Play Areas in an Adults' Designed World, But What Do Children Prefer?

Research: The preference for play areas of children of the age of 10 to 12 living in Rotterdam

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Minor Thesis;
Play Areas in An Adults' Designed World, But What Do Children Prefer?

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Preface

This minor thesis is written as part of the course Landscape Architecture and Planning with the specialisation Cultural Geography. The purpose of the report is to distribute more information about the importance of playing of children. Besides, the recent problems of the development of the children related to their play behaviour and activities. Within this research the children had the opportunity to show their preferences about their play areas instead of the adults (designers, policy makers, etc.).

Readers who are especially interested in current literature about all facets around playing chapter 2 will provide a broad overview. Chapter 3 and 4 discuss the design of the research. The results of the research are shown in chapter 5 and the summary of the results are presented in chapter 5.5. Finally chapter 6 discusses the conclusion of the total report.

I am very grateful for being given the opportunity to do this research about children their preference for play areas. I would like to thank Maarten Jacobs, Wageningen University, for the support and the given feedback which has made this report stronger. I would also like to thank the primary schools; OBS de Globe, BS Het Spoor, and OBS Delfshaven for participating in this research.

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1. Introduction

Outdoor playing has been shown to be an important tool for children to develop themselves physically, socially and cognitively. By the time many playgrounds are designed for children in Western Societies. However, it is shown that the outdoor playing behaviour of today is not the desired behaviour. Children are not enough outside and are not enough physical active. One of the consequences is the major social problem obesity. Obesity (Body Mass Index > 30) is a rapidly growing problem in Western Societies.

In earlier research there is looked to the preference of children about different playground designs, but the preferences of the different public spaces around the children their homes are still not examined as play areas, like bushes and nature. It is important to know what children prefer to play on to change their current playing behaviour.

To get a full understanding of the playing behaviour of todays' children a broad literature study was needed this for creating a clear picture of several influences on children's outdoor playing behaviour. From this research there is formed a demarcation towards the preference of the children and it tightened the problem statement and conceptual model. Furthermore, it is shown that the preferences of children do not fit with the designs of the play facilities which are created for them. To create facilities on which children are willing to play, we need to know what the children want, what their preferences are.

Firstly, a broad literature review about playing in relation to the environments, the social situation, and the development of children is discussed. Secondly, the conceptual model is debated. This model is based on the results of the literature review. Here are the kinds of places (scenarios) described as well as the perceived characters (independent variables) which are the measurement tools, to measure the preference of children, in this research. Thirdly, the method section is discussed of the research, including the research design, scenarios, operationalization, data analyses, and the sample. Fourthly, the results of the research are shown in tables and discussed. Fifthly, the conclusion is debated in which the preference of the children of the age of 10 to 12 living in Rotterdam is shown and this in relation toward the decrease of the amount of children their playing behaviour and activities, the growing number of children with obesity, and the policies and urban designs of the municipalities. Finally, the results, measurement tool, and the research itself are critical discussed in the chapter discussion.

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2. Literature Review

The Concerns about Children's Outdoor Playing Behaviour and Associated Development Skills through the Consequences of their Personal Situations and Environment in Western-Societies

2.1 Intro

In 1977, Pollowy (pp. 320) discussed that designers oftentimes do not have accepted children's activities and play as most necessary function of early life, when they design neighbourhoods. These days, the statement seems equally valid, as the designed public spaces in Western-Societies are predominantly made to respond to the needs and wishes of adults (Matthews 1995; Valentine 1997). Within these adult-oriented public spaces (Valentine 1997) children have received some places, playgrounds. In these playgrounds the designer has though of children, but when children leave these spaces they become an outsider, as Matthews (1995) describes it, in the adult planned world. However, parents oftentimes do not let their children go outside un-supervised because they find it too dangerous for them (Valentine 1997; Mckenzie, Elder & Nader 1997). This causes that the playgrounds and parks are often not reachable for children. (Hart 1979; Barbour 1999; Veitch, Salmon & Ball 2008) Traffic and strangers are the most important factors which decrease the feeling of safety (Matthews 1995; Valentine 1997; Tandy 1999; Veitch, Bagley, Ball & Salmon 2006).

Besides the long distances to the facilities and busy traffic routes as barriers, there are also shortcomings in the facilities themselves. Children evaluate the traditional playgrounds oftentimes as boring and not exciting. This is mentioned by the children, because they are missing a challenge. This was especially the case when children become older than 10 years (Veitch *et al.* 2006). This is an age when children start to explore their neighbourhood (Matthews 1995). For these children the playgrounds and public spaces should be more complex, have novelty and should offer all challenges (Callecod 1974). According to Berlyne (1960), by increasing the arousal it should be stimulating the play behaviour.

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The results that; 'children have fewer opportunities to go freely outside' combined with the outcome that 'the children find the traditional playgrounds boring' is a social problem. Not because of the concern that the children are missing the fun outside, but because of the effects which it brings with it. Children become obese and they become less developed – in cognition, creativity, problem-solving thinking, social and motor skills- , they are getting less knowledge about the environment around them and about the living world around them including themselves. (Pellegrini & Smith 1998; Fjortoft 2000; Reilly, Jackson, Montgomery, Kelly, Slater, Grant & Paton 2004; Brodersen, Steptoe, Phil, Williamson, Wardle & Med 2005; Kopp 2011)

The purpose of this literature review is to get an understanding about the influences of the physical and personal situations of the children on their outdoor playing behaviour and associated development skills? First, the physical environment will be discussed and is divided into 'the residential area designs' and 'the playground designs'. The second section is focussed on the personal situation of children. Hereby, the key issues are parents, cultural background and gender. In the third section, several development skills will be discussed which are associated to play, like physical, social and cognitive development. These three sections together will give a full understanding of different elements which are related to the outdoor playing behaviour of children in Western-Societies. Finally, in the conclusion the overall subject about outside playing behaviour is highlighted and this will lead to the main problem which gives rise to this research. Furthermore, in Appendix one are discussed cited outcomes and conclusion of several researches on their reliability.

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2.2 The Physical Environment and Children

2.2.1 Children and Residential Area Designs

Children as the Outsider

Todays' design of public spaces in residential areas is not designed for children. This statement is discussed by Pollowy (1977), Matthews (1995), and van Eyck (2002). They argue that children are the outsiders of the society when it goes about the planning of the public space, because generally children are not taking into account while designing the public space. The public space is mentioned as a place which is not safe for children or a place where they will cause damage or nuisance as shown in a qualitative research about the perspective of people on their environment of Morrow (2001) (see appendix 1, 1.1) (Alvarez-Dardet 2000). Besides the activities of children, their facilities are also oftentimes seen to impact negatively upon how adults experience suburban or urban environments. But, also vice versa; the activities and facilities of adults' impact also negatively on how children experience the environment (Morrow 2001). Children and adults seem to have their own interpretation of the environment and different aesthetics.

A statement of van Eyck shows an interesting change in the use of space by children and by other circumstances. Van Eyck (2002: 84) refers to the effect of snow on the use of the city. "Once it has snowed, the children take over the city. They are throwing snowballs, making snowmen and are sledging. The children are more visible than ever. However, the city needs something more sustainable for their children than snow".

Safety Concerns in Residential Areas

The residential areas are important places for children. These are the places where they live and could develop themselves on several skills. The public spaces around their house could offer places where they meet friends, play, and feel safe. Unfortunately, the safe feeling is not the reality as shown in Valentine (1997) and Mckenzie *et al.* (1997) their study. Children are become afraid to be alone in the public space. According to Valentine (1997), this is oftentimes created through the concerns of the parents (Mckenzie *et al.* 1997). The worries of the parents are resulting in less freedom to explore and discover the world for children. For girls this freedom is even less than for boys. Researches show that girls have a shorter distance where they are allowed to go to than boys have (Hart 1979; Matthews 1995; Veitch *et al.* 2008). The girls are representing the highest percentage of children who are not allowed to go outside un-supervised. Still for both genders, the area (in which they can move) is oftentimes not big enough to reach the closest park or big community playground as shown in Veitch *et al.* 2008 their research.

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Most worries about the safety of the children has become through the growing amount of traffic and the parking lots around the crossing points, mentioned by the parents (Valentine 1997; Eyck 2002). Currently, the car seems to have a higher priority by the policy makers than the children have. This could have to do with the economic issues. Generally, ground in urban areas is expensive and scarce. This means that play facilities cost the municipality more money than it offers economic benefits. In contrast to playgrounds and children facilities, cars and infrastructures are giving more benefits to a city through a better economic status. However, the municipality should get an understanding about the importance of play in children's early years (Eyck 2002). Children need spaces to move freely for developing themselves on several skills (cognitive, creative, social and motor-skills) (Matthews 1995).

Exclusion of Children

Not only busy streets and long distances make it difficult for children to play freely as discussed by Hart (1979). In England the signs on the communal grass send also a strong sense of exclusion towards children. On several patches grass in residential areas are signs added to show children that they are not welcome there. The signs show "No Ball Games". Neighbours try to avoid the 'noise' of children and balls by placing those signs, argued by Alvarez-Dardet (2000) and Morrow (2001) (appendix 1, 1.1). Those signs are a good example of seeing the use of the public space through an adults' eye. (Matthews 1995).

Recommendations for Residential Area Design; Focussed on Children

In addition to the communal spaces, the structure of the neighbourhood is also an important factor for the amount of physical activity of the children. According to Veitch *et al.* (2006) and Holt *et al.* (2008), it is important to have an urban design with courts (a square surrounded by houses and where cars are avoided) and cul-de-sacs (a dead-end road with only local traffic) settings. These structures are ideal for young children who are not allowed to go far from home and play on the street near home, because through the small traffic flow on these roads. Besides the opportunity of playing on the street near home, it offers parents also a good opportunity to supervise their children. In this way children are more often allowed to play outside. Determined by Veitch *et al.* (2008) children who have a better opportunity for active free play will be more physical active. This is an important effect, because more and more children become obese through being not enough physical active (Wang and Lobstein 2006).

In contrast to Veitch (2006), Holts' *et al.* (2008) advices also a grid for a child friendly residential area design. Namely, in their research they also focussed on older children. Only these children need higher movability (more opportunities to move over a longer distance) opportunities according to them. The grid structure offers this higher movability instead of a court or cul-de-sacs residential area design. In this structure streets and blocks are more connected, which creates more opportunities to go somewhere and to increase the distance. Other results of a high movability are the increases in the opportunities of having more friends and a higher physical activity. Towards these arguments courts and cul-de-sacs are important urban structures for young children, but for the older children a grid seems to offers more and better opportunities.

Conclusion of the Residential Area

Adults and children seem to have different kind of aesthetic values of the public space. Children's activities and facilities give a negative impact upon how adults experience the environment. This goes together with the result that the public space is currently designed for adults' benefits like cars and infrastructure. Children are less taken into account during the designing process, which causes that traffic structures are dominant in the areas. Traffic is hereby an important factor for the unsafe feeling of an area, according to parents. Busy roads are dangerous for children and create barriers for them. Children are oftentimes unable to reach community playgrounds and parks on their own. These barriers are a serious problem when you realize that children are also not enough physical active. Besides the physical barriers, it is shown that the time which children are spending outside is correlated to the amount of physical activity. This is an important outcome, because currently a lot of children do not move enough and problems as obesity are growing in the Western Societies. Children need the possibility and stimulation to go out freely. To realize this there are a few elements which have to change, the safe feelings in neighbourhoods. But, also good urban designs can increase the time spending of children through designs as a cul-de-sac, which is interesting for young children. For making more friends and having a higher movability, the structure of a grid offers more opportunities for older children. But, also the attractiveness of the public space and playgrounds should fit more in a children's perspective. So, children want to be outside.

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2.2.2 Playgrounds, are they Children's Places?

Adults' Design

Playgrounds are the spaces which are designed 'for' children, a place where they can be physically active. Playgrounds are oftentimes designed as fenced spaces with different equipment, which attracts children to it. Unfortunately, this is not how it works (Hart 1979, Matthews 1995, Barbour 1999, Veitch *et al.* 2008). Several studies have shown that children find the traditional playgrounds with equipment as a slide, swings and merry-go-round the least fun and less interesting (compared with other playgrounds setting which will be discussed later in this section) (Hayward 1974; Barbour 1999; Fjortoft 2000; Evans 2006; Veitch *et al.* 2006). Urban designers have oftentimes the idea; by designing a traditional playground, that they create a place which children see as their place, and like. However, it is seen that adults like the design of the traditional playground most and the children less, according to Hayward *et al.* (1974) and Matthews (1995).

