Learning Through Play
A Playful Phenomenology

Request for Approval of Thesis Research
Project Book Presented to:
Arief Setiawan and Chris Welty

and to the
Faculty of the Department of Architecture
College of Architecture and Construction Management

by
Niloufar Mehrjerdian

in partial fulfillment of the requirements for the Degree

Bachelor of Architecture

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Marietta, Georgia
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I would like to dedicate this book to everyone who was part of this journey with me.

To Professor Arief Setiawan and Professor Chris Welty, thank you for always showing up with a smile, encouraging words, and great stories. Thank you for your guidance and support throughout the thesis and my architectural education.

To my architecture family, the Penguins, Caleb, Ana, Eddie, Hala, Abdel, Nham, and Diego, thank you for all the laughs and adventures and happiness throughout the past 5 years.

To Michelle and Diana, thank you for always having my back and encouraging me to keep going even when I wanted to give up. I would not have gotten through architecture school without you guys.

To Noah, thank you for being the best thesis partner I could’ve asked for. You encouraged me and pushed me to work harder than I thought I could.

Finally, to my family, Nasrin, Masoud, and Nikki, thank you so much for your unconditional love, support and encouragement you’ve always given me. None of this would’ve been possible without you.

Dedication

If childhood is a journey, let us see to it the child does not travel by night. 

- Aldo van Eyck, 1962
Section I

Chapter 1: Theorem

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1.2.1 Friedrich Froebel
1.2.2 Jean Piaget
1.2.3 Henri Raphael Pestalozzi
1.2.4 John Dewey

1.3 Cognitive Stages

Section II

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Chapter 5: Bibliography

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Living and Learning Center

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Chapter 1: Theorem
1.1 Thesis Statement

At the South Border of the United States, children are being held in facilities for days. While at these facilities, these children do not have the opportunity to learn like other children around their age do. This thesis explores ways to design spaces for children that encourage cognitive development.

By looking at research done by Jean Piaget, Friedrick Froebel, Johannes Pestalozzi, and John Dewey, the thesis will examine the development of a child’s brain, and the development of cognition from birth to adulthood. Jean Piaget, a psychologist, divided the human brain’s development into four stages, the sensorimotor stage, the pre-operational stage, the concrete operational stage, and the formal operational stage. These stages which start from birth and go into adulthood show how the brain develops throughout our lives. Friedrick Froebel, the father of kindergarten, considered play as an important factor in the cognitive development of a child. He, like Piaget and many others before and after him, explored the development of cognition. His studies led him to his theory that play allows a child’s mind to grow, by using imagination, creativity, and haptics to develop their cognition and become critical thinkers.

The research led to key words, such as play, imagination, complexity, and haptics. Using the keywords and the research, a set of geometric volumes were created, which were then used to design a Living Learning Center for the children at the South Border of the United States.

The Living Learning Center is designed to encourage the development of cognition in children. The Center provides living and educational spaces for each child. A child’s development should not change based on his/her race, culture, or background. Circumstance or status should not deprive any child from their basic needs. Just because these children are locked up, should cognitive development stop? Can play be the agency for change?
**FRIEDRICH FROEBEL**

According to Robert Owen in Friedrich Froebel: Froebel played an important part in the education system, we were named the Father of Kindergarten, and believed that kindergarten should focus on play and teaching through play. We designed the Gifts and Occupations as a method of teaching through touch. The gifts were designed in a way that, while the occupations were designed to use the knowledge from the gifts.

