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Usability of playgrounds for children with different abilities

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ABSTRACT: *The aim of the present study was to better understand how children with different abilities use playgrounds to engage in creative play and interact socially with their peers. Twenty children aged between 7 and 12 years, with different abilities, participated in interviews. The findings showed that playgrounds served as a reference point for all the children, they challenged a child's physical abilities and provided opportunities for role-playing and social interactions. However, for children with disabilities, playgrounds had limited accessibility, usability and did not support interaction with peers. A methodological limitation of the study was that the interviewer only met the children once. Further research should be carried out to investigate if creating playgrounds according to universal design principles and adapting them to the needs of children with disabilities would improve social interactions and provide more opportunities for play. Copyright © 2007 John Wiley & Sons, Ltd.*

Key words: paediatric occupational therapy, playground accessibility, universal design

Introduction

Play is essential to a child's development; it is regarded as an all-encompassing activity that helps to develop different skills such as social, intellectual, emotional and physical abilities (CAOT, 1996; Rodger and Ziviani 1999; Stagnetti, 2004). Playgrounds are designed especially for children, to play in, and they provide children with opportunities for both physical and social activities. In a playground, children's awareness of their environment is developed, and while playing, children can learn social norms and values (CAOT, 1996; Stagnetti, 2004).

For children with disabilities these skills are important for their development; however, the physical environment of a playground can be difficult to master and thereby be an obstacle for participating in play activities (Tamm and Skär, 2000). Ground cover and play equipment are important factors to consider when planning or modifying playgrounds, in order to provide easy access and inde-

pendence for children with mobility limitations (Prellwitz and Tamm, 1999; Stout, 1988). For children with sensory limitations, play with sand, water and noise-makers has been suggested by Stout (1988). Occupational therapists could provide perspectives on playground design and equipment so as to develop playgrounds for children with and without disabilities (Stout, 1988). However, more information is needed about subjective experiences to better understand what makes playgrounds usable.

Policies – both international (UN, 1993) and Swedish (SOU 1997) – advocate children's rights in society. Sweden's National Action Plan on Handicap Politics proposes that all of Sweden should be accessible by the year 2010 (Regeringspropositionen, 1999/2000). In addition, in Sweden, since 1987, there has been a law stating that public places, including playgrounds, should be usable for people with disabilities (Plan-och bygglagen, 1987). In the USA the Americans with Disabilities Act (ADA, 2000) prohibits discrimination on the basis of disability in facilities such as playgrounds, and a national building code regarding play areas was developed in the year 2000. This code requires playground builders to plan for universal accessibility. In addition, accessibility should also include opportunities for children to engage in creative play in playgrounds while they are interacting with their peers (Hendy, 2001; Malkusak et al., 2002).

From the child's perspective, what types of play activities do today's playgrounds support and what is lacking? Listening to children with disabilities can help when designing playgrounds that are universally accessible and which promote social interaction.

In recent years occupational therapy research has focused not only on an environment's accessibility but also on its usability. The concept of usability implies that a person should be able to move around, be in and use the environment on equal terms with others (Iwarsson and Ståhl, 2003; Carlsson, 2004; Fänge and Iwarsson, 2005). Usability takes into account users' subjective evaluation of effectiveness, efficiency and satisfaction when performing an activity. According to the definition of usability by Iwarsson and Ståhl (2003), the concept consists of three components: person (P); environment (E); and activity (A), that is, activity performance is a transaction between these three (P–E–A). The P component in the present study refers to children with and without disabilities. The E component refers to playgrounds and the A component refers to play activities on the playground. Another focus in recent years, both within occupational therapy and in relation to the concept of usability, is 'universal design'. This focus supports the need for usability by designing products and environments that are usable by all people without specialized design, which may be stigmatizing (Ringaert, 2002). Universal design is a design approach that assumes that the range of people's abilities is ordinary, not out of the ordinary (Ostroff, 2001). A well-designed playground using the principals of universal design can provide physical and social settings so that children with disabilities become part of the overall play experience (Goltsman, 2001). By gaining knowl-

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edge about playgrounds and the activities that are important to them from children we will increase our knowledge and increase the usability of playgrounds. The aim of the present study was to better understand how children with different abilities use playgrounds.