Children's Play Areas

However, researchers which have used the method of mapping like Hayward *et al.* (1974), Hume, Salmon & Ball (2005), Holt *et al.* (2008), and Veitch *et al.* (2008) (children drawing on a map of their living environment) with the questions; 'Where do they play?'; 'What do they find an interesting place?'; and 'What is their favourite play?', they received other answers than the playground, which was oftentimes expected it would be. They received several answers like home yard, street, local grass spaces, school yard and shopping areas. Also 'traditional playground' was mentioned, but only by a few children and not as much as was expected it would be (Matthews 1995; Veitch *et al.* 2008) (appendix 1, 1.1). They expected it, because these spaces are particular designed for them. Matthews (1995) concludes that the design of the traditional playground is made from an adult point of view, the aesthetics of adults (Humpel *et al*. 2002). However, this design is not what children naturally prefer (Hayward *et al.* 1974; Hart 1979). This argument can lead to the answer on the fact that children do not really like 'their' spaces that much and do not mention it on their maps that often (Matthews 1995).

Children's Involvement in Processes

Pellegrini *et al.* (1998) suggest that playgrounds should not be designed 'for' children but 'with' children. According to Pellegrini *et al.* children should be taken involved in the process of urban developments for creating places, routes and facilities for children. They believe that the effects would be that children also become more stimulated to go outside and become involved in the environment (Valentine 1997). Besides this, they believe that the children will use their self-designed space more often and will also feel more responsible for the space

and equipment. This can probably lead to less demolished equipment and a cleaner space (Pellegrini *et al.* 1998).

Children's Playground Preferences

After the results about the traditional playgrounds which is seen to be boring (mentioned in the first paragraph of this section) and the fact that these results do not offer what the designers expected that it would be. Researchers started to study the playground preferences of children. One of the studies was done by Hayward, Rothenberg & Beasley (1974). They found out that children prefer an adventure playground (incorporate various types of movable materials and tools for children to use in *constructing* their own play structures) in first place. This one followed by the contemporary playground (multi-purpose and linked structures that provide various means for entry and exit, and areas or fixtures that promote *dramatic play*) and on the last place the traditional playground, while this playground design has been used in almost all western residential areas (Hayward *et al. 1*974) (appendix 1, 1.2).

According to Callecod (1974), playground should offer complexity, novelty and challenge. Berlyne (1960) and Callecod believe that those characters promote the playing behaviour and children express hereby their preference. As well Fjortoft (2000) indicates that children are searching for a challenge. According to him and also Evans (2006) offers a natural playground the challenge and complexity were children are looking for. The traditional playground is mentioned through all these researches as less interesting. There is less 'arousal' for children. As Berlyne (1960) shows, by increasing the arousal (challenge, complexity and novelty) the play behaviour should be promoted (Brown & Burger 1984).

Children's Age and Physical Competence

Also the age of the children is an important factor, Barbour (1999) and Veitch *et al.* (2006) believe that this can decide if a place or equipment is a success for them yes or no. The age of children is strongly connected to the physical competence, argues Barbour (1999). As Veitch *et al.* (2006) discuss in their inquiry; children of the age of 10 are searching for new things (movements, living things, routes, etc.). They start to discover their environment, but also their own body 'what they can do yes or no'. For these children the current play facilities in the traditional playground, does offer less new triggers. For the younger children the current equipment of a traditional playground is new. This place provides them a place to learn new things and movements. For young children these playgrounds offer enough complexity. By creating more age-related-equipment all ages should be covered on a play facility and that should provide a trigger for all children.

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Recommendation for Playground Design; Focussed on Children

Brown *et al.* (1984) suggest that working with zones is also important. They believe that this offers different areas in which children can have different play behaviour like playing in sand, climbing, running, and playing role games and do not interrupt or bother each other. Another design recommendation is presented by Kruidenier (1978). He suggests 'encapsulation' as a key element. Children need in their game places where they have privacy. Places where they feel they 'get away from it all'. As Appleton (1984) discusses, human prefer landscapes which provide prospect and refuge opportunities. They believe that people like places where they can see without being seen. Currently, most playgrounds are open because of safety reason and the way parents and adults prefer it. In this way they can see their children easily. However, it is not the instinct of a child to play in an open space.

It is interesting to know what children prefer to fit the designs to their interests. But, researches have also shown that currently fewer children can go outside unsupervised. When children go to a play facility, they are often companied by an adult. In this case the play facilities have to offer the children as well as the adults good opportunities to stay and to be there (Mckenzie *et al.* 1997; Valentine 1997). Mckenzie *et al.* described in their analysis; that parents prefer facilities as: toilets, water, etc. to have on play facilities. The most frequently indicated point is safety. Parents want safe facilities and places for their children (Mckenzie *et al.* 1997; Valentine 1997; Veitch *et al.* 2006).

Conclusion Playgrounds

Designers have made through time many places for children to play in. However, research shows that children are not using these places as often as it was expected to be. Research has shown that children do not prefer the traditional playgrounds the most which are designed most often in western residential areas. The current playgrounds are mainly designed from an adults' perspective and the aesthetics of adults. Children are more interested in characters like challenge, novelty, complexity, and arousal. Because of the results that show that children and adults do have other preferences, it would be interesting to do not design playgrounds for the children but with the children.

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2.3 The Social Situation around the Children

2.3.1 Parental Influences

Parental Control

As mentioned in the last paragraph in section 'Playgrounds, are it Children's Places?' parents actively control and restrict their children's use of space, shows Valentine (1997). Not only by looking to the facilities for their child(ren) but as well for themselves, argue Mckenzie *et al.* (1997). Furthermore, Mckenzie *et al.* (1997) argue that besides controlling the use of space, they also have total control about access, how far the children are allowed to go from home without supervision. Valentine (1997) believes that this is all strongly connected to the fear which the parents have. Places which parents identify as dangerous places for their children are; public parks, shopping centres, playgrounds and outside school, in this particular order (Valentine 1997). Research of Valentine (1996) and Mckenzie (1996) show that three of the five parents indicated that they had more freedom to play outside in their childhood compared with their own children. Furthermore they show that parents fear traffic accidents or the bad influence of outsiders/strangers on their children (Tandy 1999; Veitch *et al.* 2006) in particularly mothers (Valentine 1997). Also Valentine (1997) and Veitch *et al.* (2006) do believe that these fears shape the range of the spatial restrictions, which according to the parents have become smaller through time (appendix 1, 1.3).

Valentine (1997) indicates as well, that parents find their children not enough developed on social skills. Research shows that they argue that children cannot distinguish between good and bad people. Furthermore she shows that the children are, according to the parents, too naïve so they cannot recognize potential danger or deal with it appropriately. This is an interesting conclusion because the social skills can be learnt outside, by coming in contact with peers and other people. However by holding the children close to home they do not get the opportunity to gain experience with the social skills. The situation seems to shows a descending spiral.

Home Situation which Causes Sedentary Behaviour

As mentioned above children become less developed in social skills, also according to the parents. However, there are more causes whereby children are limited in their developments like the increasing amount of sedentary behaviour. Situations where; children are being overprotected (Valentine 1997) or; the parents do not have the opportunity to go outside with their children (and they are not allowed to go un-supervised), these children are forced to stay at home (Valentine 1997; Veitch *et al.* 2008). A result of these situations, in which children stay at home for long periods a day, is that they show more sedentary behaviour

and are less active, according to Tandy (1999). Tandy believe that this can causes a lot of physical problems like obesity, less developed motor skills, and social skills but as well a limited developed identity with place and community (Cunningham and Jones 1995 cited in Tandy 1999). For these effects it seems needed that the parents get enough confidence and thrust in their neighbours and neighbourhood. But also situations in several neighbourhoods have to become safer and need more social control, as discussed by Valentine (1997).

However, research have shown that not only the situation outside or the overprotection is the cause for sedentary behaviour. Also the household situation can be an influencing factor as discussed by Brodersen *et al.* (2005). One of the outcomes of their research is that children (both genders) in single-parent household show more sedentary behaviour. An explanation is not given in Brodersen *et al.* (2005) their research.

Conclusion Parental Influences

As discussed above parents play also an important role in the issues about sedentary behaviour of the children and the problems of being not enough physical active. The majority of the parents are worried about the children and about letting them play freely outside. Many parents see a lot of unsafe factors in their neighbourhood, but they also do not have the time to go out with them for physical activities. When the phenomenon of not being able to play outside will not be solved it could have a lot of development problem for the children.

2.3.2 Gender Differences

Growing-up as a Boy or as a Girl

When children are born the differences are immediately visible by colours between the two genders. Girls wear pink and the boys blue. However, it is not only the colour and clothes but also the differences in behaviour which people expect, according to Hart (1979). He believes that this is already clear by the first toys which the children receive. Generally, the girls get dolls and the boys blocks and cars. He also believes that the effects of the toys are reflecting in the playing behaviour of older children in the playground. When the boys start playing in a playground their playing behaviour is more focussed on physical active play and the grove motor (blocks). While, the girls their playing behaviour is more focussed on symbolic play (dolls) with drama and role play (Hart 1979).

Gender Differences in Physical Activity and Way of Playing

The differences between boys and girls during playing and physical activities are oftentimes included in studies. All these researches show the same kind of results whereby the boys are more physical active than girls (Pellegrini *et al.* 1998; Sallis, Prochaska & Taylor 2000; Brodersen *et al.* 2005; Hume, Salmon & Ball 2005; Veitch *et al.* 2008). But on the other side,

girls engage more in fantasy play and at a more sophisticated level than boys do. It is said that boys often combine their play with physical strength through playing fighting and superhero themes. While girls stay more around domestic and dramatic themes with less physical activity, argued by Pellegrini *et al.* (1998).

When we look to the physical activity of children Sallis *et al.* (2001) show that there is one place which is positive associated to both genders with physical activity. They mentioned the school playgrounds when this design is promoting the activity. In that research, it was positively correlated with the children's activity levels (higher physical activity). However, after school time there is been shown a difference. Veitch *et al.* (2008) find out that the location where the children play in their free time differs by gender. A higher proportion of girls are seen being active in their yard at home, also argued by Hume *et al.* (2005). Besides this, a higher proportion of boys compared to girls are seen being active in other public open spaces like sport fields. This result made Veitch *et al.* (2008) and Hume *et al.* (2005) believe that girls are staying closer to home for playing and physical activity than boys do. Only when the children become older, the girls start to use the leisure space as well, according to Lee and Abbott (2009). Lee and Abbott (2009) see that the genders use the space in a different way, while boys are still playing sports and organised games the girls are using the space less formal and create oftentimes a place to meet and talk.

Girls are more protected

In the research of Sallis *et al.* (2001) is argued that the school playground seems to be a place in which both gender show more physical active behaviour. Only the fact that girls are also physical active in the school playground is in contradiction to the general picture we have. Pellegrini & Smith (1998) discuss that boys are more developed and more physically active compared to girls. They believe this is caused through hormonal and social events. The hormonal source is androgens (lead to growth of muscles) which the boys have more than the girls. The social events are for example the fathers who have more vigorous play with their sons than with their daughters. This causes that we have created a picture in which we consider girls as inappropriate for vigorous play. They argue that this causes that we are become more concerned about the girls when they are physical active. Fagot (1974) and Pellegrini (1988) have done a study to the supervision of the teacher during the school break. The results showed that the girls were supervised more closely than the boys because they believe the teachers were more worried about the girls.

Hart (1979) argues, that parents are quite lax by restricting a range and play for boys. Parents their argument is oftentimes 'boys will be boys'. But he finds out that the girls are kept nearer to home (Hart 1979; Valentine 1997). These places are seen as more safe, like

local playgrounds or home yard. Valentine (1997) discusses that the boys have a broader range; this offers them the opportunity to have a more diverse play place. She shows that boys often can go to the river banks for fishing or go through wooded areas which provide them different play structures like constructing play.

However, the study of Veitch *et al.* (2008) suggests the opposite of the other researches; about the places where boys and girls are allowed to go to. Veitch *et al.* ask the children on how many places they are allowed to go unsupervised. The outcome showed that girls are allowed to go to more places unsupervised than boys are. This is an interesting outcome compared to all the other outcomes; whereby the girls have to stay closer to home.