### General Principle

**Cognition**

- Simple to Complex
- Haptic Learning
- Play

**Explanation**

- Repetition
- Patterns
- Geometry

- Learning by touching
- Sensory learning

- Teaching through play
- Imagination
- Sound and light

**Relationship to Cognition**

- Geometric Shapes
- Basic Elements
- Scale
- Complexity

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### Gifts and Explanation

<table>
<thead>
<tr>
<th>Gifts</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gifts 1 and 2</td>
<td>A soft ball connected to a ring. The ball was small, perfect fit for a small child’s hand</td>
</tr>
<tr>
<td>Gifts 3-6</td>
<td>A set of cube, plane, and sphere. The set was made of wood; because at this stage, a child would enjoy the sound of a hard, noisy ball more than a soft ball. The cube is stable while the sphere is easy to roll around. The sphere is a replica of the cube and sphere</td>
</tr>
<tr>
<td>Gifts 7</td>
<td>The cube broken down into smaller pieces. The purpose was to introduce division, and how one thing could be made-up of smaller things. It was for the child to understand the notion of part to whole and part to part. The different sizes of the pieces start the child to think about numbers and forms, getting the child ready for mathematical studies</td>
</tr>
<tr>
<td>Gifts 8-10</td>
<td>A combination of sticks, rings, and points. At this stage, a child is able to make the shapes-out of the shapes he has learned about in the previous gifts with the sticks. The step also contributed to the learning of writing, with the sticks being used to teach the alphabet to the child</td>
</tr>
</tbody>
</table>

---

### Quotes from Theorist

Froebel believed that a child learns by starting their education with learning simple geometric shapes, then having the shapes divided into more complex shapes, differing in shapes and size. Of the gifts: it is clear that the use of such objects may serve as an admirable introduction to mathematical, artistic, and other real...
**Gift 1: Human Scale**

**Cube**
- Small
- Medium
- Large
- Extra Large

**Plan**
- One
- Few
- Many

**Inside Cube (Space)**
- Plan
- Inside Cube (Space)

**Sphere**
- Small
- Medium
- Large
- Extra Large

**Plan**
- One
- Few
- Many

**Inside Sphere (Space)**
- Plan
- Inside Sphere (Space)
GIFT 2: HUMAN SCALE

Divided Cube

Section

Plan

Inside Cube (Space)

Small

Medium

Large

Extra Large

One

Few

Many

Chapter 1: Theorem
Jean Piaget According to Kendra Cherry in “What are Piaget’s Four Stages of Cognition” and the article “Education Theory/Constructivism and Social Constructivism” by UCD, Jean Piaget proposed that learning is a dynamic process comprising successive stages of adaption to reality during which learners actively construct knowledge by creating and testing their own theories of the world. He was one of the first to conclude that children think differently than adults. He created four stages of cognition that start from birth and go into adulthood.

**General Principle**

**Cognitive Development:**

- The 4 Stages of Development in Children:
  - Sensorimotor
  - Pre-operational
  - Concrete Operational
  - Formal Operational

- Dividing the learning development of a child into age groups and their characteristics

**Explanation**

He was one of the first to conclude that children think and learn differently than adults. He divided the development of a child’s brain into four stages, where at each stage, a child learns or develops a new way of learning. The stages help in teaching children by ensuring the child is only taught in ways s/he will understand.

He thought of learning as a dynamic process, where knowledge isn’t forced on the children instead they are encouraged to construct their knowledge by doing and testing “theories.”

- Legitimating a dynamic process
- “Knowledge” wouldn’t be forced on the children
- Symbolic thinking

**Summary**

- 0-2 years old
  - Children know the world through their senses and movements.

- 2-7 years old
  - Development of language and symbolic play
  - Imagination

- 7-11 years old
  - Logical thought exists but the children can’t think in abstract or theoretical ways yet.

- 12+ years old
  - Children start to think in abstract ways and reasoning.

**Explanation**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensorimotor Stage</td>
<td>At this age, a child is only able to understand the world through their senses. They learn about things by touching, smelling, or seeing the objects.</td>
</tr>
<tr>
<td>Pre-operational Stage</td>
<td>During this age period, the ideas of imagination is important. It is how children begin to express their ideas about the world. It is also the age when children can see their own “theories” in the playground where the child has the ability to move around and use their imagination to play.</td>
</tr>
<tr>
<td>Concrete Operational Stage</td>
<td>During this period, the child begins to understand how the world around them works. This is also the stage where the child starts to think of others around him, rather than just what he sees and believes and feels.</td>
</tr>
<tr>
<td>Formal Operational Stage</td>
<td>During this period, the child begins to think in abstract ways and are reason behind everything. They understand more complex subjects and are able to relate what they know to what they see.</td>
</tr>
</tbody>
</table>

