



TRULY INCLUSIVE?

The reward of thrill in universal play designs

Observations of usability of playgrounds and play equipment for users with disabilities and their teachers

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Executive summary

Research shows that children with disabilities participate in far less leisure activities outdoors than typically developing children¹. This represents a health risk for the children. However, it also represents an equity and social-emotional risk. Newer research states that cooperative play between children with disabilities and typically developing children support the areas of self-efficiency, tolerance, and empathy of both user groups².

This white paper is about the degree to which non-specialized, age appropriate play equipment and playgrounds can be usable to children with mobility and learning disabilities, as well as typically developing children. The aim is to make playgrounds more inclusive, on an informed level, by drawing upon universal play formulas that unite children in play. Our hope is in this way to create more inclusive, universal play spaces, without posing a disproportionate burden on budgets.

Based on interviews with their teachers and our play observations of 4-6yearold children with disabilities, we conclude that:

Formal, physical play is by far the most occurring and most popular play type

- To be able to use a play activity independently is an important success criteria.
- Being able to access a play unit independently does not mean that play activities can be used independently.

Public inclusive playground

- As for the ramped structure in the public playground, all children can access the elevated level, however, 50% in our observation need assistance to use the egress slide.
- As for the standard post and platform structure in the kindergarten, 66% of the children can access the elevated level, 33% need assistance to use the slide.
- As for the ground level solitary play activities, 50% of the children can access and enter independently, all children can use them independently.

Kindergarten playground

- The kindergarten play equipment is a tool in physiotherapy and embedded teaching.
- The post and platform structure in the kindergarten inspired dramatic play, stimulating cognition and language in 40% of the children.
- The post and platform structure in the kindergarten facilitated social play between children with different disabilities.
- Some children with disabilities will rarely or never be able to undertake physical play independently.

Thrill as a motivator

Physical thrill in play holds a great attraction to the observed children with physical disabilities. The attraction of that thrill made these children take leaps of learning through play, both physically, socially, and cognitively. Our observations indicated, however, that the attraction of spending time with peers might overshadow the thrill of a given physical attraction.

These observations in the majority follow the observations made on typically developing children and play. Good inclusive playgrounds aren't necessarily that much more complicated, time, and space consuming than other playgrounds. They can function as physiotherapy for a wide range of children with physical disabilities. However, they are still highly challenging to all other users as well, as they are designed on universal design principles: usable for all to the widest extent possible.

Universal and inclusive designs include all users, stimulating their need for thrilling play experiences and social interaction.

The KOMPAN Play Institute sincerely wishes to thank the children, teachers, management and parents of the special kindergarten Platanhaven in Odense, Denmark, for all of their playful help for the observations in this white paper.



¹ See among others Perceived barriers and facilitators to participation in physical activity for children with disability: a qualitative study, Nora Shields and Anneliese Synnot, in BMC Pediatr. 2016; 16:9. (Un)limited possibilities?, The physical Activity Report Card, Active Healthy Kids, The Netherlands, May 2017; Children with Disabilities, The State of the Worlds Children, UNICEF 2013

² Jihee Han, Ostrosky, Michaelene M; Diamond, Karen E (2006). Children's Attitudes Towards Peers With Disabilities: Supporting Positive Attitude Development, Young Exceptional Children, Vol. 1, issue 10, 2006, SAGE Journals



Background

Many planners report that creating playgrounds that include users with disabilities is strenuous and expensive: Recommendations and policies for inclusive play are far from consistent. User needs are hard to understand.

Space and budget limitations along with a general insecurity of user abilities are the main obstacles reported when designing inclusive playgrounds. So the mapping of relevant play types and play needs of children with a range of disabilities grows in importance.

Accordingly, the KOMPAN Play Institute has looked into the success criteria of inclusive playgrounds for children with a variety of disabilities and their teachers. We observed the usage of playgrounds and equipment that is highly successful with typically developing children on a group of 3-6yearold children with disabilities. We wanted to see to what extent users with disabilities could use the same equipment as peers without disabilities.

The usability of non-specialized playground solutions

We found that a vast amount of non-specialized equipment matched the need of the vast majority of children with

disabilities. This made us curious as to where the limits of universal play equipment go.

Many freestanding, ground level activities such as spinners, seesaws and hammocks etc. are widely usable to wheelchair using children when assisted into or onto the pieces. These designs hold an attraction that supports play between users with disabilities and typically developing children also. The usability is often most critical in post-and-platform play combinations' elevated level activities.

Based on our research, the most relevant question will be: are there are thrilling activities in the playground for you? The thrill is, in our observations and in the caregiver interviews we made, the reward that makes children surmount obstacles such as climbing tough accesses. The thrill is a shared reward of playground play of both children with disabilities and typically developing children.

On special equipment in playgrounds

Usability and thrill are main success criteria for inclusive playgrounds, however, sharing the thrill with peers is as important. We have observed that even very

popular activities cannot compete with the social action. If the social action is elsewhere, it will attract the interest. It may help explain why, in our observations, much special equipment rest unused.

