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A comparative study of active play on differently designed playgrounds

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The physical and social environment of children in cities is continuously changing. Knowledge about the positive effects of natural play experiences within the child's development is becoming widely known. Affordances of diverse landscape elements and especially loose parts for play in natural environments influence play activities. New concepts of natural playgrounds emerge and call for more research in this field. We conducted a comparative study on differently designed playgrounds (contemporary, naturally structured) in Bremen, Germany. The aim of the study was to further explore how diverse play environments afford different forms of play in kindergarten children aged between five and six years. Results show differences in number and duration of play episodes as well as in the occurrence of different categories of play. Existing observational instruments need improvement to adequately evaluate the impact of new playground concepts on early childhood activities.

Keywords: *Active play; Playground; Play categories*

Introduction

Play—a definition

For centuries, theorists, philosophers and researchers have worked on a 'universally acceptable scientific definition of play' (Frost & Klein, 1979, p. 21). Due to the complexity of play, it will continuously be difficult to achieve a definition of play that captures all of the dimensions (Chancellor, 2005, p. 33). The aspect of play and physical activity, discussed in Pellegrini and Smith (1998) as well as in Neto (2007), we consider very important to our research. Physical activity play encompasses most of our aspects of play. However, the definition of play that applies best to our study can already be found in the work of Frost (1979). The author describes play with

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a play–work continuum and characterizes play as active, spontaneous, fun, purposeless, self-initiated and serious (Frost, 1979, p. 21). Our focus will be on free play. Even though broad knowledge about the impact of play exists, time and place for uninterrupted free play and open-ended play in everyday life are decreasing.

Setting—play in urban play areas

Our focus will be on play environments within urban areas. What makes urban areas very special is the self-initiated free and spontaneous activity play that is far from institutional rules and is unhampered by regulations. Yet little detail is known about the play activities of preschool-aged children in urban out-of-school play areas beyond the institutional regulations of school and kindergarten (Kleine, 2003; Laging, 2006). Only a few currently published studies focus on outdoor play areas beyond school within public space (Blinkert, 2005; Frost, 1992; Niklasson & Sandberg, 2010; Schemel & Wilke, 2008).

Affordances of traditional and contemporary playgrounds

Related studies following the instrumental approach of play research (Meire, 2007) have already looked at the relation of play activity behaviour and developmental aspects in diverse outdoor play areas (Bailey et al., 1995; Barbour, 1999; Cullen, 1993; Dowda, Pate, Trost, Almeida, & Sirard, 2004; Dymont, Bell, & Lucas, 2009; Fjørtoft, 2001, 2004, 2009; Hart, 1993; Hart & Sheehan, 1986; Louca-Mai, Gibb, Henshall, & Lewis, 2008; Ozdemir & Yilmaz, 2008; Shim, Herwig, & Shelley, 2001). Many of them confirm a positive influence of playgrounds and playground features on the play activities of children. The effects measured are mostly on physical activity or the different forms (categories) of play. Some authors differentiate between physical activity itself and different forms of play. Others describe physical activity play as a form of play itself (Cullen, 1993; Neto, 2007; Pellegrini & Smith, 1998).

Firstly, physically active behaviour increases due to diversity of playground features (Fjørtoft, 2009). Barbour (1999) noted that children's engagement with materials and equipment in the physical environment positively affected their motor skill development. Spacious preschool environments with diverse natural elements trigger physical activity and development (Boldermann et al., 2006; Fjørtoft, 2004, 2009; Ozdemir & Yilmaz, 2008).

Secondly, looking closer at the different forms of play, Shim et al. (2001) identify the positive effects of general outdoor playgrounds, observing more functional and dramatic play. Frost and Campbell (1985) compare second-graders' play behaviour on a traditional playground and on a creative playground. While functional or exercise play and games with rules occur significantly more on the traditional playground, dramatic and constructive play happen more often on the creative one (Frost & Campbell, 1985). Cullen (1993) investigated that total physical play occurred in more than one-half of the observed play activities whereas total creative play and non-play

categories happened far less. Children who engage in physical play are less likely to engage in creative play and *vice versa* (Cullen, 1993). Cullen (1993) confirms that the longer the play periods last, the more creative and constructive the types of play that occur. Less structure encourages children to engage in more social interaction with peers as well as in the most complex forms of play (Shim et al., 2001). Hart and Sheehan (1986), however, could not find meaningful differences within the play categories when comparing a traditional playground and a contemporary playground.