Method

Study design

A descriptive study design was chosen to elicit children's attitudes and thoughts about playgrounds. The method selected for analysing the children's experiences was content analysis, a method which elicits meanings and insights from the words of the respondents and identifies patterns in data (Appleton, 1995).

Participants

Twenty children (9 girls and 11 boys; age range 7–12 years, mean age 9.4 years, standard deviation (SD) 1.67 years), with different abilities, participated in the study. There were five children with restricted mobility, five children with severe visual impairment, five children with moderate developmental disabilities and five children without disabilities. All the children included in the study had good communicative abilities and the children with restricted mobility used assistive devices.

Procedure

The children with restricted mobility and developmental disabilities were selected with the assistance of two occupational therapists and psychologists from two children's rehabilitation clinics in northern Sweden. Letters were sent to their parents requesting permission for the children to participate in the study. After consent was given a suitable time was arranged for an interview with child. The ethics committee at Umeå University, Sweden, approved the study.

Data collection

Data were collected by the first author through an interview guide, together with an outline of topics to be covered (Kvale, 1996). The first question was a broad one, asking the children to describe what they thought when they heard the word 'playground'. After that, the interview focused on topics such as 'Tell me about the playground at your school, what do you do on playgrounds, and with whom?' and 'What would you like to do at the playground that you cannot do today?' The interviews were tape-recorded and took place in the child's home or school, they lasted between 20 and 45 minutes.

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Data analysis

Content analysis, by Catanzaro (1988), was used to analyse the interviews. The interviews were tape-recorded then transcribed verbatim. The transcripts were read through several times. The first step was to divide the text into meaning units. In content analysis a meaning unit comprise a sentence or a paragraph which contains some understanding that the investigator needs, and a new meaning unit starts when there is a change in content or meaning in the text. The meaning units were identified, coded and then clustered through a process of comparison. The clustered meaning units were then condensed in order to make the text shorter but retain its core message. The text and the codes were read again and new codes with interpretations of the underlying meaning were generated. These codes were then sorted into different categories (cf. Catanzaro, 1988). After that, two different categories were formulated. Both authors discussed the two categories and identified sub-categories. To validate the categories and the sub-categories both authors returned to the data and read through the text once again to confirm the content of the formed categories.

Results

The analysis resulted in two categories with seven sub-categories (Table 1). The first category describes similarities in the children's experiences, regardless of their abilities. The second category describes the differences in experiences the children had.

Despite ability differences, playgrounds offer similar experiences

The children described many similar experiences of activities that take place on the playground. What differed between the children was the intensity and frequency of use of the playground, which depended on the children's abilities and the accessibility of the playground.

TABLE 1: Overview of categories and sub-categories which were constructed from the analysis of the interviews with children

Categories	Sub-categories
Despite ability differences, playgrounds offer similar experiences	A place everybody knows
	A place for private conversations
	Challenges for everybody
	Play equipment with a recognizable design
Dissimilar experiences as a consequence of the usability of playgrounds	A place to be with friends
	Playing games or sitting on the swing
	The design hinders play activities

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A place everybody knows

One similarity of the children's experience of playgrounds was that all the children described their playground to be a place they knew very well and would miss if it did not exist. The children could describe in detail both the playground at their school and the playground closest to their home; this was regardless of whether or not they could use the playground. The children also stated that they used the playground as a reference point, the place you went to outdoors in your free time or the place where games started or ended, and, for some, it was a place to meet up with friends. The swings were described as the centre of the playground, a place for social gatherings or a place where it was OK to just sit when the children were by themselves. The swings were also described as the most important and usable play equipment, and for the children with disabilities, the most wished-for place to be in the playground. If most of the playground was difficult to get to, the swings were worth the effort to try and reach them.