“ *The underestimation of the abilities of people with disabilities is a major obstacle to their inclusion and to the provision of equal opportunities.*

Some play advocates accuse these play pieces of stigmatizing and excluding users³.

Some special designs even isolate, or literally fence in, users due to safety regulations on the play piece (e.g. fenced motorized swings). The accusation is shared by the caregivers we interviewed. They univocally doubt the general benefit of special equipment that isolate children in wheelchairs from other children. They argue that the social interaction with peers and teachers is a fundamental part of the fun of playgrounds, in the case of for instance swings.

³ In Australia, the debate of the usability of for instance motorized swings in public playgrounds has been quite intense.

Observation fields

The aim of the observations was to observe the play possibilities and possible limitations on inclusive, non-specialized play equipment, and playgrounds developed on the principles of universal design⁴.

To measure the advantages and limitations of play equipment made to ensure high physical, social-emotional, and cognitive play benefits for all children, the KOMPAN Play Institute cooperated with the special education kindergarten, Platanhaven, in Odense.

Platanhaven welcomes 35 children with disabilities aged 3-6 on a daily basis, from 7am to 5pm. The children are not able to attend kindergarten for typically developing children. Most children spend 6-8 hours a day in kindergarten. The staff has a Danish caregiver bach-

elor degree (bachelor in pedagogical studies) with additional schooling in special education. The children are divided into 4 groups, and we observed 1 group.

With the help of the children, teachers and management of Platanhaven, we undertook:

1. 1 observation of the children in free play in a universal design, accessible public playground in Fruens Bøge, Odense (in total 10 children aged 3-6 years).
2. 3 play observations of 5 children aged 4-6 years playing on and around a new post and platform play structure in Platanhaven.
3. 3 post observation individual interviews with 3 trained special needs teachers who work with the children.

As the observations take their starting point in free play, we chose the observed children from the group who voluntarily sought out the test post and platform unit in the kindergarten (real names of children are known to the editor):

Mikkel, 5 years. Uses walkers and leg braces and has limited control of muscles and a learning deficit.

Susan, 5 years. Uses wheelchair and has no control of her leg muscles.

Anna, 5 years. Has a language/speaking learning deficit.

John, 4 years. Has a language/speaking and social-emotional learning deficit.

Kate, 6 years. A solitary observation was made of Kate, who has walking impairments, severe visual impairments, and a learning deficit.



⁴ Universal design: usability to the widest extent possible for all user groups, without the need for adjustments and without posing a disproportionate burden in *The Future of Children*, Vol. 26, No. 2, "Starting Early: Education from Pre Kindergarten to Third Grade", (Fall 2016), pp. 185-205, Princeton University. The authors are program managers in the Center for Learning and Development at SRI International.

Procedure and methodology

Play types and play behaviours

We grouped the play behaviours observed according to the measures described in the Play Observation Scale⁵, dividing them into three categories of social play behaviours and five categories of cognitive play behaviours:

Caregiver support and pedagogical methodology

The caregiver support, we categorized inspired by work made by Kathleen Hebbeker and Dinna Spiker in The Future of Children⁶.

Definitions of social and cognitive play behaviours

Social play behaviours

- **Solitary play:**
The child plays alone, paying little attention to other children.
- **Parallel play:**
The child plays independently, but alongside another child.
- **Group play:**
The child plays with other children.