Affordances of natural play areas and loose parts in general

Natural elements and spacious environments are preferred areas for play (Boldermann et al., 2006; Holmes & Procaccino, 2009; Lucas & Dymont, 2010; Ozdemir & Yilmaz, 2008). Instead of perceiving forms, children perfectly recognize the functions of different landscapes and use them for play (Gibson, 1979). Perceiving affordances rather means to observe possible actions provided by the surrounding environment. Research gives evidence that there is a strong relation between structures of landscape and the forms of play (Fjørtoft, 2001).

Again, looking at the two aspects—physical play activity and different forms of play—the importance of natural elements and loose parts in nature becomes evident. The term ‘Loose Parts’ is based on Nicholson’s (1971) Theory of Loose Parts. Moveable components in children’s play rather offer open-ended play as well as many forms of usage (Nicholson, 1971). Natural environments invite more physical activities than traditional playgrounds (Boldermann et al., 2006; Fjørtoft, 2004; Fjørtoft & Sageie, 2000). Play in nature or on natural playgrounds promotes motor development (Fjørtoft, 2004). Dymont et al. (2009) point out that most vigorous activity can be noticed at manufactured equipment and most natural play environments invite moderate play.

Children in naturally designed areas, compared with traditional playgrounds, show a rather complex, long-lasting and systematic play in age-mixed groups that has a positive influence on social competencies (Blinkert, Reidl, & Schemel, 2008). The environment affords more creativity by offering loose parts and a changeable environment that does not only define one single function (Blinkert et al., 2008; Nicholson, 1972). Maxwell, Mitchell, and Evans (2008) provided preschool children on a traditional playground with additional loose parts. Children increased constructive play, ‘which not only encouraged dramatic play but also communication and negotiation skills’ (Maxwell et al., 2008, p. 36). Fixed equipment promotes competition rather than cooperation (Barbour, 1999). Frost and Campbell (1985) identified a preferred use of action-oriented equipment over static equipment and multiple function equipment over single function structures. Herrington and Studtmann (1998) comprehensively document that the introduction of different natural landscape elements on the playgrounds could encourage different and varied types of development. Examining different affordances of various outdoor spaces, Niklasson and Sandberg (2010) showed that, ‘participants perceived and utilised affordance mostly from climbable features, moldable materials and shelters’ (p. 492).

Natural play areas—a new concept

As the physical and social environment of children in cities is continuously changing and knowledge about the positive effects of natural play experiences within the child's development gets widely known, new concepts of natural playgrounds come into view. Not only is the installation of loose and natural parts of interest. Speaking for Germany, entirely new concepts of nature-orientated playscapes and nature experience areas emerge (Blinkert, 2005; Schemel & Wilke, 2008).

The emerging concept of nature-orientated playscapes in Germany requires more research to emphasize the special characteristics and challenges. Showing the importance of the natural environment for the child's development in general was the initiating first step (Benke, 2005; Kleine, 2003). Further research should move a step beyond, focusing on nature-orientated playgrounds in particular. Knowledge about the impact of different playground concepts and their specific affordances on the play activities of children is important.

Aim of the study

Different characteristics of the play environment of children are expected to have an impact on children's play activities and especially the forms of play. We thus conducted a comparative study on differently designed playgrounds to further explore early childhood activities on these places. The focus of the study lies on assessing the diversity in play activities:

- (a) detailing the number of play episodes,
- (b) the occurrence of the different categories of play,
- (c) the duration of play episodes, and
- (d) patterns of play episodes—relative frequencies.

Evaluations assessing different outdoor play environments and activities on them are still needed (Louca-Mai et al., 2008; Shim et al., 2001). This also includes the re-evaluation of 'approaches to outdoor play' (Waller, Sandseter, Wyver, Ärlemalm-Hagser, & Maynard, 2010, p. 438). Most studies define the outcome of playground activity either by frequency of play area preferences or by physical activity monitored as intensity. Different forms of play on nature-orientated play areas are mostly a neglected aspect.