**Theory/Constructivism and Social Constructivism**

Jean Piaget proposed that learning is a dynamic process comprising successive stages of adaption to reality during which learners actively construct knowledge by creating and testing their own theories of the world. He was one of the first to conclude that children think differently than adults. He created four stages of cognition that start from birth and go into adulthood.
Simple Elements

- Lines, shapes, angles
- Believed in learning through heart, head, and hand
- Learning through touch, feelings, etc.
- Learning through play
- Learning by touch
- Learning through play

Haptic Learning

- Haptic Play
- Using imagination
- Connecting with nature

Learning through heart, head, and hand

He believed that the more a child played outside, the more a child is able to understand the laws of nature, leading to understanding rules.

Haptic Learning

- Learning by touch
- “Hands-on” learning

Creative activity

- Critical Thinking
- Analysis
- Evaluate

In the spirit of Froebel, Dewey and his followers agreed that children should be permitted to move about in the classroom, learn with their hands as well as their minds, associate freely with their companions, and thus live in a normal school society.

John Dewey rejected the notion that schools should focus on repetitive, rote memorization and proposed a method of 'directed living' - students would engage in real-world, practical workshops in which they would demonstrate their knowledge through creativity and collaboration.

Students should be provided with opportunities to think for themselves and articulate their thoughts.

John Dewey believed children learn better by touching and feeling the objects. He was a strong believer that students need to interact with their surrounding environments.

Students should be provided with opportunities to think for themselves and articulate their thoughts.
Sensorimotor is the first stage of development, according to Piaget. At this stage, the child, age 0-2, uses his senses to touch objects and start to understand them by their shape, texture, material, etc. They understand everything in the simplest forms and terms.

At the preoperational stage, the child, age 2-7, starts developing more aspects of cognition, such as morphology. They start to think in symbols, and use imagination during their activities, such as play.

At the concrete operational stage, the child, age 7-11, starts to think in more complex ways. Using the things he has learned through the previous stages, his cognition is now more developed.

The formal operational stage is the final stage of cognition in a child. The child, age 11-16, starts to think in more ‘dynamic’ ways, associating more advanced terms. The child has now learned to think critically, questioning what the sees or learns.

Pestalozzi, Froebel, and Piaget’s theories focused mainly on the fact that children need to be taught in a simple manner at a young age, then moving to a more complex way of teaching as their cognitions develop. Pestalozzi believed that children should be taught in a simple manner, focusing on practical activities. Froebel believed that children should be taught through play, allowing them to freely express and explore the world with no rules. Piaget believed that children should be taught through the process of discovery, allowing them to understand the world through exploration and critical thinking.

Haptic learning uses the senses, such as touch, smell, and sight, to learn about the objects surrounding the person. By feeling the things around them, the child will be able to easier understand the object and its characteristics and remember it. Haptic learning relies on the senses, such as touch, smell, and sight, to learn about the objects surrounding the person. By feeling the things around them, the child will be able to easier understand the object and its characteristics and remember it.

Critical thinking comes from the development of cognition. Symbolic thinking is part of critical thinking.
Chapter 2: Analysis
Chapter 2: Analysis

2.1 Current Conditions

At the southern border of the United States, thousands of people, men, women, and children of different age groups, travel by foot, bus and boats to reach the border of Mexico and the United States. Because of circumstances in their home countries, such as poverty, war, and even extortion, the people are forced to leave their homes and embark on the long journey from their countries to the United States, hoping for a better future for themselves and their children.

Because of the high number of migrants traveling, there are buses and boats that carry more people than they could hold. On their journey to the United States, the immigrants are forced to walk thousands of miles, cram into buses and boats, to reach their destination. With a high number of the immigrants traveling from Honduras currently, the journey takes over a month (from San Pedro Sula to Tijuana – as shown in fig 4 and fig 5).