Cognitive play behaviours

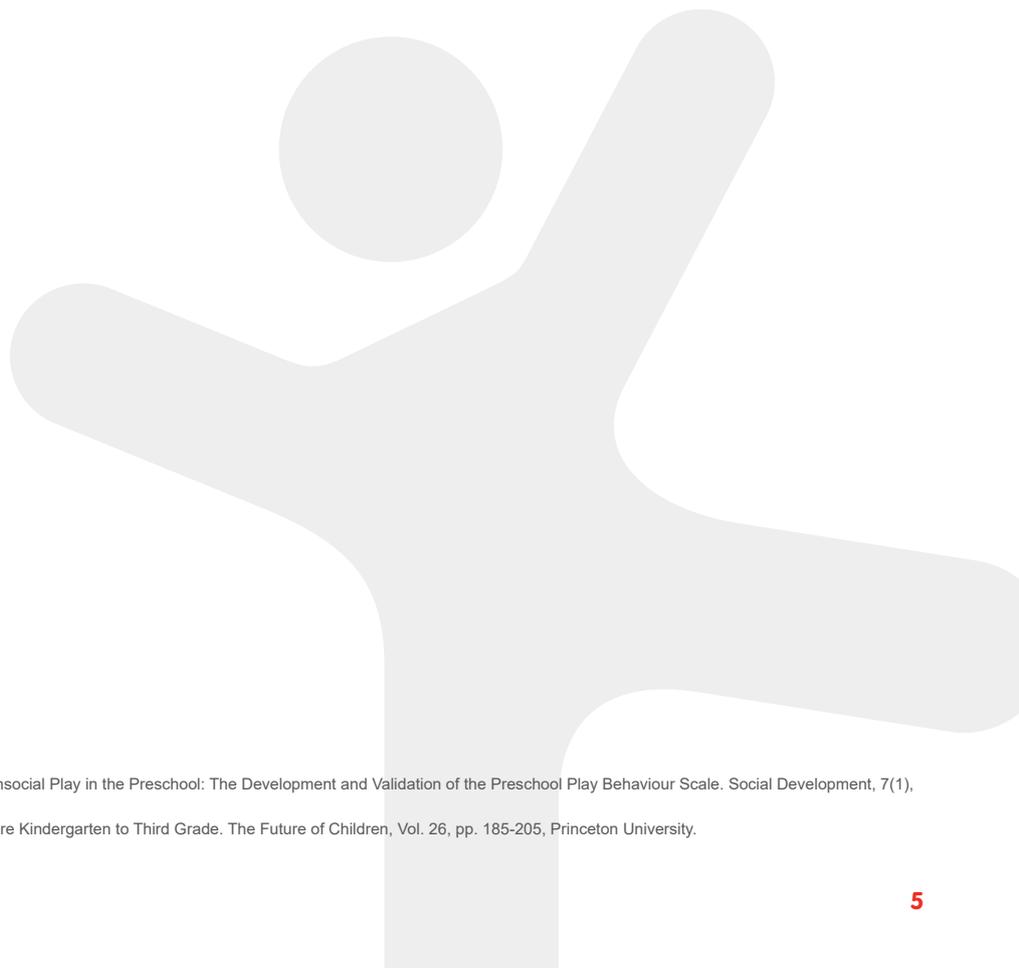
- **Functional play:**
Play which centers around enjoying the physical sensation that a certain activity provides, e.g. sliding.
- **Constructive play:**
Manipulating objects to create something, e.g. building with Lego.
- **Explorative play:**
Focused examination of an object, e.g. examining stones on the ground.
- **Dramatic play:**
Symbolic, pretend play, e.g. playing doctor.
- **Games:**
Playing games that have rules, e.g. hide-and-seek.

Teaching behaviours observed

- Social skills training
- Incidental teaching
- Peer directed interventions
- Embedded instruction
- Naturalistic instruction
- Physical assistance

⁵ Coplan, R. J., & Rubin, K. H. (1998): Exploring and Assessing Nonsocial Play in the Preschool: The Development and Validation of the Preschool Play Behaviour Scale. *Social Development*, 7(1), 72-91. <http://doi.org/10.1111/1467-9507.00052>

⁶ Hebbeker, K. & Spiker, D. (2016): Starting Early: Education from Pre Kindergarten to Third Grade. *The Future of Children*, Vol. 26, pp. 185-205, Princeton University.



Play observation day at an inclusive public playground Fruens Bøge, Odense

The Fruens Bøge inclusive playground has a pour-in-place rubber surfacing and parking/accessible path possibilities nearby, as well as a convenient range of public traffic services. These features support easy access for users with disabilities. Next to the playground, there are tables, benches, bins, and a vast grassy area with trees. The playground is informally, but efficiently fenced with double, low hedges towards the train and road but open towards the forest.

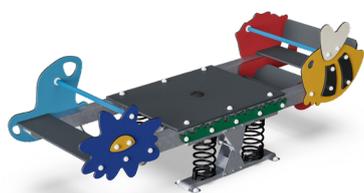
Our play observations from the playground were made with 10 children with a range of cognitive and physical disabilities aged 3-6 years on a rainy day. The children used all play equipment. The moving ground level pieces and the ramp structure were the most popular. In our analysis of the play day, we focus on Mikkel and Susan to monitor the difference in walking impairments and walking disability. The predominant play types observed were functional/physical play and group play. The main teaching behaviour observed was physical assistance.

The entire playground features:

- An entry area with an inclusive ramped play structure with a recommended user age of 2-6 years, but used by children from 1 and up to 8 years.
- An area with a toddler themed piece and a series of single spring equipment and a big Home Seesaw.
- A transition area with spinning equipment:
 - three Spinner Bowls in red-yellow-green.
 - one Supernova, a piece awarded for its inclusive design.
- A teenage area with climbing unit with three spinners.



The ramped KOMPAN-ELEMENTS play structure



Home Seesaw



Spinner Bowls



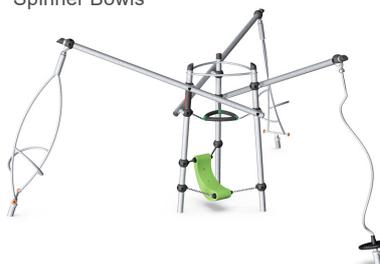
Grazy Gander



Gorilla



Supernova



Music panel



Talk & Tumble

Key findings

The ramped KOMPAN ELEMENTS post and platform structure

Designed as a courtyard layout with three parts forming a U-shape, the structure offers ample opportunities for play, around, under and on the structure. Two children's wheelchairs can pass each other on the ramp. Adult supervision is made easy as there is ample space, a maximum height of 150 cm and many egresses.

