

Article

Children's Perception and Utilization of ECEC Physical Environments

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Abstract: Early childhood education and care (ECEC) institutions play an important role in many young children's lives. Child-oriented research about the role of the physical ECEC environment in children's play is scarce. The present study aims to develop knowledge about what children consider crucial elements in the physical ECEC environment. Seventy-one children (3–6 years old) were interviewed to gain insight into their perspectives on the physical ECEC environment. This study indicates that children desire a physical ECEC environment with various affordances supporting different play possibilities and that the social context influences how children may interact with the physical environment. The design of the physical ECEC environment is crucial to children's everyday play experiences while in care.

Keywords: physical environment; affordances; play; ECEC institutions; children's perspective



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1. Introduction

Early childhood education and care (ECEC) institutions are essential in many young children's everyday lives and represent a significant arena for early development [1]. The quality of an ECEC institution influences children's health and development [2], and the physical environment of ECEC institutions is an important part of the ECEC learning environment. The quality and characteristics of the physical ECEC environment were previously found to influence elements such as children's play, physical activity, involvement, well-being and social interactions [3–9]. As such, developing knowledge about how to best design a child-friendly ECEC environment is of great importance.

Following the growing attention to the impact of the ECEC institution on children and the potential to influence child outcomes, the ECEC learning environment is increasingly studied. Many of these studies are conducted from adult-centric standpoints, where interventions or strategies to boost children's future academic or developmental outcomes are discussed. The present study is affiliated with the perspectives of the sociology of childhood [10], in which childhood itself has an intrinsic value and in which children are seen as active participants worthy of being studied in their own right and as active participants in constructing their own social lives in the society where they live. When trying to design the physical ECEC environment in the best way, the users of the environment, i.e., the children, should have a say and should be listened to. Therefore, a vital aim of this study is to try to capture children's perspectives on the physical environment in ECEC institutions. Such knowledge is needed to design a child-friendly environment that acknowledges children's interests and their right to participate.

Previous studies that have included children's voices in research on the physical play environment have found that children are attentive to the characteristics of the physical environment and especially to the play possibilities therein. In a Norwegian study by Bratterud, et al. [11], children expressed a preference for opportunities for physical and constructive play and indicated that they enjoyed interacting with a variety of materials. Equipment for active play, such as climbing towers, monkey bars, scooters, places for ball

games, and rocks to climb, was also prominent in 5- to 9-year-old drawings of their desired play spaces [12]. Moreover, children expressed through their drawings a desire for more enclosed spaces such as playhouses, natural elements, water and materials that could be used in pretend play [12]. In line with this, Zamani [13] found 4- to 5-year-olds to enjoy playgrounds with places to hide where they could also engage in physical play, dramatic play, and explorative play. The children in Zamani's study also emphasized the role of natural environments and how they enjoyed using natural materials such as sand, dirt, stones and flowers and manufactured loose parts such as toys, ropes, and tires [13]. In a study on 6–11-year-olds' perspectives on public playgrounds in Sweden, Jansson [14] found that children described using playgrounds for placemaking, challenges and manipulation. The children explained how natural elements provided challenging activities such as climbing, possibilities for manipulation with natural materials, and placemaking through building huts and shelters [14]. By studying children's photographs and drawings, Muela, et al. [15] found that children favored environments that provided motor challenges, shelter and hiding places, and possibilities to explore natural materials. These studies indicated that children prefer physical spaces that offer diverse play opportunities, different loose parts, natural elements, challenges to their physical and motor abilities and smaller confined spaces for hiding and shelter. Most previous studies have targeted the outdoor environment, and few studies have addressed the indoor environment. The present study is directed toward both indoor and outdoor environments.

This overview of the literature demonstrates the central role of play in the child-environment relationship from children's perspective. According to Sutton-Smith [16], play is a multifaceted concept, often characterized by having fun, being with friends, choosing freely, pretending, being intrinsically motivated, and being free from outside rules [16]. Children themselves describe playing as voluntary and self-controlled and as a fun, active, spontaneous, free, unlimited, natural, and self-initiated activity [17]. Play has a crucial role in Norwegian ECEC institutions, where this study was conducted. The framework plan for Norwegian ECEC institutions [18] highlights the central role of "free play" in early education. During free play in Norwegian ECEC institutions, children have been found to engage in play types such as functional play (e.g., running, cycling, climbing, tumbling), symbolic play (e.g., role play, pretending, social play) and constructive play (e.g., building, drawing, loose parts play) [19]. A physical environment that provides a variety of play possibilities thus seems to be beneficial for children.

