Kindergarten

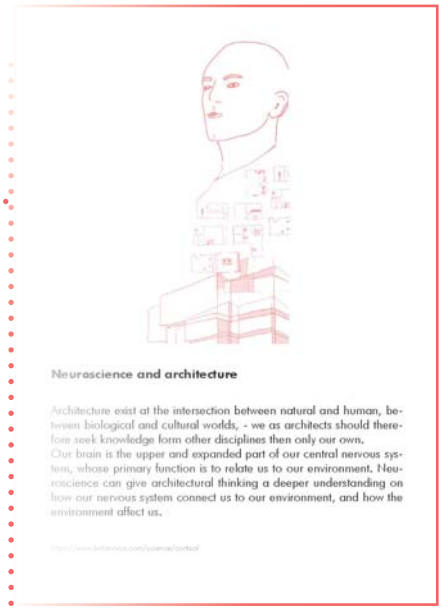
/ Enhance learning and destress through play

Tilla Tine Bårdsdatter Bønes Diplom 2020

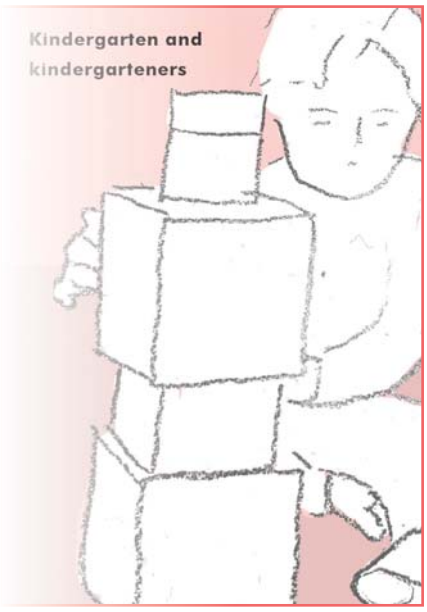
Further reading

https://miro.com/app/board/o9J_krErOEs=/

My entryway for my diploma is through neuroscience in relation to architecture. Neuroscience can give architectural thinking a deeper understanding of how our nervous system connect us to our environment, and how the environment affects us.



I have applied the knowledge I gained from neuroscience to designing a kindergarten. Surveys show that children in kindergarten are showing a higher level of cortisol in their salvia during a time of the where it is expected to be low. Cortisol is a stress hormone, and this indicates that the children are exposed to stress during time in kindergarten. Long-term stress can affect the brain anatomy and learning capabilities. Younger children are most vulnerable, since our brain is under critical development between 0-2 years. How can we make a kindergarten that is destressing and enhancing the child's trust and capability to learn?



In this context a kindergarten is defined as an educational facility with a curriculum taught through play for children between the age of 10 month and 6 years. These kids are spending 5 to 8 hours a day in kindergarten with caretakers that are not their parents – their primary caretaker. The teachers attention is also divided between several other children. First and foremost the organization and motivation of the caretakers is crucial for a good learning environment in kindergarten. However, the architecture should work with and not against the life in kindergarten. The architecture can be a driving force and facilitate learning – in this case learning through play.

My main concern is decreasing the stress levels in children. I have focused on some neuroscientific topics and use them to find a design solution. Some of the most important topics I have concentrated on is peripersonal space - the interaction between the human body and its surroundings. For example by doing an cooperative task, like some type of play - one gains trust and gets more comfortable in his environment.