According to the data done by the American Civil Liberties Union (ACLU), there are 2,654 children currently separated from their families at the United States Border cities. Out of this number, more than half of the children (64.5%) are boys, with 41.3% being ten years and older.

The number of the children has grown over the past few years; however, the spaces they are being held in has not gotten bigger, which has resulted in thousands of children put together in small cages with no bed, or even privacy. While in these facilities, the children do not get any time outside, with no access to fresh air or natural sun light.

With over high of children being held at facilities in cities at the United States Border, it is important to ensure that these children are getting the care they need, especially in the development of cognition in the child’s life. Without the proper equipment, setting, and activities that encourage cognitive development and critical thinking in children, such as play, the future of the child’s lives could be affected in negative ways. Because of the high number of immigrants, the amount of time these children spend at the facilities has increased. With the increase in time, there needs to be a better way and better place to house the children while they are in the care of the government.

![Fig 3. Overcrowding at the Border Patrol’s McAllen, Texas, Centralized Processing Center](image3)
![Fig 4. A tent city for migrant children in Tornillo, on the Tex- as border.](image4)
![Fig 5. Security personal stand before shoes and toys left at the Tornillo (Texas) Port of Entry where minors crossing the border without proper papers have been housed after being separated from their families](image5)
Fig 4. Length of time it took to complete journey

Fig 5. Number of asylum seekers waiting at the Mexican border to enter the U.S.

Fig 6. Number of children (2,654 total) separated from their parents

Fig 7. Migration Path of the caravan

Fig 8. Destinations of the immigrants

Fig 9. Locations of facilities where children are held

Fig 10. Number of children (2,654 total) separated from their parents

Chapter 2: Analysis

Fig 11. Number of children (2,654 total) separated from their parents

Fig 12. Number of children held at each location

Table:

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Boys</th>
<th>Number of Girls</th>
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<tbody>
<tr>
<td>New York</td>
<td>458</td>
<td>354</td>
</tr>
<tr>
<td>Bronx</td>
<td>354</td>
<td>26</td>
</tr>
<tr>
<td>Irvington</td>
<td>26</td>
<td>18</td>
</tr>
<tr>
<td>Yonkers</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>Ferry</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>Syosset</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>Lincolndale</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Kingston</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>New York</td>
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<td>1</td>
</tr>
<tr>
<td>Rochester</td>
<td>1</td>
<td>1</td>
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Texas:

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Boys</th>
<th>Number of Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brownsville</td>
<td>348</td>
<td>174</td>
</tr>
<tr>
<td>Harlingen</td>
<td>174</td>
<td>65</td>
</tr>
<tr>
<td>San Antonio</td>
<td>163</td>
<td>101</td>
</tr>
<tr>
<td>San Benito</td>
<td>101</td>
<td>63</td>
</tr>
<tr>
<td>Houston</td>
<td>65</td>
<td>63</td>
</tr>
<tr>
<td>Baytown</td>
<td>63</td>
<td>41</td>
</tr>
<tr>
<td>Corpus Christi</td>
<td>41</td>
<td>36</td>
</tr>
<tr>
<td>Raymondville</td>
<td>36</td>
<td>25</td>
</tr>
<tr>
<td>Glendale</td>
<td>25</td>
<td>13</td>
</tr>
<tr>
<td>Oracle</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Queen Creek</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

Arizona:

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Boys</th>
<th>Number of Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoenix</td>
<td>208</td>
<td>84</td>
</tr>
<tr>
<td>Tucson</td>
<td>84</td>
<td>81</td>
</tr>
<tr>
<td>Mesa</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td>Youngtown</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>Glendale</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Oracle</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Queen Creek</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

Florida:

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Boys</th>
<th>Number of Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homestead</td>
<td>145</td>
<td>63</td>
</tr>
<tr>
<td>Opa Locke</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>Miami</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Cutler Bay</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Statistics:

- 617 Boys under 10 (23.2%)
- 416 Girls under 10 (15.7%)
- 1,096 Boys 10 and older (41.3%)
- 525 Girls 10 and older (19.8%)
The dining room requires enough space for a person to be able to move freely throughout the space without running into obstacles. There is a required minimum of 3'0" circulation clearance. The seating clearance between seats and walls is 2'8".

