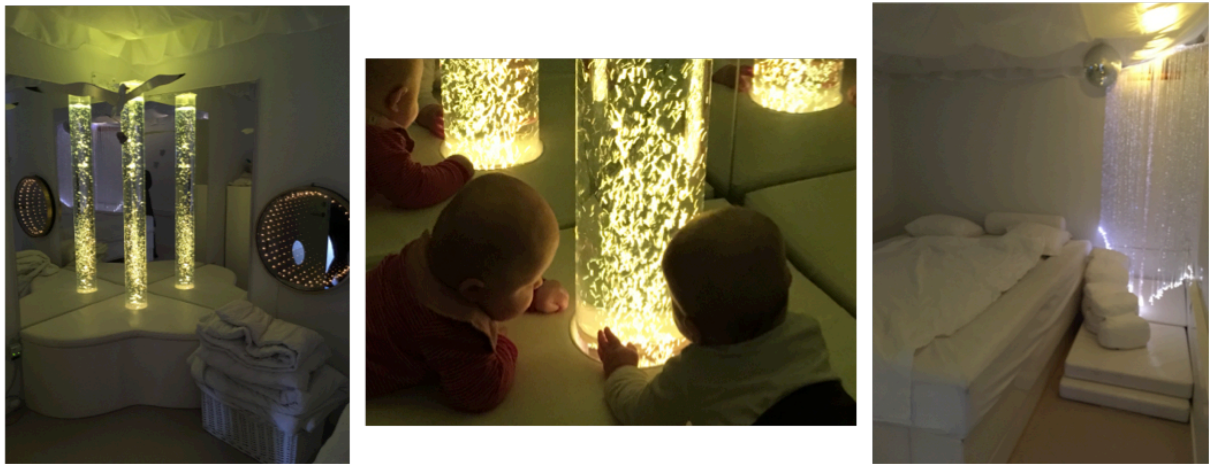
The nurse is preparing to weigh and measure the girl. The girl is lying on the examination bed, while the mother takes off the girl's clothes. "Oh, it is a bit chilly in here", the mother and nurse agree. And they are right it is a bit cold. (...) The mother puts a body stocking on the girl and sits down with the girl on her lap. After a bit she takes the scarf she has around her neck and wraps around the girl" (Appendix, p. 34).

It was too cold for the girl to be just in a body stocking and the physical parts of the examination were coming in stages, so she got cold in between. At the MBW consultations on the other hand it was very warm. We both noticed it while observing and also had it reported from parents. And in these situations the child was wearing a duvet, so this is the complete opposite situation. The parents, the staff and the children are sharing the MoC about regulation of the temperature.

Lighting

Lighting is a MoC to the staff, parents and children as well. When visiting the Snoezel houses, we were attending a 'stimulastic' class for young children and their mothers. We were sitting on the floor, talking to two mothers while we were waiting for the third and last mother to arrive. One of the mothers told us about her birth, which had been in a special sensory room, with dimmed lights and calm music, creating a pleasant atmosphere. She had been asked beforehand whether she wanted the lights dimmed, and she had chosen this option because she believed it would be really unpleasant for the child to be born into glaring light. And furthermore, she added that she had

appreciated it a lot herself as well, especially for the couple of hours after giving birth. The other mother present at the room told us that she had been given the option to have the lights turned on or off, and she had chosen to have them all turned off. The experiences of these two mothers gives rise to questioning whether lighting only is a MoC to the parents? Due to the child-parent interrelation described earlier, it is difficult to separate the MoCs of the child and their parents. Our experience points us in the direction that lighting affects the children as well. Being with the 'stimulastic' class we went with the three mothers, their babies and the instructor into 'the white room', which is a room only lighted very softly with white fabric covering the lamps in the ceiling and then a fibre optic and lighted bubble pipes (see picture 43).



Picture 43: 'The white room' in a Snoezel house.

In here the babies were lying, absorbed by looking at the lights. The atmosphere was calm and relaxed. Afterwards, when trying to lie in the room by ourselves we both felt tranquillity spread in our bodies (see picture 44). In this we experienced how lighting had an effect on both the babies and ourselves, indicating that it has an effect on babies, but also at adults.



Picture 44: Exploring the white room ourselves.

But how is light a MoC when taken into the context of the hospital, does it also play a role in the examinations? As described earlier, we have attended three different kinds of examinations; regular, semi-intensive and MBW. At the regular and semi-intensive examinations the child should be awake but feel as calm and comfortable as possible,

but still with light enough for the staff to see clearly. Two nurses from semi-intensive pointed out how they do not think the lighting lives up to this at the current state. They told that they think the lighting is terrible and we asked what they meant by terrible; if it needed to be dimmed? They answered:

"Yeah or some top lighting, so you would have slant light from the side. In order to make it lighted enough but without having it (the light) right into your face. Sometimes they start to blink so much that you almost get cramps from being in here." Her colleague continues: *"In our own department (semi-intensive inpatient department) some of the rooms have a button which you can use to turn the power up or down. It actually works alright (...) But it is still having a strip light right into your face. No matter if you dim it or not it is not very nice to lie down and look into"* (Appendix, p. 118)

They connected the blinking eyes of the children with discomfort, which has made the lighting a MoC to them. They let us know both how unpleasant they believe it is to the child, but also how they need light to see what they are doing. On the other hand they had an experience with a different room at the hospital, which was newly redesigned. They saw this place as an example of how light could be used to change the setting and be help instead of a problem: *"It is just really nice. Its like; 'Ursula is coming and then we can just make the light red and warm and soft, because she is always scared'. There is just something about lighting and how you feel"* (Appendix, p. 108) In this quote the nurse connects red, warm and soft light with something that make the child feel better and less scared. They both had this view of the glare light being something creating discomfort and the ability to change the light into something warmer and softer a way of making the child feel better.

In the third kind of examination, the MBW, the child is going to fall asleep. In these examinations the lights are turned off, either before the child enters or when it has been sedated and is ready to sleep. In our field notes from the first MBW we wrote: *The human physiologist turned off the all the light in the room. It needs to be dark when the child is put to sleep (...) The rest of the preparation is done in darkness* (Appendix, p. 5). In this kind of examination the light might seem unimportant, because it is just to be turned off and that is all. But first of all there is a conflict about that the child needs a dark room to fall asleep in, while the doctors and nurses need light to prepare the examination. At this examination the doctor held the medicine and syringe all the way

up to the window, in order to see if he was dosing right, which is an unstable solution, since it was clearly difficult for him to see what he was doing.

Lighting is therefore a MoC to children, parents and staff. Sometimes a lot of light is required, sometimes darkness is required, and therefore the solution should be flexible. Apart from brightness, light can also be part of creating comfort or discomfort for both children and adults.

Discussion

We have now uncovered the different actor's MoCs and defined different themes. As it appears from the previous sections these MoCs are highly intertwined and so are the themes. We have seen how many of the MoCs are shared between the different actors. An example is physical and relational proximity between the children and their parents, which is a MoC shared by all three actors the children, the parents and the staff. Yet there are still different motives behind this MoC among the actors. While the children and their parents in some way keep each other calm by being in physical proximity, the staff uses this calm atmosphere to easier completing the examination. In that way the themes get intertwined as well, like in this example where the feeling of proximity leads to a calm atmosphere. Another example is in relation to stimulation, which can be used as a method to create a good relationship between child and staff. Therefore we will argue that these themes cannot be seen as isolated entities, but more like a network that is intertwined and linked together.

Defining requirements and criteria

On the basis of the revealed MoCs and themes we have defined some requirements and criteria, which we have used to navigate the later design process. The requirements and criteria are described in the following figure 5:

Themes	Requirements	Criteria
Proximity and Safety	<ul style="list-style-type: none"> Parents should have the opportunity to access the child and the other way around. Parents and children should have the opportunity to see each other. Parents and children should have the opportunity to hear each other. Parents and children should have the opportunity to reach each other. 	<ul style="list-style-type: none"> It would be nice to make it possible for parents to shield the child from impressions. It would be nice to make it possible for mothers to breastfeed.
Establishing relations	<ul style="list-style-type: none"> Interessement devices should be accessible in the examination room. The staff should be able to establish contact to the child, both to establish a relation and to be able to treat the child. 	
Stimulation	<ul style="list-style-type: none"> There should be materialities targeting different age groups. Materialities should be accessible in the examination room. 	
A calm atmosphere	<ul style="list-style-type: none"> The staff should make time for the child. The staff should inform the parents about the procedure of the examination. 	<ul style="list-style-type: none"> It would be nice if the staff moved slowly.
A homely atmosphere	<ul style="list-style-type: none"> The room must not reflect a clinical environment, i.e. it should be colourful. 	<ul style="list-style-type: none"> It would be nice if the room supported a homely atmosphere, e.g. looked like a child's room or a living room.

Informing and involving parents	<ul style="list-style-type: none"> The staff should welcome the parents and tell them what is going to happen and how and what they want the parents to do during the examination. 	<ul style="list-style-type: none"> It would be nice if the staff also focused on the parents during the examination.
Accessibility of equipment	<ul style="list-style-type: none"> Equipment should be accessible in the examination room. Equipment should be placed safely in the room. 	
Temperature and Lighting	<ul style="list-style-type: none"> It should be possible to turn on or turn off the light. It should be possible to regulate the temperature. 	<ul style="list-style-type: none"> It would be nice to be able to adjust the power of the light.
Over all	<ul style="list-style-type: none"> All materials must be able to be washed off or washed with spirits or be single use materials. All materials must be able to be switched on/off. 	<ul style="list-style-type: none"> It would be nice if all materials were mobile and could be moved.