Changes in their playground were also something all the children had experienced: most of the time the children explained that these changes had made the playground less usable. Some children claimed that all the 'fun stuff' had been removed. Their experiences expressed a sadness that 'their' playground was gone, changed or that it was in need of repair. One child said, 'I loved the little house, I had fun there, I don't understand why they had to take it away' and another, 'I had fun there until they took all the things away.' The children also described that these changes had happened without them understanding why.

A place for private conversations

Another finding was that the children described the playground as a usable place for privacy, away from adults, together with friends. Here, somewhere in a private corner – on the swing, on top of the jungle gym or on a bench – private conversations took place. For the children with disabilities this was mostly expressed as a wish or as something that had happened once or twice, but it was something they remembered as significant. This 'sitting around talking' was perhaps the most important activity on the playground, and all the children expressed that these conversations should take place where there were no adults present. The children also expressed wishes for benches, houses and other equipment at the playground that would support this activity. One of the children said, 'I can crawl to the swing and then we can sit and talk; we don't play anything we just talk about different things.'

Challenges for everybody

The playground was, according to the children's experiences, a place for activities that posed some sort of challenge. However, the kinds of challenges they described

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were different depending on the children's abilities. For example, a challenge for the children without disabilities could be to perform activities that were forbidden by the adults, such as hanging upside down or sitting on the highest point on the jungle gym. One child stated, 'Almost everybody tries to hang by the knees. I know we are not supposed to, but it is fun and scary. I like to see my feet and say "Hi feet"'. To reach the highest point on the jungle gym or the roof of a playhouse, both children with and without disabilities mentioned as a challenge – either something they did or something they wished to do. For the children with disabilities other challenges were described, for example trying to use play equipment never tried before or to do an activity on the playground without an adult there to assist them. This was expressed in the following ways, 'I tried to climb up the slide, it's hard but its fun, I can do it all by myself' and 'I have a slide by my house I can play there without my mother being there.'

Play equipment with a recognizable design are more usable

Another experience that was similar between all the children was that some playground equipment promoted role-playing on the playground. According to the children, these role-playing activities were usually created around play equipment with a recognizable design, that is, things shaped like a house, a car, a boat or an animal. The playhouse produced a number of activities, such as playing 'store', 'school' or 'family'. The playhouse could also serve as a jail or a place where the witch or monster lived. Most of the children expressed a wish for these kinds of play equipment since, according to them, very few playgrounds had them. Play equipment shaped in other recognizable designs produced role-playing activities as well. One child said, 'I wish for a roof and a house and a store and a car. I play with my friend until dark' and another, 'I wish they would get rid of the old swings and the jungle gym, I want a playhouse where I can play, hospital, bank, bakery, café, bowling ally, florist, hockey rink and I want a new basketball hoop.' The activities that these designs generated seemed to hold the children's interest for a longer period of time than the jungle gyms and slides.

Dissimilar experiences as a consequence of the usability of playgrounds

The children's descriptions of dissimilarities in playground usability, attributed to the environment and the children's different abilities, were also evident. These findings showed that, compared with children without disabilities, children with disabilities lacked a number of opportunities to use this environment and if they could use it they were not on equal terms with others.

A place to be with friends

The children without disabilities experienced the playground as a meeting place; this was, according to them, a place were you never played alone. If you

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came to a playground by yourself you either waited for your friends to arrive or you made new friends with the children who were already at the playground. The experience of the children with disabilities was different: they were seldom with friends at the playground. One child said, 'Once I was with a friend at the playground, we sat on the swings, but it was only once.' None of the children with disabilities mentioned ever making new friends at the playground.

For the children with disabilities the school playground was difficult to use and they rarely got help from adults, whereas at the playground by their home an adult was necessary if they were to use the playground at all. A visually impaired child said, 'I'm always with an adult, I wish I could sit on the swings with the others.' The experience of the children without disabilities was that they rarely had an adult with them. If they did the adult would never participate in playing, they would only sit on the park bench and watch.