Applied instruments do not pay enough attention to the rising variety of playgrounds and their specific affordances and play activities. Emerging concepts such as nature-orientated playgrounds need more investigation prior to a broader application. Collecting data from two differently designed playgrounds, the novelty of this study lies in revealing the impact of different playground environments on the forms of free play, all taking place in urban out-of-school areas. The present study builds on Gibson's (1979) concept of affordance, fundamental in the ecological approach of

perception and action. Also, Nicholson's (1971) Theory of Loose Parts is essential while looking at the affordances of natural play environments.

Methods

Setting

Our study has been conducted on urban play areas in Bremen, Germany. We recorded activities on a naturally structured play area and on a contemporary playground. Using an observation protocol, a total of 59 five-year-old to six-year-old children (26 girls and 33 boys) was observed for 30 minutes each. Children were recruited from two different kindergartens in Bremen. The preschool staff, the children and the children's parents were informed of the research project prior to the observations, and gave their consent to the study.

Participants and playground classification

The choice of participants was purposive. Comparing two different playground concepts meant only including children playing on either the naturally structured playground or the contemporary playground. These playground concepts served as selection criteria. The classification of playgrounds is according to Frost (1992), who classifies the playgrounds 'into four types: traditional, designer or contemporary, adventure, and creative or adapted' (p. 133).

Contemporary playground

This improved traditional playground (Holmes & Procaccino, 2009) selected for the study shows devices with interesting and inviting materials, textures and heights all aesthetically designed. Most playground equipment is fixed and monofunctional. The place is surrounded by bushes. The contemporary playground features a playhouse with climbers and a slide, a sandbox, a water area with a pump, two spring riders, a seesaw, a roundabout and a soccer goal.

Naturally structured playground

The naturally structured playground offers wild and natural areas where nobody interferes with nature by cultivating. Natural playgrounds emphasize lots of trees, indigenous vegetation (shrubs, grasses, flowers, etc.), sandboxes with creative land-forms, dirt, rock structures, natural materials and sculptures, natural water areas and natural fences. The only interference took place when the playground was built. An earlier lawn area was turned into a highly structured zone with elevations and vales, lots of bushes and ditches.

What makes this playground different to nature experience areas is some playground equipment made of natural materials such as wood and ropes. This area

includes one climbing tower, several trees and ropes for balancing, a water pump, a willow dome, a Tarzan swing and a hammock. Children can also find a natural theatre including stone seats and a stage made of wood. Lots of surrounding old trees invite the children to climb or swing. A huge sand area close to the so-called water-and-mud area has also been arranged. Due to nature, children could use a lot of moveable equipment. A wide range of open-ended play options enhances the creative use of natural materials as well as imaginative thinking skills.

Procedures

A total of 59 individual field observations were carried out: 21 (nine female, 12 male) observations took place on the contemporary playground, and 38 (17 female, 21 male) observations have been recorded on the naturally structured playground. Although we tried to obtain an equal number of observations per child, and an equal number of children in each setting, for various reasons this was not always possible. Each naturalistic observation lasted for 30 minutes. This procedure yielded an average observation time of 1770 minutes. The period of observation lasted from the end of April 2009 until mid-June 2009, always from 10:00 am until 12:00 pm. Data-capture days included a weather range from sunny days to light rain.

We only had one single observer within the study. The observer visited the participating kindergarten groups and the playgrounds prior to the study in order to become acquainted with participants and settings. The observer had been trained before collecting all data. During the observational period the observer randomly selected one child and followed the participant as inconspicuously as possible but as openly as necessary. Since the observer knew the names of the children it was possible to make sure not to observe the same child twice. In the beginning, some problems of reactivity occurred. Children had to learn that the observer does not take part in their play. The children quickly habituated to the situation and the 'following' observer. The more frequently children were observed, the more oblivious the behaviour that could be seen (Maxwell et al., 2008). Nevertheless, one has to acknowledge the likelihood that the researcher might still influence the play.

Bailey et al. (1995) detail the advantages of direct observation when assessing physical activity including physical and social environmental influences. According to Flick (2006) this has been a non-participatory observation. More applicable seems to be the classification of Bamler, Werner, and Wustmann (2010), who divide participatory observation into active or passive participation. In our study we applied the passive participatory observation method since our observer could be considered part of the observing situation but did not actively take part. Our procedure follows the instructions of Frost (1992).

Even though play episodes can include movement between different features or spaces within the observed area, a play episode was mostly finished when children changed the playground position towards another place. To make sure that only entire play episodes were documented, the trained observer did not note spatial changes

lasting less than one minute. Those short interruptions away from the actual play episode position were mostly part of the very same.