The play types we register are mainly functional/physical play. However, social play is happening to a large extent. Focusing on the physical usability of the playground, Susan in her wheelchair and Mikkel with his walker take pleasure in accessing the platform. Susan needs assistance to get into activities, both on ground and elevated level of the playground: even though she can access the ramp independently, she needs assistance to get out of the chair and onto the slide. She manages to slide down the double slide three times with assistance of a caregiver. Mikkel can get to and enter the slide independently, but is hesitant to do so. He also slides without assistance, multiple times.

The solitary play pieces: Spinner Bowls, Crazy Gander and Home Seesaw

The ground level solitary pieces get the most use from the children. This observation is backed by the caregiver interviews. They are mainly used for functional/physical play and group play.

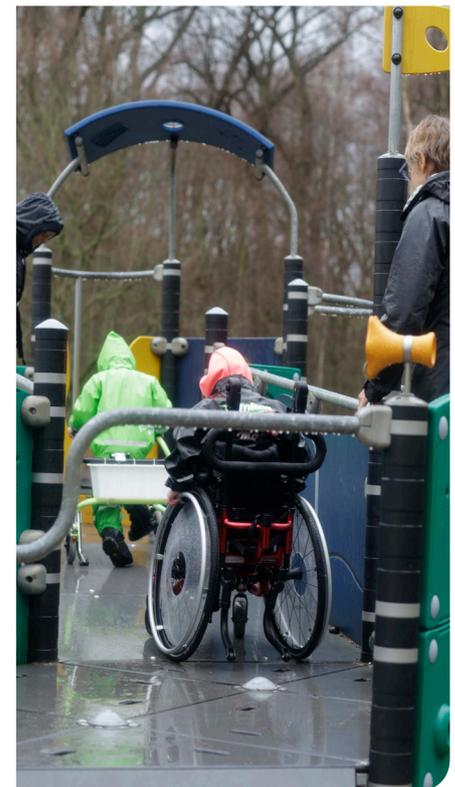
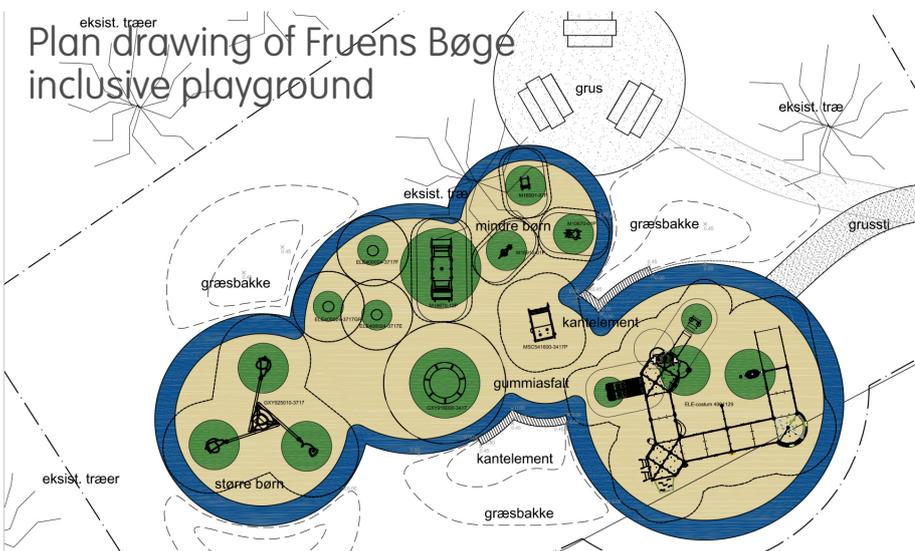
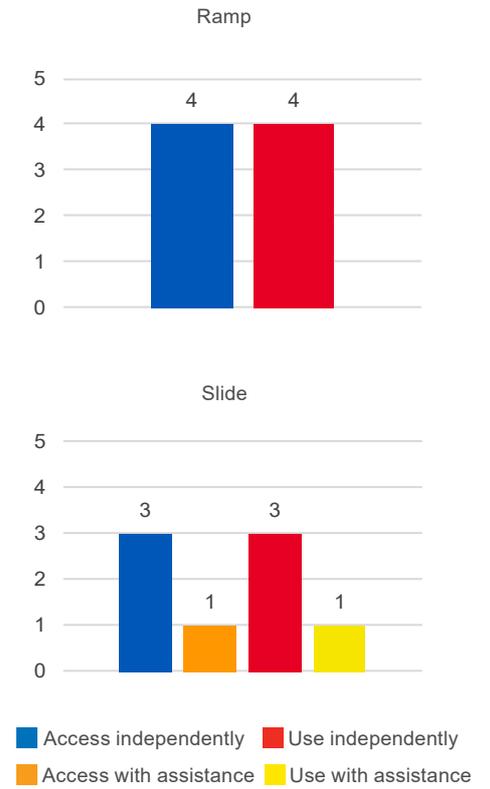
Susan spends the majority of the time playing in the Crazy Gander single springer and the Spinnerbowl. These play pieces she can set into motion independently, once placed in the piece. The Spinner Bowl in this play observation, Susan uses in a longer group play scenario with Anna, 5 years, who is physically typical for her age. The two girls take turns spinning and being spun by the other.