The effect of greenery and outdoor space.
An outdoor space that is more akin to the natural environment generates more activity and more creative and self-conducted play. Wayfinding, navigating in surroundings. In this kindergarten, each entrance to the home base is a bit different. The ceiling is visible from most parts of the kindergarten and can be used to navigate through the building. There are furnishings and spaces dedicated to the child that are mirroring its size and capabilities.
A noisy environment has a negative effect on learning, for example on language development. However, children need to be able to express their excitement in appropriate surroundings. Therefore, a kindergarten requires both quiet and noisy environments

Gamle Lone skole
(Old Lone school)
Site: Longeletet 155 294/41

The overall design solutions and ideas could be implemented in any kindergarten. Nonetheless, I chose to work with a plot. This kindergarten is situated in Arna at old Lone Skole. Bergen municipality is aiming for Arna district to become an attractive place with high density and urban life.
Arna is the district of Bergen with the fastest collective connection to the center of the city. Moreover, the municipality is planning a kindergarten on the plot which would host the children belonging to today's kindergarten "Indre Arnavegen" and the growing numbers of inhabitants in the area Lone, Haukeland.

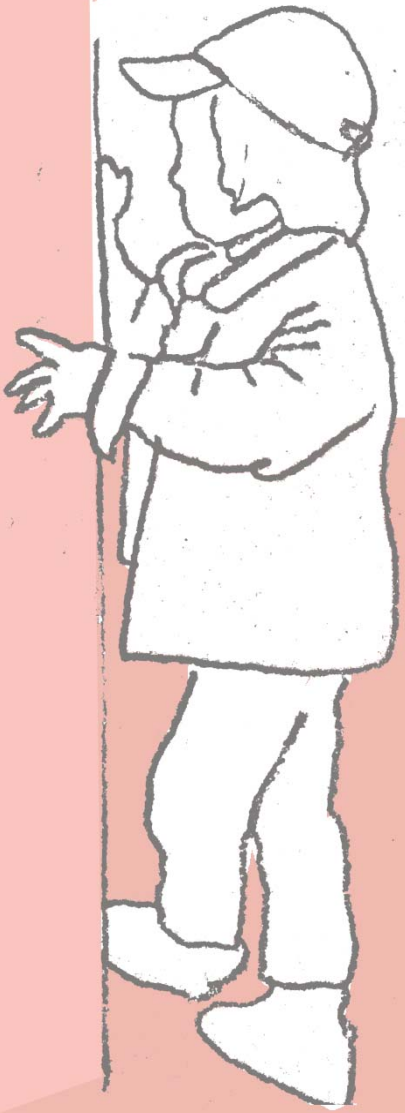
One condition from the Bergen Municipality is that Kindergartens built today should also function after kindergartens opening hours, as well as being flexible to different usages after closing. In this particular kindergarten, the main body of the building would be open for events of the community.
In this case, the municipality wants to keep the existing school building. During my process I have both worked with keeping and with demolishing it. I ended up keeping it and found it to be a good to have an dialog with the existing building.

Process

DIPLOMA PROGRAM

by Tilla Tine Bårdsdatter Bønes

BAS spring 2020



Index

01

Where /What + why /How

Kindergarten

How to enhance life in kindergarten with design based on neuroscience

/Where//Laksevåg barnehage

Laksevåg barnehage is on the A list for renovation, and has had some media attention lately about the need for renewal of the building. The building is form 1940; build by the Germans under II world war as a workingman barracks. In 1947, the building was converted in to a day care and boarding house. The last full renovation was done in 1992.

/What + why

I would like to explore how we can use the knowledge form neuroscience to design a kindergarten that enhance learning, social skills and that protect the well-being of both children and adults.
My main concern is the smaller children in kindergarten, between 0 and 3 years of age. In 2018, 278 578 children attended kindergartens in Norway. 100 610 of these children was under the age of 3 years. 94 136 of those children spend more than 41 hours a week in kindergartens. Surveys shows that children has a high level of cortisol in their salvia during the day where the cortisol level should be low. Cortisol is a stress hormone, and this indicates that the children is experiencing stress. Stress over longer time can have an impact on the childes brain anatomy and learning capabilities. The smaller children is most vulnerable while the brain is under critical development between 0-2 years.