The theory of affordances [20] is the theoretical framework of this study. Affordances are defined as what the environment offers the individual—what it provides or furnishes, either for good or ill [20]. Affordances are closely linked to the characteristics of the environment and the child, the child's previous experience and the behavior of the child. Since affordances include both the environment and the perceiver, affordances are relational, and Heft [21] argued that the interaction between the child and the environment is immediate, as affordances are perceived directly in the activity. The child-environment interaction addressed with the concept of affordances is influenced by the child's characteristics, the physical properties of the environment and the social context where the child is. Kytta [22] divided affordances into three categories of affordances where the first category, the field of promoted action, refers to affordances supported by the social context. This term refers to the affordances that children utilize through encouragement and facilitation from adults and other people around them, as well as the values and norms in the community, society, and culture that they are a part of. The second category, the field of constrained actions, refers to how children's behaviors may be restricted. This term describes how children's possibilities for actions can be influenced by, e.g., adults deciding what is allowed or not allowed or internal and external rules for how to behave in a specific context such as an ECEC. The third category is the field of free action. This term refers to affordances the child discovers independently and sometimes to the surprise of adults. While exploring and utilizing such affordances, the child usually does not know how other people or society will react to his or her discovery (Kytta, 2004). By separating between what children "can"

do and “ought” to do, the significance of sociocultural meaning for intentional human behavior is included in the understanding of affordances (Heft, 2003). Therefore, the social context in the institution may be influential on how children may use the physical ECEC environment.

The aim of this study is to better understand children’s perceptions of the physical ECEC environment. Based on previous studies in the field and the theoretical framework of this study, play is expected to be an essential concept to include in this investigation. Therefore, the research question explored in this study is as follows: What are children’s perspectives on crucial affordances in the physical ECEC environment for play?

2. Materials and Methods

This study was conducted as part of a larger project, EnCompetence, funded by The Research Council of Norway and approved by the Norwegian Social Science Data Services. The project’s main objective was to develop new knowledge that will result in higher competence in planning, designing, and developing ECEC institutions’ physical environments. The primary data collection in this study involved structured video observation of the participating children’s free play. The children were also interviewed about their perspectives on the physical ECEC environment, and the present substudy builds on child interview data.

2.1. Procedure and Sample

To provide a mix of different ECEC institutions in terms of ownership, age, size, location, physical environment and organization of children, eight institutions were included in the study using a purposeful sampling strategy [23]. Two private ECEC owners and one public ECEC owner participated as partners in the project, and three institutions were recruited from each private owner and two from the public owner. Based on written descriptions provided by the owners of eligible institutions with at least 20 children in the targeted age group (3–6 years of age), the researchers in the project selected institutions to ensure a mix of different institutions with varying physical environments. The participating institutions were built between 1989 and 2014 and had between 56 and 117 children enrolled. Three institutions were located in rural areas, three were located in urban areas, and two were found on the ground floor of apartment buildings in the inner city of a large Norwegian city. Further descriptions of the institutions and their physical environments are available in previous publications from the project [4].

Ten children were randomly selected for participation in each of the participating institutions, and five boys and five girls among the children provided written consent from their parents for enrollment in the study. Among the 80 children in the total project sample, nine children declined to be interviewed and did not participate in this substudy. The sample in this study, therefore, consisted of 71 children, 36 girls and 35 boys. The average age was 4.7 years ($SD = 0.6$) at the interview time, and the ages ranged between 3.8 and 5.8 years of age.

The four researchers who conducted the interviews developed together with the project manager a detailed protocol for the semistructured interviews and age-appropriate questions to ensure that children were asked the same questions across the different institutions. The questions used in this article were as follows:

- What do you like to play in the ECEC institution?
- Where do you like to play in the ECEC institution?
- What do you like to play with in the ECEC institution?
- What would you have changed in the ECEC institution (physical environment)?
- Where do you think it is fun to be in the institution?