Conclusion Gender Differences

From the moment children are born they receive toys, which according to the society, fit to their gender. In western societies girls receive toys like dolls and boys toys like blocks and cars. These first toys influencing already the way in which the children learn and stimulate different developments. Girls are seen in researcher as less physical active compared with boys. But, girls are stimulated to play more fantasy and symbolic play. Besides the way of playing, there is also a difference between the two genders when we are looking to the freedom will playing and being outside. It is oftentimes shown that girls are playing closer to home than boys do. In addition to the freedom in spatial range, girls are also closer watched during vigorous play compared to boys. Adults are more concerned about girls when they are physical active this has to do with the picture we have created in our mind. Boys have to be active and do vigorous play and girls should do more relaxed play like roll play. The outcome of the general picture which is created by the society fits the outcome that girls are less physical active than boys are.

2.3.3 Cultural Background

In the research of Karsten (2003) about children's use of the public space in Amsterdam is focussed on gender. He mentions a difference in cultural background. He discusses that the Turkish and Moroccan girls were underrepresented in the public spaces in Amsterdam. He compared the play behaviour of genders and saw more male peers of the same ethnicity than female peers in the public playgrounds.

Furthermore, Brodersen *et al.* (2005) discussed in their study that ethnicity minority groups (non-White) show more sedentary behaviour. In general studies about play and physical behaviour ethnicity has not been seen as a factor with different outcomes.

2.4 The Development of a Child

Outside playing has been shown not to be only a function for having fun but also an activity through which children can learn several skills. In this section the development of different skills are discussed like the physical, the social and the cognition. Through time there is paid more and more attention to the impact and importance of outdoor learning environment of children's play (Hayward 1974; Barbour 1999). As Henniger (1993) argues, outdoor play experiences effectively stimulate young children's development.

2.4.1 Physical Development

Obesity

Currently, children their physical development is a hot item in society and science. This has to do with the fact that more and more children become obese (Wang 2006) (appendix 1, 1.5). On one side, children their eating behaviour is out of proportions and the food that a lot of children eat is not the right or healthy food, according to Scaglioni *et al.* (2008). But on the other side, children also do not exercise enough. Researchers suggest that at least 60 minutes a day of physical activity is developmentally appropriate (Biddle, Sallis & Cavill 1998). However, it is shown that a lot of children do not reach this amount of time (Pate *et al.* 2006). These two points, bad eating behaviour and low physical activity, are both factors for children to become obese, as discussed by Reilly *et al.* (2004), Hume *et al.* (2005), Powell *et al.* (2005), Holt *et al.* (2008), and Scaglioni *et al.* (2008).

Sedentary behaviour

In addition to physical activity, there is also done research to the sedentary behaviour of the children. The results of the research of Brodersen *et al.* (2005) demonstrate that a lot of children show too much sedentary behaviour. The children are also called by their parents 'indoor kids', discovered Veitch *et al.* (2006). Children seem to play more and more inside (Tandy 1999; Veitch *et al.* 2006; Holt *et al.* 2008). This is a negative flow because as several researchers like Sallis *et al.* (2000) believe that children who play less outside are less active. This causes that these children are unable to fulfil the required 60 minutes of physical activity a day.

According to Brodersen *et al.* (2005) sedentary behaviour goes often together with instable situation of health and psychological factors or unfavourable socio-demographics characters (like; single household, ethnicity minority group) or environmental factors. The children who show more sedentary behaviour do not only have a bigger change to become obese but they

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also have a higher risk for having less body-awareness and –control, argued by Scaglioni *et al.* (2008) and Kopp (2011).

Gross and Fine Motor Skills

As Kopp (2011) argues, children who are often inside did not receive the opportunity to get a full body awareness and to learn to control and invent their own body (Isenberg, Quisenberry 2002). Controlling your own body by gross motor skills like; running, jumping, climbing, crawling etc. this can be stimulated by games as soccer and playing tag, discusses Barbour (1999).

In addition to the gross motor skills, the fine motor skills (hand coordination, eye-body coordination) can be stimulated by playing as well, argues Case-Smith (2000). She believes that therapies, for fine motor, with a playful design appear to be more effective than a business appearance. Examples she gave of games and play for stimulating the fine motor skills were building sand construction and playing with blocks. These fine motor skills ask for more concentration and coordination.

Play is an important tool for children to develop their body control by the gross and fine motor skills. According to Fjortoft (2000) the developments of the gross motor skills (functional play) are standing the most central by outside playing.

Conclusion Physical Development

Currently, a lot of children have to deal with obesity and sedentary behaviour it is shown to be a dangerous and an unhealthy situation. The sedentary behaviour leads to a lot of children with less body control. It is shown that playing outside and doing physical activities are important tools for children to be more physical active and being developed on gross and fine motor skill. The children should be stimulated to go outside because places inside do not offer enough space for children their physical development skills.

2.4.2 Social Development

A child has to develop social skills to be able to participate in the society. These skills can for a part only been learnt when children come in contact with other peers and people. As Case-Smith (2000) argues, the social contact which children have with their family is different compared to what they have with adults in the public space or with other children in their neighbourhood. When children are only inside after school time and in the weekends they do not learn how to communicate properly with peers and other people (Case-Smith 2000).

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Creating impressions of other people

Ladd and Price (1999) suggest that "the interaction with peers in the playground plays an important role in the development of children's perception and impression of their classmates and in the development of their peer relationships". Playgrounds, the street, parks etc. are places where children can meet peers. Ladd and Price (1999) believe that children can here develop two kinds of impressions of their peers. On one side, they can develop a positive impression of each other, which can create a friendship. On the other side, children can also see and experience negative exchange and develop a negative impression which can lead to a hostile relationship.

Making Friends

Furthermore Pellegrini (1998) and Ladd and Price (1999) suggest another interesting point by playing after school time and weekends in the public space, that children can choose their own friends to play with (appendix 1, 1.6). In schools and at home, the contacts are already formed. During free play these contacts are less defined which means that children have oftentimes the opportunity to choose their own play partner. They believe that therefore social skills are needed.

Playground Design

Playgrounds are seen as places for children to meet other peers. Barbour (1999) recommends for these designs; a playground with equipment which offers a challenge for all different levels of motor skills of children. This should promote in addition to the physical and cognitive development also the social development of all children, through helping, sharing and cooperating play, as Ladd and Price (1999) believe.

Rules

Also rules do children have to learn to be able to play with others, according to Pellegrini (1998) and Piaget (2000). Games do have rules; for example the rules of hide and seek etc. Pellegrini (1998) and Piaget (2000) believe that children learn to accept rules through playing games. They have to work together and to learn how to deal with expecting behaviour and following the rules, accepting and adapting them (Piaget 2000; Pellegrini 1998). Because when children do not follow a rule the game is doomed to failure.

Conclusion Social Development

Children need to develop skills to communicate/ participate with their peers and other people. They can only develop these skills when they become in contact with people. Public space and playgrounds are seen as interesting places for children to choose their friends, make friendships and define, discover the rules of playing and learn to help, share with each other. All these elements can be learned by children just by playing and being outside with peers.

2.4.3 Cognitive development

Play Forms for Cognitive Development

Many researchers studied the stimulation of the cognitive development by playing (Bishop & Chace 1971; Dansky *et al.* 1973; Pellegrini *et al.*1998; Case-Smith 2000; Brodersen *et al.* 2005). The theory of Piaget (1962, 2000) 'the theory of intellectual development' which is developed in 1952 is oftentimes used as a foundation for these researches, even there is criticism about it. Critics are about the way in which the research is mainly done, according to Donaldson (1978) namely an in laboratory-setting. Furthermore, Gergen *et al.* (1990) argue that the sociocultural context was ignored, or research was only over a short period. So, there is less known about the effects on children for the future.

The theory describes three types of play which are related to the cognitive development of a child, according to Piaget (1962, 2000) (appendix 1, 1.7). Those three types are Practice play which is explained as repeated motor behaviour (jumping, running etc.). Symbolic play is formed by motor and verbal activities with high imagination level (role play). The last form of play which seems to increase the development of cognition is games with rules (soccer, basketball, etc.). Hereby, children have to learn to adopt and accept the rules of a game to play it with each other (Pellegrini 1998).

Position of Parents

Another factor for increasing the creativity and cognitive development of children is suggested by Bishop (1971). He mentioned that when children have parents who let their children create the answers and solutions by themselves, they will develop more creativity. These children are stimulates to think, try, and making choices, which lead to a creative production (Bishop 1971). This is also seen as problem-solving thinking which term is highlighted in several researches for example of Pellegrini & Smith (1998), Case-Smith (2000), and Kopp (2011).

Conclusion Cognition

Three different types of play are seen as the stimulation for the cognitive development of a child. Also problem-solving thinking is seen as an important development, by being creative to find a solution for a problem. For problem-solving thinking is highlighted that freedom for a child is needed. Parents should give their child the opportunity to find and create answer or solutions by itself. Besides developments, which only focus on an individual child, there are also cognitive developments in social context, like learning rules for games. Hereby, learning them, acceptation and adaption is needed to play together.

2.5 Conclusion

This literature review about the outdoor playing behaviour of children discussed all related topics as the physical environment of the children, the influences of the social situation of children, and what playing means for children their development. All researches, which were related to playing, highlighted the importance of playing for children. This could have been on social skills like; children learn to work together, making friends, adapting and accepting rules through games and playing but also for stimulating the physical skills as the gross and fine motor. Furthermore the importance of playing are also argued for the cognitive development of the children, as the stimulation of the creativity and problem-solving thinking. So to conclude each research related to playing highlight the importance of it for children. Although playing is shown to be important for children there is discussed in multiple researches that currently children do not play or are not physical active enough and show too much sedentary behaviour. One the effects is the growing problem of obesity. Children become too overweight. In several researches is argued that children should be physical active for at least 60 minutes a day to be physical healthy.

However, another interesting result of the literature review is that the play areas of children are oftentimes designed by adults and it is argued that children and adults share different aesthetics. In a research about the preference for a type of playground of children and parents showed a clear difference. Whereby, the parents preferred the traditional playground (merry-go-round and slide) and the children the adventure playground (movable and various types of material). Multiple researches are done towards characters of places that children like about places and play equipment. It is argued that children like places and objects which are more complex and which they can explore, objects that are a challenge, or are new to them. Furthermore is argued that children like places where something is going on.

Other researches about places where children play and done by the method of mapping showed that children most of the time do not play in a playground. It is argued that children play often on the street. These are important results when municipalities and governments want to stimulate the outdoor playing behaviour.

Concluding, children of today need to be more physical active seen the growing problem of obesity and the importance of the development of children. However, it is also seen that the design of play areas for children do not perfectly fit with the wishes and needs of children. Currently, play areas seems to be mostly designed from an adult point of view, this point seems to be one of the main stumbling blocks for being less able to design a preferred play area for children.

3. Theoretical Framework and Research Questions

There is chosen for a broad literature review to gain a complete understanding of the situation and existing knowledge about the outdoor playing behaviour of children and the play areas. However, for a valid empirical research a tightening of a problem is needed. Many problems on several research fields are discovered in the literature review. However on one problem will be the focus which is the lack of knowledge about the preference of children for a play area.

As explained in the literature review, knowledge is gained about physical environment and the different perception of adults and children about aesthetics. Furthermore, there is showed that children should be more stimulate to be physical active and more willing to play outdoors. Therefore knowledge about the preferences of children is necessary to collect for stimulating and designing areas which will trigger children to play in. In earlier research preference of children is measured. However, this is only done about the preference for a type of playground or play equipment. Though, other researches highlight that children often do not play in the playground but in and around their neighbourhood and home. So, in the field of preference of children for playing outdoors a knowledge gap is found. No empirical research is found about the preference of children for play areas, including playgrounds and children's neighbourhood. This will be the main focus of this research. In this empirical research six different kind of places will be examine as showed in figure 1 the conceptual model. Children their preference will be predict through four different characters, derived from the literature review, namely; challenge, complexity, novelty, and arousal as showed in figure 1 below.

Figure 1; Conceptual Model

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When more knowledge is collected about the preference of children it will be better doable to design a place which children like and prefer by using and adding the perceived characteristics that children's behaviour positively influences. This will help for the social problem of obesity and the development of children. Further explanation about the conceptual model (figure 1) will be given in the following sections.

3.1 Kind of Place

The places, which will be used to get an understanding about children their preference for a play area, are selected from the results of the mapping researches which were focused on the children's current play area. By using the method mapping there were play areas found like street, bushes (communal green), backyard, playground, and park (Matthews 1995; Hume *et al.* 2005; Holt *et al.* 2008). As mentioned earlier, other researches focused on children's preferred play areas was only done across three different playgrounds types. Although, the mapping researches have shown that children their play setting and favourite play areas are oftentimes not the playgrounds. So, it is interesting to go further on the play areas on which children are playing currently and see what them triggers to play on these areas and what their preferences are. The places park and nature are chosen as result of the outcomes which Fjortoft (2000) and Evans (2006) showed. They argued that natural environments are a challenge for children to play in. Besides the challenge, it should also be better for their development, which is interesting to investigate and examine if these places are also preferred by children.