To Mikkel, the Spinner Bowl is appealing also. However, also the Home Seesaw is a huge experience. Mikkel can use both play pieces independently. Mikkel generally spends a lot of time exploring the limits of using his walker on the different surface types in and around the playground: rubber surfacing, grass, and gravel.

The main conclusions of the play day, are that:

- the solitary moving pieces hold great attraction and facilitate physical and social play interaction. In other words, the rocking and spinning offers "reward of thrill". All users with mobility disabilities observed can use these pieces independently and half of the users can access independently.
- the ramped structure holds attraction, while caregivers' assistance is preferred. All users with mobility disabilities can access independently, half of the users can access the slide independently.

Figure 1: Usage of KOMPAN ELEMENTS structure



Play observation days at Plantanhaven

Site and equipment

The playground is parted in two main play areas and laid out on grass and featuring a wide tiled path around and across the area. The most used part of the playground has benches, and the caregivers often supervise or observe play from there. There is a roomy swing area with a basket, a hammock, a standard swing, and a spring seesaw. The bike shelter is placed here, too. This area is dominated by an enormous, special designed ramp which bridges over the tiled bike path and up over a grassy hill, leading to an embankment slide.

The other part of the playground is close to the entrance area and has a grassy area with trampolines, a sandbox, and a very big play house/shop with counters.

The main observation piece for this survey was a standard two-tower KOMPAN MOMENTS post-and-platform structure with a small footprint. The structure

was placed at the fringe of the sandbox and playhouse area, on a grassy field, close to the hedge to the street. The KOMPAN MOMENTS post and platform structure features:

- Side desk at entry stairway with a conveyor belt,
- Low entry stair with wide step up to low tower platform,
- Tower platform side panel with window carvings with leaves,
- Slide,
- Upwards curving bridge with steel fence sides,
- Tower with tactile play panel (graphics and mobile arrow on inside, gearing wheels on outside).

Observation schedules

The duration of the observations had to respect the fact that these children lead quite scheduled kindergarten lives, with busy training schedules. Furthermore, we wanted the children to seek out the equipment voluntarily. No instructions were given as to how to use it or who

should use it.

Three play observations were made in the kindergarten. Susan participated actively on one occasion, Mikkel on two occasions, Anna, and John on all three occasions. We did a solitary play observation of Kate.

In contrast to typically developing children, children with disabilities often have teachers around them at all times. Each caregiver in the case observed had 1-4 children in their group, depending on the disabilities of the children. We informally observed caregiver support and interviewed the teachers on their experiences with the equipment after the observation period.

Play happening on the structure

Over the three observation days it was clear that the functional, physical play, running loops between getting up the stairs, running over the bridge and back, sliding down, crawling under the stairs, running up the slide etc. was dominant. However, social play, explorative play, and dramatic play were occurring in more instances. Even the dramatic play scenarios had a vast amount of physical activity in them.

For the purpose of this white paper, we focus on three children with different degrees of walking disabilities: Kate, Susan and Mikkel.

Mikkel, who uses walkers, is reported by the teachers to use the post and platform unit a lot. On play days, Mikkel will often walk his walker up and down hills or cycle. In the post and platform unit we see him develop from not having the ability to climb up or the courage to slide down, to doing just that in a few days time. On our observation days, he is around the post and platform unit 2 out of 3 days. On the third observation day, he rises at the bridge handholds, encouraged by an adult, and walks over,

assisted to a standing position by the railings. He slides down independently, on his stomach.

Susan, who is in a wheelchair, is reported not to use the post and platform unit much. As for the kindergarten's special unit with a long ramp, she does not use it at all. She mainly spends play days on her cycle. On the third play day, Susan passes by in her wheelchair and looks through the entry platform window. The teacher encourages Mikkel to take a go on the slide. He starts his walker. Susan says: "Me too", and the teacher, wheels Susan to the entry platform, carries her onto the slide. Susan waits at the slide top as the teacher goes around to the slide entry to place Susan's legs properly on the slide and wait for her at the mouth of the slide. Susan is very aware of the camera and the spectating peers and smiles as she goes down.

Kate, who has a walking impairment, limited sight, and learning deficits, enters the structure with the assistance from her caregiver. She walks and scoots the structure with the assistance of the

handrails of the bridge. She explores details primarily with her hands. At the 2nd tower platform she touches and tries out the tactile details. Her caregiver is close to her at all times, communicating with knocking and hoo-hoo sounds. A lot of naturalistic and embedded instruction and physical assistance takes place, the caregiver following Kate from the outside of the structure, contacting her through panel openings and demonstrating functionalities. Kate explores the unit independently on elevated level, scooping back and forth over the bridge, investigating the 2nd tower play panel. After a few hesitant tries, she dares to slide down. She rises with assistance and goes back to the bridge, using the structure as a support for walking. She works her way around the structure and explores it on the outside, stopping at play panels to feel and try out functionalities.