Figure 5: Requirements and criteria.

These requirements and criteria have been used in the process of developing the design game as a medium to create a space for discussing different solutions, which will be described further in the next section. The sub-solutions within each theme in the design game have been developed in an iterative process of brainstorming, researching and analysing our empirical data. This process is described more thoroughly in the research design section, but the requirements and the criteria have throughout this process been a foundation for the assessment of potentials and barriers in relation to the different solutions within each theme. Furthermore these requirements and criteria have been used in the process of choosing the design concept for the room.

Phase 2: Designing with actors - Exploring partial solutions

After having analysed the MoCs of the actors, we are heading towards the second step of the analysis, which is the conceptualising phase. In this phase we are focusing on translating the MoCs into a design game aiming to open up for a space to discuss these MoCs and possible solutions. In this process it became clear for us that some of the themes and the MoCs would be difficult to support within our framework of multisensory environments. An example of this is the theme information and involvement of the parents. To find solutions on how to accommodate the parents need for information requires a project in itself. Furthermore, we have found it difficult to support this theme by the design of a multisensory environment. Still we find it extremely important to highlight the MoCs related to this theme, because we have experienced that if the parents are not informed it is difficult for them to stay calm and be there for their child. Furthermore we have seen how information can help creating a calm atmosphere. In that way information and involvement of the parents becomes a theme that needs to be taken serious in order to make our solution effective in the end, but we do not find this task appropriate for this project. This should be a separate project focusing solely on this. Instead our focus is to design a concept that accommodates the different MoCs within the frames of multisensory environments.

In the following section we will unfold the outcome of our design game. We will go through the different themes of the game and explore which partial solutions the families and staff chose and what their reason and arguments were. The section will mainly be focused on the things they chose and talked most about. If you wish to explore how the remaining parts of the design game took place, extended information can be found in appendix 16-20.

As mentioned previously we played the design game with two sets of parents, one single parent, a nurse and a human physiologist. The specific participants were:

- Nurse from semi-intensive
- Human physiologist from MBW
- Parents of Simon, now 6 months old, MBW patient
- Parents of August and Adam, now 12 months old, regular patients
- Mother of Caroline, 12 months old, semi-intensive patient

Picture 45 illustrates one of the game-boards after an ended playing session. The three concepts made by the participant are visualised by the different coloured circles. Each colour represents a concept.



Picture 45: The design game board with three concepts. The themes from left: Proximity and safety, establishing relations, stimulation, a calm atmosphere, a homely atmosphere, temperature and lighting, accessibility of equipment.

Proximity and Safety

In order to create the feeling of proximity and safety most families and staff chose 'nursing chair' and 'sling'.



Nursing chair

The mother of Caroline started out by choosing a nursing chair with the following argument:

"It is sometimes like 'wuah a bloodsample is to be drawn and how should I hold my child?'. So maybe a good base to sit in (...) It would be nice if it could rock a bit, because it can be soothing sometimes. But on the other hand, it is a little difficult right, because on the other hand if you are to undergo some sort of examination it might not be the best idea

that you sit and rock around (...) then you should be able to lock it. And it should be nice and soft to sit in right? So it doesn't feel like the chair is throwing you off" (Appendix, p. 134).

In this example, the mother thinks the situation is a bit chaotic and therefore she believes that the chair would be a base for her to sit in. Apart from being a base she thinks it should be *"nice and soft"* and it should invite her to sit comfortable with her child. The other two sets of parents also chose the chair. The father of Simon said: *"Even though it says nursing chair (in the game) a chair like this could be nice for a me as a dad as well"* (Appendix, p. 140).

Talking to the staff they also both chose the nursing chair in their first concept. The nurse from semi-intensive said: *"I choose a nursing chair, or somewhere to sit more comfortably than those cold plastic chairs, because we actually have breastfeeding mothers. Or we ask the parents to sit and hold their children while we take bloods samples or do other things. And they sit uncomfortably and we sit uncomfortably"* (Appendix, p. 130). The nurse would like to be able to offer the parents a proper place to sit, which would also allow a better work position for her.

Overall both families and staff believed that the chair would make it possible to sit in different comfortable positions with the child, when procedures are carried out and in general. In addition some said a chair would add atmosphere to the room, which integrates well with the theme 'a homely atmosphere'.

Sling

When two of the mothers were making their own concepts, without their husbands, different thoughts on the theme came up. The mother of Simon said:

"What I like the most is to have him really close to me, so I think I would choose the sling. We often carry him in a carrying sling, so if there were one available it would be nice. Especially if something has hurt really bad it is nice to be able to get him really close" (Appendix, p. 140). The mother of August and Adam described the sling as: *"The highest degree of closeness"* (Appendix, p. 143).

The nurse from semi-intensive looked at the sling and said: *"Working with children laying in slings might be a bit unpractical"* (Appendix, p. 130). To her, the sling was not a possible solution. This relates to the staff's MoC concerning accessibility of equipment and also their ubiquitous strive for making the examination efficient and free

of obstacles. According to the nurse the sling does not integrate well with this. A controversy between the parents' and children's MoC of being in close physical proximity and the staff's MoC concerning making the examination efficient is present.

Establishing relations

Within the theme establishing relations between child and staff, most of the actors chose the solutions 'singing songs', 'glowing stick', 'feather' and 'fibre optic'.



Singing songs

Both the parents of Simon and the parents of August and Adam liked the idea that the staff should sing to their children in order to establish relation. They both had really good experience with doing this at home or in the car. Whereas Caroline's mother said: *"it might be a bit much to ask from the staff"* (Appendix, p. 134). When the nurse from semi-intensive looked at the solution of singing songs, she laughed and said: *"I'm still practising"* (Appendix, p. 130), while the human physiologist said: *"I do not really feel like doing that. It seems a bit like a pedagogue thing I think"* (Appendix, p. 137). In this way there are different opinions about singing songs.

Glowing stick and fibre optic

All of the participants thought that something like the glowing stick or the fibre optic would be good solutions. They believe the two things have many of the same attributes, such as: exciting the child's curiosity, being fun, be something to catch the child's attention, be something to play with, be something they could reach for and hold in their hand and that be colourful and glowing.

When we played the game with the parents of August and Adam they chose 'singing songs' in their first concept, but in the second concept they reached the conclusion that this might work best for themselves and that for the staff a new and different thing as the fibre optic might actually work better:

"It is new and different and they will quickly feel safe because she (the nurse) is showing something fun, which will make them come along, because they will be curious

about it. That is a good way to establish relation. Just like they (their general practitioner) had that magic wand with stars they could turn upside down. It is sort of the same principle as the glowing stick. It is something different they haven't seen before and they will be curious - even though they are a bit scared - but then their curiosity will win" (Appendix, p. 143).

The human physiologist said, that due to the nature of the MBW examination, her way of establishing relation to the child should not be too stimulating in an arousing way. Therefore she chose the glowing stick, but with the criteria that it should not be glowing too brightly.

Stimulation

On stimulation the most chosen solutions were 'swing', 'activity board', 'mobile' and 'ceiling decoration'. A few also spoke of other solutions such as rattles or teething rings, but thought that this was something they would bring from home.



Ceiling decoration and mobile

According to parents and staff the ceiling decoration and the mobile would both be stimulation, calming, enhancing the atmosphere and fun to look at. Furthermore they believed the mobile to be calming, because of its slow movement.

The mother of Caroline chose a mobile and said: *"I am thinking about that mobile because they are lying down so often. Then they have something to look at while lying there"* (Appendix, p. 134).

The human physiologist chose the ceiling decoration and said: *"Then the child will have something to look up at if they wake up or look at until they fall asleep"* (Appendix, p. 137). Just like when she chose the glowing stick to establish relation, she mentioned that the ceiling decoration should not be too bright or arousing. Apart from being calming or fun for the children to look at the mother of August and Adam also believed that the ceiling decoration could do more than that. She said: *"I just think it can create the nicest atmosphere"* (Appendix, p. 143). Both solutions were mentioned as being particularly good for the youngest children in our target group. For the youngest

children though, the mobile would probably be the best solution, since they are not yet capable of seeing very far.

Activity board

The activity board was chosen because the families and staff believed it could be something stimulating and fun to explore. Some of them said it would be useful in the small breaks during the examination. They underpinned that it should have many functions in order for it to catch attention for the longest possible time and that it might have to be mobile, for the sake of the small children or the very ill children, who would not be able to go play with it. They generally believed it to be the best-suited solution for the older part of our target group.

The father of Simon said: *"I am going to go with the activity board, in order to keep the tablet a bit aside. Because the children are so young (...) You can hit it without any trouble. I believe that is better. And then it is more fun to explore instead of just sitting there, hitting some screen"* (Appendix, p. 140).

On choosing the activity board the mother of August and Adam said: *"I think it needs to have some volume, instead of it just being a small thing. I think it would be best if it has volume and that there are many different things to touch. It could be made along the panels, so they could play with it themselves. I think they would actually find that very amusing"* (Appendix, p. 143).

Swing

When seeing the swing the nurse from semi-intensive said full of enthusiasm: *"A swing would be really cool! There are a lot of things, like when you're done with what you're have to do, and then you often need like a place to park them (the children). Actually I think this is a really good idea!"* (Appendix, p. 130). The nurse saw this solution both as a way to stimulate the child and to have a place to sit for the child after being examined. The human physiologist also chose the swing: *"The children I deal with don't need stimulation. I mean they need to calm down. So I would choose the swing because it doesn't stimulate a lot"* (Appendix, p. 137). She believed that the children should not be stimulated in terms of arousal, but rather stimulated to be calm.