So, the areas which are often mentioned by the mapping research and the natural environments (because of their challenge and complexity) are chosen as variables of kind of places which will be offered as scenarios and presented to the children in the questionnaire (see figure 1).

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3.2 Perceived Characteristics

The variables, perceived characteristics, will be used to predict the preference of the children for the different kind of places mentioned above. The perceived characteristics like complexity and mystery are introduced in the environment psychology by Kaplan & Kaplan (1979) for landscape perception and aesthetics. However, in 1974 Callecod already examined the playground behaviour and preference of children based on the characteristics complexity, challenge, and novelty. Other researchers have also used his ideas and concepts in their researches like Brown *et al.* (1984), Ellis (1984), Moore (1985), and Barbour (1999). Besides the three perceived characteristics of Callecod, the arousal theory of Berlyne (1960) is also often used to measure the hedonic value of a place. By an optimal arousal level the highest hedonic value will be measured. The perceived characteristics; challenge, complexity, novelty, and arousal will be used in this research to predict the preference of the children for a play area. This choice of variables is suitable, because these variables have previously been used by other empirical researches focussing on children and predicting their preferences for play behaviour, play equipment, and playground types and seems to be highly applicable for predicting the preferences for play areas.

3.3 Preferred Play Areas

The goal of this research is to get an understanding about the preferred play areas, by using the variables of perceived characteristics for predicting the preferences of the children. This will be measured by using a questionnaire.

The research questions which will be answered in this research are;

- To what extent is the preference influenced by perceived *challenge* of the play area (Street, Bushes (Communal Green), Backyard, Playground, Park, and Nature)?
- To what extent is the preference influenced by perceived *complexity* of the play area (Street, Bushes (Communal Green), Backyard, Playground, Park, and Nature)?
- To what extent is the preference influenced by perceived *novelty* of the play area (Street, Bushes (Communal Green), Backyard, Playground, Park, and Nature)?
- To what extent is the preference influenced by perceived *arousal* of the play area (Street, Bushes (Communal Green), Backyard, Playground, Park, and Nature)?

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4. Methods

4.1 Research Design

A questionnaire is used to explore the preference of children for a play area. Children of the age of 10 to 12 of three different primary schools in Rotterdam were asked to respond on the questionnaire. There is chosen to offer the children a questionnaire and ask them about different scenarios of play areas all in the same way. Furthermore, this method was beneficial because it was possible to receive in a short amount of time a hundred completed questionnaires.

4.2 Scenarios

The following scenarios were offered to the children.

- Street
- Bushes
- Park
- Backyard
- Playground
- Nature

The decision for choosing these places is explained by the conceptual model by 'kind of places'. These are based on earlier researches and literature. The scenarios are offered to the children per a4 with two pictures of the play area and the five questions (1) Preference, (2) Challenge, (3) Complexity, (4) Novelty, and (5) Arousal.

There is chosen for two pictures, in this way the weakness of the influence of a specific picture is less applicable. Furthermore, there is chosen for neutral picture regarding to the weather and people. There is chosen to do not show children on the pictures. This is all done to minimalize the influences on the children about the scenarios. The questionnaire is added in appendix 4.

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4.3 Operationalization

In this research the preference of children for play areas is examined by measuring the dependent variable preference and by measuring the independent variables to predict the preference (Table 1). The independent variables are the perceived characters; complexity, challenge, novelty, and arousal. By each scenario the children are asked for their perception about the characteristics and their preference. The question for their preference is used as a control measurement.

Independent Variables • perceived characteristics – challenge, complexity, novelty, arousal - Dependent Variables • Preferences

Table 1; Dependent and Independent Variables

The dependent variable, preference, is measured by the question 'how much the children like to play in the play area'. The children judge the play area by a four-point scale (++, +, -, -- or 2, 1, -1, -2).

For the independent variables, the perceived characters, is also made use of a four-point scale categorical (++, +, -, -- or 2, 1, -1, -2). The questions per perceived characteristic are showed in table 2. The play area which receives the highest score on all four characteristics will result in a preferred play area.

Variables	**Survey question**
Preferences	How much do you like it, to play here?
Challenge	Is it an adventure to play here?
Complexity	Is there a lot to do?
Novelty	Are there new things to discover?
Arousal	Is there a lot going on?

Table 2; Variables and related survey questions

Because of the fact that the target sample will be children, the measurement questions have to be simple, clear and not too broad. Furthermore, there should be not too much questions in total, for the risk that children will lose that attention.

There are four independent variables and six scenarios which will result in 24 questions to predict the preference. By adding the question of the dependent variable the questionnaire will consist of 30 questions in total. When more measurement questions per independent variable would be included the questionnaire will be too big for children to response on it with full attention. Only the most central questions will be asked to the children per perceivable

character. Besides those questions, they will also be asked for their gender and age (questionnaire added in appendix 4). Also will the questionnaire be collected and sorted per school and class.

By 'preferences' is asked in a direct way as shown in table 2 'if they like a specific play area'. This question is the overarching question about their general preferences. The answer options which were provided were; very nice (++), nice (+), no fun (-), no fun at all (--). The answers of all questions were supported by smiles in different colours; dark green (++), light green (+), orange (-), red (--)

The following questions are specific facets/ characteristics which measure an argument of children their preference (Berlyne 1960; Callecod 1974), like the challenge. In the questionnaire is asked to the children; if they see a specific place as an adventure to play in. The answer options by this question were; yes a big adventure (++), yes an adventure (+), no, no adventure (-), no not at all an adventure (--).

By using the word adventure, there will be measured if it is a challenge for the children. There is chosen for the word adventure, because this is a word which will give a better understanding for the children. The word adventure is more often used for children, like Adventure Park, or in books with stories for children.

The third question is also a specific question about one character, namely complexity. In the question about complexity is asked; if there is a lot to do. Complexity is seen as a lot of different activities with varying levels of difficulties (Callecod 1974). Complexity itself is probably too difficult for children to get an understanding about and to understand the question. The used formulation of the question 'if there is a lot to do' will give a better understanding and will still measure the complexity/variation of the play area. The answer options were; yes a lot to do (++), yes something to do (+), no, not much to do (-), no nothing to do at all (--).

The fourth question measured the novelty of the play area. This is asked by the question if there is a lot to discover on the specific play area. Discovering new objects is hereby associated with novelty. The question is made specific and less abstract or difficult which will be better understandable for the children. The answer options which were provide were; yes a lot to discover (++), yes something to discover (+), no, not much to discover (-), no nothing to discover at all (--).

The last question is measuring the arousal of a play area. The related question to arousal is formulated as 'is there is a lot going on?'. Answer options were; yes there is a lot going on (++), yes something going on (+), no, not much going on (-), no nothing going on at all (--). Arousal is seen as people, physical environment, activities the complete picture of a place (Berlyne 1960). Asking this would be too broad or too abstract. There is chosen for the question 'if there is a lot going on', because it will steer them in the preferred way of thinking. The children probably will not take everything in a count, but they will think broader about the play area.

The last four questions measure a predictor of preference. By combining the last four questions it should be possible to predict the answer on the first question. By asking these five questions the preferences is broadly measured on all different but related characters.

4.4 Data Analyses

The data will be first analysed by a reliability test. Hereby, the four perceived characteristics; complexity, challenge, novelty, and arousal will be analysed if it is justified to compute the four variables into one index 'perceived stimulation' by the cronbach's alpha, Item total correlation, and the alpha if item deleted.

Furthermore, the relationship between the preference and each perceived character will be analysed. This will be done by a regression analysis with the regression and the p-value. In the case that the four perceived characteristics can be computed to one index perceived stimulation, the relationship between the perceived stimulation and the preference will also be analysed by the regression analysis.

Thereafter, the differences per play area will be analysed based on the preference and the perceived stimulation by the 'repeated measured ANOVA'.

Finally, the influences of the different characters (age, gender, and schools) of the respondents will be analysed by a one-way ANOVA.

4.5 Sample

The target for this research will be the children of the age of 10 to 12 living in Rotterdam. Looking to the cognitive development stages of children, the ages 10 to 12 shows that children can look from more than one viewpoint, which means that they are aware that the world is not only focussed on them. They become aware of the feeling, thinking, and also of other people. Besides this awareness, the older children start to develop abstract thinking.

There is also chosen for this specific age group, because of the following reasons. One functional reason is the fact that this age group is able to read and complete a questionnaire. Other reason is based on the result that this group is missing the challenge in play areas (Veitch *et al.* 2006). This group has the age when you start to explore your neighbourhood and as well the world around you (Matthews 1995). Besides that, the children are at the age that they choose where they are going to play by themselves. Young children are oftentimes with supervision and are dependent on their supervisors' decision where to play. So, for this age group it will be easier to communicate their preference for a play area based on previous results.

By contacting primary schools it will be easier to come in contact with this target group. In this research there chosen to do the questionnaire in one city, namely Rotterdam. By examining children only in one city the influences of other factors will decrease, like differences in landscapes. There will be made use of non-random Quota Sampling (guided by some visible characteristics as gender, the location, and kind of primary school) (Kumar 2011). Because of this sample method and by examining only one city the findings cannot be generalised for the whole Dutch population but it will be justified to do for Rotterdam.

4.5.1 Test panel

Before the questionnaire was distributed to a large group of respondents it was tested by a small group of children of the age 10. In total, 10 children have formed the test panel and have completed the questionnaire. When the children were responding on the questionnaire I was listing to their talks about the topic and their opinion. So, I could hear if they understand the question and their way of thinking while answering the questions. After completing the questionnaire they were also being asked if they understood the questions and if it was difficult to respond on the questions. The children responded that the questions were easily understandable and it was clear how to check your answers. All children had completed the complete questionnaire. Despite of the majority, gave logical answers which showed a clear opinion, one child gave by one scenario a positive assessment to the first question and the follow-up questions about the same scenario (for predicting) were all answered negative. This showed that there is another character for this child which gives a positive influence for this preferring this play area. But, because only one child at one scenario gave this judgement, the questions and the characters for measuring and predicting the preferences of a play area are not changed.

It was useful to test the questionnaire on the test panel, because extra attention had to be mentioned on the fact that it was two-sided printed, because of limited budget. But, when extra attention was given to it, it work out fine. However, the main importance of the test panel was to find out if the questions were clear to the children and if their way of thinking about the questions gave the desired response, which was the case.

4.5.2 Respondents

For the research three primary schools have participated, whereof; three times group 7 and three times group 8. The three schools are all located in Rotterdam but on different areas of Rotterdam. Rotterdam is naturally divided in two parts; North and South. This is created by a river the Maas which goes straight through the city. The big differences between the two parts, is that the city centre is located in the North part. In this research one school is located in the South part of Rotterdam; this school is called 'Openbare Basisschool (OBS) de Globe'. 41 children of the primary school the Globe have participated in the research. The next school was Basisschool (BS) het Spoor which is closely situated to the centre in the North part of Rotterdam. Of this school 27 children took part in the survey. The last school called OBS Delfshaven, which is located in the North-West of Rotterdam. Here 33 children completed the questionnaire.

Below the text there is table 3 presented with all the characters of the respondents; the schools, gender, age, and the groups of school (which present the year in which they are on primary school). In all the three schools the two groups (7&8) were separated. They all had different teachers and different classrooms.

Another important issue where was thought about before holding the questionnaire, was the fact that not all children will have a backyard. In one of the scenarios is a backyard mentioned as play area. Before the children started the questionnaire a short introduction was given about the questionnaire and there was also said that in case you have no backyard yourself you can probably imagine if you would like or dislike playing in one. The other play areas were more accessible and there were no additional questions about.

In total, 101 children have completed the questionnaire for this research. The distribution of the respondents on the characters 'gender' and 'the groups of school year' are equally, 56 to 45 and 52 to 49. There will be no extra calculations needed for weighted data. The character 'age' of the children has resulted in a distribution with a peak on the age of 11 years old. About 50% of the respondents are 11 years old, about 25% is 10 years old, and again about 25% is 12 years old. The outcome of the characters of the respondents shows an equally to central distribution, which is favourable. The results of the questionnaire do not need to be corrected based on the characters of the respondents. Furthermore, the number of 101 respondents for this research with a time limit is shown to be valid for statistical measurements and for drawing conclusions out of it.

