

Nature experiences and nature connection of children in urban natural playgrounds in the Netherlands

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Master thesis



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“Every individual matters. Every individual has a role to play. Every individual makes a difference.”

-Jane Goodall-

Preface

During my childhood I lived in a small rural village in the Netherlands, located next to a forest. I loved going to this forest, wandering for hours, climbing trees and listening to the sounds of nature. I believe that these experiences have developed a strong bond between nature and me, which eventually has led to me being the nature supportive person I am nowadays.

Three years ago I moved to the capital of the Netherlands, Amsterdam, assuming that this city was a place without nature. I wondered what Amsterdam children would be like, not having the opportunity to interact with nature like I did during my childhood. Soon I found out however that there are many green places in the city, with lots of different animal and plant species.

About one year ago I discovered a natural area in Amsterdam, where children in boots and muddy clothes were playing around. I found out that this place was called a 'natural playground' and there appeared to be many more of them in the city. Watching children playing in these natural playgrounds raised the question in me: *Would these natural playgrounds create a bond between children and nature, like the forest did in my childhood? And if so, would this contribute to the development of a nature supportive society?* This was a big motivation for me to set up this research.

During my research I read the book 'Reasons for hope: a spiritual journey' of Jane Goodall (1999), who stated the quote on the previous page. Her book is not only about her research on chimpanzees, but also about the importance of people's awareness of the natural world around them. This book was very inspirational to me and I agree with Jane Goodall that when people will see and feel the importance of nature, they will care for it and support it. Every individual child that gets the opportunity to connect with nature might become one extra person with a careful attitude towards nature.

This research would not have been possible without the help of many people. First, I would like to thank my supervisor Birgit Elands for all her support. I sometimes was quite struggling in my research process, but after talking, skyping or e-mailing with Birgit I often felt much more confident in continuing my research. Second, special thanks goes to all children and adults I spoke with during data collection. I was surprised by the openness and honesty of children about their experiences with nature. Furthermore, I would like to thank all employees and owners of Het Woeste Westen and De Natureluur for involving me in their activities and providing me with useful information about the natural playgrounds. Their enthusiasm in their work to bring children in contact with nature worked as an inspiration for me. Also, I would like to thank Jesse Leeuwendal for reading this thesis and checking it on grammar. And last but not least, lots of thanks goes to all my family, friends and my boyfriend Kevin, for listening to my 'adventures' in the natural playgrounds. Also, during the research process, which was not always easy, they were very helpful and supportive to me.

Amsterdam, March 16th 2016

Louwra Renske Postma

Summary

The contact between nature and children has been decreasing over the past century. Children and young people alienate from nature, since most of them do not experience nature any more. Real nature experiences however, have positive effects on children's health and wellbeing. On the other hand, nature experiences might lead to nature connection and have a positive effect on the wellbeing of nature. To bring children in contact with nature again many initiatives have been undertaken of which one is the development of natural playgrounds. Many of these playgrounds are located in cities. This research studies how nature experiences in urban natural playgrounds relate to nature connection amongst children. One of the factors studied is whether there are differences between children with a non-Western immigrant and a native Dutch background.

To study nature experiences amongst children in natural playgrounds theories of Margadant-van Arcken (1990) and Van der Waal, Van den Berg and Van Koppen (2008) are used. They made a categorization of nature experiences amongst children. In this research some of their categories are replaced by more relevant categories. The categories of nature experiences studied in this research are: 1. Challenging nature, 2. Useful nature, 3. Active nature, 4. Fantasy in nature, 5. Intriguing nature 6. Aesthetic nature, 7. Fear and aversion to nature and 8. Non-natural experience.

Nature experiences are evoked by specific characteristics of the environment that afford children to behave in a certain way (Gibson, 1979; Heft, 1988; Lerstrup, 2016). This theory about 'affordances' is used to make the classification of children's behavior in nature experiences easier. Also it is used to determine differences between natural playgrounds, since they have different environmental features, which might lead to different nature experiences amongst children.

Theories about nature connection were used to study how children in natural playgrounds are connected to nature. Cheng and Monroe (2012) developed the nature connection index for children. They state that nature connection consists of four dimensions: enjoyment of nature, empathy for creatures, sense of oneness and sense of responsibility.

A case-study has been done in Amsterdam, the Netherlands. Two natural playgrounds have been selected, namely Het Woeste Westen and De Natureluur. Both these playgrounds are in an urban setting and they are located in city districts that inhabit people with a non-Western immigrant and a native Dutch background. The playgrounds are about the same size (3 ha) and they both organize activities during clubs every week. There are however some differences in environmental features between the two playgrounds. In this research, different qualitative methods were used, namely observations, focus group discussions with children and informal interviews with adults. For the observations an observation scheme and for the focus group discussions a question list with pictures were made in advance.