One family also believed that this would be a both fun and pleasant way to be stimulated. The father of August and Adam said: *"They like to sit on the swings at the*

playground for some time right? But that might be when they are a bit younger...?”. To which the mother replied: *“No because it is nice. And they really like to lie in them (the swings). And it is relaxing to lie there and be rocked. It makes them relax”* (Appendix, p. 143).

A calm atmosphere

In relation to this theme most of the families and staff chose ‘soothing music’ and ‘light regulation’. Light regulation will be addressed under the theme ‘light and temperature’.



Soothing music

In the design game, soothing music was generally believed to be: calming, creating an atmosphere and something that is good to fall asleep to. Some of the participants underlined the importance of the music not being too loud and not disturbing the dialogue between staff and parents.

The mother of August and Adam chose music in all of her three concepts: *“Probably also because it means so much to me. And I can also see how much music affects them. Also when they are to fall asleep. If they are troubled at night you can put on music or if we are driving home and they are dead tired in the car the music is just good. I think music can do so much”* (Appendix, pp. 143-144). The human physiologist shared the same view: *“I’ve thought about calming music myself. That it might be interesting to try it out to see if it works. Because I don’t know. It works on me!”* (Appendix, p. 137).

A homely atmosphere

The most chosen solutions to this theme were ‘covering equipment’, ‘colour on the walls’ and ‘pictures’.



Covering equipment

On covering equipment the parents of Simon disagreed a bit. The father argued that hospital equipment is going to be part of his son's life, because of his chronic disease and therefore it would be best to teach him that the equipment is harmless. On the contrary the mother said, that she would prefer the covering of equipment to be there: *"I would like it to be there. Primarily for him, but actually I also think it would do something for myself. If it (the equipment) wasn't there, then he wouldn't seem quite so ill"* (Appendix, p. 141).

Both the representatives from the staff thought the equipment affected the families badly. When speaking of the cables above the examination bed one of them said: *"All that spaghetti that hangs above, there are just a thousand cables hanging there right and it just looks awful (...) It just frightens people a lot (...) the children do not realise it, but their parents they, I mean, I myself would be like 'wow!'"* (Appendix, p. 131).

It is important that the covering is a flexible solution, which makes it easy to fold aside.

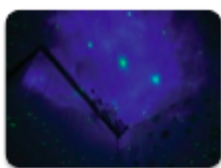
Colour and pictures

Pictures and colours on the wall is something both staff and families really valued. The pictures should be something to look at and create a cosy atmosphere. There were different opinions about colours on the walls, if they should be calm, vivid, warm or patterned, but they agreed that totally white walls were not the right solution.

The mother of Simon said: *"Right now it doesn't matter if it is safari or forest theme as long as it is something with vivid colours"*. To which the father added: *"Yeah that it isn't just a white room because that is what makes it hospital-like right?"* (Appendix, p. 141).

Temperature and Lighting

In this theme 'light effect on wall', 'light regulation', 'open window' and 'temperature regulation' were the most chosen and valued ones.



Light effect on wall

The light effect on a wall was chosen for some of the same reason as 'ceiling decoration'. According to parents and staff the ceiling decoration and lighting effect would be stimulating, calming, enhancing the atmosphere and fun to look at.

The father of August and Adam said following about the light effect: *"It could be something that moved. That might be something that would be calming."* The mother continued: *"That is both calming and also fun because it moves. For a little baby I think we should choose that. It enables you to give the baby the possibility to do something else than just being carried around"* (Appendix, p. 144).

Light regulation

The nurse from semi-intensive picked this for two out of her three concepts and said: *"Light regulation. That is a huge problem. You need to be able to change the tones of the light so it isn't that white-blue light which just seems horrible (...) It should be possible to make it more warm. It is cold and spooky enough here at the hospital"* (Appendix, p. 131). It is not just the power of the light that should be possible to adjust, but also the tone of the colour.

Every single participant in the design game chose this solution. They all believed it must be horrible for the babies to lie down and look up into a bright light and that it bothers them as well. Furthermore the families and staff from the MBW examination believed that the light in the room today is either too dark or too bright and that it should be possible to turn the power slowly up and down.

Open window and temperature regulation

Everyone chose one of these two solutions, in order to create a nice temperature in the room. The nurse from semi-intensive said: *"Temperature regulation is a must! You HAVE to integrate this in your room!"* (Appendix, p. 131). To a lot of the families it was not only important to have the right temperature, but also to get fresh air and daylight. When choosing the open window the parents of Simon said in unison: *"To get real air and real light!"* (Appendix, p. 141). The mother of August and Adam argued that it also allowed her to watch the day going by outside.

Lastly, the window also had another important function according to the nurse from semi-intensive: *"Fresh air is just good. And - I don't know if you have noticed it - but*

the patients smell very different. And if an African family have just been in, who eat spicy food and are sweating from anxiety and then just afterwards comes little Agnes with her mom from Hellerup. Those kinds of things get commented on (...) It should be a human right to be able to open a window” (Appendix, p. 131).

Accessibility of equipment

The solution, which was chosen the most for this theme was ‘on wheels’.



On wheels

For this theme a nurse suggested a small bureau on wheels, which should be packed with equipment in the morning by the person using the room. Then you would have the exact things you needed and there would not be unnecessary things lying around like she had experienced in the rooms with cabinets.

Phase 3: Testing a mock-up room

Now it is time to turn our attention towards the mock-up room. In the following section we will introduce you to the mock-up room and the different solutions, we tested on the basis of the output from the design game. Furthermore we will explore how children, parents and staff interacted in and with our mock-up room, to let you see how the different elements worked.

The mock-up room



Picture 46: The mock-up room seen from the entrance.



Picture 47: The mock-up room seen from the window.



Picture 48: The mock-up room with the light turned off.

Designing the mock-up room

On the basis of the output from the design game we have selected some solutions to test in the mock-up room. The choices of solutions within each theme will be elaborated on in the following.

Proximity and Safety

In this theme, having an instrument or base for being physically close has been a focus for the actors. Since both parents and staff chose the chair, and no staff chose the sling in the design game, we decided on testing a nursing or rocking chair in order to meet the controversy between the mothers' wish for complete nearness in the sling and the staff's wish for being able to access the child easily. After having researched on nursing chairs, we realised how expensive they were, so we went back to the result of our design game to find out the elements a nursing chair should

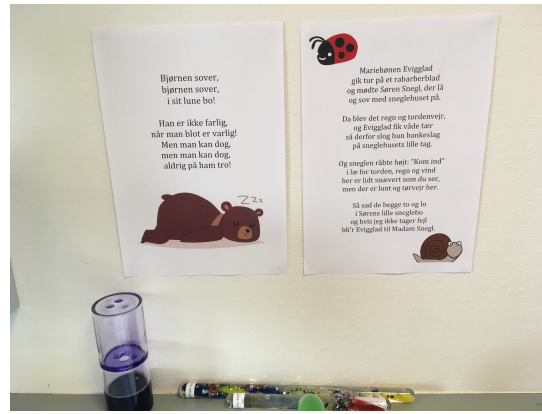


Picture 49: Rocking chair.

consist of. It became clear that the parents wanted it to be comfortable to sit in and that the rocking feature was a central function, because it could help calming the child down. To test these features, we found a rocking chair, which we placed some soft pillows in to make it more comfortable to sit in.

Establishing relations

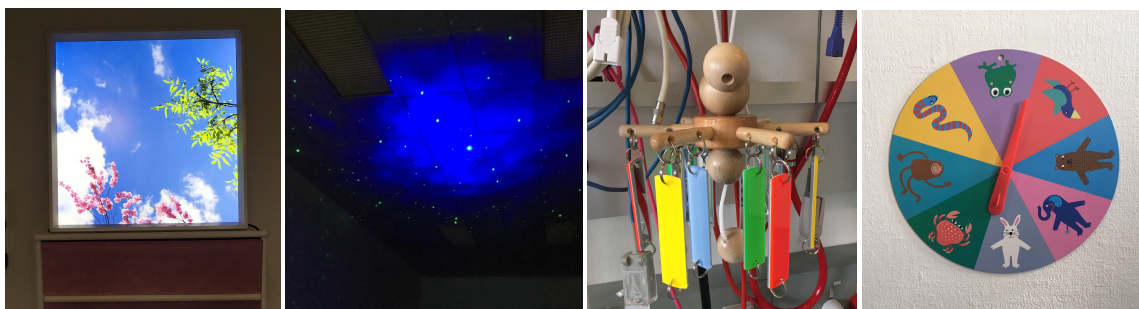
In order to try test different solutions within this theme, we decided to try finding a fibre optic and a glowing stick, which were the most chosen solutions in the design game. As described previously the fibre optic and the glowing stick have many of the same attributes and can work as a third actor to establish relations through. Therefore we chose to test the most accessible solution for us, which were a magic wand that has the same capacities as a glowing stick (see picture 50). Furthermore we decided that it would be interesting to make a small experiment related to the solution 'singing songs'. We hang up two printed children's songs on the wall right next to the bed, to see if any staff - or parents - might take up the invitation (see picture 50).



Picture 50: Magic wand and songs on the wall.

Stimulation

On the basis of the actors' arguments in the design game we chose to test some different solutions within the theme stimulation. The first one was the ceiling decoration, which can be used to stimulate the children looking up at the ceiling. We were able to borrow a lighting decoration looking like a window (see picture 51) to be installed in the ceiling, but it turned out it was not possible to install in our test room. Instead we decided to place the "window" up against the wall, to still test the effect of the light, and got another ceiling decoration, which was a projector to light up the ceiling with stars (see picture 51). Furthermore we chose to test the mobile, which was a popular solution among the actors playing the design game. The mobile was chosen to stimulate the youngest children, who are not capable of seeing the ceiling. We chose the activity board for the elder children in order to meet the requirement of having materialities targeting different age groups.