Conclusion of the observations at Plantanhaven

The stairway and the slide were used the majority of the time. The teachers confirmed this in the interviews. The physical progress of Mikkel was remarkable, and the equipment clearly supported play for Kate as well. Susan needed assistance in entering the slide, but could slide with no assistance.

In total, 66% of the users with mobility disabilities observed could access and use the slide independently, all of the children could slide independently and 33% needed assistance for access (Figure 2).

The case of Susan is worth scrutinizing. It is obvious to speculate that her desire to slide was present on the play equipment used by others only: she wanted to slide in the observation unit as well as on the play day intervention in Fruens Bøge. But Susan never used the dominant ramped structure in the kindergarten playground, leading up to a slide. There can be more reasons for this: Susan would need assistance to get into the slide in all cases.

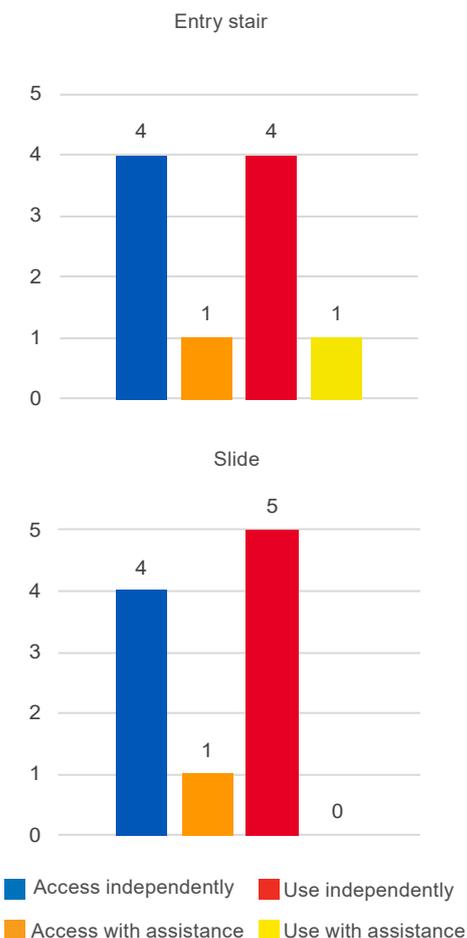
The bridge was very popular, too, which the teachers confirmed in the interviews. The running over, hanging in arms, and jumping, the crawling below and over and the support for walking provided for Mikkel and Kate were strong assets of the bridge.

The bridge additionally made a stage for dramatic play, with Anna acting out scenes from Billy Goat's Gruff and Snow White. The two play panels in the structure, function as play props (apples for Snow White) and story telling boards respectively supported dramatic play. The dramatic play scenarios obviously stimulated the active vocabulary and use of spoken communication in Anna and the active participation of John. The dramatic, language, and social play stimulation of the play panels confirms previous studies on the play value of the structure⁷.

Physical play, social play with group play, and cognitive play with dramatic play were the main play types registered in the observations made. Additionally, mainly with Kate and partly with Anna, John and Mikkel, we observed solitary, explorative play, too. This was mainly centered around the play panels.

The teacher support of play was predominant in the children with physical disabilities, who needed physical assistance. However, embedded instruction and naturalistic instruction as well as incidental teaching the teachers used regularly. We observed mainly the slide and the play panel desk used in embedded instruction, for as well physical activity, dramatic play (Anna and John), and explorative play (Kate).

Figure 2: Usage of KOMPAN MOMENTS structure



Mikkel climbing the slide



Susan sliding



Kate in the play tower



⁷ In Markussen-Brown, J. (2016), Play Value; The influence of playground equipment on preschoolers' play behavior and language use, KOMPAN Play Institute, KOMPAN A/S

Teacher interviews

We interviewed the three main teachers of the children observed. It was obvious that their playground, although mainly featuring standard equipment, was a therapeutic tool in their work. One caregiver stated that what they used to do in the physiotherapy facility indoors in the old days, in the playground the children did the same movements voluntarily and independently. She stated that “The play equipment makes physiotherapy fun and voluntary”.

“*The playground makes physiotherapy fun and voluntary*”
- Teacher interview

There was a common agreement among the teachers that the KOMPAN post and platform structure supported physical as well as spoken interaction and assistance. The structure also allowed the teachers to step back and let the children play independently. The

transparency and low height of the play structure eased informal observation as well as guided and instructed play. The fact that the unit is small in footprint, the teachers saw as an advantage: they reported that the children could oversee the structure. The social interaction was more physical and the consideration of others necessary on for instance the narrow bridge. They emphasized that conflicts did not occur, but children avoided or solved conflicts themselves while playing.