Bedrooms are required to have enough space to allow up to three beds, but no more than three. There is a required diameter of 3'6" in front of the closet for dressing. Each person should have a closet, a bedside table and a bed.

Cubicles used as storage for the children. The height cannot be taller than 4'6", with a foot of depth to allow enough space for the children's things.

Required Spaces:
- Major Entry
- Minor Entry
- Recreational Spaces
- Kitchen
- Dining
- Bedrooms
- Bathroom
- Office

The dining room requires enough space for a person to be able to move freely throughout the space without running into obstacles. There is a required minimum of 3'0" circulation clearance. The seating clearance between seats and walls is 2'8".

The proposed floor plan for a classroom focuses on collaborative space, allowing the children to collaborate with their peers. It also gives space for a dynamic circulation within the classroom.

Bedrooms are required to have enough space to allow up to three beds, but no more than three. There is a required diameter of 3'6" in front of the closet for dressing. Each person should have a closet, a bedside table and a bed.

The proposed floor plan for a classroom focuses on collaborative space, allowing the children to collaborate with their peers. It also gives space for a dynamic circulation within the classroom.

Bedrooms are required to have enough space to allow up to three beds, but no more than three. There is a required diameter of 3'6" in front of the closet for dressing. Each person should have a closet, a bedside table and a bed.
2.2 Precedents

Vittra Telefonplan

Architect: Rosan Bosch
Stockholm, Sweden

Vittra Telefonplan is a school without walls. The school’s design focuses on collaborative spaces where the children are taught different subjects and use different areas but there are no walls acting as boundaries. “Students are taught in groups according to level based on the school’s pedagogical principles of ‘the wateringhole’, ‘the show-off’, ‘the cave’, ‘the campfire’ and ‘the laboratory’.”

The different spaces create boundaries and force a certain movement throughout the space.

Fig 14

Fig 15
The Fuji Kindergarten is another school that does not use walls as boundaries. The school is open, with sliding glass doors only closing during cold weather. The building was designed to “encourage children to play and interact by breaking down the physical barriers found in the typical early childhood educational architecture.”

*Fuji Kindergarten*

*Architect: Tezuka Architects*

*Tokyo, Japan*

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**Fig 17. Light Analysis**

**Fig 18. Green Spaces**

**Fig 19. Exterior vs. Interior**

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Chapter 2: Analysis

Skanderborggade Day Care Centre

Architect: Dorte Mandrup Arkitekter
Copenhagen, Denmark

The Skanderborggade Day Care Centre was designed with focus on outside spaces. The building is divided into three sections for the three age groups using the building.

“The three group rooms are designed to be different in shape and orientation. One group room has direct access to the circular courtyard and the façade facing Skanderborggade. The second has access to the western courtyard and the façade facing Skanderborggade. The third group room has access to the western courtyard and the mapping courtyard.”

Fig 20
Fig 21. Light Analysis
Fig 22. Exterior vs. Interior
Fig 23. Exterior Spaces
2.3 Case studies

Aldo van Eyck’s Orphanage was used as a case study for its program, design, and materiality. Looking at the design of the orphanage, study was done on the formation of spaces, circulation inside the building, and the separation of spaces and its geometries.

The space was then broken down into simple, basic geometries, relating back to Froebel’s Blocks.
Each Children’s area had holes in the ground in their courtyard, which depending on the material inside of it gave the children a different thing to play with. The ones with sand allowed the child to play with sand, and after rain, when the sand turned into mud, the children had a different material to play with.

Each space is formed of different boxes of spaces, contributing together to form a central common area for the child to use and interact with different people.