Playing games or sitting on the swing

One of the dissimilarities between the children with and without disabilities was in their description of their play activities and how they used the playground equipment. According to the children without disabilities, play activities in the playground had names, usually involved other children and they used the playground equipment in many different ways. For example, the slide was a mountain to climb where the camp was underneath or the swing could be a boat that carried them over the ocean. One child expressed it this way, 'On the big slide we play crocodile, you try to climb up but the crocodile pulls you down.' The children with disabilities, on the other hand, did not describe these kinds of play activities; their play activities had no names and, for example, the slide was something you climbed up and went down or the swing was something you sat on. One child with restricted mobility said, 'I sit in the sandbox or I sit on the swing.' These descriptions lacked interactions with others.

The design hinders play activities

The usability of playgrounds, according to the children with disabilities, depended on their design. For the children with restricted mobility, sand was their biggest obstacle, but they also stated that the playground equipment was too small for them to manoeuvre around if they had some sort of mobility device. For example, if the child could enter the playhouse using a wheelchair they could not turn the wheelchair around inside the playhouse and therefore had a difficult time getting out again: 'I wish for a path made of wood so that I could use my wheelchair and that things was sort of bigger.' Their experience was that the playground was a place they did not visit much. According to these children, the playground equipment was only for smaller children, 'It's mostly little kids there, I don't know why I'm not there, it's really not a problem I can get in with the wheelchair to the playground I just have to toil and moil (work

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hard).' For the children with visual impairments the grey wood which playground equipment is often constructed from made it difficult for them to see stairs and barriers. They also wished for playgrounds to be closer to the school building so it would be easier to find them and also it would be easier for them to know if the other children were there. The experience of the children with developmental disabilities experiences was that a lot of the playground equipment was complicated to understand, for example it was hard to understand where to start and how to use large, multi-functional jungle gyms with slides and ropes to climb. Swings and other equipment that was for sitting on were often too small for them. Both the children with visual impairments and those with developmental disabilities expressed that they did not want to try some playground equipment when other children were present because they were afraid they would not use the equipment the right way and would be teased by the other children. Instead, they would sit and wait until they were by themselves and then try. The children without disabilities never mentioned any problems with playground equipment. Their experiences of playgrounds were that this was their place and they spent a lot of time there.

Discussion

The aim of the present study was to better understand how children with different abilities experience usability in playgrounds. In the study it was evident that all the children, regardless of their abilities, had experienced playgrounds and that they were a special place they did not want to be without. The most important function the playground had, according to the children, was to offer social interaction with peers. They were also seen as an important place to have private conversations, meet friends or make new friends. The findings also showed that, regardless of the children's abilities, there were many similar experiences of the activities that took place in playgrounds. When integrating the P, E and A components, according to the Iwarsson and Ståhl (2003) definition of usability, the results showed that the P component (the functional capacity of the children) was quite heterogeneous and that the E component (the playgrounds) was quite different, while the A component (play) had several similarities. To focus an enquiry on the A component seemed, in this case, to add to our understanding of usability.

The results also showed that all the children, regardless of ability, sought challenges or risks on some level. According to Rodgers and Ziviani (1999), experience of challenges, disappointments and failures are common human experiences which can be experienced in a supportive play environment. Often, children with disabilities are overprotected by well-meaning parents and caretakers. According to Mårtensson (2004) the jungle gyms with several climbing functions are one attempt to meet children's needs for challenges; however, children are capable of creating their own challenges, with a diversity of experi-

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ences where the challenge was more on a mental level. Therefore can today's modern playgrounds, built on small areas with one or two large multi-functional jungle gyms, seem boring to children and make them look for challenges elsewhere (O'Brien and Smith, 2002; Mårtensson, 2004; Solomon, 2005). In the present study, children looked for challenges but none of them wished for large multi-functional jungle gyms; instead, all the children wished for more recognizable things or 'real things', meaning houses, cars and boats. According to Mårtensson (2004), it is around these 'real things' that play on a more mental level, such as fantasy play and role-playing, has a tendency to take place. Creating playgrounds that have more 'real things' which promote fantasy and role-playing might also encourage more social interaction between children.