Picture 51: From left: Luminous window, star ceiling, mobile, activity board.

A calm atmosphere

In this theme there was a clear enthusiasm regarding music, whereas we chose to test this. In our research on music players we found a solution that was easy to use and thereby we could meet the staff's MoC about having easy access to equipment (picture 52). The music plays when the cap is open, like illustrated at the picture, and when you close the cap the music stops. The choice of music was made on the basis of a sound expert, who had tested the calming effect of different music and have found



Picture 52: Music player playing soothing music.

that a specific album of Mozart have an especially calming effect. We turned on the music before the examinations, so it had to be an active choice for the users of the room to turn it off, if they disliked it.

A homely atmosphere

The father of August an Adam had big trouble choosing *one* solution within this theme and said: *"The interplay between all of these things also create the atmosphere"* (Appendix, p. 144). Because of this statement we decided to test a couple of things together. We chose to put different pictures at the wall and covering some of the white elements (e.g. the changing table) in the room with some coloured paper to make the walls more colourful and less clinical. Furthermore we added some flowers, which a few had mentioned would create a more homely atmosphere. We wanted to try covering the equipment, but it conflicted with the staff's need for having easy access to the equipment and due to safety reason, we were not allowed to cover the equipment in the room.



Picture 53: Pictures on the wall, colored changing table and flowers.

Temperature and Lighting

Since there already was a window in the examination room we chose to try using this more actively in our test, by opening it up between the examinations. We could not install light- and temperature regulations and have therefore chosen to test the light effect on the wall (see picture 54), which furthermore became a solution on the decoration of ceiling from the theme 'stimulation'.



Picture 54: Light effect on wall.

Accessibility of equipment

We tried to get a small bureau on wheels to test at the hospital, but did not succeed in finding one. Instead the way we tried to test a solution within this theme was to make sure that all the things, we brought into the room for testing, should be made easily accessible and easy to use.

Test output

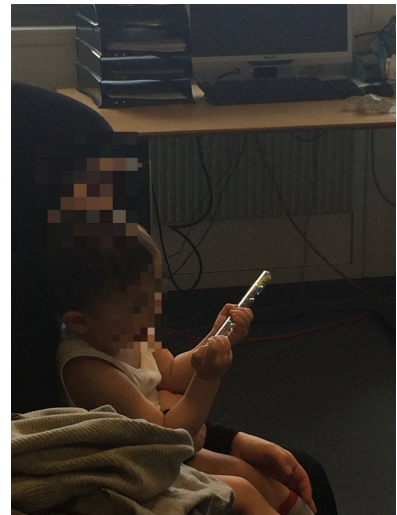
In the following we will analyse the output of the test. As mentioned in a previous section our data is based on observations of examinations in the mock-up room and on-spot interviews with the parents and staff during or after the examination. All of the examinations were part of the daily scheduled program at the hospital and therefore true situations, and not just test-setups.

Magic wand and activity board

The first story we will bring forth from our thick descriptions is about Hassan, who was at a regular examination:

The next family who is being examined in room 4 is 16-month-old Hassan and his mother. At first the Hassan does not even want to go into the room and he wrenches free of his mother and runs a bit away from the door. The mother waves at him and says 'bye-bye'. The nurse looks around in the room and reaches one of the magic wands (...) She holds it out towards the boy and says 'have you seen this nice magic wand, Hassan, isn't it fine? Would you like to have a look at it?' Curiously the boy approaches to see the glittering, colourful stick. Shortly afterwards he is inside the room and the door is shut behind him.

His mother settles herself on the blue chair closest to the doctor and the boy crawls up onto her lap with the magic wand in his hand. He takes a long glance at the magic wand (see picture 55). Shortly afterwards you can tell that the boy gets more confident. He looks around the room and looks at one of the researchers with a glint in the eye and holds the magic wand out towards her. Then he drops the magic wand on the floor. He hesitates a bit before he jumps down from his mother's lap and picks it up. From not even wanting to come into the room he has quickly gotten confident enough to jump down from his mother's lap and walk around the room by himself. He spots the round activity board hanging on the wall. He walks over there and spins the arrow powerfully and looks triumphing at his mother (see picture 56) (Appendix, p. 152).



Picture 55: Hassan is playing with the magic wand.

In this situation the magic wand worked as something interesting and new to the boy, making him curious. In this way he went from being scared to feeling safe and starting to create a relation to the foreign people in the room. It was good that the magic wand was something he could grab and hold by himself, making it possible for him to still sit with his mother and furthermore he looked proud and excited to hold this new thing by himself. Afterwards he got more confident and started exploring the room. In this way it worked well that the activity board was fixed to the wall because



Picture 56: Hassan is playing with the activity board.

it gave him the option to move away from his mother, having something to reach and manoeuvre on his own. Even though some parents and staff mentioned in the design game that the activity board maybe should be mobile in order for the youngest children to use it, the situation with this boy indicates that the fact that the mobile is fixed to the wall also works well in order to get him to explore the room on his own and learn that it is also okay to be in there without sitting on his mothers lap.

Afterwards when talking to the nurse about the mock-up room she says: *"I am quite excited. You could see for yourself how it worked with that magic wand"* (Appendix, p. 154).

The wand also works very well for younger children, which we saw in the following situation, where the wand also became an exercising tool. Four-month-old Clara was having a regular examination, because she had tension in her neck from always looking to the right and not the left. She was in company of both of her parents. The doctor is examining the child, when we enter the field notes:

He looks into her mouth, which makes her start complaining but only shortly. Then her mother gives her the magic wand, which she scrutinises while lying on the examination bed (...) Afterwards she is turned around and placed on her stomach. The mother takes the magic wand and moves it in a half circle in front of the girl's head. The girl follows the movement of the magic wand and in this way they train looking to the left, which she has not been willing to do before. The mother gets very excited and says to her husband 'we need to get one of these at home!'. They keep on moving the magic wand back and forth and the girl's head follows (Appendix, p. 155).

In this situation the magic wand worked both as something Clara can grasp and hold and as a distraction and stimulation when she is being examined. Secondly her parents also discovered the possibility to use this to get her attention and make her curious enough to actually turn her head.

Lastly, we observed a situation at semi-intensive with 11-months-old William (but 7,5 in 'corrected age' due to being prenatal), who held the wand right from entering the room and throughout most of it. When he was put at the scale the staff and his mother took off all of his clothes and removed his diaper, as they usually do. But the interesting part was that even though the diaper and everything has to come off, both parents and staff allowed him to keep the wand in his hand while at the scale, without debating it.

Mobile

The mobile generally catches the attention of the children quickly, when they are put on the examination bed (see picture 57). In the following situation the staff use it to distract and stimulate William while they examine him:

While the doctor is twisting and turning the little boy the nurse Frida holds out the colourful mobile which the boy is very engaged in. Energetically he reaches out for it, which makes all the little rectangles with colour and mirrors dangle around (Appendix, p. 147-148).



Picture 57: William reaches for the mobile, while holding the magic wand in the other hand.

Another patient going through a regular examination is 3-month-old Eva. She is staring calmly, while lying on the bed. It is difficult to tell whether she is looking towards the mobile or just is staring at the cables or something else.

In a third example 2-month-old Asger is having a regular examination, accompanied by his mother and grandmother. The doctor had just left the room in order to confer with a colleague:

The boy is lying on the examination bed, looking at the mobile with his mother (...) The child is reaching for the mobile. 'He really likes that mobile' the mother says and smiles at me. I use the waiting time to ask them how they experience the atmosphere in the room (...) She comes back to the mobile and says that it was really nice and asks where she can buy one (...) She thinks that he likes the colours of the mobile (Appendix, p. 157).

16-month-old Hassan did not play with the mobile, while lying on the examination bed, but his father knew of a different solution: *The boy is put at the examination bed and undressed. His father pulls out a bunch of keys from his pocket, which the boy then fidgets around with (Appendix, p. 153).* They did not try to use the mobile and he did not even touch it. Maybe he did not see it or maybe it just did not catch his attention. Another reason could be the age of the child. Hassan is 16 months old and maybe too old to find it interesting with a mobile.

In the situations where the mobile was used it seemed to work, because it was distracting the child from the examination by being catching attention and being

something you can explore with its many mirrors and different colours. It primarily seemed to catch the attention of the youngest children.

Rocking chair

Many of the families used the rocking chair (see picture 58) actively, by rocking either with or without their child. Some of them thought that it was a little bit hard to sit in though, so it is important that it is softer than the one we used in our mock-up. In the following situation a family has just arrived with their 11-month-old son William for a semi-intensive examination:



Picture 58: Rocking chair.

The mother sits down in the rocking chair and the father takes a seat in the blue chair. The mother starts rocking back and forth and tells that she had just been looking at a chair like this because she would love to have one at home. 'But this one is good', she says, 'it is just low enough for someone with my height to be able to reach the ground properly instead of rocking back and forth with only the tip of my toes in the ground' (Appendix, p. 147).

Afterwards she tells that the rocking chair was comfortable and that it seemed like her son, enjoyed rocking while sitting with her. She wanted to have one at home.

In the next situation we are at a regular examination with Hassan at 16 month, who is playing with the activity board:

Then he goes to his father and crawls onto his lap. Until now the father has just been sitting calmly in the rocking chair, but as soon as the boy is in his lap he starts rocking back and forth. When he stops rocking, Hassan knocks his father's knees while he leans forward. I think it looks like a signal to his dad to keep on rocking back and forth (Appendix, p. 153).