Table 3; Characters of the respondents

Schools	**Gender**		**Age**				**Groups**		**Total**
	Girls	Boys	10 yrs.	11 yrs.	12 yrs.	13 yrs.	Group 7	Group 8	
OBS De Globe	24	17	4	23	13	1	22	19	41
BS het Spoor	15	12	9	11	7	0	15	12	27
OBS Delfshaven	17	16	11	15	7	0	15	18	33
Total	**56**	**45**	**24**	**49**	**27**	**1**	**52**	**49**	**101**

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5. Results

In this results section, first the reliability of the four variables challenge, complexity, novelty, and arousal will be tested and discussed. There will be looked if it is justified to make an index called "perceived stimulation" that comprises these four variables. Secondly, all five variables per scenario will be discussed and the influence of perceived characters individually on the preference. Furthermore, the relationship between the perceived stimulation and the preference will be analysed. Also the differences or similarities between the play areas will be shown. The possible influences of the different ages, genders, and schools will also be analysed and discussed. Finally, a summary is written about the main results and outcomes of the research.

5.1 Scale Analysis

5.1.1 Perceived Stimulation

For all five play areas, Cronbach's alpha was bigger than or equal to .65, as table 4.1 and 4.2 reflect. Furthermore, alpha did not increase by deleting any item in any of the areas. Finally, item total correlations were generally above 0.4 except for one item. For all of these reasons, composite indices were computed as the average of challenge, complexity, novelty and arousal, per play area. This composite index, called "perceived stimulation", will be used in further analyses.

The results of 'item total correlation' do not show outstanding results on the independent variables in the different play areas. This result shows in combination with the outcomes of 'alpha if item deleted' that a composite index of all four independent variables together will give the best results for further analyses and for predicting the preference. The outcomes of 'item total correlation' shows only on the play area 'street', on one independent variables a result < 0.4 namely 0.371 for the variable 'arousal'. All the other outcomes show an acceptable score on 'item total correlation'.

The most important outcome of this analysis is that a combination of the four independent variables; Challenge, Complexity, Novelty, and Arousal is justified by the results of the reliability analyses and this perceived stimulation will be used in further analyses.

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Table 4.1; Reliability Analysis

Relationship Perceived Characteristics Per Play Area	Mean	St. Dev.	Reliability Analysis: Item Total Correlation	Alpha if Item Deleted	Cronbach Alpha (α)
Street					0.648
Challenge	-0.39	1.280	0.396	0.601	
Complexity	0.14	1.364	0.463	0.554	
Novelty	-0.23	1.385	0.482	0.540	
Arousal	0.61	1.325	0.371	0.618	
Bushes					0.862
Challenge	0.04	1.555	0.753	0.805	
Complexity	-0.15	1.479	0.665	0.842	
Novelty	0.29	1.458	0.712	0.823	
Arousal	-0.43	1.350	0.712	0.824	
Playground					0.760
Challenge	0.12	1.358	0.614	0.672	
Complexity	1.09	1.138	0.533	0.720	
Novelty	-0.11	1.428	0.595	0.683	
Arousal	0.40	1.348	0.502	0.734	

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Table 4.2; Reliability Analysis

Relationship Perceived Characteristics Per Play Area	Mean	St. Dev.	Reliability Analysis: Item Total Correlation	Alpha if Item Deleted	Cronbach Alpha (α)
Park					0.735
Challenge	0.48	1.265	0.549	0.662	
Complexity	0.78	1.137	0.456	0.713	
Novelty	0.24	1.328	0.544	0.665	
Arousal	0.33	1.320	0.560	0.656	
Backyard					0. 819
Challenge	-0.70	1.237	0.622	0.781	
Complexity	0.09	1.347	0.640	0.774	
Novelty	-0.61	1.249	0.637	0.775	
Arousal	-0.52	1.312	0.667	0.760	
Nature					0.859
Challenge	1.04	1.294	0.677	0.832	
Complexity	1.05	1.298	0.676	0.787	
Novelty	1.08	1.186	0.783	0.833	
Arousal	0.81	1.376	0.689	0.828	

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5.1.2 Preferences and Perceived Characteristics

Before the analyses with the perceived stimulation will be discussed there will also be looked to the assessment per character and the influence per character and per play area on the preference. The results are made visible in the table 4.1 to 4.4. Whereby, table 4.1 and 4.2 show the mean and standard deviation and table 4.3 and 4.4 the p-value and the β per play area.

Play Area the Street

The preference of the street is assessed by the children with a mean of 0.74 (table 5) which show a positive response on this play area. Furthermore, the standard deviation (st dev.) of 1.163 (table 5) is in comparison with the results of the perceived characters which show also a small deviations (table 4.1). The amount of challenge and novelty which the street offers is reviewed by the children to be negative (table 4.1). The complexity on the street is assessed close to zero (0.14) which results in a neutral idea about the complexity of the street. Finally, the arousal is measured and it is positively assessed with a 0.61. So, children find that there is something is happening on the street.

Besides the reliability analysis, a regression analysis has also run over the data. Whereby, the four characters are still separated. The results are presented in table 4.3. Hereby is shown that the perceived characters challenge and arousal have a significant relationship with the variable preference. So, the differences of these two variables are big enough to influence the preference. The strength of the relationship is shown by β; arousal 0.334 and the challenge 0.216.

Play Area the Bushes

The children did not show their preference for the bushes as play area in their responses. The preference had a mean of -0.12 (st dev. 1.551) (table 5). So, the children had a slightly negative almost neutral attitude towards the bushes. For the perceived characters complexity and arousal were also assessed slightly negative (table 4.1). The challenge of the bushes is seen more neutral and the bushes offer the children little novelty. The standard deviations are shown from 1.350 to 1.555. So, by the question about challenge with a standard deviation of 1.555 showed that the children had slightly different opinions about it. In table 4.3 the following results are shown based on the regression analysis; the perceived characters challenge and complexity have a significant relationship with the preference for the bushes. Both are influencing the preference, the strength is; challenge β =0.420 and of complexity β= 0.419.

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Play Area the Playground

Children had given a high positive rating for the preference for the playground with a mean of 1.22 (table 5). They shared their opinion about the preference for the playground because of the standard deviation of .980 (table 5). Only the variable novelty received a slightly negative score of -0.11 (table 4.1). The complexity of the playground was rate as highest of the perceived characters with a mean of 1.09. The children assessed the challenge and arousal in the playground with a small positive score. All the results are presented in table 4.1. The individual relationship per perceived character compared with the preference of the playground is presented in the table 4.3. Hereby, only challenge (β =0.208) and complexity (β =0.405) show a significant relationship with preference.

Play Area the Park

Also about this play area the children had a preference for the park. The mean was 1.09 with a standard deviation of 1.021 (table 5). However, the perceived characters scored by all a small positive mean, with a spread of .24 to .78. So, the park has to the opinion of the children all the characters but they are not optimal. All results are presented in table 4.2. The results of the regression analysis presented in table 4.4 shows that challenge and complexity have a significant relationship. So, these two characters show significant differences with the preference and influencing the preference. The strength of the relationship is by challenge β =0.380 and for complexity β =0.413.

Play Area the Backyard

The backyard is not assessed as a high preferred play area. On preference the mean was 0.19 (st dev. 1.367) (table 5). Furthermore, the measurements of challenge, novelty, and arousal on the backyard showed a negative attitude of the children (table 4.2). So children assessed the backyard on several perceived characteristics negatively. The backyard offers no novelty nor is it seen as a challenge to play in, based on the outcomes of the mean per character (table 4.2).

The regression analysis of the perceived characters and the preference showed that challenge and complexity have a significant relationship (table 4.4). Whereby, challenge and preference have strength of β = 0.366 and complexity β= 0.250.

Play Area the Nature

The nature is a play area which children like to play in shown by the mean of 1.12 (st dev. 1.365) by preference for the nature (table 5). Also the perceived characteristics were assessed with high scores which resulted in means from .81 to 1.08. So, children find the nature challenging, complex, it offers novelty, and there is something going on (table 4.2). By the outcome of the regression analysis challenge and complexity showed a significant relationship with preference. So, these two characters are influencing the preference. The Beta of the relationship showed challenge $\beta = 0.565$ and complexity $\beta = 0.342$ (table 4.4).

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Table 4.3; Relationship between Perceived Characters and Preferences

Predictors	Adjusted R^2 or β	*P*-value
Street		
Total	0.260	<0.001
Challenge	0.216	0.03
Complexity	0.190	n.s.
Novelty	0.001	n.s.
Arousal	0.334	0.001
Bushes		
Total	0.554	<0.001
Challenge	0.420	<0.001
Complexity	0.419	<0.001
Novelty	-0.129	n.s.
Arousal	0.111	n.s.
Playground		
Total	0.406	<0.001
Challenge	0.208	0.05
Complexity	0.405	<0.001
Novelty	0.126	n.s.
Arousal	0.083	n.s.

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Table 4.4; Relationship between Perceived Characters and Preferences

Predictors	Adjusted R^2 or β	*P*-value
Park		
Total	0.352	<0.001
Challenge	0.380	<0.001
Complexity	0.413	<0.001
Novelty	-0.012	n.s.
Arousal	-0.059	n.s.
Backyard		
Total	0.355	<0.001
Challenge	0.366	0.001
Complexity	0.250	0.023
Novelty	0.046	n.s.
Arousal	0.073	n.s.
Nature		
Total	0.714	<0.001
Challenge	0.565	<0.001
Complexity	0.342	0.001
Novelty	-0.025	n.s.
Arousal	0.008	n.s.

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5.2 Relationship between Perceived Stimulation and Preferences

Through the results of the reliability test it is seen justified to compute the average of the four variables. This composite index 'perceived stimulation' is here used in the regression analyses to measure the relationship with the preference. Table 5 shows the results (mean and st dev.) of the preference and perceived stimulation also the results of the regression analysis are shown by the correlation coefficient (Regression; R) and the P-value.

Firstly, it is shown that generally the standard deviation is wider by the variable preference compared to the perceived stimulation, except in case of the playground area. Besides the differences of the standard deviation, based on preference there is one play area the bushes which has a negative average score. In case of the perceived stimulation there are two play areas with a negative average score, namely the bushes and the backyard.

Secondly, in table 5 is presented the results of the regression analysis. The p-value shows on all play area/scenario a significant relationship between the two, preference and the perceived stimulation. All results show a p-value of < 0.001. The strength of the relationship is presented by the correlation coefficient (R). The lowest correlation between the preference and the perceived stimulation is shown by the play area the street with a strength of $R = 0.49$. However, also this outcome shows almost a substantial relationship (rule of thumb ≥ 0.50). The other outcomes of correlation coefficient are 0.51 up to 0.75. Thus, overall the preference and the composite index perceived stimulation show a substantial relationship. Which means that there is found a relationship in the way of responding on the questions. This is needed for predicting the preference of the children.

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Table 5: Relationship between Perceived Stimulation and Preferences

Relationship between Perceived Stimulation and Preferences	Mean	St. Dev	Regression Analysis *R*	*P*-value
Street			0.492	< 0.001
Preference	0.74	1.163		
Perceived Stimulation	0.03	0.939		
Bushes			0.694	< 0.001
Preference	-0.12	1.551		
Perceived Stimulation	-0.06	1.232		
Playground			0.619	< 0.001
Preference	1.22	0.980		
Perceived Stimulation	0.38	1.003		
Park			0.513	< 0.001
Preference	1.09	1.021		
Perceived Stimulation	0.45	0.940		
Backyard			0.605	< 0.001
Preference	0.19	1.367		
Perceived Stimulation	-0.45	1.042		
Nature			0.754	< 0.001
Preference	1.12	1.365		
Perceived Stimulation	1.00	1.082		

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5.3 Preference and Perceived Stimulation per Play Area

By using the Repeated Measured ANOVA it is possible to test the statistical differences between the play areas based on the preference and the perceived stimulation. The differences of the play areas will be discussed first by using the variable preference and thereafter the composite index perceived stimulation (Appendix 2).

5.3.1 Statistical differences per play area based on preference

The first result based on the Repeated Measured ANOVA is the 'Sphericity Assumed' which shows an alpha level small than 0.05. This indicates that the averages of all the preferences per play area are not the same, which is needed when you want to compare the different play areas statically. So, the main effects of differences per play area are statistically significant.

The results of the combinations of the play areas are shown in the appendix 2; table 6.1. In case of a statistically significant combination it is justified to say that there is a substantial difference between the two means. In this research, play area the street shows in combination with park, backyard, and nature a substantial difference. Also the combination of the nature and the bushes show a substantial difference.

In all other cases the combinations were not significant, which means that the differences between the averages of the preference on the different play areas show no statistical differences. This causes that it is not justified to rank the play areas based on preference.