Protocol

Only one trained observer recorded all observations and used a partly standardized protocol. Even though the procedure of the observation followed clear guidelines, the protocol gives leeway to add additional information in narrative form. The protocol included all play episodes within the observation time. Information about each play episode included the place of activity, the duration, the social category of play (solitary, group of two children, or group of more than two children) including gender and, most importantly, narrative information about the play itself. The researcher continuously wrote about the activities of the target child, known by name and outer appearance. The coding of the play episodes happened after the direct observation by only one researcher. The order of first recording the activity in narrative form and secondly doing the coding ensures that the researchers use the data even when categories will change in the course of the study. Each play category was precisely defined to capture all forms of activities for the children on differently designed playgrounds.

Ethical considerations

The ethical rules in social science research were considered. We followed the rules of confidentiality, information, autonomy and voluntary participation to our best knowledge. Parents received a letter of information and we also organized a parent's evening to inform about the study and offer the opportunity to ask questions. With the consent of the parents and pre-school teachers as well as the use of ethical guidelines, the rules for ethics have been observed.

Categories of play

A selective acquisition of diverse activities is complicated. For the purpose of our study, the phenomenological approach of the play theories is closest to our subject matter. The categories of play in this study were based on the classification of Kolb (2005) according to the early remarks of Buytendijk. We decided on this phenomenological-based classification because simple play of animals and humans builds the foundation of the theory. Frost (1992) details the categories of play in accordance with several researchers. However, Kolb's classification is closer to our purpose of study and the field of study. Play categories abstract different forms of play that might have similar effects on the development of the child. All classifications turn out to be difficult since all forms of play can have multiple effects. Appropriation to the categories is difficult. In our study we applied the following classification:

- Play with: functional play and constructional play (own body, object and materials), distinguishing mark: varying repetition.
- Play as: role play and symbol play (imaginative play object, a well-defined object loses its well-known meaning and displays a different object within the child's play and imagination, orientation on role-models, not only copying but also developing their own play while realizing their own ideas, wishes and needs).
- Play for: play with rules (competition), organizing activities of several players.

Also, categories can overlap. This is why we modified the classification of Kolb (2005) and added a category Mix, which includes all play episodes that show an overlap of different categories. In addition to that, a category of non-play has been introduced for capturing breaks, sitting and talking, relaxing, cueing and others (Frost, 1992). Each child's observation was coded according to the above-mentioned modified form of play categories. The set of categories does not present a hierarchical order of specific play activities.

Approach to play research

Frost (1979, p. 21) characterizes play as active, spontaneous, fun, purposeless, self-initiated and serious. These characteristics show our approach to play and playground environments. As Meire (2007) gives an overview of the qualitative research on children's play, he points out two different approaches to play. Because our study focuses on the different categories of play that might appear on diverse playground environments, our approach to play is neither instrumental nor interpretive (Meire, 2007). While observing the categories of play and their frequencies on different playscapes, the present study can be seen as an indirect instrumental approach. While assuming certain benefits of different forms of play, our comparative study can point in one or the other direction relative to the frequencies measured. As some forms of play are supposed to have higher developmental benefits than others (Sutton-Smith, 1997), higher frequencies on one place can be understood as a more positive outcome. Influences of play and play environment on children's activities and their social, cognitive and motor development have been documented in a number of play studies (Burrmann, 2008; Frost, 1992; Moore, 2009; Sutton-Smith, 1997).

Results

Different types of play environment are expected to have an impact on children's play activities. In our study we want to focus on the play episodes and their diversity to further determine the characteristics of play in various kinds of public play areas. The data are examined to determine how different play environments afford certain forms of play activities. Firstly, the study focuses on the general question of how many play episodes children will have within the observed 30 minutes depending on different play environments. If there are differences in the number of play episodes, it is of

further interest how these differences come about. Essential follow-up questions will additionally look at the diversity of chosen play episodes with the basis of defined play categories, the temporary distribution and typical patterns of play episodes.