The teachers all commented on the progress and persistence of the children in play. They were positively surprised by the progress in play of Anna and Mikkel in particular. Mikkel, they reported, took great joy in playing in the structure also on his own, and Anna invented a series of dramatic play scenarios that all activated vocabulary not previously observed by the teachers.

Teachers registrations of desirable play support and play experiences

Physical play:

- Thrill
- Independence
- Persistence

Social play:

- Group play: turn taking
- Solitary play: independence

Cognitive play:

- Role play
- Language (naming, reporting, explaining)

Conclusion of the teacher interviews

All three teachers emphasized the importance of the following points:

- Physical play is by far the most popular among the children, preferably responsive physical play items (like spring seesaws, spinners etc.).
- The children will go a long way to experience “thrills”, like sliding, swinging, being up high.
- The children should be able to undertake activities independently as much as possible, without adult assistance.
- Adults can help children onto things they can then do independently as many children would not be able to do any activities without being assisted onto equipment without missing out on the inclusivity or social interaction of play.
- The social-emotional dimension of play is important. The children also need places to retract to, in small groups or individually, like play houses and sand boxes.

The social contact, in for instance pushing a swing for a child, is important, and there is a common resistance to for instance motorized swings (“We used to have one, but it rusted. We never used it.”)

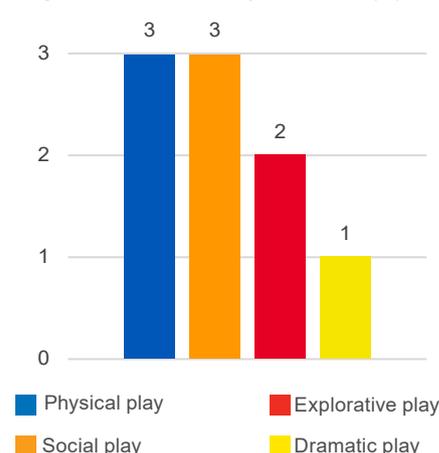
The three teachers univocally stated that the kindergarten’s huge, special-designed hill with a wide track up to a slide saw extremely limited use.

There can be many reasons for the limited use. In our observations it was remarkable that no children used the special design on the occasions when we visited, even though it was placed centrally in the playground, next to the benches and tables that the teachers used for outdoor breaks. It can be speculated, based on the observations on the smaller post and platform structures, that proximity may be important: it may feel isolated to be on the top of the hill alone.

The teachers highlight the following pieces of equipment as especially usable to children who cannot get out of their wheelchairs independently:

- The Spinner Bowls,
- The spring equipment with back and leg/calf support (Crazy Gander/ Home Seesaw),
- The ELEMENTS ramped unit to go up and down.