Data shows that children had many different nature experiences in the natural playgrounds. The experience most present during observations was useful nature, which can be subdivided in nature as material supplier, which is characterized by children making new things of natural elements or objects; nature as a tool, in which natural elements or objects are used in their original form; and nature to eat, in which natural objects are used to make food. The experience second most present during

observations was challenging nature. In this experience children were taking risks like falling in the water or on the ground. Challenging nature was performed individually and concentrated. The next experience was active nature, which is about physically active behavior like running or jumping. The environment of the natural playground seems to invite children to behave actively since they often run from one place to another. Floating on the rafts in the natural playgrounds was also classified as active nature. Intriguing nature in natural playgrounds is about children being fascinated by nature or natural objects, like animals or plants and they are gaining knowledge by this experience. Often adults are involved in intriguing nature, who teach children things about nature. Fear and aversion to nature was characterized by children experiencing dangerous or unpleasant feelings towards nature, for example towards animals, mushrooms or plants. Also pain and cold are part of fear and aversion to nature. Fear and aversion can be stimulated by adults telling children the dangers of their behavior. Fantasy in nature was a very variable experience amongst children. There are however two central themes distinguished, namely animals and prehistoric men. Aesthetic nature was only seen a few times during the research. It was not only about seeing the beauty of nature, but also for example about smelling nature. Adults sometimes pointed out the beauty of nature to children. The last experience in natural playgrounds is the non-natural experience, in which children made use of the non-natural play objects in the playgrounds.

Different factors influenced the nature experiences amongst children. The most important influential factor was whether children showed spontaneous behavior or whether they were involved in organized clubs. During spontaneous behavior useful nature, challenging nature and active nature were dominant. During clubs useful nature, intriguing nature and fantasy were dominant. Also adults influenced nature experiences amongst children, since many adults encouraged or discouraged children to show certain behavior. The ethnic background (non-Western immigrant or native Dutch) of children did not play a role in children's nature experience. Also differences in nature experiences between the different playgrounds were little.

Nature connection was studied during the focus group discussions with children, based on the four dimensions of nature connection: enjoyment of nature, empathy for creatures, sense of oneness and sense of responsibility. In enjoyment of nature the central elements seemed to be fun, variety in experiences and self-determination, leading to positive feelings towards nature. This shows that enjoyment of nature is mainly about the affective component. Empathy for creatures and the understanding of creatures being vulnerable appeared to be species dependent. Children seem to be more empathic towards animals and plants they like than towards animals they do not like. This demonstrates a link between enjoyment of nature and empathy for creatures. Empathy for creatures seems to be stimulated by learning about creatures and their functions, in which often adults are involved. This demonstrates the cognitive component of empathy for creatures. Empathy for creatures has however also an affective component, because children sometimes have feelings about the feelings of animals. Sense of oneness is about the understanding that humans are depending on and part of nature. Sense of oneness also seems to be stimulated by learning, when children learn about humans' place in nature and the origin of products in nature. This demonstrates the cognitive component of sense of oneness.

These three dimensions of nature connection seem to be depending on each other and are therefore called 'steps', meaning that the first step is necessary to develop the second and the second step is necessary to develop the third step. Sense of responsibility can be present amongst children in different forms within the three steps of nature connection. Sense of responsibility for nature can be anthropocentric (wellbeing of humans), biocentric (wellbeing of individual natural creatures) or ecocentric (wellbeing of nature in general).

This research shows that different nature experiences in natural playgrounds can facilitate the different steps of nature connection. All nature experiences can facilitate enjoyment of nature. Self-determination was an important element in enjoyment of nature and therefore spontaneous behavior (independent playing) seems to be the most beneficial for enjoyment of nature. The nature experiences useful nature, intriguing nature and fantasy in nature can facilitate both empathy for creatures and sense of oneness. During clubs these experiences were most dominant and therefore these clubs seem to be beneficial for the development of empathy for creatures and sense of oneness. Since the steps of nature connection are dependent on each other, a combination of spontaneous behavior (independent playing) and clubs in urban natural playgrounds seems to be the best way to develop a strong nature connection amongst children.

To conclude, nature experiences in natural playgrounds can play an important role in nature connection amongst city children. This nature connection might lead to more nature supportive behavior during adulthood and therefore, natural playgrounds could contribute to a more nature supportive society.