Play episodes

Number of play episodes. Independent *t*-tests on the number of play episodes within the observed 30 minutes revealed highly significant differences between the different play environments ($p > 0.000$). Children playing in the naturally structured play area showed approximately three (3.05 ± 1.71) play episodes within half-an-hour of observation; whereas children on the contemporary play environment almost doubled the number and had approximately six play episodes within the same time of investigation (5.57 ± 1.47). This result supports previous investigations that also found longer-lasting play episodes on naturally structured playgrounds (Blinkert, 2005; Blinkert et al., 2008). Knowledge about absolute frequencies requires more details about the actual difference. Where does this difference come from? At this point a categorization of the play episodes might offer more details about the diversity of play.

Occurrence of the different categories of play. To gain more knowledge about the diversity of play on differently designed playscapes we categorized every single play episode according to the classifications of Kolb (2005). Questions about which play categories appear more often than others are of primary interest. The mean values of the categories play with and play for and the category others show significant differences between the diverse environments. Children playing on the contemporary playground showed statistically more play episodes in all three of them. However, differences of the mean values of the category play as and the combination category could not be statistically proven (Table 1).

Duration of play episodes. Investigating the temporary profiles of the children offers more information to explain the different numbers of play episodes observed. Questions about the duration of play episodes arise. The distribution of play episodes within the observed time will be displayed in five-minute intervals (Figure 1).

Play episodes on the contemporary playground are for the most part shorter. More than one-half of the play episodes on the contemporary playground last only up to five minutes. Thirty-five per cent of the play episodes fall within the 6–10-minute

Table 1. Frequency of play categories on natural and contemporary playgrounds

	Play with	Play as	Play for	Others	Combination
Nature	1.45 (± 1.37)	0.53 (± 0.83)	0.13 (± 0.41)	0.24 (± 0.49)	0.71 (± 0.8)
Contemporary	3.14 (± 1.68)	0.62 (± 0.97)	0.52 (± 0.68)	0.67 (± 0.73)	0.62 (± 0.8)
Significance	0.000	0.701	0.023	0.022	0.677

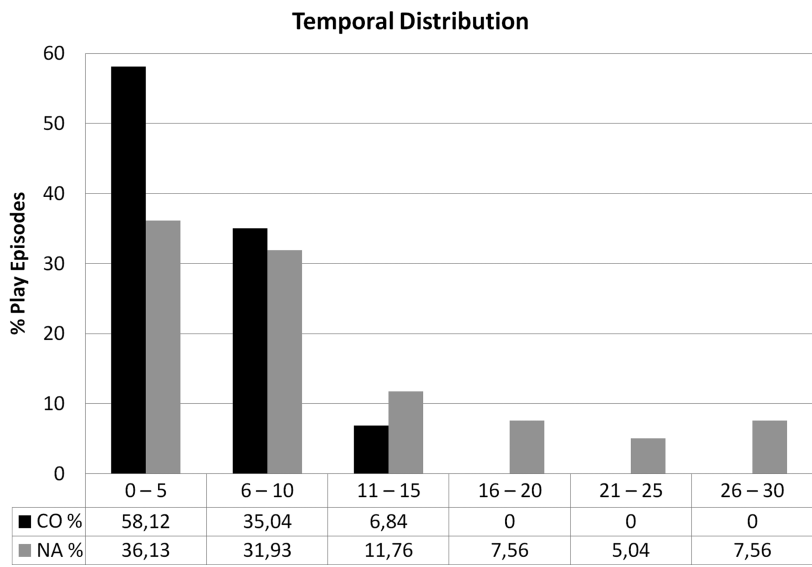


Figure 1. Temporal distribution. Note: CO, contemporary playground; NA, natural playground

interval whereas only around 7% of the children need 11–15 minutes for one play episode. Surprisingly, none of the three longer-lasting intervals appeared ever on the contemporary playground. The three most attractive spots within the first interval up to five minutes were the ones for relaxation, swings and the mud-and-water area; closely followed by climbers and see-saws. All in all, children chose only one-half as many different places within this interval as children on the natural playground did. Most striking within the interval up to 10 minutes were the spring riders followed by slides and climbers. Roundabouts, activity without equipment and play with rules seem to be most common within the interval up to 15 minutes.