Figure 3: Teachers rating: relevant play types



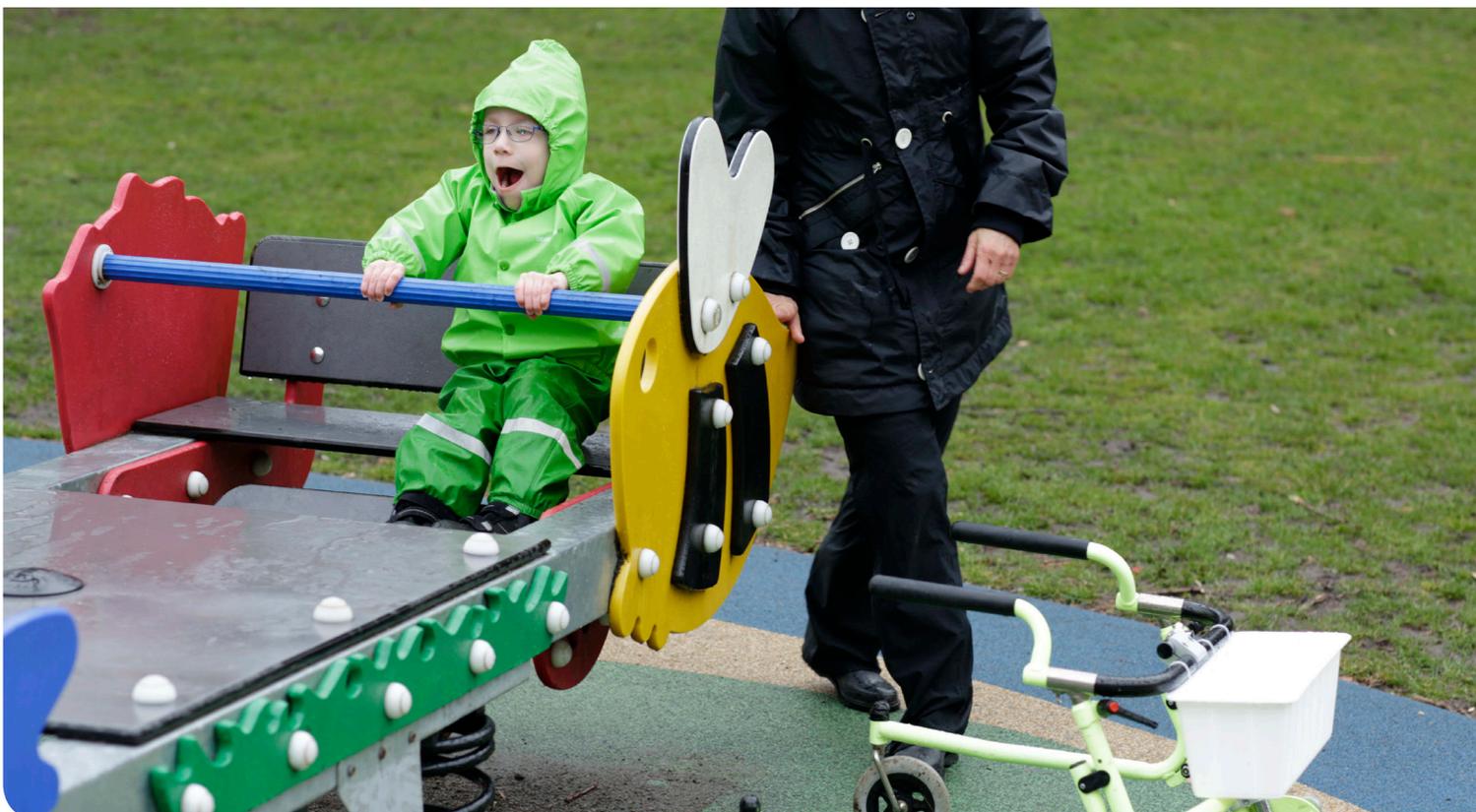
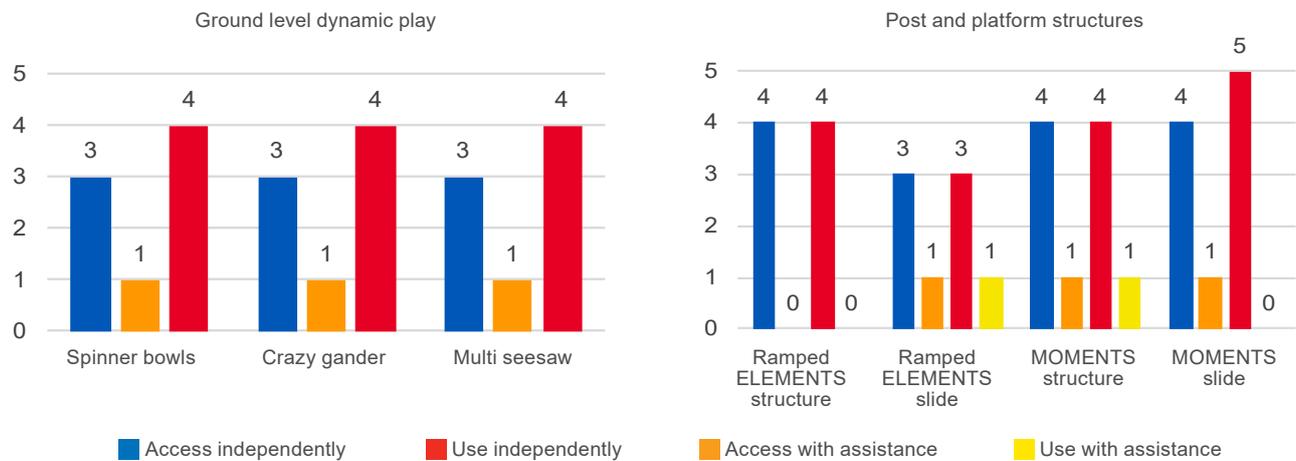
Conclusion on the three observations

Good inclusive playgrounds aren't necessarily that much more complicated, time and space consuming than other playgrounds. They can function as physiotherapy for a wide range of children with physical impairments. However, they are still highly thrilling to all other users as well, as they are designed on universal design principles: usable for all to the widest extent possible. This supports inclusive play: that all children can play together.

As for the ramped structure investigated in the public playground, all children can access elevated level, however, half need assistance to use the egress slide. As for the standard structure observed in the kindergarten playground, 66% of the children can access elevated level, 33% need assistance to use the slide. As for the ground level solitary play activities, half the children can access and enter independently, all children can use them independently.

When we look at the caregivers' rating of relevance for the children of the different play types, the solitary play pieces may offer the biggest thrill. The social play around them is easy, and some, like the seesaw, facilitate more users at the same time.

Figure 4: Number of children who can access and use play equipment





Children of all ages and abilities have a right to play. This right is stated in two United Nations conventions, as play is fundamental to all children's health, well-being, learning and social inclusion. Play is the way children learn and interact, the way they get to understand themselves as valuable and welcome in the community.

A good KOMPAN playground motivates all and excludes no-one. A good KOMPAN playground is inclusive. It is designed with universal design principles. Universal design means meeting the needs of all without creating too specialized solutions. At KOMPAN we believe that this approach welcomes all and segregates no-one.

Universal design was always the way of KOMPAN design. We stick to universal design, as this has proven beneficial to users as an including way to provide play. In an inclusive KOMPAN playground everyone can play together or play with something.



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