5.3.2 Statistical differences per play area based on perceived stimulation

Also with the variable perceived stimulation show the 'Sphericity Assumed' an alpha level of smaller than 0.001. So it indicates that the averages of all the perceived stimulations per play area are not the same.

By perceived stimulations more combinations of play areas are shown significant, substantial different (Appendix 2; table 6.2). Nature shows in combination with all the other play areas a substantial difference. The play area backyard shows generally a significant relationship, except for one area the bushes between these two the characterized differences are not statically different. The play area park show substantial differences with the street, backyard, and nature. The play area bushes show only one significant relation with nature. The differences between the other play areas are not statistically different. Also, ranking the play areas based on the perceived stimulation is not possible, because not all combinations of the play areas are statistically significant different.

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5.4 Comparisons Characters of Respondents

In this section there is looked at the different characters of the respondents; like age, gender, and schools. The data is analysed if there could be found evidence to conclude that these different characters do influence the way of answering the questions. All the characters are tested by a one-way-ANOVA with the variable preference and perceived stimulation.

5.4.1 Age Differences

The outcome of the test showed that the influence of age on the preference and perceived stimulation is not significant; all P-values are bigger than α-level of 0.05. So the age of the children do not influence the way of answering. The children of the three different ages do respond in the same way. This is also made visible in the tables 7.1 and 7.2 shown in appendix 3; the means of all three ages are closely together.

5.4.2 Gender Differences

Also the results of the test on gender show that there are no difference in opinion between boys and girls about preference for play areas. All the α-level are bigger than 0.05, which shows that this relation is not significant and no statistical differences can be found. All the results are shown in appendix 3 in table 7.3 and 7.4.

5.4.3 School Differences

Generally, the results show to be not significant, so the schools on which the children are following their lessons is not influencing their opinion about the play areas with the variables perceived stimulation. Except for the preference of the play area the street, this shows to be significant with a p-value of 0.003. So, based on which school a child follows his/her lessons their opinion about preference of playing on the street is influenced. All the results are shown in appendix 3 in table 7.5 and 7.6

These outcomes demonstrate that there are no statistical differences for answering the questions between the different characters of the respondents, which means that the data do not have to be weighted. All results are presented in tables in appendix 3.

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5.5 Summary Results

The data which is received out of the questionnaire is in the chapter results presented and discussed by test and analysis results.

In the first section is discussed if the four perceived characters can be computed to a composite index. Through reliability test it is shown that it is justified to compute the four variables to a composite index called 'perceived stimulation', all Cronbach alphas were bigger than or equal to 0.65.

Secondly, the results of the four individual perceived characters and the preference are discussed per play area. Hereby, was presented that the street offers no novelty nor does it offers a challenge to the children. In the opinion of the children, the bushes offer a bite of novelty. However, all other means were closely related to neutral and the preference scored even a negative mean. The play area the playground was an interesting area, all perceived characters and preference showed a quite high positive mean, except for novelty which had a negative mean. In the park all perceived characters are seen by children but these are not optimal, according to them. However, the backyard is assessed on three of the four perceived characters negatively. The character complexity scored a neutral mean which was the same for the preference. The last play area was the nature, hereby all perceived characters and the preference scored a high mean. The nature was the only place which scored on all characters and preference a positive mean.

The results of the regression analysis for the perceived characters separated showed that in general the characters challenge and complexity have a significant relationship with preference per play area, except for play area the street. Hereby, challenge and arousal showed to have a significant relationship and thus significant difference which influence the preference.

In further analyses is made use of the composite index perceived stimulation. Section 5.2, Relationship between Perceived Stimulation and Preferences, showed by using the reliability test the strength of the relation between the perceived stimulation and the preference. On all the six play areas is there found a significant relationship, all p-values were smaller or equal to 0.001. The strength of the relationship is shown by the regression whereby 5 out of 6 showed a regression bigger than 0.50 and one play area the street was 0.49 which can also been seen as a substantial relationship. It is needed to have a significant substantial relationship for predicting the preference based on the perceived characteristics.

After the results that there is a relationship between the preference and perceived stimulation it is interesting to know if the six play areas can be compared and if the differences between the different play areas are big enough. In case that the differences are big enough it is possible to rank the different play areas. For this test, there is made use of the Repeated Measured ANOVA whereby the changing element the areas are. Firstly, the 'Sphericity Assumed' showed by the preference and by the perceived stimulation an alpha level small than 0.05. This indicates that the averages of all the preference and of the perceived stimulation per play area are not the same, which is needed when you want to compare the different play areas statically. However, when the play areas were compared one to one for preference and for perceived stimulation, between several areas the differences no statically different. It was not possible to speak of substantial differences between all the play areas. So, it is not possible to rank the outcomes of the preferences and the perceived stimulations of the different play areas.

Finally, it is tested if the different characters of the respondents influencing the way of answering and their way of thinking. The characters which have been tested are age, gender, and the school. All three characters resulted to be not significant. So the differences between the boys and girls, the three different schools, or the ages 10, 11, and 12 were not statically different. There was one outcome significant, namely the variable preference in combination with the character school this showed to be significant by the play area street. This means that the children on the different schools share substantial different opinion about the preference for the play area the street compared to the other schools. However, because this was by just one play area on one variable it showed that it does not influence all the outcomes of the research. Overall differences between the characters were not statically, so it did not influence the overall outcomes.

In chapter results the main outcomes were that it is justified to compute the four perceived characters challenge, complexity, novelty, and arousal to a perceived stimulation. Furthermore, the perceived stimulation and the preference show to have a substantial relationship, which is needed for predicting. Besides the substantial relationship, it is not justified to rank the play areas, because the differences between some of the areas are not statistically. However, this is not a barrier for other tests or analyses. Finally, a main result was that the characters of the respondents did not influence the way of answering the questions of the questionnaire.

6. Conclusion

The social problem of children whom are not physical active enough and the related problems as obesity are oftentimes told and showed on the television, in new papers, in magazines, and on the internet. Also in the scientific literature is oftentimes mentioned the phenomenon obesity. Results of studies show that children do not have enough exercise and are not active enough during the day. In addition to obesity it is also shown in researches that playing, what is related to physical activities and exercise stimulate the development of children on several skills. Playing is seen as a learning process of body and environment. So it is seen important that children have the opportunity to play and are stimulated to play.

In this research there is focussed on the relation of children their preferences and their play environment. As mentioned earlier in the literature review, children have different preferences than adults have. Children have also different aesthetics than adults have. In this research there is looked to different areas in which children are able to play (street, bushes, playground, park, backyard, and nature). Earlier research has shown that children do not like or do not prefer the traditional playgrounds compared to the adventure and the contemporary playgrounds. However, thousands and thousands of traditional playgrounds are designed in Western Societies. These results made it interesting to do a research to the preference of the children for a play area. Generally, people do things more often when they like something to do or they visit a place more often when they like the place. So, it is needed to get a clear understanding of the preference of the children for a play area. Based on the literature review there are four perceived characteristics mentioned to predict the preference of the children for a play area; challenge, complexity, novelty, and arousal. Based on the data it is possible to get results about the extent of influence per perceived character per play area to the preference. This will give more clarity about the needs and demand of children for a play area.

In the section Scale Analysis is evaluated the assessment of the children about the four perceived characters per play area. This analysis shows the mean per perceived character and results in a comparative assessment as by the variable preference. However, by running the regression analysis, in general only the perceived characters challenge and complexity showed to influence the preference. Except for the play area the street hereby challenge and arousal showed to have a significant relationship. So through this research there can be said that preference is influenced by the challenge and generally also by the complexity. The perceived character challenge is measured by the question; 'Is it an adventure to play in a play area?' and complexity by the question; 'Is there a lot to do in the play area?'. Novelty and arousal are less influencing the preference. In the situation that the perceived characters

will be used separately the characters challenge and complexity are the important characters for predicting the preference of children. The strength of the relationship of challenge with the preference was for street and the playground a minimal relationship (β ≥ 0.10). For the bushes, the park, and the backyard the relationship showed to be a typical relationship (β ≥ 0.30). And the play area nature presented a relationship of challenge and preference to be a substantial relationship (β ≥ 0.50). By the perceived character complexity, the play areas the street and the backyard showed a minimal relationship with preference. The other play areas bushes, playground, park, and nature resulted in a typical relationship between complexity and preference.

Though for predicting the preference, all four perceived characters are used and computed to one composite index, called 'perceived stimulation'. Based on the results of the Cronbach Alpha it was justified to create one variable out of the four characteristics. This variable perceived stimulation is also used in further analyses.

The regression analysis tested the relationship between the preference and perceived stimulation. Hereby, all play areas showed to have a significant and a substantial relationship. Which means that the perceived stimulation of the variables; challenge, complexity, novelty, and arousal is a reliable variable to predict the preference. Although by using the Repeated Measured ANOVA it is shown that as well as by the variable preference as by the variable perceived stimulation the differences between the different play areas themselves are not statistically different. This does not make it possible to compare or rank the different play areas based on the means of the two variables; perceived stimulation or preference per play area.

When the play areas are been investigated individually there can be said that the play areas the street, the playground, the park, and the nature are preferred by children. The bushes and the backyard are less preferred by children. By the play area the playground is also shown that the children identify the playground as preferred play area. However, when children have to assess the different perceived characters of the playground they are less enthusiastic. This can mean that the children hear or read in the questionnaire 'playground' and associate it with a place for them to play in. However, when they think about what these places offer to them they find it less attractive. This is also an interesting outcome, but this research has not enough evidence to give a clear explanation about this response, further research would be needed. The play area the nature shows by both variables, preference and perceived stimulation, a high positive response based on these data the nature is highly preferred.

To get children more physical active there should be paid more attention to them. Furthermore designs that are made for children should fit better to their preferences for making the designs a better success. These children have shown to ask for challenge (adventure) and complexity (something to do), which scored both quite high by the play area nature. By having this knowledge it will be better possible to designs play areas for children where they are willing to go to and that they will be more physical active.

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7. Discussion

In this chapter there will be looked at the research and questionnaire with a critical view.

As mentioned in the literature review the social aspect of playing is important for children their developments. Besides this, people prefer places where other people are (Gehl 2010). As Gehl (2010) argues people attracts people. This phenomenon could also have played a part by the way the children responded on the questionnaire. Like on the street, park, playground are in general a lot of people around. A situation in which of a lot of people are in somebodies backyard will be less likely, which could be an explanation of a lower score of this play area. So, when further research will be done on the topic preferences in combination with play areas. I would recommend to including a social question in the questionnaire as independent variable next to the questions about challenge, complexity, novelty, and arousal. About the importance of people or friends with a certain play area. In this research, based on the literature review, there is more focused on the physical and perceived characteristics.

Furthermore, it was seen that children generally gave a high score to the variable about the preference for the playground than to the means of the perceived characters. An explanation for this could be that this place is specific made for them, the 'children'. This can maybe give a positive feeling like 'our places'. Also, the children are allowed to play on these places, which could give them a positive feeling and opinion about these places, even when they find the physical elements of the playground less attractive. So, besides the possible missing question about the social factor, it could also be the fact that these places are made for them and this association can probably have created a high positive opinion towards these places. But further research would be needed to receive a clear understanding about the opinion of children about the playground because a different way of answering the questions can be seen compared to the other play areas when focussing on the averages. Although, the perceived stimulation is still useful for predicting the preferences of children for the playground based on the regression analysis.

As mentioned in the section Sample the play area backyard is a place which not all children have. Although, the children knew that they we allowed to answer the questions about the backyard. Also in the case they did not have a backyard themselves gave still complications. Twice as much 'missing values' were found in this scenario. Namely, in total 15 values were missing by backyard, six values by the playground, five by nature, two by the park, and one by the street and the bushes. The fact that not all children have a backyard could be an explanation for this. In further research it would be interesting to add a question; if they have

a backyard. Besides the number of missing values, the backyard is also quite low assessed. In a situation that a lot of children do not have access to a backyard, it could be a reason why it is assessed low. So by further research a question about the accessibility of the backyard is interesting to include, because this is the only scenario which is private property.

The final discussion point is about the fact that the research is only done in the city Rotterdam in the Netherland. It would be interesting to do this research also in other cities on children of the age of 10 to 12, to see if there are similarities in their responses. So that a broad and clear understanding can be created about the preference of children and that it can be used for promoting and stimulating their physical activity and their developments.

Thus points which need extra attention for further research on this topic with this measurement tool are; the influences of the social factor on the different play areas, the scenario playground is differently assessed in comparison towards the other play areas, by the scenario backyard need a question be included if they have a backyard to get better understanding about their responses, and it would be interesting to do this research in more cities in the Netherland. With improvements on these points, more and further research will improve the understanding of children their preference for a play area.