The temporal distribution of the observed play episodes on the naturally structured playground appears to be quite different. Even though the intervals up to five minutes, up to 10 minutes and up to 15 minutes occur in that order and in four of five cases, the children on nature playgrounds also spend time in longer-lasting intervals. More than 7% of play episodes lasted up to the entire time of observation. Play on this kind of environment more often developed while playing and therefore lasted sometimes longer. The shortest play episodes happened at many places, but the three most popular were the balance trunk and the balance rope closely followed by a little rise. Frequently used play spots within the second and third intervals were the fence and bushes and the little rise with the tree house as well as the balancing rope and the hammock. The intervals up to 20 minutes and up to 25 minutes present the willow dome, the performance stage and the mud-and-water area as attractive places considering the frequency of usage. The longest play episodes occurred at and in mud-and-water places as well as in spacious places, the willow dome, the performance stage and on the hammock.

Table 2. Patterns of play categories (%)

	Play with	Play as	Play for	Others	Combination
Nature	44.66 (±35.67)	18.92 (±27.87)	3.23 (±10.46)	6.3 (±13.34)	26.9 (±32.71)
Contemporary	56.18 (±27.45)	11.78 (±23.28)	9.93 (±13.45)	11.45 (±12.31)	10.66 (±15.0)
Significance	0.204	0.324	0.056	0.151	0.012

Patterns of play episodes—relative frequencies. Within the results it was also interesting to see whether the children have different patterns of play episode categories. Do they arrange the episodes they play within the observed 30 minutes differently according to the surrounding environmental aspects? For instance, do children on the contemporary playground spend relatively more time in certain play categories than children on the natural-orientated play space and *vice versa*?

All play episodes within the observed 30 minutes add up to 100%. At this point, we want to present the distribution of the play categories within the defined amount of time. Only within the variable of the combination of different categories did data show significant differences between the observed play environments. Children on the naturally structured environments therefore preferred more combinations of play categories (Table 2).

Discussion

Results: number, occurrence, duration and patterns of play episodes

Taken together, these findings suggest that children on naturally structured playgrounds, in comparison with contemporary playgrounds, have fewer play episodes within the same amount of observed time. Children on nature-oriented play spaces play longer within one play episode and can sometimes have episodes that last the entire observing time of 30 minutes. This aspect could suggest a high degree of concentration. The relation of long play and concentration needs further investigations and applicable instruments. Such long play episodes did not even appear on the contemporary playground. In these fewer but longer-lasting play episodes, children on nature play areas are less involved in the categories play with and play for and the category others compared with the contemporary playground (Table 1). The play episode patterns on the two environments only show statistically significant differences for the combination of play categories within one episode. The naturally structured environment afforded patterns of play category distribution where the combination of individual categories occurs far more often.

In short, the results of our study can barely be discussed with other studies as there are hardly any works that have an almost similar setting of play environments and methodology. A different emphasis of different play categories or the emphasis on intensity of physical activity as well as insufficient numbers of participants

(Barbour, 1999) make a discussion of our results in relation to previous works impossible. Hart and Sheehan (1986), Fjørtoft (2004), Maxwell et al. (2008) and Schemel and Wilke (2008) agree in at least some aspects with our study design and can be used as comparative studies. The investigation of children's play in urban playscapes besides physical activity has been a topic of low priority within child play research. Hart and Sheehan (1986) found no significant differences between the traditional playground and the contemporary playground concerning the play categories. Our study revealed differences within play categories even though one should consider that the classification of play is different in the two works. Hart and Sheehan (1986) rather found differences in social forms of play as solitary play happens more often on the traditional playground. They also noted more passive action in the contemporary playground setting.

In terms of play episode duration, our results support the outcome of Blinkert (2005) and Blinkert et al. (2008). All works notice that episodes last longer on naturally structured playgrounds in comparison with the traditional one. Children on nature playgrounds can have both short and long play episodes. But what is striking within our comparison is the fact that children on contemporary playgrounds scarcely play longer than 15 minutes within one episode. Children on the nature-orientated play space show episodes lasting up to even half an hour. These results reinforce our impression during close observations. In the course of play, children on naturally structured playgrounds started their play episode and developed it further and further. Environment might afford more creativity and fantasy by offering loose parts and a changeable environment that does not define only one single function (Nicholson, 1972). Data for the contemporary playgrounds and the impressions of the observer illustrate that children do not show as much development and fantasy within one play episode due to a less affording environment.