All diagrams drawn over plans and sections from: https://www.archdaily.com/151566/ad-classics-amsterdam-orphanage-aldo-van-eyck.
Chapter 2: Analysis

Geometry of overall plan

Light wells

Natural Light

All diagrams drawn over plans and sections from: https://www.archdaily.com/151566/ad-classics-amsterdam-orphanage-aldo-van-eyck.
Breaking down the building for each age group, the basic geometries of the buildings were analyzed.

Chapter 2: Analysis

Division of geometry

Subtraction of geometry

Addition of geometry

Monumental Scale

Normal Scale

Extracted Geometries

Breaking down the building for each age group, the basic geometries of the buildings were analyzed.

Breaking down the building for each age group, the basic geometries of the buildings were analyzed.
Chapter 2: Analysis

Repeated Geometries

Color
- Brown (brick)
- Gray (concrete)
- Translucent (glass)

Materials
- Exposed Concrete Cupola
- Precast Concrete Beams
- Glass Blocks
- Brick Masonry

Rules
- Linear pattern of rooms, offset of spaces
- Interlocking of spaces, creating common spaces in-between
- Geometry of rooms, plus the added courtyard for each private room section

From the analysis done on the plans and sections, a set of rules were extracted. The most common rules were the hierarchy, interlocking of spaces, and the addition of a courtyard to each building.

In relation to cognitive development, the materials used in the building along with the main colors are pointed out.

Lion’s Park Playscape is a playground made up of recycled steel tins and tubes. The playscape was analyzed as a case study by breaking down the spaces created by the tins that act as boundaries. With the boundaries in place, the in-between spaces and the movement within those spaces is analyzed.

The space was then broken down into simple, basic geometries, relating back to Froebel’s Blocks.

Lion’s Park Playscape
Architect: Rural Studios
Greensboro, Alabama

Fig 30

Fig 29
Open, "simple" space, no obstacles

All diagrams drawn over plans and sections from: ruralstudio.org/project/lions-park-playscape/
Chapter 2: Analysis

Repeated Geometries

Color
- Primary colors (Pipes)
- Gray (steel)

Materials
- Steel pipes
- Recycled steel drums
- Grass
- Shaw

Similarities in shapes, and the proximity to each other, creating barriers

Similarities in shapes, and the space in between each barrel creating space in between for circulation

From the analysis, a set of rules were extracted. The most common themes were the intersection of spaces and how the tins were assembled in different ways to create boundaries and movement throughout the park. Relating back to materiality and colors used for cognitive development in children, an analysis was also done on the materials and colors used in the playscape.

Fig 31
Fig 32
Fig 33
Fig 34
Chapter 3: Playful Explorations
Using Froebel’s blocks, I created new formations by using different shapes and sizes of the building blocks. The new formations were then analyzed by breaking them down into different categories, analyzing their scales, perception of space, and geometries. These were then rated based on complexity with a set of rules that were extracted from the analysis.

Using the new shape as a base shape, I created new geometries based on the Operative Design book, adding and subtracting volumes from the shapes and creating new spaces and volumes, with different configurations of each.
Chapter 3: Playful Explorations
- Proportions: Higher in vertical than horizontal
- Narrow space
- More movement allowed

ADD:
- Initial Volume

ADD:
- Initial Volume

PROCEDURE
- Orientation Variations

OFFSET
- Intersect

BASE SHAPE

NEW SHAPE IN PLAN

NEW SHAPE IN SECTION

NUMBER OF LAYERS PERCEIVED

SPACE CREATED BY BLOCKS IN PLAN

SPACE CREATED BY WALLS

SCALE IN SECTION TO CHILD

VARIATIONS OF MATERIALS

MOTION WITHIN SPACE

VOLUME

NUMBERS OF LAYERS PERCEIVED

SUN ANALYSIS IN SECTION

Chapter 3: Playful Explorations
- Equal proportions on each side
- Spaces for movement and habitation
- Simple geometries (squares/ Froebel’s Second Gift)
- Interception of spaces