To keep the conversation flowing and conduct the interviews in a child-friendly way, the interviewing researcher adjusted the wording and order of the questions. Due to the participating children’s range in age, verbal skills and willingness to talk about their play preferences, the length and depth of the interviews varied. Most interviews had a

duration of 10 to 15 min. The shortest interview had a length of 7 min, and the longest was 20 min. The interviews were conducted in September and October 2018. The corresponding author of this paper conducted interviews in four participating institutions, while three other researchers were responsible for interviewing the children in one institution each. The interviews were recorded on digital sound recorders with consent from the children and their guardians. A research assistant transcribed the interviews in Norwegian. The authors of this paper translated the quotes from the interviews presented in this paper from Norwegian to English. The aim was to translate the passages word-for-word. However, some minor adjustments were made in some quotes to keep the interpreted initial meaning.

2.2. Analysis

The first analytical phase involved inductive coding of the raw interview transcripts. This process was inspired by stepwise-deductive induction analysis, as suggested by Tjora [24]. This method of coding is close to the empirical data and often involves using terms of codes that are identical to the words children used in their expressions. The first inductive data coding was conducted in NVivo (1.5.1) and resulted in 137 unique codes. These codes were mainly activities, places, materials, and descriptions of how and with whom children played in the ECEC institutions. Examples of frequently occurring codes were Lego, sandbox, playhouses, building blocks, family play, sliding, climbing, tumbling space, forest, swings, play animals, spade and bucket. Among the 137 initial codes, 63 codes were used more than once. The codes used more than once ranged from being used two times to 31 times. In total, 582 codes were applied in the initial coding, with an average of 8.2 codes used per interviewed child. The number of codes used in each interview ranged from 1 to 24.

Building on the study's theoretical framework, the theory of affordances, and in dialog with the data, the initial codes were grouped into overarching categories. This process was conducted after the complete data material was coded. To increase the coding quality and grouping of codes, the second author of this article reviewed the analysis and provided comments and adjustments to the initial coding and interpretation.

2.3. Ethical Considerations

Since young children were the subjects in this study, special ethical considerations were needed. Written consent to participation was collected from the guardians of the children. In addition, consent to participate was collected from the children themselves. For a young child, fully understanding the abstract ideas and consequences of participation in research is challenging, and power relations between adults and children are important to consider [25]. Child-friendly approaches to provide information about the study, the interview and the voluntary nature of participation were applied. Children were told that we were interested in how they utilized the physical environment for play and that we would like to talk to them about this and record the conversation if this was okay. This process resulted in nine of the 80 children declining to participate in the interview.

Although particular attention to ethical considerations for the inclusion of children in research must be given, such attention should not degrade children as less competent actors whose perspectives are less important to include in research. Children's right to participate in research (and to withdraw) as competent informants is linked to children's rights as human rights [26]. Thus, including children in research that concerns their lives is essential from an ethical perspective, yet special attention to ethical issues must be given.

3. Results

In the interviews, the participating children described a wide range of environmental features that they enjoyed and liked to play with, and they also had thoughts about what could have been better if they were to decide how the physical environment was designed. The overarching categories that were developed based on the initial inductive coding

structure and the presentation of results were affordances for constructing, affordances for pretending and affordances for physical activity.

3.1. *Affordances for Constructing*

Children described how both places and materials available in ECEC institutions provide possibilities for building and how they enjoyed such activities. Many children described building huts, cars, houses or birds' nests by moving elements in the physical environment and creating new subspaces with materials. Such constructions were often temporary places used for a short period, but more permanent projects were also described in the interviews. A four-year-old girl explained how she and other children had been building a hut in the outdoor environment for several days:

Jane: Do you know what we are building on the top of the hill? We are building a wooded hut.

Researcher: Yes, is it fun to build?

Jane: Yes, now we are working on the walls. (. . .) At first, we were using a hammer on the floor with nails.

Researcher: Yes, who punched the nails?

Jane: That was the children.

Children were also building huts indoors. Such activities were often dependent on sufficient space and materials:

Researcher: In what room do you enjoy playing the most?

Simon: The gross motor room, since that is the largest room.

Researcher: The gross motor room?

Simon: Yes

Researcher: Do you like to play there because it is the largest room?

Simon: Yes, since there it is such building blocks.

Researcher: Yes, the large soft ones?

Simon: Yes.

Researcher: What are you doing with them?

Simon: I am building with Andy. (. . .) Huts and such.