In this regard, Blinkert (2005) offers a side note to the aspect of dwindling fantasy of children. Further research might additionally apply creativity scales to measure this emerging aspect. Blinkert (2005) explores the difference of a waste container and a spring rider to question the frequently used—but in his opinion false—explanation of monofunctionality of playground equipment. In these days, children live in a world that is partly made for them. It is difficult for children to convert equipment that is already appropriate for them. Their fantasy does not really get stimulated. In earlier days the environment was not child-appropriate so it seemed easier to let their imagination run wild (Blinkert, 2005). Nature-orientated playgrounds put their focus on the experience of nature rather than child appropriateness. Therefore children can let their imagination run wild, instead of putting in too much effort to convert child-appropriate playground equipment. Several outcomes support this argument (Barbour, 1999; Dowda et al., 2009; Frost & Campbell, 1985; Shim et al., 2001). Frost (1992) indicates that children often playing in social fantasy play are more socially competent than those who play less often.

Results of the play categories clearly indicate that children on nature play areas are less involved in the categories play with and play for and the category others compared with the contemporary play area (Table 1). In particular, the categories play

for and others support our impressions of the observations. Children on contemporary playgrounds spend a lot of time waiting in queues, an aspect we have not even seen once on the counterpart. Also, the category play for is typical for the contemporary playground. Child-appropriate equipment affords an elaborate refunctioning to keep the play exciting and demanding for a longer time. Children on contemporary playgrounds quickly begin a new play episode, change over to other equipment or maintain the excitement by playing for something.

Methodology—improvement of instruments

Differentiation of play categories. The diversity of play areas requires more differentiation within the defining categories. As a nature-orientated environment affords specific kinds of activity and play (Fjørtoft, 2004; Gibson, 1979) that are not common on traditional or contemporary playgrounds, the categories of play need to get additional space for extended, revised or new categories of play. Instruments need to get adjusted to the variety of play environments.

The play with category covers a wide range of play activities. Taking the aspect of fantasy or creativity, the building of a dam might be more creative than climbing or sliding. In addition, few data detail the category play with concerning the play with or without loose material. Maxwell et al. (2008) take on this research gap and focus on the effect of loose parts on outdoor play behaviour. Dowda et al. (2009) already consider the aspect of portable play elements but only mention the children's preference for it. So if the children on the contemporary playground show more episodes within the category play with, it is hard to tell about fantasy, creativity or the play with or without loose parts.

Future research needs to further differentiate the categories to gain more knowledge about the diversity of play and the affordances of the play environment. If we go back to the thoughts of Blinkert (2005) and the results of Shim et al. (2001), the category play with might especially get an additional category including activities that refunction equipment or environmental features.

Also, some categories that seem to be important do not get enough attention in the common use of categories. We would suggest a category that includes swinging and losing one's balance. Lots of equipment on children's play areas makes a point of doing so. Already mentioned earlier, the introduction of a refunction category could help to grasp the diversity of play activities.

Equipment spots or areas—what should be on the protocol? According to previous observation protocols, we chose spots, special places or equipment of the playgrounds as the lead for observation. However, especially in the naturally structured environments, the children use the advantage nature offers—extensive space. Children then do not only move from one equipment spot to the next. In future work, leads of natural playscapes should also include specific areas without certain play equipment.

Tracks—assessing the *in-between* play activity. Tabular documentation of an activity within a defined space allows only insufficient opportunities to assess the environment in which activity takes place. Instead of only observing children at spots and certain equipment zones, the observer protocol should offer assessment features that also cover the *in-between* such as paths and tracks. If movement brings the room into being, then this movement should be documented in a spatial way. The space *in-between* and the paths on nature-orientated play areas, which do not even exist on contemporary playgrounds, are frequently used. Often, the way itself is the actual activity.

Conclusion

To sum up, comparing active play on differently designed playgrounds particularly shows the unique characteristics and affordances of nature-orientated playgrounds. Finding most complex forms of play as well as long-lasting play episodes in natural play areas confirms the need to re-evaluate ‘approaches to outdoor play’ (Waller et al., 2010, p. 438). Before using play and nature for instrumental purposes, research should take a step back and have a closer look at play itself again (Kolb, 2005). A changing social and physical environment and emerging concepts of nature playgrounds open up new fields of research.

Even though our results as well as related studies assess physically active play and sometimes the different forms of play, nature-orientated play areas require more research. The significant feature of loose parts in natural areas especially affords different documentation and assessment tools for the observation of play.

Providing architects and officials with knowledge about play activities on differently designed playgrounds, future planning could consider which environmental structures and playground features afford what kind of play activity.

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