When the doctor started examining the boy he still sat with his father in the chair. The doctor started saying something about it maybe not was the best solution to sit in the rocking chair, but he stopped himself in finishing the line. This situation illustrated how the rocking chair can interfere with the staff's MoC of having easy access

to examine the child. On the other hand the staff also have a MoC about letting the child be in close proximity to their parents, which they are when sitting in the chair. These conflicting MoCs can be the reason why the doctor interrupts himself and let them sit there, while being examined. Later on, when the father wanted to put the boy on the examination bed, he could hardly rise from the chair because it was so low and he was so tall. It would be useful to have a chair, which could regulate the height.

Lastly, when we came into the room to talk to a family after an MBW examination had been carried out, the mother sat in the rocking chair with her son, rocking slowly back and forth while he was waking up from his sedated sleep.

The chair functioned as a place for the parents to sit and for many as a place to sit with their child. None of the families who used the mock-up room were breastfeeding their child or had a really unhappy or screaming child who needed consolation, so whether the chair would work in these situations we do not know. But what we could observe was happy and calm children, when they were sitting with their parents. Furthermore, the rocking function of the chair seemed to be useful, which makes it an important part of the design.

Starry sky and window decoration

The nurse doing regular examinations tried to show the stars to Hassan, but they were not very bright and visible in daylight and he took a few glances at the stars and then lost the interest.

After an MBW examination with 15-month-old Carl, the grandmother of the child told that the stars were very fine and that they had caught the attention of the boy.



Picture 59: Starry sky.

While the starry sky works best when it is dark, the window decoration seems to work well when the room is enlightened (see picture 60). When 11-month-old William was being examined he got highly aroused by the window. The doctor had just declared that the little boy was finished being a patient in the semi-intensive department, because he was doing so well and there was an elated atmosphere:

While the doctor keeps on talking to the parents the nurse picks up the little boy, places him on her arm and carries him around. She takes him to the luminous 'window' at the end of the room. She lifts him up to the window and he dilates his eyes widely and starts smacking the 'window' with his little hands in wild enthusiasm (Appendix, p. 148).



Picture 60: Luminous window.

In this example the window works as something with light and colour, which stimulates the child and makes him excited. Furthermore, it is a way for the staff to establish a relation with the child through looking at the window together and holding him while he looks at it.

In the following example the window obtained a different function. We are back at the examination of the 4-month-old Clara, who had tensions from always looking to the right:

At one time the father picks up the girl and starts carrying the girl towards the luminous window. He tries to approach it in a way that forces the girl to turn her head to the left in order to see it. 'We can train it here as well' he says (Appendix, p. 155).

In this example the window becomes something that inspires the father to pick up his girl and try training her neck by looking at it from a specific angle.

In general the mock-up room inspired the parents and staff more in order to pick up the children and use the room actively. We did not observed these things happen in the same manner in the prior version of the room.

Music

The music was something that all families and staff noticed and appreciated, except one family who did not mention it. For some it was almost the first thing they noticed. 3-month-old Eva and her mom entered the room for a regular examination. We write in our field notes:

The doctor asks a lot of questions, they talk about eating habits and general well-being. In the background the tones of Mozart are playing in a low tone of voice. After talking the mother puts the little child on the examination bed following the directions of the nurse and doctor. 'What lovely music' she says (Appendix, p. 150).

Afterwards we talked to the mother, who told that the atmosphere was really nice in the room, due to many things, but especially the music. She finished off by saying that out of all the music was her absolute favourite.

In another example the mother of 3-month-old Asger and the boy's grandmother are waiting for the doctor to confer with a colleague. While waiting we are asking how they experience the atmosphere in the room. Here is the mother's answer written in our field notes:

'The atmosphere is pleasant. I think the music is pleasant. It creates tranquillity', the mother says. I ask her whether it is tranquillity to her or her son, to which she replies that it creates tranquillity for her, but that she believes it does the same for him. She explains how she uses 'white noise' at home to make him fall asleep, so music is generally something that calms down her son (Appendix, p. 157).

The human physiologist told that she had turned the music on while being in the room preparing the examination, just because she liked it herself. When we asked the family how they experienced the examination, they told that they liked the music. Normally they use music themselves in order to get the boy to sleep at home. The mother uses her phone to play music, which can be anything 'soft' like pop or children's songs. Music is definitely an effective tool for them in order to make themselves and their child calm.

When talking to the staff they also liked the music and even though a doctor said that he was too focused on the child to really notice it, it did not bother him and he was sure that it was a good thing for the parents.



Picture 61: Music player.

The atmosphere

In continuance of the music comes the atmosphere, since the two are rather intertwined. As a mother in the previous section on music said: *'the atmosphere was pleasant'* and then she continued by telling, how the music was part of making it pleasant.

Already when we were setting up the mock-up room interesting things started to happen. As the rocking chair was in place and we were setting up pictures on the wall, several nurses and doctors poked their heads into the room, curious about what was happening. A doctor whom we had never met before came in and said: *"This looks like an allotment house, it is really cosy!"*.

After an examination in the mock-up room the mother of 3-month-old Eva told us, how she experienced the room. In our field notes we wrote:

She really liked the music, which she also mentioned, when we were alone in the examination room. She thinks it creates tranquillity, she says. She has been here before and she definitely believes that the room is much more cosy now. She mentions that the chairs were nice: 'The chairs were snug and, a little like a living room, a bit like armchairs?'. She adds that there generally was a homely and pleasant atmosphere in the room and says: 'I believe it is important to have the right balance between



Picture 62: Flowers and pictures at the wall.

feeling that things are clean and feeling that things are homely'. She thought this was very well balanced in the mock-up room (Appendix, p. 151).

When talking to the family, who had been attending the MBW examination, they told that the atmosphere was comfortable and cosy and that the boy had been calmer, than he used to be.

What specific effect this cosy and homely atmosphere had we cannot say definitively, but turning back to our themes and MoCs we know that there is a wish for a calm atmosphere and a homely atmosphere, which seems to be what the interplay between many of the materialities and the music that we put into the room created.

Updating the requirements and criteria

Through playing the design game and testing the mock-up the design concept has been negotiated and developed. The requirements and criteria have therefore been updated in order to integrate the knowledge gained from the design game and the mock-up test. We will now give a brief review of the final requirements and criteria. The added requirements and criteria are written in purple in order to make it visual what has been updated on the basis of the design game and mock-up test:

Themes	Requirements	Criteria
Proximity and Safety	<ul style="list-style-type: none"> Parents should have the opportunity to access the child and the other way around. Parents and children should have the opportunity to see each other. Parents and children should have the opportunity to hear each other. Parents and children should have the opportunity to reach each other. 	<ul style="list-style-type: none"> It would be nice to make it possible for parents to shield the child from impressions. It would be nice to make it possible for mothers to breastfeed. It would be nice to make it possible for the parent and child to rock or swing together. It would be nice to have something soft for the parent to sit at.
Establishing relations	<ul style="list-style-type: none"> Interessement devices should be accessible in the examination room. The staff should be able to establish contact to the child, both to establish a relation and to be able to treat the child. 	<ul style="list-style-type: none"> It would be nice if the child could hold some of the interessement devices. It would be nice if the interessement devices were colourful or luminous.
Stimulation	<ul style="list-style-type: none"> There should be materialities targeting different age groups. Materialities should be accessible in the examination room. There should be something to look at when lying down, i.e. in the ceiling or hanging from the ceiling. 	<ul style="list-style-type: none"> It would be nice if the stimulation for the children lying down could be changed in modes. A more calming and a more arousing mode.

Stimulation	<ul style="list-style-type: none"> • There should be materialities targeting different age groups. • Materialities should be accessible in the examination room. • There should be something to look at when lying down, i.e. in the ceiling or hanging from the ceiling. The 0-1 year old children's different abilities of seeing should be taken into account. 	<ul style="list-style-type: none"> • It would be nice if the stimulation for the children lying down could be changed in modes. A more calming and a more arousing mode.
A calm atmosphere	<ul style="list-style-type: none"> • The staff should make time for the child. • The staff should inform the parents about the procedure of the examination. 	<ul style="list-style-type: none"> • It would be nice if the staff moved slowly. • It would be nice if there was calm background music.
A homely atmosphere	<ul style="list-style-type: none"> • The room must not reflect a clinical environment, i.e. it should be colourful. 	<ul style="list-style-type: none"> • It would be nice if the room supported a homely atmosphere, e.g. look like a child's room or a living room. • It would be nice to make it possible to cover medical equipment.
Informing and involving parents	<ul style="list-style-type: none"> • The staff should welcome the parents and tell them what is going to happen and how and what they want the parents to do during the examination. 	<ul style="list-style-type: none"> • It would be nice if the staff also focused on the parents during the examination.
Accessibility of equipment	<ul style="list-style-type: none"> • Equipment should be accessible in the examination room. • Equipment should be placed safely in the room. 	
Temperature and Lighting	<ul style="list-style-type: none"> • It should be possible to turn on or turn off the light. • It should be possible to regulate the temperature. 	<ul style="list-style-type: none"> • It would be nice to be able to adjust the power of the light. • It would be nice with daylight. • It would be nice having access to fresh air from the outdoors.

Figure 6: Updated requirements and criteria for the design concept.