Samenvatting

Het contact tussen natuur en kinderen is in de afgelopen eeuw verminderd. Kinderen en jongeren vervreemden van natuur, omdat veel van hen natuur niet meer ervaren. Natuurervaringen hebben echter een positief effect op de gezondheid en het welzijn van kinderen. Aan de andere kant zouden natuurervaringen kunnen leiden tot een band met natuur wat een positief effect zou kunnen hebben op het welzijn van de natuur. Om kinderen weer in contact te brengen met de natuur zijn er veel initiatieven genomen, waaronder de ontwikkeling van natuurspeeltuinen. Veel van deze speeltuinen zijn gerealiseerd in steden. In dit onderzoek is onderzocht hoe natuurervaringen in stedelijke natuurspeeltuinen samenhangen met natuurverbinding bij kinderen. Een van de onderzochte factoren is of er verschillen zijn tussen niet-Westerse allochtone en autochtone Nederlandse kinderen.

Om natuurervaringen bij kinderen in natuurspeeltuinen te onderzoeken zijn theorieën van Margadant-van Arcken (1990) en Van der Waal et al. (2008) gebruikt. Zij maakten categorieën voor natuurervaringen bij kinderen. In dit onderzoek zijn sommige van hun categorieën vervangen door relevantere categorieën. De categorieën van natuurervaringen in dit onderzoek zijn: 1. Uitdagende natuur, 2. Gebruiks natuur, 3. Actieve natuur, 4. Fantasie in natuur, 5. Intrigerende natuur, 6. Esthetische natuur, 7. Angst en afkeer voor natuur en 8. Niet-natuurlijke ervaring. Natuurervaringen worden uitgelokt door specifieke kenmerken in de omgeving die het kinderen mogelijk maken om bepaald gedrag te vertonen (Gibson, 1979; Heft, 1988; Lerstrup, 2016). Deze theorie over 'mogelijkheden' is gebruikt om het gedrag van kinderen makkelijker te kunnen classificeren in natuurervaringen. Daarnaast is de theorie gebruikt om verschillen in gedrag van kinderen tussen speeltuinen te kunnen vaststellen, omdat de speeltuinen verschillende specifieke kenmerken hebben. Theorieën over natuurverbinding zijn gebruikt om te onderzoeken hoe kinderen in natuurspeeltuinen verbonden zijn met natuur. Cheng en Monroe (2012) hebben de natuurverbinding index voor kinderen ontworpen. Zij schrijven dat natuurverbinding uit vier dimensies bestaat: genieten van natuur, empathie voor natuurlijke wezens, gevoel van eenheid met natuur en verantwoordelijkheidsgevoel voor natuur.

In Amsterdam is een casus geselecteerd waar twee natuurspeeltuinen zijn geselecteerd, namelijk Het Woeste Westen en De Natureluur. Deze speeltuinen liggen in een stedelijke omgeving in stadsdelen waar zowel mensen met een niet-Westerse allochtone als autochtone achtergrond wonen. De speeltuinen zijn ongeveer even groot (3 ha) en beide speeltuinen organiseren activiteiten tijdens hun wekelijkse natuurclubs. Er zijn echter een aantal verschillen in omgevingsfactoren tussen beide speeltuinen. Voor dit onderzoek zijn verschillende kwalitatieve onderzoeksmethoden gebruikt, namelijk observaties, focusgroep discussies met kinderen en informele interviews met volwassenen. Voor de observaties is vooraf een observatieschema gemaakt en voor de focusgroep discussies is vooraf een vragenlijst met foto's ontwikkeld.

De verkregen data toont aan dat kinderen veel verschillende natuurervaringen hadden in de natuurspeeltuinen. De meest aanwezige natuurervaring tijdens de observaties was gebruiks natuur. Deze ervaring kan worden opgedeeld in natuur als leverancier van grondstoffen, waarbij kinderen nieuwe dingen maken van natuurlijke elementen; natuur als gereedschap, waarbij natuurlijke elementen worden gebruikt in hun originele vorm; en eetnatuur, waarbij natuurlijke elementen worden gebruikt voor de