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Appendix

Appendix 1:

Literature Review: The Reliability of the Statements

The literature review has shown the critics on the design of the residential living area and of the traditional playgrounds. Furthermore, the problems are discussed about the issue safety and the concerns of parents. Also the differences are mentioned about the expecting behaviour of gender and the outcome of the level of the physical activity for boys and girls. In the last section is shown the effects of playing and the importance which playing is for the development of children. There is written about the physical, social and cognitive development.

1.1 Feeling the Outsider

In the first section the exclusion of the children in the environmental planning of the public space is discussed. It is seen as an important outcome. Matthews (1995) and Morrow (2001) wrote both about the phenomenon that the children are the outsiders by the environmental planning of public space.

Matthews (1995) has drawn these conclusions by using three different methods first ask the children, aged 9 to 11 years, to describe their favourite, scary and dangerous places outside their home. The results show that the street near home is seen as the favourite place and playgrounds are mentioned as fifth after local grassed spaces. The spaces which are mentioned by the children are seen by Matthews as adults' spaces. The spaces which are designed for the children, the playground, are not often used by the children. Furthermore, there is asked for where they play by themselves or by friends and the children have drawn the place which they enjoy the most for playing. Also these results of the drawings showed places like street and local shopping area as favourite places. The playground was mentioned on the sixth place. Through the use of different methods the results of this research is more reliable. The two methods which measured the places of children where the children play showed the same results. By using two different methods the playgrounds is mentioned on only the fifth and sixth place and in both cases the street is highlighted most often. Matthews (1995) concluded on the basis of empirical support, that the children play in the areas which are designed for adults' activities instead for children, so the children are not taken into account, the outsiders, during environmental planning.

Morrow (2001) wanted to find out young people's view on the social world and their experience of the communities. The research is done by the use of several research methods like; interviewing, photographing, mapping, and group discussion. Through triangulation the outcome has become more reliable. A result of the photographing was the pictures of a sign with 'on ball games' on it. Besides the picture, there were also children who told about an experience in which neighbours were screaming at the children that they have to go or to stop with ball games. Also was the sign drawn and mentioned on the maps. By all different research methods is the exclusion of children on the communal grassed field mentioned. Children indicated in several ways that they have the feeling of being not accepted. Because of the overlap between the data, received from different methods, the results have a good reliability.

These two researches show two different results which are caused by the fact that children are not taking into account by the planning of the environment. Currently, children play more often on places which are not designed for them like the street and communal grass fields, this can causes trouble between the children and neighbours and a feeling of exclusion.

1.2 The playground

Besides the design of the residential area, the playground itself is also designed without children participation. Hayward *et al.* (1974) has done research to three different playgrounds traditional, adventure and contemporary. There is made use of three methods observation, behavioural setting recording, and interviews. The results of mapping show, the same as more researchers have suggested that; the playgrounds are made from an adults' perspective and that these places are not designed to the preferences of the children. The mapping shows that children of school-age scored the adventure playground twice as high compared to the contemporary and traditional playground. Instead of the adventure playground the parents do have the traditional playground as favourite one and the adventure on the last place. This shows that parents/ adults have another idea and preference of playgrounds than children have. The same results by the children were shown in the interviews. 83% preferred the adventure playground instead of the traditional playground which is designed oftentimes. The children are interviewed on the playground self but there was also count how many children were playing on the preferred playground and only 15 % of the children of the traditional playground found this.

Besides Hayward *et al.* (1974); Hart (1979), Humpel (2002), and Matthews (1995) had also mentioned that standard/traditional playgrounds are not the preferred play areas of children. The difference between the methods of Hayward compared with Matthews; is that Matthews had asked the children where they play and what their favourite place was. The outcome was

that the playground was not mentioned that often, it was ranked fifth and sixth. Hayward *et al.* (1974) have asked to three specific playgrounds whereof the traditional playground was ranked third out of three. So both researches show with empirical support that the traditional playground is not what children prefer. Those are important outcomes, because this playground is most often built in Western-Societies.

1.3 Safety

Another issue as barrier, to let the children go freely outside, is safety. Valentine (1997) and McKenzie (1997) have written about this topic and the influence on parents and children. Valentine hold interviews and questionnaires under parents of pre-school children about safety issues and parental fears. She has this research supplemented to her theoretically research. Also McKenzie has used the interview method. By looking at the kinds of elements parents find important for their children and themselves in the public space. Valentine has used a qualitative research and McKenzie has made use of a qualitative research by counting the decision factor of the parents and thereafter calculating the correlation between the decision factors and the demographic facts and time. Mckenzie showed that safety is most often mentioned with a p-value of 0.002 for the correlation with ethnicity and the same p-value was for distance from home, which showed that both have a correlation. The two researches show both evidence based on theoretical research supplemented with their owned received empirical research.

1.4 Playing and the correlations with other factors

In section 'the situation around the children' is elaborated on gender differences. Research is done to the physical activity, play behaviour, freedom differences between boys and girls. In this research are the following researchers cited and discussed: Pellegrini *et al.* (1998); Sallis *et al.* (2000); Brodersen *et al.* (2005); Hume *et al.* (2005); Veitch *et al.* (2008). Pellegrini *et al.* have done research to all correlations and cost-benefits analyses, experimental researches from other researches and based on these results they have formed their conclusions about the development of play during childhood. Sallis *et al.* did also a study based on all other researches about the topic correlation of physical activity.

Brodersen *et al.* have done their own research with a questionnaire and observations to different factors (like socio-demographic, health, and environmental, etc.) correlated with the physical activity and sedentary behaviour and this done for boys as well as for girls. A typical outcome of the correlations was that some factors had a strong correlation with the physical activity by the boys, however did not mean that all these factors were also correlated by the

girls. This makes it difficult to use it as measurement by children, there is sometimes a separation needed.

Hume *et al.* (2005) on the other side have used a completely different method they have used mapping and photographing as method. Based on these data are drawn conclusions. As mentioned in the discussion is mapping a relative new method which is not often been used. The analysis through coding of the maps is seen as the most difficult phase by using this method. To decrease bias they have done the coding in pairs. In addition to the coding, is mentioned that the way of explaining the mapping and photographing exercise are also difficult because the children should not be being influenced by the explanation of the researcher. However, the exercise has also to be clear to the children. These points are important to keep in mind by using the method or by look at the results. Veitch *et al.* (2008) have also used the mapping method. They provided the children a map and asked for drawing an X on it to show where they live and play. This way of using the maps excluded the problem of coding all the drawings of the children. Besides the coding difficulty, it was possible to calculate the distances to all kind of facilities. The results look to me reliable compared to Hume *et al.* (2005) this has to do with the fact that not all drawings were readable for the researchers which mean that you lose your data and the X is readable. However, the question is if all children can read a map of their own neighbourhood. Besides this, you maybe miss other important information which the children cannot tell by only drawing a cross. So, both ways of mapping has advantages and disadvantages. So, the text about the topic gender is constructed on collected literature which is based on all different methods. A lot of the results were overlapping each other and through triangulation are the results and conclusions more reliable.

1.5 Obesity

The section about the physical development of children and the social problem obesity are oftentimes shown in several articles. Wang and Lobstein (2006) are one of the auteurs which have done research to the problem and phenomenon of obesity. They did a cross sectional and a longitudinal research the overweight and obesity. Whereby they have done their research in several countries and also looked to social-economic status. Besides their own research, they have also compared the country trends with other surveys on this topic. By using these data there is collected strong evidence for the conclusion that obesity is a growing problem in the western societies looking to the BMI (weight and height) of children through time. Compared to other topics which are discussed in the review is the BMI level a concrete instrument and easily to compare with other countries.

1.6 Communication

The subject that playing improves the communication skills is less concrete. The measurement tools are less obvious. However, Pellegrini and Smith (1998) and Ladd and Price (1999) have tried to show the importance of play for the social development. Pellegrini and Smith have shown that the social development is stimulated by play through playing games. For games are rules needed otherwise the game will not work out. Children need to communicate with each other and they have to accept that rule. Pellegrini & Smith (1998) and Piaget (1962, 2000) see here an important form of play which increases the social development of children. Ladd and Price (1999) discuss more social skills which are according to them stimulated and developed by play. They show that during free play children are able to choose their own friends. During school the children are oftentimes connected on each other. But during free play they are free to choose their own friends and build up friendships. However besides the friendships, also hostile relationships are created by children through negative impressions which they get of the other. Ladd and Price (1999) do also see elements of helping each other and sharing play equipment with each other as a stimulation of the social skills. All these conclusions are based on several observations which are done on playgrounds. The observations where focussed on peers behaviour during playing for the formulation of the observing topics they have done brought inspection by other researches. This made their observation as complete as possible and their results stronger and more reliable.

1.7 Cognitive Development

The last topic which is discussed in this review is the cognitive development. Important researchers were Piaget (1962, 2000), Pellegrini *et al.*(1998) and Case-Smith (2000). Piaget was one of the first researchers who focussed on the cognition and conception of children. He investigated the cognitive development of children through playing. He saw that children use their imagination and own interpretation while playing, by creating for example of a box a home. His research is done in laboratory settings this was one of the critics of other researches. Hereby is it possible that the behaviour of the children is influenced by the setting and the surrounding. Besides the imitation of children, there is also referred to the creativity which is stimulated through play as fantasy/symbolic play. Children play that they are a doctor or a patient and by playing this they learn a role of a personality. The last cognitive skill which is mentioned as a factor which will develop through playing is problem-solving thinking. All these elements; fantasy play, problem-solving thinking and creativity are all investigate by observing children's behaviour while playing. Because of the fact the behaviour is difficult to code and the data is influenced by the interpretation of the observer

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create that observations can give less concrete results. However, several researchers have investigated the development of the cognition of children during playing; from these results are these phenomena oftentimes mentioned which show that these results are more reliable.

This literature review and the constructed measurement tool is based on researches with all different research methods like observations, questionnaires, interviews, mapping, photographing. Through triangulation are the results made stronger and is shown that the majority gave results which are reliable. Although, at some points or statements there can be given critique.

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Appendix 2:

Results: The Statistical Differences between the Play Areas based on Preferences and Perceived Stimulation

Table 6.1: The statistical differences between the play areas based on preferences

The statistical differences between the play areas based on preferences	Repeated Measured ANOVA					
	P-value					
	Street	Bushes	Playground	Park	Backyard	Nature
Street		*n.s*	*n.s*	0.006	0.005	0.000
Bushes	*n.s*		*n.s*	*n.s*	*n.s*	0.000
Playground	*n.s*	*n.s*		*n.s*	*n.s*	*n.s*
Park	0.006	*n.s*	*n.s*		*n.s*	*n.s*
Backyard	0.005	*n.s*	*n.s*	*n.s*		*n.s*
Nature	0.000	0.000	*n.s*	*n.s*	*n.s*	

Table 6.2: The statistical differences between the play areas based on perceived stimulation

The statistical differences between the play areas based on Perceived Stimulation	Repeated Measured ANOVA					
	P-value					
	Street	Bushes	Playground	Park	Backyard	Nature
Street		*n.s*	*n.s*	0.006	0.005	0.000
Bushes	*n.s*		*n.s*	*n.s*	*n.s*	0.000
Playground	*n.s*	*n.s*		*n.s*	0.000	0.003
Park	0.006	*n.s*	*n.s*		0.000	0.002
Backyard	0.005	*n.s*	0.000	0.000		,000
Nature	0.000	0.000	0.003	0.002	0.000	

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Appendix 3:

Results: Influences of the Characters of Respondents on Preference and Perceived Stimulation

Table 7.1; Influences of Age on Preference and Perceived Stimulation

Influences of Age on Perceived Stimulation and Preferences	Oneway-ANOVA Analysis	
	Mean & *P*-value	
	Preference	Perceived Stimulation
Street	*n.s.*	*n.s.*
10yrs	0.50	0.01
11yrs	0.76	0.05
12yrs	0.93	0.03
Total	0.74	0.03
Bushes	*n.s.*	*n.s.*
10yrs	-0.50	-0.18
11yrs	0.06	0.10
12yrs	-0.19	-0.30
Total	-0.14	-0.07
Playground	*n.s.*	*n.s.*
10yrs	1.17	0.18
11yrs	1.27	0.42
12yrs	1.30	0.50
Total	1.25	1.00

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Table 7.2: Influences of Age on Preference and Perceived Stimulation