As evident in these examples, building was linked to the use of different materials. Children specifically mentioned in the interviews how materials such as Lego, large and small blocks, plastic boxes, puzzles, spades and buckets were enjoyable to play with and how such materials were used for construction. In the interviews, children expressed that the natural environment included several materials that they enjoyed playing with, such as water, soil, mud, stumps and sticks. According to children, both using such materials in play and exploring how they felt and reacted to other materials was exciting. A four-year-old girl described how to make mud and that she tasted it:

Researcher: What are you doing when you play in the playhouse?

Thea: Tasting "klisjklasj" ("Klisjklasj" is a norwegian term for a mudlike substance children create by mixing water with sand or soil.).

Researcher: Do you taste "klisjklasj"? How do you make "klisjklasj" really?

Thea: You need water (. . .) and sand.

Researcher: And then you mix it together?

Thea: Yes.

Several children highlighted materials for arts and crafts as enjoyable elements in the physical environment and how drawing, painting, using scissors, making masks, making jewelry and beading were desirable activities. Often, materials for construction were available at designated places in the ECEC institutions, such as in the sandbox, tables, or indoor rooms established for crafts and construction. Some of the participating institutions had rooms for physical activities and construction with larger magnetic building blocks (30 cm × 30 cm) that many children highlighted as enjoyable in the interviews:

Researcher: What I wondered is where you enjoy playing when you are inside?

Andrew: With magnetic blocks.

Researcher: With magnetic blocks? (. . .) What are you playing with them?

Andrew: Making houses. Different things.

Researcher: Different things. Houses. What other things, then?

Andrew: Castles as well.

The interviewed children clearly enjoyed constructive play with different materials. When children built houses, castles and cars or built with Lego or other construction materials, such play episodes were often described to involve pretending, which is introduced next.

3.2. *Affordances for Pretending*

Children described a variety of enjoyable play episodes where they engaged in different types of pretend play. Pretend play is often a social form of play, and children highlighted how essential other children were for their play activities while in ECEC institutions. When they were asked about what they liked to play within the institutions, many children, such as this four-year-old boy, named other children that they enjoyed playing with:

Researcher: What do you enjoy playing with in the ECEC institution?

Christopher: I like to play with Hans, Lisa and Martin. They are my friends.

Researcher: Yeah, what are you playing then?

Christopher: Family, building blocks and Lego.

Several children mentioned family play as an enjoyable activity that they engaged in. Ava describes how she plays family in the playroom:

Researcher: Where do you think it is the most fun to be in the institution?

Ava: At the playroom.

Researcher: At the playroom. Why is it nice to be in the playroom?

Ava: Because it is plenty of toys there!

Researcher: Yes, what do you play in the playroom?

Ava: Family.

Family play was often linked to specific places in institutions such as family corners, doll corners, car corners, play kitchens, outdoor kitchens, and outdoor playhouses. These places were often equipped with materials that children described as enjoyable to play with while pretending, such as dolls, outfits, blankets, pillows, strollers, play animals, play cars, costumes, dresses and kitchen equipment.

Several children described how having access to many materials was enjoyable. A boy explained that he would have placed a great many toys in the institution if he were to decide, and a girl said her favorite room was the place with many things and many dresses. Affordances provided by such materials and the other children may have inspired play, as this four-year-old boy described related to pretend play with dresses:

Researcher: What did you play before we came in here?

Jack: We played, that we had dresses on.

Researcher: You had dresses on, okay.

Jack: And then we had to kiss each other.

Researcher: Yes, so you had to kiss each other. Was that fun?

Jack: Yes. (. . .) If one gets kissed, then you have to try to kiss two.

The boy described how this play involved running around and chasing each other and kissing other children. Many of the pretend play episodes that children described in the interviews involved physical activity. Play episodes described by the children in the interviews, such as pretending to be lava monsters, Batman, animal catchers, children captured in a labyrinth, monsters, police and robber, pirate, Spiderman or Superman, have clear vigorous and bodily components. Several of these pretend play themes were linked to superheroes and TV shows. Moreover, a five-year-old boy described how they pretended

to play Angry Birds in the outdoor environment, illustrating how applications for phones may also influence children's physical pretend play in ECEC institutions:

Researcher: Where do you feel good in the ECEC institution?

Liam: The swings.

Researcher: The swings. Why is that?

Liam: Because, there, we are playing Angry Birds and so.

Researcher: Are you playing Angry Birds?