/How

Our brain is the upper part and expanded part of our central nervous system, whose primary function is to relate us to our environment. I would like to explore the link between the users pre-cognitive expectations and multi-sensorial experience of space. This comprises the study of the topological and proxemics relationships of bodies with borders, geometry, light, rhythm, texture, color, materials and sound. Moreover, understanding how emotions will strengthen attention, memory, learning and quality of social relation. Through analysis of interactions between each element of the architectural process and the human sensory system, I am aiming to understand how our bodies are receiving signals from the outside world. Senses such as seeing, hearing, feeling and smelling. Architectural process such as, light, topology, organization, use of space, geometry, rhythm, texture and matters, sounds and odors.

02

INTRO

Laksevåg barnehage

Sverre Hjelandsvei 17 is originally a German crew barracks from the camp at Melkeplassen during World War II. The interior of the building has changed a lot, but it has largely retained its appearance main shape, location, and outdoor area

1940: Built as a German crew barracks

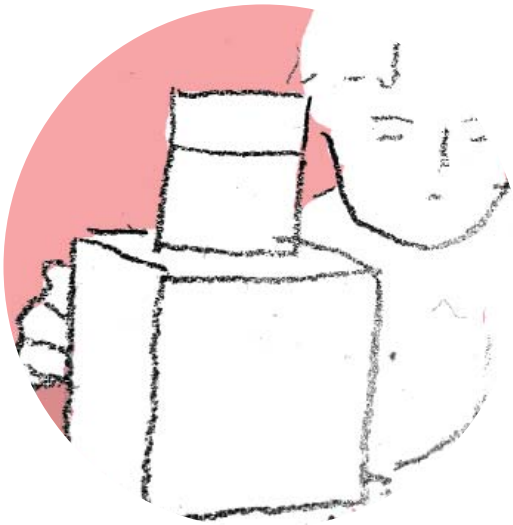
1947: Converted in to day care and boarding houses

1992: Renovated

Plot: 2006 m^2
BTA: 802 m^2
Play area: 331,7 m^2
Children under 3 years: 30
Children over 3 years: 43

Byantikvaren, *Antikvarisk dokumentasjon Laksevåg bgh*. Skriftserienr: 2015-2/13

Bergen kommune. Barnehagebruksplan 2016 - 2030

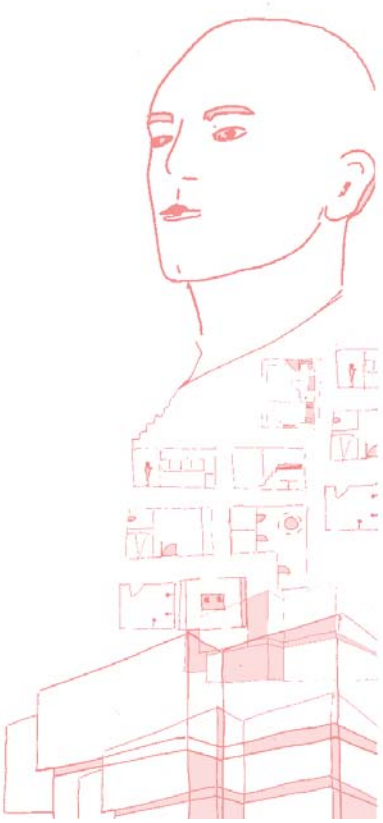


Kindergarteners

In 2018 there were 278 578 children atteding kindergardens in Norway. 100 610 of these children was under the age of 3.
94 136 of those childen is spending more then 41 hourse a week in kindergartens.

Kindergarten is here defined as a place where children from 10 month to six years attend every weekday, from five to eight hours. What we define as a small kindergarten in Norway is the size up to 50 children. A medium big kindergarten is form 50 to 80 children. Big kindergarten is from 80 and up. The biggest kindergarten in Norway has 481 children (numbers form 2016). Norwegian kindergartens is based on three models. Avdelingsbarnehage, Basebarnehage and Sonebarnehage.

https://www.ssb.no/utdanning/statistikker/barnehager
https://forskning.no/partner-stress-norges-forskningsrad/stress-i-barnehagen-er-verst-for-de-minste/1230337



Neuroscience and architecture

Architecture exist at the intersection between natural and human, between biological and cultural worlds, - we as architects should therefore seek knowledge form other disciplines then only our own.
Our brain is the upper and expanded part of our central nervous system, whose primary function is to relate us to our environment. Neuroscience can give architectural thinking a deeper understanding on how our nervous system connect us to our environment, and how the environment affect us.