Influences of Age on Perceived Stimulation and Preferences	Oneway-ANOVA Analysis	
	Mean & *P*-value	
	Preference	Perceived Stimulation
Park	*n.s.*	*n.s.*
10yrs	1.08	0.26
11yrs	1.16	0.65
12yrs	0.93	0.29
Total	1.08	0.46
Backyard	*n.s.*	*n.s.*
10yrs	-0.10	-0.65
11yrs	0.10	-0.54
12yrs	0.67	-0.14
Total	0.22	-0.46
Nature	*n.s.*	*n.s.*
10yrs	1.13	0.79
11yrs	1.31	1.15
12yrs	0.74	0.85
Total	1.11	0.98

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Table 7.3: Influences of Gender on Preference and Perceived Stimulation

Influences of Gender on Preference and Perceived Stimulation	Oneway-ANOVA Analysis	
	Mean & *P*-value	
	Preference	Perceived Stimulation
Street	*n.s.*	*n.s.*
Girls	0.84	0.10
Boys	0.62	-0.06
Total	0.74	0.03
Bushes	*n.s.*	*n.s.*
Girls	-0.07	0.14
Boys	-0.18	-0.30
Total	-0.19	-0.06
Playground	*n.s.*	*n.s.*
Girls	1.25	0.31
Boys	1.18	0.45
Total	1.22	0.38

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Table 7.4: Influences of Gender on Preference and Perceived Stimulation

Influences of Gender on Preference and Perceived Stimulation	Oneway-ANOVA Analysis	
	Mean & *P*-value	
	Preference	Perceived Stimulation
Park	*n.s.*	*n.s.*
Girls	1.02	0.56
Boys	1.18	0.32
Total	1.09	0.45
Backyard	*n.s.*	*n.s.*
Girls	0.33	-0.41
Boys	0.02	-0.50
Total	0.19	-v45
Nature	*n.s.*	*n.s.*
Girls	1.11	1.07
Boys	1.14	0.89
Total	1.12	1.00

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Table 7.5: Influences of Schools on Preference and Perceived Stimulation

Influences of Schools on Preference and Perceived Stimulation	Oneway-ANOVA Analysis	
	Mean & *P*-value	
	Preference	Perceived Stimulation
Street	0.003	*n.s.*
BSO de Globe	0.61	-0.09
BS het Spoor	0.30	0.22
BSO Delfshaven	1.27	0.02
Total	0.74	0.03
Bushes	*n.s.*	*n.s.*
BSO de Globe	-0.15	0.05
BS het Spoor	-0.41	-0.11
BSO Delfshaven	0.15	-0.14
Total	-0.12	-0.06
Playground	*n.s.*	*n.s.*
BSO de Globe	1.37	0.52
BS het Spoor	1.23	0.49
BSO Delfshaven	1.03	0.11
Total	1.22	0.38

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Table 7.6: Influences of Schools on Preference and Perceived Stimulation

Influences of Schools on Preference and Perceived Stimulation	Oneway-ANOVA Analysis	
	Mean & *P*-value	
	Preference	Perceived Stimulation
Park	*n.s.*	*n.s.*
BSO de Globe	1.02	0.24
BS het Spoor	0.96	0.66
BSO Delfshaven	1.27	0.56
Total	1.09	0.45
Backyard	*n.s.*	*n.s.*
BSO de Globe	0.35	-0.22
BS het Spoor	-0.38	-0.81
BSO Delfshaven	0.47	-0.44
Total	0.19	-0.45
Nature	*n.s.*	*n.s.*
BSO de Globe	1.12	1.04
BS het Spoor	0.58	0.70
BSO Delfshaven	1.55	1.17
Total	1.12	1.00

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Appendix 4:

The Questionnaire

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Vragenlijst - De Voorkeur van Kinderen -

De straat
De bosjes
De speeltuin
Het park
De achtertuin
De natuur

Speelplek 1: De Straat

Vraag 1: Hoe leuk vind je het om op straat te spelen?
(Teken een rondje om één gezichtje)

- Heel leuk
- Leuk
- Niet leuk
- Helemaal niet leuk

Vraag 2: Is het een avontuur om op straat te spelen?
(Teken een rondje om één gezichtje)

- Ja, een heel groot avontuur
- Ja, een avontuur
- Nee, geen avontuur
- Nee, helemaal geen avontuur

Vraag 3: Is er veel te doen op straat?
(Teken een rondje om één gezichtje)

- Ja, er is veel te doen
- Ja, er is iets te doen
- Nee, er is niet veel te doen
- Nee, er is helemaal niets te doen

Vraag 4: Kan je op straat veel nieuwe dingen ontdekken?
(Teken een rondje om één gezichtje)

- Ja, er is veel te ontdekken
- Ja, er is iets te ontdekken
- Nee, er is niet veel te ontdekken
- Nee, er is nooit iets te ontdekken

Vraag 5: Gebeurt er veel op straat?
(Teken een rondje om één gezichtje)

- Ja, er gebeurt veel
- Ja, er gebeurt wat
- Nee, er gebeurt niet veel
- Nee, er gebeurt nooit iets

Speelplek 2: De Bosjes

Vraag 6: Hoe leuk vind je het om in de bosjes te spelen?
(Teken een rondje om één gezichtje)

- Heel leuk
- Leuk
- Niet leuk
- Helemaal niet leuk

Vraag 7: Is het een avontuur om in de bosjes te spelen?
(Teken een rondje om één gezichtje)

- Ja, een heel groot avontuur
- Ja, een avontuur
- Nee, geen avontuur
- Nee, helemaal geen avontuur

Vraag 8: Is er veel te doen in de bosjes?
(Teken een rondje om één gezichtje)

- Ja, er is veel te doen
- Ja, er is iets te doen
- Nee, er is niet veel te doen
- Nee, er is helemaal niets te doen

Vraag 9: Kan je in de bosjes veel nieuwe dingen ontdekken?
(Teken een rondje om één gezichtje)

- Ja, er is veel te ontdekken
- Ja, er is iets te ontdekken
- Nee, er is niet veel te ontdekken
- Nee, er is nooit iets te ontdekken

Vraag 10: Gebeurt er veel in de bosjes?
(Teken een rondje om één gezichtje)

- Ja, er gebeurt veel
- Ja, er gebeurt wat
- Nee, er gebeurt niet veel
- Nee, er gebeurt nooit iets

Speelplek 3: De Speeltuin

Vraag 11: Hoe leuk vind je het om in de speeltuin te spelen?
(Teken een rondje om één gezichtje)

- Heel leuk
- Leuk
- Niet leuk
- Helemaal niet leuk

Vraag 12: Is het een avontuur om in de speeltuin te spelen?
(Teken een rondje om één gezichtje)

- Ja, een heel groot avontuur
- Ja, een avontuur
- Nee, geen avontuur
- Nee, helemaal geen avontuur

Vraag 13: Is er veel te doen in de speeltuin?
(Teken een rondje om één gezichtje)

- Ja, er is veel te doen
- Ja, er is iets te doen
- Nee, er is niet veel te doen
- Nee, er is helemaal niets te doen

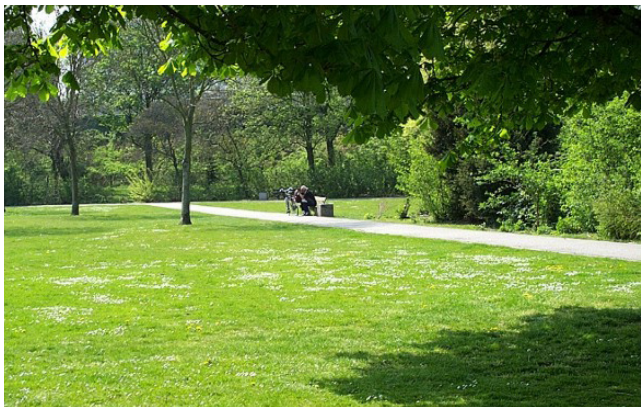
Vraag 14: Kan je in de speeltuin veel nieuwe dingen ontdekken?
(Teken een rondje om één gezichtje)

- Ja, er is veel te ontdekken
- Ja, er is iets te ontdekken
- Nee, er is niet veel te ontdekken
- Nee, er is nooit iets te ontdekken

Vraag 15: Gebeurt er veel in de speeltuin?
(Teken een rondje om één gezichtje)

- Ja, er gebeurt veel
- Ja, er gebeurt wat
- Nee, er gebeurt niet veel
- Nee, er gebeurt nooit iets

Speelplek 4: Het Park



Vraag 16: Hoe leuk vind je het om in het park te spelen?
(Teken een rondje om één gezichtje)

- Heel leuk
- Leuk
- Niet leuk
- Helemaal niet leuk

Vraag 17: Is het een avontuur om in het park te spelen?
(Teken een rondje om één gezichtje)

- Ja, een heel groot avontuur
- Ja, een avontuur
- Nee, geen avontuur
- Nee, helemaal geen avontuur

Vraag 18: Is er veel te doen in het park?
(Teken een rondje om één gezichtje)

- Ja, er is veel te doen
- Ja, er is iets te doen
- Nee, er is niet veel te doen
- Nee, er is helemaal niets te doen

Vraag 19: Kan je in het park veel nieuwe dingen ontdekken?
(Teken een rondje om één gezichtje)

- Ja, er is veel te ontdekken
- Ja, er is iets te ontdekken
- Nee, er is niet veel te ontdekken
- Nee, er is nooit iets te ontdekken

Vraag 20: Gebeurt er veel in het park?
(Teken een rondje om één gezichtje)

- Ja, er gebeurt veel
- Ja, er gebeurt wat
- Nee, er gebeurt niet veel
- Nee, er gebeurt nooit iets

Speelplek 5: De Achtertuin

Vraag 21: Hoe leuk vind je het om in een achtertuin te spelen?
(Teken een rondje om één gezichtje)

- Heel leuk
- Leuk
- Niet leuk
- Helemaal niet leuk

Vraag 22: Is het een avontuur om in een achtertuin te spelen?
(Teken een rondje om één gezichtje)

- Ja, een heel groot avontuur
- Ja, een avontuur
- Nee, geen avontuur
- Nee, helemaal geen avontuur

Vraag 23: Is er veel te doen in een achtertuin?
(Teken een rondje om één gezichtje)

- Ja, er is veel te doen
- Ja, er is iets te doen
- Nee, er is niet veel te doen
- Nee, er is helemaal niets te doen

Vraag 24: Kan je in een achtertuin veel nieuwe dingen ontdekken?
(Teken een rondje om één gezichtje)

- Ja, er is veel te ontdekken
- Ja, er is iets te ontdekken
- Nee, er is niet veel te ontdekken
- Nee, er is nooit iets te ontdekken

Vraag 25: Gebeurt er veel in een achtertuin?
(Teken een rondje om één gezichtje)

- Ja, er gebeurt veel
- Ja, er gebeurt wat
- Nee, er gebeurt niet veel
- Nee, er gebeurt nooit iets

Speelplek 6: De Natuur

Vraag 26: Hoe leuk vind je het om in de natuur te spelen?
(Teken een rondje om één gezichtje)

- Heel leuk
- Leuk
- Niet leuk
- Helemaal niet leuk

Vraag 27: Is het een avontuur om in de natuur te spelen?
(Teken een rondje om één gezichtje)

- Ja, een heel groot avontuur
- Ja, een avontuur
- Nee, geen avontuur
- Nee, helemaal geen avontuur

Vraag 28: Is er veel te doen in de natuur?
(Teken een rondje om één gezichtje)

- Ja, er is veel te doen
- Ja, er is iets te doen
- Nee, er is niet veel te doen
- Nee, er is helemaal niets te doen

Vraag 29: Kan je in de natuur veel nieuwe dingen ontdekken?
(Teken een rondje om één gezichtje)

- Ja, er is veel te ontdekken
- Ja, er is iets te ontdekken
- Nee, er is niet veel te ontdekken
- Nee, er is nooit iets te ontdekken

Vraag 30: Gebeurt er veel in de natuur?
(Teken een rondje om één gezichtje)

- Ja, er gebeurt veel
- Ja, er gebeurt wat
- Nee, er gebeurt niet veel
- Nee, er gebeurt nooit iets

Vraag 31: Hoe oud ben je?
(Teken een rondje om één gezichtje,
wanneer ‘anders’ vul je leeftijd er ook bij in)

9 jaar
10 jaar
11 jaar
12 jaar
anders, ...

Vraag 32:Ben je een jongen of meisje?
(Teken een rondje om één gezichtje)

Jongen
Meisje

Dit is het einde van de vragenlijst!

Heel erg bedankt voor het invullen van mijn vragenlijst!
Je mag deze inleveren bij je juf of meester!

Liesbeth