The design concept

We have now analysed what kind of MoCs 0-1 year old children and their parents have in relation to being treated at the hospital. We have together with parents and staff developed some concepts that accommodate these MoCs and finally tested some elements of these concepts in a mock up room. All this has resulted in the following design concept of an outpatient examination room for 0-1 year old children. The design concept should be understood as a drawing illustrating the multisensory environment elements that are important to the room and what their most important features are, which is described in the textboxes. We are aware that there are other important elements in a hospital room, such as the right clinical equipment, but since the focus of this project is on the experience of the child and the parents, this is what is accentuated in the concept. Our design concept is of course just the final concept of this particular project. In a participatory design process like this it is natural that people keep on evolving the design and translate it into their specific space or develop it further.

The design concept



<p>1) soothing music</p> <ul style="list-style-type: none"> - For example Classical music 	<p>6) Fiber optic</p> <ul style="list-style-type: none"> - To stimulate the child when lying at the bed - Can switch between different colours - Works like a mobile - Can be used by the staff to establish relations with the child 	<p>11) Comfortable chair</p> <ul style="list-style-type: none"> - Comfortable sitting possibilities for more than one parent 	<p>16) Pictures on the wall</p> <ul style="list-style-type: none"> - Pictures at the wall that creates a homely atmosphere
<p>2) Ceiling decoration</p> <ul style="list-style-type: none"> - Changeable in a way that it can be seen both in daylight and in darkness - One mode to stimulate the children lying down and looking up - One mode to calm down children, who are too aroused or who are going to sleep 	<p>7) Equipment hidden but still accessible</p> <ul style="list-style-type: none"> - Medical equipment placed at a slide that can be hidden, when not in use and pulled out, when needed. 	<p>12) Nursing chair</p> <ul style="list-style-type: none"> - A chair to use to for breastfeeding - Have to be comfortable and soft - Should be able to rock 	<p>17) Regulating boards</p> <ul style="list-style-type: none"> - Easy access and user-friendly board to regulate the music, temperature, lightning and the ceiling decoration
<p>3) Blackout curtains or shutters</p> <ul style="list-style-type: none"> - Makes it possible to darken the room, so children can fall asleep 	<p>8) Mirror</p> <ul style="list-style-type: none"> - To stimulate the child - Invites the child to lie on its stomach 	<p>13) Activity board</p> <ul style="list-style-type: none"> - Stimulating activity for the older children - Activities that activate the senses 	<p>18) Sliding wall</p> <ul style="list-style-type: none"> - A wall that can slide, which makes it possible to cover the stimulating activities if the child is going to sleep
<p>4) Colours on the wall</p> <ul style="list-style-type: none"> - Full painted walls - It is easier for the smallest children to see contrasted colours than it is to see small paintings. 	<p>9) An accessible bed</p> <ul style="list-style-type: none"> - The bed is placed in a way that it can be accessed from different sides. This enables both parents and staff to approach the child. 	<p>14) Selection of playing objects</p> <ul style="list-style-type: none"> - Objects for children to choose - Can be used by the staff to establish relations with the child - Placed so the child can reach it 	<p>19) Window</p> <ul style="list-style-type: none"> - Placed so the children can look out as well. - Gives daylight to the room
<p>5) Open window</p> <ul style="list-style-type: none"> - Makes it possible to get fresh air, ventilate and cool down the room 	<p>10) Flowers</p> <ul style="list-style-type: none"> - To create a homely atmosphere 	<p>15) Mirror</p> <ul style="list-style-type: none"> - Can be used by the staff to establish relations with the child - Placed so the children can watch themselves 	<p>20) Warm lightning</p> <ul style="list-style-type: none"> - Adjustable light that as default is warm and comfortable. - Possible to regulate the power and to regulate the colours

User journey

The following user journey is from the perspective of a mother visiting an outpatient department with her 6-month-old son Ole.

I am sitting in the hallway with Ole on my lap. Soon a smiling nurse comes and asks us to go with her. We walk down the hallway and come into a cosy room with music floating from the speakers, soft, warm lighting and a lot of interesting things on the walls. I can already tell that Ole likes the room; he dilates his eyes kicks his legs while he looks around at the coloured walls and the different objects. I walk around the room for a moment and let Ole explore the wall decorations and activities while he is still sitting on my arm. The nurse grabs a rattle and starts shaking it. The sound makes Ole look at her and they babble and play a bit with each other while the nurse pads his hand and hands him the rattle. I take a seat in a soft rocking chair in the corner of the room. There are flowers on a small table and the nurse has sat down in front of me and started to tell me how a regular examination like this usually is carried out. If I did not know better I would almost think we were just having tea in a living room. The doctor comes in and presents herself. While I tell them about the general wellbeing of Ole they both keep on smiling and looking at Ole, saying things to him and presenting new, colourful toys to him. Now the nurse wants to measure Ole's weight and height, and I put him on the examination bed to undress him. The room is warm and he enjoys lying there just in his diaper, kicking with his legs. The nurse puts him on the scale and points to the ceiling while he is lying there; 'Do you see the clouds and the hot air balloon, Ole?' she says. Back at the examination bed the doctor uses a feather to tickle him and check out his reflexes. When she moves the feather from one side to the other he follows it with his eyes. The doctor needs to put a stick into his mouth to see his throat. It looks a bit uncomfortable, but the nurse is using some long, luminous fibers hanging over the bed to distract him. At the end though he starts to complain a little bit, but the doctor tells that this part of the examination is over now, so I take him up and walk over to the mirror on the wall. We look in to the mirror for some time and then we go to the large windows and look at people passing by outside. Now he is smiling again. I give him his clothes back on while the doctor tells me that everything is okay. Ole is hungry now and I ask if there is somewhere I can breastfeed him. They tell me that I can just stay in the room. They ask if I want the lights or temperature to be different, and when they have regulated it they leave the room and I sit down to breastfeed Ole in the rocking chair.

How does the design concept meet requirements and criteria?

The design concept is a suggestion of how the requirements and criteria *could be met*. Some of the elements of the concept are closely linked to a requirement or criteria, while elaboration and discussion of how other elements meet requirements and criteria is necessary. The requirements and criteria are mainly discussed in the chronological order of how they are presented in the previous table. But since some of them are intertwined, because they are fulfilled by the same elements from the concept, they will be treated simultaneously.

Being shielded

Being able to shield the child is a criterion. In order to be able to do this, the concept includes a small, simple corner, which offers the parents and their child a place to withdraw a bit from the rest of the room and be shielded. In this corner there are less activities and pictures on the wall. Furthermore there is a sliding wall (no. 18), which allows parents or staff to shut off the activity board or the interessement devices in order to shield the child from the stimuli. The criteria of being able to shield the child could be met in many other ways, e.g. having a folding wall or curtain next to the small corner, allowing the parents to create their own little room.

Breastfeeding, rocking and sitting comfortably

This aforementioned corner is also meant to meet the criteria of being able to breastfeed, rock or swing and sit soft, by offering different sitting possibilities for both parents (no. 11-12). The chairs are big and with armrests, allowing the mother to sit comfortably while breastfeeding. There are a lot of other ways to meet these three criteria. Here we have chosen to meet more criteria in *one* solution, but this could also be split up into e.g. a swing and a sofa.

Accessibility of equipment and covering equipment

The criterion of being able to cover medical equipment is in slight conflict with the requirement of having accessible equipment. We have tried to meet both by making a cabinet, which can hide the medical equipment and yet make it easily accessible (no. 7). Since we have not tested this, we do not know how it works in praxis. But the important part of this cabinet is that the safety should be well tested and the access must be so

easy that it does not delay urgent treatment, in order for it to live up to the requirements. Covering the equipment is also part of meeting the criterion of making the room look like a child's room or a living room. Meeting these criteria are an example of how there are conflicting MoCs, which we would like to meet equally. But in this case it is difficult to meet both entirely, since the easiest access is that there are no steps of uncovering equipment before the staff can access it. However we believe this is a compromise for meeting both the requirement and the criteria.

The other equipment, such as the interessement devices are placed in individual holders on the wall, making them easy to access and visible for staff, children and parents.

Something to look at while lying down

In the theme 'stimulation' there is a requirement stating: *There should be something to look at when lying down, i.e. in the ceiling or hanging from the ceiling. The 0-1 year old children's different abilities of seeing should be taken into account.* This requirement is met by two different solutions: By making a decoration of the ceiling (no. 2), which can be stimulating for children lying down and furthermore it meets the requirement of a non-clinical environment by being colourful. The second part of meeting this requirement is the fibre optic (no. 6), because it is visible for the newborn children, who can only see 25 cm. In this way children's different abilities of seeing is met. Furthermore this gives something for the children to reach out for and fidget with during examination, which meets the criteria of being a colourful and luminous interessement device that is accessible for the staff and easy for them to use in the examination situation when hanging above the examination bed.

The concept includes a switchable ceiling decoration. The modes are 'day' to arouse and entertain and 'night' in order to calm down. This is made in order to meet the criteria of making a more calming and a more arousing mode in the stimulation for the child who is lying down.

A calm atmosphere

In the theme 'a calm atmosphere' there are two requirements and two criteria. This concept only directly meets the criteria of playing calm background music (no. 1). Hopefully this nudges the staff to move slowly and make time for the child, which are a

criterion and a requirement that would then be met indirectly. It was our impression that the staff made time for the children during the test, but we have too little data to be able to say for sure if this is due to the music, since we also saw a lot of staff making time for the child before putting music into the room.

To meet the demands and requirements more in this theme, more elements nudging to tranquillity could be involved in the concept. Furthermore in order to make the staff be calmer might also require changes in other levels of the hospital organisation, but this is beyond the project at hand.

Light and temperature

In order to meet the criteria of daylight and fresh air the concept includes floor-length windows with the possibility of opening up a section (no. 5 & 19).