Liam: Yes.

Researcher: What are you doing when you are playing Angry Birds?

Liam: We have to hit the king. Then, we have to make a circle. (. . .) Then, we build up high speed on the swing and try to hit him.

Researcher: Mhm, so what are you throwing?

Liam: No, we only hit him. Do not throw anything.

Researcher: Ah, so you are jumping your selves? Are you jumping off the swing?

Liam: On the phone at home, we are sliding it, and it says "Angry Birds"!

Researcher: So if I want to play Angry Birds on the swing, what do I do?

Liam: We have to make a circle, and then you build up speed, high speed. Then, you have to hit him. Afterward, you take a key and unlock only one cage.

This quote also exemplifies how many of the interviewed children retold enjoyable complex pretend play episodes that were closely linked to specific places in the physical environment and how children used a variety of equipment with different intended purposes for pretend play. These latter pretend play episodes were closely linked to bodily play and physical activity. Such affordances are introduced next.

3.3. *Affordances for Physical Activity*

Many of the activities children described to be enjoyable in the interviews were challenging motor activities that involved physical activity and movement. Activities such as balancing, jumping, playing in an obstacle course, running, sliding, play fighting and tumbling are examples of such activities that children specifically mentioned in the interviews. Climbing and cycling were the two activities that most children named. Cycling was carried out in outdoor spaces on tricycles, kick bikes and bicycles, while climbing occurred both indoors and outdoors. The possibilities for challenging climbing were different in the environments of the participating institutions. Among the children with access to forest areas and trees within the outdoor spaces of their institutions, many highlighted the favorable possibilities for climbing in such natural environments. A five-year-old boy in one of the institutions without trees to climb wished there was a higher climbing tower:

Researcher: Would you wish that something was different?

Anthony: Yes.

Researcher: What then?

Anthony: That we had a new climbing tower.

Researcher: A new climbing tower? (. . .) Why do you want a new climbing tower?

Anthony: Because then I could be somewhat higher.

Researcher: Is the one you have too low?

Anthony: I am not afraid of heights. (. . .) I want it to be as high as a mountain.

Additionally, different traditional games with rules, such as "the bear is sleeping", "kick the box", soccer, "red light", hide and seek, and various chase games, all involving physical activity, were highlighted by children in the interviews as enjoyable. Games with rules were commonly carried out in the outdoor environment in open spaces, but chase games also occurred in indoor places such as in the hallways and near cubbies, as described here:

Researcher: Where do you enjoy being in the institution?

Bella: In the hallway.

Researcher: The hallway. Why is it fun to be in the hallway? (. . .) What are you playing in the hallway?

Bella: Actually, we are playing “the bear is sleeping” in the hallway.

Such chase games occurring in hallways and near cubbies may be related to commonly occurring restrictions on such activities in the indoor environment. The hallway may be a place where such activities are allowed and a place where children may play without adults. Several children described how activities involving running and being loud were forbidden by adults. Such rules also seemed to influence where children enjoyed being in the indoor environment. This five-year-old boy gave this as the reason for why he enjoyed being in a specialized room for physical activity:

Samuel: Now I know where I enjoy being the most—the gymnasium.

Researcher: Why is the gymnasium best then?

Samuel: Because we can run around and be wild.

Researcher: So you can run and be wild in the gymnasium?

Samuel: Yes.

Researcher: And you cannot do that here?

Samuel: No, not in the preschool department’s rooms and so.

Researcher: Why can you not do it in the department?

Samuel: I have no idea. Only outside and in the gymnasium.

The child further described how adults could become upset if they ran and that it would be allowed to run indoors if he could decide. A five-year-old girl from another institution described similar restrictions:

Researcher: What do you prefer, being outdoors or indoors?

Ella: It is best outside because then we can run, and indoors we cannot run.

Researcher: Why can you not run indoors?

Ella: Because the adults decide in the institution, and when adults say it is not allowed to run, it is only allowed to run outdoors.

Researcher: Yes. Why do you think they decide that it is not allowed to run indoors?

Ella: Because it is a department where one is supposed to walk and play.

Researcher: Oh, but is it not common to run when one is playing?

Ella: Yes, just do not run in the department.

Researcher: Ah, yes. What happens if you run in the department?

Ella: Then, the adults may be angry with the children. (. . .) And they have to say no.