03

CALENDAR

Diploma weekly program

WEEK 1 – 8

Münster School of Architecture

+ Social sciense essay at BAS

WEEK9

Reading up and gathering information about how to apply neuroscience to architecture.
Contact kindergartens for possible visits.
Research what the architectural frames for kindergartens is today and what kindergartens stands for.
During the research, I would like to make concept models and drawings to get started on something that could end up as my design.

WEEK 10

2. Presentation

Getting started on drawing the existing building

How we receive signals from the outside world.
Light, topology, organisation.
Space, geometry, rhythm, texture and matters, sounds and smells

Visiting kindergartens.
(How do a typical day look? How do they organize them self? How do they deal with territories and proxemics? What do they do to protect their peripersonal space?)

WEEK 11

How the brain elaborates and memorises data form the hearing, visual, tactile, smell proprioceptive and interceptive system.

How the environment affects mind and body.
Rhythm, proxemics, materials, textures, colours and sound.

Design drafts based on the findings.

Finished 3D model of existing.

WEEK 12

How the environment affects mind and body.
dimensions, proportions, shapes, wayfinding, the topology and the natural light and the greenery

Design draft based on the findings.

WEEK 17 WEEK 18 WEEK 19

Fine-tuning the design based on the presentation

Prepering for external presentation

WEEK 20

External presentation

Finetuing based on external presentation

WEEK 21 WEEK 22

Final model work

Final drawings and illustrations

Finetuing based on external presentation

WEEK 23 WEEK 24 WEEK 25
Exebition periode

Building 1:1

04

CURRICULUM VITAE

Tilla Tine Bårdsdatter Bønes

Born: 29.05.1991

Nationality: Norwegian

Contact info:
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Diploma tutors

Andrè Fontes, APP
Eva Kun, DAV

Academic CV

Bergen School of Arcitecture
spring 2014–2017

Bachelor 3 years at BAS

University of Bergen (UIB)
spring 2011–2014

Bachelor in art history

Toneheim folkehøgskole
spring 2010–2011

One year music school. Classical guitar.

Tanks vgs.
spring 2007–2010

General studies

Steineskolen i Bergen
(Waldorf school)

1-10th grade

Mastercourse

Münster School of Arcitecture
winther 2019/2020

ma.m2.1 Stegreifentwurf
Münster, Deutschland
Die Reise um mein Zimmer

Teacher: Arch. ETH Daniel Blum,
Dipl. Arch. AA Daniel Koo

Group: Tilla Bønes, Mark Deutzmann and
Mohaymen Moradi

An intensive four-week course. Two parts, on individual and group work.
1. Stay in your room for 24 hours, do nothing then to take in and draw what you see.
2. Find a place at the university campus and do a 1.1 intervention.
The task is about understanding the place and its qualities. The process is more important than the end result; the result should be a documentation on a brave and well-articulated process on understanding of a place.
We gathered stories and talked about the role a heap is playing at the campus.

ma.m2.1 Stegreifentwurf
Münster, Deutschland
Stilleben > Stillegen

Teacher: Pascal Maas M.A.,
Matthias Zühlke M.A.