General

Everything in the concept meets the requirements, except few things. These are the requirements on information and a requirement on the staff being able to establish relation to the child. Regarding information we have already described how this is a project in itself, which we will not go further into, since it is not something that is to be supported by multisensory environments. Though, we will still emphasise that this is a theme with great importance in order for the concept to work. The other requirement regarding the staff's ability to establish relation with the child is partly met by the interessement devices. They support the staff in establishing contact and relation to the child and thereby meet the requirement indirectly. However there is also an element of human capacities of the staff, which might be further developed through education and practice.

An overall criterion for all themes is that things should be mobile and can be moved. This is not met by all elements of the concept, in the sense that many of the things can be switched on or off, or changed position, but it cannot be entirely removed. E.g. the sliding wall (no. 18), which allows changing the room. By not having the things entirely movable but only switchable we believe that this meets the criterion of accessibility better, allowing staff always to find materialities, devices and equipment in the same places.

During our test a mother commented on the balance of feeling at home and feeling that things were clean, professional and under control. We have kept this in mind when making the room, in order to give it a homely atmosphere but still not making it so homely that the feeling of being in good, professional hands waives.

In order to meet the criteria of easy usability there are regulating boards (no. 17) to control and change the temperature, lighting, music and ceiling decoration. The options are kept simple in order to navigate and choose easily, with e.g. the ceiling having just two modes.

Implementation

The implementation of the concept can be approached in different terms. The short-term implementation is to work with the atmosphere of the room through smaller elements. This can be to install music, paint a wall, put flowers in the room and change the chairs. Furthermore playing objects and holders for these can be installed as well.

The long term is to work with the more static elements of the room, which are supporting the atmosphere and amount of daylight and fresh air. This can be such as creating the sliding wall, the floor-length windows, a solution to cover equipment and the ceiling decoration.

In the coming Children's Hospital Copenhagen we recommend that both short- and long-term implementation is considered, whereas on the existing Rigshospitalet we recommend to start out with working on the atmosphere through short-term implementation and thereafter estimate which of the static, permanent solutions they will engage and invest in.

Conclusion

In this study we have found that children in the age group 0-1 year old, their families and the staff have several MoCs related to the following eight themes: *Proximity and safety, establishing relations, stimulation, a calm atmosphere, a homely atmosphere, informing and involving the parents, accessibility of equipment and temperature and lighting.*

In relation to proximity and safety the young children and the parents have a MoC about being in physical and relational proximity to each other. This consists of caress, comfort, safety, shielding, breastfeeding and consolation. The nurses as well have a MoC related to making the child stay in close proximity to the parent and enable breastfeeding, because it makes it easier for them to do their job. In addition the staff have a MoC about making the child feel safe at the examination bed, which also will make it easier for them to complete the examination. The children have a MoC about being placed at the examination bed, which makes them unhappy.

Within the theme establishing relations the staff has a MoC relating to establishing relationships to both the child and the parents. They are trying to achieve this by using different interessement devices to catch the attention of the child or by talking directly to the child and indirectly to the parents and thereby calming down both of them. The parents do also have a MoC about establishing a good relationship between their child, themselves and the staff. Lastly the child has a MoC about being seen and talked to.

In relation to stimulation, we can conclude that children have a MoC about being stimulated. The staff has a MoC about distracting the child as a medium to easier examination and stimulation can be a way to achieve this. The parents have a MoC related to giving their children a good experience of the examination, in which stimulation can help. Both the parents and the staff point to the importance of using age-specific toys or materialities to stimulate the children.

Both the parents and the staff agree on the importance of creating a calm atmosphere, which benefits both the parents and the child. One of the MoCs they share is related to making time for the child and not stress through the consultation. Another

MoC is related to giving the parents information, which makes them relax and creates a calm atmosphere.

In relation to a homely atmosphere both the parents and the staff have a MoC about the current clinical environment and a MoC about getting a more homely atmosphere. A less clinical environment will give rise to a more homely atmosphere.

Information is a central MoC for both the parents and the staff. As already stated in another theme, to inform and involve the parents can create a more calm and relaxed atmosphere for child, parents and staff.

The staff has a MoC about having easy access to the equipment they use both in relation to the medical remedies used to examine the child, but also in relation to toys or materialities that can function as playing elements to distract the child.

Lastly, temperature and lighting are MoCs to the child, parents and staff. In some examinations a lot of light is required, while darkness is needed at others to let the child fall asleep. Also in relation to temperature there is a need for regulation. Therefore the solution to this should be flexible.

We have translated these MoCs into requirements and criteria and a design concept for an examination room targeting the age group of 0-1 year olds and their families. The concept is presented in the following illustration and consists of a visual representation and a description of the different elements in the room and the functions of these.

The design concept



1) Soothing music - For example Classical music	6) Fiber optic - To stimulate the child when lying at the bed - Can switch between different colours - Works like a mobile - Can be used by the staff to establish relations with the child	11) Comfortable chair - Comfortable sitting possibilities for more than one parent	16) Pictures on the wall - Pictures at the wall that creates a homely atmosphere
2) Ceiling decoration - Changeable in a way that it can be seen both in daylight and in darkness - One mode to stimulate the children lying down and looking up - One mode to calm down children, who are too aroused or who are going to sleep	7) Equipment hidden but still accessible - Medical equipment placed at a slide that can be hidden, when not in use and pulled out, when needed.	12) Nursing chair - A chair to use to for breastfeeding - Have to be comfortable and soft - Should be able to rock	17) Regulating boards - Easy access and user-friendly board to regulate the music, temperature, lighting and the ceiling decoration
3) Blackout curtains or shutters - Makes it possible to darken the room, so children can fall asleep	8) Mirror - To stimulate the child - Invites the child to lie on its stomach	13) Activity board - Stimulating activity for the older children - Activities that activate the senses	18) Sliding wall - A wall that can slide, which makes it possible to cover the stimulating activities if the child is going to sleep
4) Colours on the wall - Full painted walls - It is easier for the smallest children to see contrasted colours than it is to see small pointings.	9) An accessible bed - The bed is placed in a way that it can be accessed from different sides. This enables both parents and staff to approach the child.	14) Selection of playing objects - Objects for children to choose - Can be used by the staff to establish relations with the child - Placed so the child can reach it	19) Window - Placed so the children can lookout as well - Gives daylight to the room
5) Open window - Makes it possible to get fresh air, ventilate and cool down the room	10) Flowers - To create a homely atmosphere	15) Mirror - Can be used by the staff to establish relations with the child - Placed so the children can watch themselves	20) Warm lightning - Adjustable light that as default is warm and comfortable. - Possible to regulate the power and to regulate the colours

Putting the project into perspective

In the following we will take a step back and take a view of the project from a distance. There are two different aspects of this; a view on our research design and a view on our findings and how they can be of use.

Perspective on the research design of the project

It has been helpful to work with the framework of translations, since this has helped (and forced) us to constantly look back and see the process as a whole, making sure that everything has been brought into the next phase of the project through some sort of translation.

The way the socio-technical is understood as entangled and defining each other within the network works well with the focal point of multisensory environments, since the premise of this is that the environment is in constant interplay with human actors. The American feminist Susan Leigh Star has emphasised that ANT often gives more voice to the powerful actors in a network through telling the story from their perspective instead of that of the invisible or suppressed actor (Star, 1991). We have tried to avoid this by doing participatory design, which as stated in an earlier section has a specific focus on democratising through involving vulnerable actors. In this section we also stated how Hirom and Hendriks point to some challenges when doing participatory with vulnerable actors (Hirom et al., 2017; Hendriks et al., 2014). Some of these could possibly be at stake in our field as well. Hendriks et al. point towards how relatives often over- or underestimate the capabilities of their family. During the design game parents sometimes disagreed on whether the child would be able to stand by the activity board by themselves or for how long time some activity would occupy their children. Their different perceptions on the child's capabilities and wishes visualises that when the parents answer on behalf of their child we can not be sure of complete accordance with the actual capabilities or needs of the child. Another example of this is the situation with the parents of August and Adam who said that they want to keep tablets and screens 'a bit on the side', while their two boys were put in front of a television with Teletubbies in order to keep them occupied, while we were playing the design game. In this example we could have asked more to the contradiction of this;

what part of their answer was their parenting approach and what part was about their child's favourite activity. In this way you could say that it is difficult to obtain equality between all actors, which is the goal in participatory design. Through observing and testing we have tried to bring the children more directly into the design process. In order to do this even more, we could have made some direct tests with the children, letting them respond directly to more solutions, instead of only those chosen for them by others. A situation underpinning that we could have done this is concerning the children's MoC about being uncomfortable at the examination bed. In the design game we had made two solutions (swaddle blanket and waterbed) in order to accommodate this. In the test we could have made direct interventions with the child, e.g. by putting the child both directly on the examination bed and afterwards on a swaddle blanket, in order to see how they reacted. What is worth to mention is, that making a lot of direct interventions with the child, could potentially cause the examination to become unnatural and thereby be a bias for the project.

In order to gain more of the child's perspective we could also have studied 0-1 year olds in other situations, such as at home or at the nursery. Or we could have made some creative obstructions for ourselves when we were doing our fieldwork, such as having one day where we should make thick descriptions or notes as ourselves and one day where we should write them as being the young child, in order to challenge ourselves to try to see the world more with their eyes.