Strategies to balance adult rules against their desire to be physically active and challenge their physical capabilities were reported by many children, especially related to the indoor environment. This five-year-old boy described how the children used large magnetic building blocks to jump from heights, although the adults did not allow such risky play:

Researcher: Why do you enjoy being in the building room?

Kai: We are making houses. (. . .) And jumping. With two blocks.

Researcher: Why are you jumping with two blocks?

Kai: Because the adults say, (. . .) that we are only allowed to jump from two blocks.

Researcher: What if you were to decide? How high would you have jumped?

Kai: Forty thousand. Forty-nine blocks!

Researcher: Why do you think that you are not allowed to jump from forty-nine blocks?

Kai: It is too high.

Researcher: Why is it too high?

Kai: I don’t know. Maybe I can—perhaps I can hurt myself.

Researcher: Are the adults afraid that you may hurt yourselves?

Kai: Yes. (. . .) But one time, I jumped from great height with David and then Phillip also dared, and Lisa and Sofie. All of them dared.

Researcher: How high did you jump then?

Kai: We jumped the same, from five blocks.

Researcher: Oh, five blocks. Would you say that you jump from more blocks when the adults are not watching?

Kai: Mhm, we are just sneaking. (. . .) And when they are coming, we play that we are jumping from two blocks. Fast.

Researcher: Is it fun to jump from more than two blocks?

Kai: Yes.

Researcher: How does it feel in your body when you are jumping?

Kai: It tickles. (. . .) It tickles in my tummy.

Researcher: It tickles in your tummy? Is that a good feeling?

Kai: Yes. I can feel my heart without holding my hand on it.

In addition to activities and games with rules involving physical activity and enjoyable places for physical activity, the participating children described many different materials that afforded physical activity. In particular, access to bicycles, balls, gymnastics equipment, mats, and larger building blocks was mentioned by several children related to affordances for physical activity.

4. Discussion

This study demonstrates how children want the physical ECEC environment to hold affordances for various play behaviors. Some of the participating children were more directed toward play activities such as constructing, pretending, and arts and craft activities, while others were more attentive to vigorous physical play possibilities. Although there were individual differences in children's play preferences, most children described how they enjoyed various activities, such as building, pretending, being physically active, using natural and manufactured elements, and challenging their physical capabilities. This finding is in line with the findings of children's play preferences by previous studies [11–14] and suggests that ECEC institutions should strive to support a variety of play behaviors.

To provide children with affordances for various play behaviors, having a varied stock of materials is necessary. From the perspective of the theory of affordance, loose parts and materials are essential to enhance the possibilities for play in the ECEC environment. Gibson [20] argued that movable objects afford an extensive range of options for individuals. Materials that children can move and change can be used in various ways, and Heft [21] highlighted that materials that are changeable and moldable, such as sand and water, are popular among children. In line with this, Nicholson [27], in his classical work on the theory of loose parts, argued that children love to interact with materials and that materials are essential for children's play, experimentation, creativity, discovery and enjoyment.

Children in the present study also expressed a desire for sand, water and other natural materials. Moreover, the participating children highlighted smaller construction materials, larger construction materials, toys, cycles, balls and open-ended loose parts. These findings align with previous studies that have included children's perspectives on the physical environment [11,13,15] and underline the essential role of varied materials in ECEC institutions to promote children's play. Several children in the present study also emphasized that the amount of available material is essential to the environment's child-friendliness. As such, ECEC institutions should aim to have a variety of loose parts that children can access themselves in the environments where children play.

Although the present study was focused on the affordances provided by the physical ECEC environment, many children highlighted peers as essential for their play. Other children represent numerous affordances (Gibson, 2014), while they may also inspire and demonstrate how the physical ECEC environment may be used. McLaren, et al. [28] found that children's use of the physical environment was influenced by other children, as children mimicked each other and were triggered by other children's behaviors. The children's perspectives in the interviews demonstrate how other children were essential for play and for sharing experiences while exploring the physical environment's possibilities. ECEC environments should, therefore, be designed to facilitate peer play. This perspective illustrates

the significance of social affordances for children's exploration of affordances in the physical environment and the influence of the social context on child-environment interactions.