Chapter 3: Playful Explorations

Scale in relation to child

Number of layers perceived

Space created by wall

Movement within space

Blocks in plan

Space created by blocks in plan

New Shape in Plan

Volume

New Shape used in section

Variations of materials

Movement within space

Volume

Sun analysis in section

Chapter 3: Playful Explorations

ADD: DEFINED

PROCEDURE

ORIENTATION

VARIATIONS

ADD: MERGED

PROCEDURE

ORIENTATION

VARIATIONS

DISPLACED

PROCEDURE

ORIENTATION

VARIATIONS

INITIAL VOLUME

ADD:

MERGED

PROCEDURE

ORIENTATION

VARIATIONS

MERGE

BEND

DISPLACED

BASE SHAPE
- Proportions: x * 2x
- Narrow space
- Intersection of spaces results in more complex, with more vertical movement allowed
- Rules:
  - Intersection of spaces
  - 3D geometries used
  - Introduction of angles

NEW SHAPE

ADD:
GENCE

ADD:
BRANCH

ADD:
ROWE

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SCALE IN RELATION TO CHILD

NUMBER OF LAYERS PERCEIVED

SPACE CREATED BY WALLS

MOVEMENT WITHIN SPACE

SPACE CREATED BY BLOCKS IN PLAN

NEW SHAPE IN PLAN

VOLUME

NEW SHAPE USED IN SECTION

NEW SHAPE USED IN SECTION

VARIATIONS OF MATERIALS

VARIATIONS OF SECTION

NEW SHAPE USED IN SECTION

VOL:

SPACE CREATED BY WALLS

NEW SHAPE IN PLAN

VOLUME

CHAPTER 3: PLAYFUL EXPLORATIONS
Chapter 3: Playful Explorations
Living and Learning Center

Using the previously found geometries, the building was designed to include living and educational spaces. The ground floor consists of the main entrance with offices for the staff and a food court, leading to the educational spaces (classrooms) in the back with a playground in the middle. The second through the fourth floor include the living spaces, with different geometries and different configurations of those geometries used to form the floor plans of each floor.
Building 1 - Habitation Space

Starting with the more simple geometry found, the floor plans for Building 1 were designed. Using the established rules, the floor plans consists of the below geometry, with the different configurations for each floor, starting with a more open floor plan and leading to a more complex formation of the geometries. The colors and materials used in the rooms are meant to encourage cognitive development.

Program

Circulation

U-Shape Formation

Private vs. Public

Diagrams

Materials

Concrete Walls

Carpet in Rooms

Glass

Wood Doors

Color

Primary color (White)

Secondary color (Translucent)

Medium (White)

Light (White)

White (Concrete)

Translucent (Glass)

Concrete Walk

Carpet in Rooms

Wood Door

Glass

Chapter 4: Design
Building 2 - Habitation Space

The geometry used for Building 2 consists of more sides and angles. Applying the rules to the floor plan, the geometry is used in different configurations that still allow for the rules to apply. Because of the geometry, each room includes a balcony.

Base Volume

Level 2

Level 3

Level 3

The diagrams show the circulation and the differentiation between private and public areas. The materials used include concrete, glass, and wood, with primary colors for the walls. The balcony is an exterior space that is part of the common areas.
Building 3 - Habitation Space

Building 3’s floor plans use the same rules as the other floors; however, this building’s formation is designed to have the most simple movement in the floor plans, even though the geometry used is the most complex.

Program: U-Shape Formation

Materials:
- Concrete Walls
- Carpet in Rooms
- Wood Doors
- Glass
- Color
  - Primary colors (Walls)
  - White (concrete)
  - Translucent (glass)
Using what was gathered in the analysis and research part, I produced a set of rules that will be incorporated into each floor plan, no matter the geometry. The rules were formed in relation to cognitive development in children. Although there are a set of rules, each floor and building will have a different complexity level because of the geometries, the movement, and the space inside each building. Incorporating different colors and materials also encourage the cognitive development in children.
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