Another point from the study of Hendriks et al. is that participating in a design process was too stressful for some of the people with dementia and their relatives. This has been a concern in our project as well, since some of the children were very ill. Therefore we have, in some parts of the project, made decisions on behalf of the families, instead of letting them have their own say, as it is the ideal state in PD. We have in some situations not asked if we could take photos or not asked questions after an examination, since we estimated that it would be too stressful for them in the given situation and that the consequence might be that they would be overwhelmed and then not even wanting to let us observe the examination.

Perspective on the findings of the project

Some of the findings of this project may not seem entirely new to the staff at hospitals. Some of the MoCs and themes are seen before in similar studies on children in general

and on children in other ages at the hospital. But the aim of this project was to study the specific MoCs and possible solutions for this specific age group. Therefore the findings can be seen as a further elaboration and clarification of some of the things already known. For example we already knew that it is good to be distracted and diverted with stimuli when having a procedure, but what we found out was how this is best done specifically for the 0-1 year olds. We have also found how proximity and safety is an especially important issue for this age group. So some of the things are recurring, but sharing, negotiation and development of knowledge about what is specifically important with this group is emphasised.

This specific project is made with outpatients, but some of the MoCs and some of the solutions might be relevant for inpatients as well. However this can - probably - not directly be translated to inpatient rooms and patients, since some of the practices here are different and other needs and MoCs might be at stake. Since the young child understands the world through sensory perceptions it is important that there is something sensory for the inpatients to process. We will therefore strongly encourage Copenhagen Children's Hospital or others to look further into integrating multisensory environments into inpatient departments.

References

Ayres, A. (2009). *Sanseintegration hos børn*. Kbh.: Hans Reitzel.

Baker, R., Bell, S., Baker, E., Holloway, J., Pearce, R., Dowling, Z., Thomas, P., Assey, J. and Wareing, L. (2001). A randomized controlled trial of the effects of multi-sensory stimulation (MSS) for people with dementia. *British Journal of Clinical Psychology*, 40(1), pp.81-96.

Blok, A. and Jensen, T. (2009). *Bruno Latour. Hybride tanker I en hybrid verden*. 1st ed. Hans Reitzels Forlag.

Brandt, E. (2006). Designing exploratory design games. *Proceedings of the ninth conference on Participatory design Expanding boundaries in design - PDC '06*.

Brandt, E. (2007). How Tangible Mock-Ups Support Design Collaboration. *Knowledge, Technology & Policy*, 20(3), pp.179-192.

Brandt, E., Messeter, J. and Binder, T. (2008). Formatting design dialogues – games and participation. *CoDesign*, 4(1), pp.51-64.

Bødker, S. and Buur, J. (2002). The design collaboratorium: a place for usability design. *ACM Transactions on Computer-Human Interaction*, 9(2), pp.152-169.

Callon, M. (1986). Some Elements Of A Sociology Of Translation: Domestication Of The Scallops And The Fishermen Of St Brieuc Bay. In: J. Law, ed., *Power, action and belief: a new sociology of knowledge?*, 1st ed. London: Routledge., pp.196–223.

Callon, M. and Latour, B. (1981). Unscrewing the Big Leviathan; or How Actors Macrostructure Reality, and How Sociologists Help Them To Do So?. In: K. Knorr and A. Cicourel, ed., *Advances in Social Theory and Methodology*. Routledge and Kegan Paul, pp.277-303.

Chung, J. and Lai, C. (2002). Snoezelen for dementia. *Cochrane Database of Systematic Reviews*.

Clausen, C. and Gunn, W. (2015). From the Social Shaping of Technology to the Staging of Temporary Spaces of Innovation – A Case of Participatory Innovation. *Science & Technology Studies*, 28(1), pp.73-94.

Cooper, C. (2008). *Politikens bog om barnets udvikling 0-3 år*. Kbh.: Politiken.

Cross, N. (2008). *Engineering design methods*. 4th ed. Chichester, England: John Wiley and Sons Ltd, pp.123-138.

Frederiksen, M. (2015). Mixed methods-forskning. In: S. Brinkmann, L. Tanggaard, O. Thornye and B. Nake, ed., *Kvalitative metoder : en grundbog*, 2nd ed. København: Hans Reitzel, pp.197-213.

Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books, pp.1-10.

Hauck, Y., Rivers, C. and Doherty, K. (2008). Women's experiences of using a Snoezelen room during labour in Western Australia. *Midwifery*, 24(4), pp.460-470.

Hauck, Y., Summers, L., White, E. and Jones, C. (2008). A qualitative study of Western Australian women's perceptions of using a Snoezelen room for breastfeeding during their postpartum hospital stay. *International Breastfeeding Journal*, 3(1), p.20.

Hendriks, N., Huybrechts, L., Wilkinson, A. and Slegers, K. (2014). Challenges in doing participatory design with people with dementia. *Proceedings of the 13th Participatory Design Conference*, 2, pp.33-36.

Hirom, U., V.S., S., Doke, P., Lobo, S., Devkar, S. and Pandey, N. (2017). A Critique on Participatory Design in Developmental Context: A Case Study. *Cross-Cultural Design*, pp.647-658.

Jensen, T. (2003). Aktør-netværksteori : en sociologi om kendsgerninger, karakter og kammuslinger. *Papers in Organization, Institute of Organization and Industrial Sociology, Copenhagen Business School*, 48.

Juliane Marie Centret & ReD Associates (2014). *BørneRiget - Brugeroplevelsen på verdens bedste hospital for børn og familier*. Copenhagen, pp.1-101.

Kvale, S. and Brinkmann, S. (2009). *InterView*. 2nd ed. København: Hans Reitzels Forlag.

Latour, B. (2008). A Cautious Prometheus? A Few Steps Toward a Philosophy of Design (with Special Attention to Peter Sloterdijk). In: *Networks of Design, meeting of the Design History Society*.

Mackenzie, A. (2014). *Everybody stay calm*. 1st ed. Victoria: Global Publishing Group, pp.28-34.

Mathiasen, R., Mølholm Hansen, B., Løkke, A. and Greisen, G. (2008). Behandling af for tidligt fødte børn på Rigshospitalet i perioden 1955-2007. *Bibliotek for læger*, pp.528-546.

McKee, S., Harris, G., Rice, M. and Silk, L. (2007). Effects of a Snoezelen room on the behavior of three autistic clients. *Research in Developmental Disabilities*, 28(3), pp.304-316.

Pedersen, S. (2016). Navigating Prototyping Spaces. Translation of knowledge and actors in participatory design. *Aalborg University Press*.

Preece, J., Rogers, Y. and Sharp, H. (2002). *Interaction design*. John Wiley & Sons, Inc.

Rigshospitalet.dk. (2018). *Neonataalklinikkens historie*. [online] Available at: <https://www.rigshospitalet.dk/afdelinger-og-klinikker/julianemarie/neonataalklinikken/om-klinikken/Sider/historie.aspx> [Accessed 22 May 2018].

Riis, O. (2005). *Samfundsvidenskab i praksis: Introduktion til anvendt metode*. 1st ed. Hans Reitzel, pp.77-90.

Robertson, J. (1979). *Young children in hospital*. London: Tavistock Publ.

Roué, J., Kuhn, P., Lopez Maestro, M., Maastrup, R., Mitanchez, D., Westrup, B. and Sizun, J. (2017). Eight principles for patient-centred and family-centred care for newborns in the neonatal intensive care unit. *Archives of Disease in Childhood - Fetal and Neonatal Edition*, 102(4), pp.F364-F368.

Sandbjerg, Å. (1979). Computers dividing man and work: Recent Scandinavian research on planning and computers from a trade union perspective. *Arbejtslivscentrum*.

Schofield, P. (1996). Snoezelen: its potential for people with chronic pain. *Complementary Therapies in Nursing and Midwifery*, 2(1), pp.9-12.

Schofield, P. (2003). A pilot study into the use of a multisensory environment (Snoezelen) within a palliative day-care setting. *International Journal of Palliative Nursing*, 9(3), pp.124-130.

Shah, P., Herbozo, C., Aliwalas, L. and Shah, V. (2012). Breastfeeding or breast milk for procedural pain in neonates. *Cochrane Database of Systematic Reviews*.

Shiga, J. (2007). Translations: Artifacts from an Actor-Network Perspective. *Artifact*, 1(1), pp.40-55.

Simonsen, J. and Robertson, T. (2012). *Routledge Handbook of Participatory Design*. Hoboken: Taylor and Francis, pp.1-17.

Snoezelhus.gentofte.dk. (2018). *Snoezelen og sanserne*. [online] Available at: <http://snoezelhus.gentofte.dk/da/Hvad-er-snoezelen/Snoezelen-og-sanserne> [Accessed 22 May 2018].

Star, S. (1991). Power, Technologies and the Phenomenology of Conventions: on being Allergic to Onions. In: J. Law, ed., *A Sociology of Monsters? Essays on Power, Technology and Domination*. Sociological review monograph, 38, London: Routledge, pp.26-56.

Steenhold, J. (1999). *Børns leg og drømmeuniverser: udvikling, drømme og lege 0-10 år*. 1st ed. Gyldendal.

Sunstein, B. and Chiseri-Strater, E. (2012). *Fieldworking. Reading and Writing Research*. 4th ed. Bedford/st Martins.

Van Weert, J., Van Dulmen, A., Spreeuwenberg, P., Ribbe, M. and Bensing, J. (2005). Behavioral and Mood Effects of Snoezelen Integrated into 24-Hour Dementia Care. *Journal of the American Geriatrics Society*, 53(1), pp.24-33.

Verheul, A. (2009). Fundamental philosophy of Snoezelen – historical background, planning and concept.

White, J. (1997). Creating a snoezelen in PICU. *Paediatric Nursing*, 9(5), pp.20-21.