Adults in ECEC institutions also represent possible play partners, yet few children in the present study mentioned playing with adults. However, many children described how rules set by adults restricted their use of the physical environment. Similar findings have been reported in previous studies, especially related to the indoor environment. Koch [29] observed several children engaging in joyful and rough play when they were confronted and stopped by an educator. Gubbels, et al. [30] argued that the social environment interacts with the physical environment related to physical activity, as children's physical activity levels were lower when more staff were present in the indoor environment. Similarly, McLaren, Ruddick, Edwards, Zabjek and McKeever [28] found that staff discouraged and prohibited rapid movements in indoor open spaces. Several children in the present study also described how running indoors was not allowed and how adults in the institution stopped risky play. Such restrictions may be considered in conflict with the framework plan for ECEC institutions in Norway [18], where children's need for physical activity and the importance of providing children with physical challenges and risky play are highlighted.

Children's descriptions of how adult rules restrict their use of the physical ECEC environment demonstrate how staff influence children's actualization of affordances through their response to children's behavior. This perspective is linked to the field of restricted behavior described by Kytta [22] and highlights the important role of the social environment in children's play in ECEC institutions. The children in the present study also described how they adjusted their play behavior if adults observed them, indicating that children develop strategies to circumvent adult restrictions. Koch [29] argued that an essential take on children's well-being in ECEC institutions is related to how children together oppose adult rules and norms while maintaining a positive relationship with the staff. These findings suggest that the social context in ECEC institutions is essential for children's use of the physical ECEC environment and that when changing the physical environment for it to become more child-friendly, it is also necessary to adjust the social environment accordingly, especially if the aim is to provide affordances for physical play.

A child-friendly environment is one where children have access to a diverse environment [22,31]. The children's perspectives presented in this study suggest that the available places, materials, other children and adults influence the child-friendliness of the ECEC environment. It is also evident from the interviews that these elements are connected and intertwined. The affordances of materials affect the affordances of play-ground equipment, and vice versa. Moreover, other children's play behavior may influence how materials are used, and rules set by adults may restrict possible affordances of the materials. This interconnectedness exemplifies the complex and context-specific nature of the child-environment relationship and how the physical environment plays an essential role in children's everyday experiences in ECEC institutions.

Limitations

The findings in this study build on interviews with 71 children from eight ECEC institutions in Norway, and limitations to this study exist. The participating institutions were not selected randomly, and the aim of this study was not to provide generalizable findings. Moreover, the culturally situated nature of the child-environment relationship implies that the results of the present study must be transferred to other contexts with caution. Although the main findings in the present study resonate with previous studies from different cultural contexts, taking specific cultural considerations is important before making changes to the physical environment of ECEC institutions. Future studies with cross-cultural perspectives and broader data material would be welcomed to shed light on the degree to which the cultural context influences children's views on a child-friendly ECEC environment.

The children participating in this study were between 3 and 6 years of age, and interviewing children in this age group may be challenging. The researchers conducting

the interviews tried to make the children comfortable, having them talk freely and sincerely about the physical ECEC environment and their play preferences. While many children shared willingly, some were reluctant to share their perspectives, and critical insight might have been missed. Nevertheless, 71 children represent an extensive sample in a qualitatively oriented data collection, and there is reason to believe that both positives and negatives are represented in this study.

One researcher conducted the qualitative analysis of the data, and the background, characteristics, perspectives and previous experiences of this researcher may have influenced the coding and interpretation of the results. This represents a limitation of the study, and having more researchers code the transcripts from the interviews independently of each other could have reduced such possible bias. However, this was not possible within the resources of the present study.

5. Conclusions

Although limitations to the present study exist, the present study has developed much-needed knowledge about children's perceptions on crucial affordances and their utilization of the physical ECEC environment in play. The takeaway point from this child-oriented study is how children desire a physical ECEC environment that holds various affordances supporting a multitude of play possibilities with other children. The participating children highlighted affordances for constructing, pretending and physical activity. In order to provide children with such play opportunities, the ECEC indoor and outdoor environment should entail varied spaces and an abundance of different materials available to children. In a child-friendly environment where children's interests and right to participate are acknowledged, children are enabled to use their ideas and creativity in dialogue with physical environment in play. The staff ought to support children's free exploration of different play behaviours, including play that might be considered risky or noisy from an adult perspective. More child-oriented and research-based knowledge about how to best expand the available affordances of existing ECEC institutions is needed to reap the benefits of a well-designed physical environment for children's everyday experiences in ECEC institutions.

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