An intensive four weeks course. Two industry halls where to be given new use that would fit to the new masterplan of the area.
I made a shopping mall for the future, named Salvage. Salvage is to save something from destruction. The shopping mall is selling only upcycled items; - items that are given to the shopping malls recycling and from there upcycled in the different workshops.

ma.m2.3 Entwurf
Gerichtssaal der Zukunft

Teacher: Prof. Dipl.–Ing. Ulrich Blum

Group: Tilla Bønes and Mohaymen Moradi

How could the courtroom look like in the future? In collaboration with law students, we discussed and made suggestions of how we could imagen the courtroom to be in the future. My group worked with family court in Germany.

ma.m5.3 Geschichte und Theorie
Theorie - Gerichtsarchitektur der Zukunft

Teacher: Dipl. phil. Thorsten Schneider

We read texts and discussed the role of law and how court room is organized and how it could be organized in the future. We read texts of Kafka, Cornelia Vismann, Michel Foucault and Jeremy Bentham.

ma.m7.3 Ergänzungsseminar
VR - Gerichtssaal der Zukunft

Teacher: David Akopyan M.A

We learned to use Unreal Engine for architectural visualization and as a tool to “visit” our designs.

Münster School of Arcitecture
summer 2019

ma.m7.2 Ergänzungsseminar
"We, the people" -Understanding the
impact of people in the built environment
through Network Driven Architecture"

Teacher: Victoria Davalos M.A.

We learned to use an analysis and visualization software named Gephi.

ba.m7.6 Ergänzungsseminar
Rhino / Grasshopper
Teacher: Adam Pajonk M.A

We learned the basic use between Rhino and Grasshopper, and some simple scripting.

ba.m1.2 Architekturdarstellung
Graphikverarbeitung
Teacher: Dipl.–Ing. Ralf Westarp

A course for Photoshop

ma.wm.2 Wahlmodul
Tankstelle der Zukunft

Teacher: Prof. Dipl.–Ing. Ulrich Blum, Mirek Claaßen M.A

Group: Tilla Bønes, Mats Engdal, Peter Mathies

This was a collaboration with Westfhalen fuel station. What is the future of the fuel station, how would it function and look? We were encourage to use Megatrends cards, trends that is predicted to take place in near and far future.

ma.m3.2 Konstruktion
material+ | konstruktion–fügung–innovation

Teacher: Prof. Dipl.–Ing. Johannes Schilling

Group: Tilla Bønes, Mats Engdal

We where to find materials of interest, either other innovative material or use it in an innovative way.
We made a project called The Spider, situated under Pudderfjordsbroen, Bergen. This is a public "furniture" working as a stage or just a peculiar thing under the bridge. Our materials was wood and textile, our innovative take on it was origami.

Competition
Europan 15

Teacher: Prof. Dipl.–Ing. Ulrich Blum

Group: Tilla Bønes, Mats Engdal

Project scale XL/L/S - territory / urban + architecture / architecture + context
Location Hilden, Ratingen, Solingen and Wülfrath-Düssel

We worked on Hilden, Ratingen nad Wülfrath-Düssel.

Bergen School of Arcitecture
autumn 2017

Orcid Island / LanYu

Teacher: Marco Casagrande

Group: Tilla Bønes, Sveinung Gjessing,
Bjørnar Skaar Haveland, Jim Rune Hoddevik, Tord Øyen

Local Knowledge based Research and Design Course for Master Students. All students are required a high level of participation for the Orchid Island Master Plan as a groupwork. The group will also edit a book or other publication of the master plan and individual designs and articles.
As an individual work, all students will produce a sustainable and feasible architectural design workbased on the Yami local knowledge and write an article of the work.

Work ecsperience
CV

01.2018-02.2019	**Opaform:** Intern
06.2015 - 08.2015	**Hellandhus:** assisten for architect Rune Helland
02.2014 - 08.2016	**Pedagogisk vikarsentral:** substitutes for kindergartens
11.2012 - 06.2014	**Mathopen natur og friluftsbarnehage:** sibstitute

Other

2016/2017	Building funiture on order
2015-2019	Dragefjellet minifestival
09.2011-09.2013	Photo editor for student magazine Atrium, UIB

Software

Revit

Rhino

Illustrator

Indesing

Photoshop

Grashopper

Unreal Engine

Gephi