Play activities on the playground were described by the children in the present study in two different ways. These two different ways could be illustrated by two core concepts in occupational therapy: activity and occupation (Golladge, 1998; AOTA, 2002; Royeen, 2002). The children without disabilities described most of their play activities on the playground as an occupation, that is, activities that had a unique meaning and a purpose. This occupation was central to their competence, and the occupation play influenced how they spent their time and made decisions on the playground. The children with disabilities, on the other hand, described most of their play as an activity, for example the goal was to sit on the swing or go down the slide, and the children's experiences did not describe a unique meaning or purpose. The only time they described their play activities more like an occupation was when they played on equipment with a recognizable design. Their descriptions did not, for the most part, reflect the complexity that is play, the imaginary world that children create while interacting with their peers. Therefore, instead of concentrating only on playground equipment, measurements and meeting accessibility standards, it is important to focus on designing opportunities for interaction. In the concept of universal design the value of standards and rules is recognized; however, compliance to these alone does not guarantee accessibility for all. Instead, universal design focuses on the inter-relationship between the physical environment and the user, with emphasis on social inclusion (Ostroff, 2001). Examples of universally designed objects, pedestrian crossings and residential environments, have proved to be useful for everybody not just for people with disabilities. Playgrounds should incorporate universal design principles so that children with different abilities can fully enjoy and participate in outdoor play activities.

In the past, within occupational therapy, play has been used mainly as a tool to reach therapeutic goals. However, in recent years, play has started to be seen as a need-fulfilling and appropriate occupation in the life of all children, and occupational therapists are starting to promote play as an occupation in itself (CAOT, 1996). Focusing on usability in playgrounds will attract attention to a problem at a societal level; doing this demands knowledge about the

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functional limitations of the target group, about accessibility of the environment, but, perhaps most of all, the subjective evaluation of the target group of the activities that are to be performed in the specific environment. When the focus is on a societal level the concept of universal design should also be addressed. Having knowledge about how to integrate the needs and abilities of all children, together with occupational therapists' knowledge about play as an activity and the of concept universal design, we should be able to provide support when creating universally designed playgrounds, an environment which supports a range of mental and physical challenges, promoting interaction and communication, and giving children a choice of challenges (Goltsman, 2001; Ringaert, 2002).

Methodological consideration

The strength of the present study lies in the insider perspective of children's experience of playgrounds. Strategies used to enhance the credibility of the study were used in the interview process to reframe and repeat questions asked during the interview and the interviewer having had experience in interviewing children. The use of citations from the interview text was also a strategy to enhance credibility. To enhance dependability and confirmability, the methods of data collection and analysis were described in detail and the analysis was done separately by the two authors. One limitation might be that the interviewer only met the children once, and thus could not detect any possible misinformation in the children's answers (Lincoln and Guba, 1985).

Conclusion

The results from the present study indicate that playgrounds are important environments for all children, regardless of their abilities, but they are not accessible and usable for all. The results also indicate that playgrounds do not fully support play activities for children with disabilities. This, in turn, might affect their opportunities to play and interact with their peers. However, a new approach to designing playgrounds is to consider the activities that children undertake on playgrounds. The playground should not only be a place for physical play activities, but should be a meeting place where play and social interactions take place. Playgrounds are a public environment according to Swedish law and they should therefore be universally designed. Occupational therapists, with their knowledge of environmental barriers, understanding of disability and specific knowledge of activities, are in an ideal position to develop and maximize play activities on playgrounds to increase their accessibility and usability. They are also in a position to educate and advocate for universal design to decision-makers. The focus of the occupational therapists' support should therefore be on both individual and societal levels.

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