bereiding van eten. De tweede ervaring was uitdagende natuur waarbij kinderen risico's nemen, zoals in het water of op de grond vallen. Uitdagende natuur wordt individueel en geconcentreerd uitgevoerd door de kinderen. Actieve natuur is gekenmerkt door actief gedrag bij kinderen, zoals rennen en springen. De omgeving in natuurspeeltuinen lijkt kinderen uit te nodigen om zich actief te gedragen, omdat kinderen vaak van de ene naar de andere plek rennen. Ook vlotvaren is geclassificeerd tot actieve natuur. Intrigerende natuur omvat fascinatie bij kinderen over natuurlijke elementen zoals planten en dieren, waardoor ze kennis opdoen. Bij intrigerende natuur zijn vaak volwassenen betrokken die kinderen dingen leren over natuur. Angst en afkeer voor natuur is gekenmerkt door gevaren en onprettige gevoelens die kinderen ervaren in de natuur, bijvoorbeeld over dieren, paddenstoelen en planten. Ook pijn en kou maken deel uit van angst en afkeer voor natuur. Angst en afkeer kunnen worden gestimuleerd door ouders die kinderen wijzen op de gevaren van hun gedrag. Fantasie in natuur is een variabele ervaring bij kinderen. Er zijn echter twee thema's die zich onderscheiden, namelijk dieren en oermensen. Esthetische natuur werd slechts een paar keer geobserveerd tijdens het onderzoek. Deze ervaring gaat niet alleen over het zien van de schoonheid van de natuur, maar ook over bijvoorbeeld het ruiken van de natuur. Soms wijzen volwassenen kinderen op de schoonheid van de natuur. De laatste ervaring in natuurspeeltuinen is de niet-natuurlijke ervaring waarbij kinderen gebruik maken van de niet-natuurlijke speeltoestellen in de speeltuinen.

Tijdens het onderzoek zijn er verschillende factoren vastgesteld die natuurervaringen kunnen beïnvloeden. De belangrijkste factor was of kinderen enerzijds spontaan gedrag vertoonden of anderzijds deelnamen aan georganiseerde clubs. Tijdens spontaan gedrag stonden gebruiksnatuur, uitdagende natuur en actieve natuur centraal. Tijdens natuurclubs stonden gebruiksnatuur, intrigerende natuur en fantasie in natuur centraal. Verder werden kinderen beïnvloed door volwassenen in hun natuurervaringen, omdat volwassenen kinderen vaak aan- of ontmoedigden om bepaald gedrag te vertonen. Etnische achtergrond van kinderen (niet-Westers allochtoon of autochtoon) speelde geen rol bij natuurervaringen tijdens het onderzoek. Ook verschillen in natuurervaringen tussen de speeltuinen waren minimaal.

Natuurverbinding is onderzocht tijdens de focusgroep discussies met kinderen over de vier dimensies van natuurverbinding: genieten van natuur, empathie voor natuurlijke wezens, gevoel van eenheid met natuur en verantwoordelijkheidsgevoel voor natuur. Bij genieten van natuur lijken de volgende elementen centraal te staan: plezier, variëteit in ervaringen en zelfbepaling, welke leiden tot positieve gevoelens. Dit geeft aan dat genieten van natuur voornamelijk een affectieve component heeft. Empathie voor natuurlijke wezens en het begrijpen van kwetsbaarheid van wezens lijkt afhankelijk te zijn van de soort. Kinderen hadden meer empathie voor dieren en planten die ze leuk vonden dan voor dieren en planten die ze niet leuk vinden. Dit toont een verband aan tussen genieten van natuur en empathie voor dieren. Empathie kan worden gestimuleerd door te leren over natuurlijke wezens en hun functies, waarbij vaak volwassenen betrokken zijn. Dit toont de cognitieve component van empathie voor wezens aan. Empathie voor natuurlijke wezens heeft echter ook een affectieve component omdat kinderen eigen gevoelens beschreven over de gevoelens van wezens. Gevoel van eenheid wordt gekenmerkt door het begrip dat mensen deel uitmaken en afhankelijk zijn van natuur. Gevoel van

eenheid wordt gestimuleerd door het leren over de mens zijn plaats in de natuur en de herkomst van producten uit de natuur. Dit toont de cognitieve component van gevoel van eenheid aan.

De drie dimensies van natuurverbinding lijken afhankelijk van elkaar te zijn en worden daarom 'stappen' genoemd in de resultaten. Dit houdt in dat de eerste stap nodig is voor de tweede stap en de tweede stap nodig is voor de derde stap. Verantwoordelijkheidsgevoel voor natuur bij kinderen kan aanwezig zijn binnen de drie stappen van natuurverbinding. Verantwoordelijkheidsgevoel kan een antropocentrisch (welzijn van mensen), biocentrisch (welzijn van individuele wezens) of ecocentrisch (welzijn van de hele natuur) karakter hebben.

Dit onderzoek toont aan dat verschillende natuurervaringen in natuurspeeltuinen de verschillende stappen van natuurverbinding kunnen faciliteren. Alle natuurervaringen kunnen de stap genieten van natuur faciliteren. Zelfbepaling was een belangrijk element in genieten van natuur, waardoor spontaan gedrag (vrij spel) het meest doeltreffend lijkt te zijn voor het genieten van natuur. Gebruiksnatuur, intrigerende natuur en fantasie in natuur kunnen zowel empathie voor natuurlijke wezens en gevoel van eenheid faciliteren. Tijdens de natuurclubs waren deze natuurervaringen het meest aanwezig, waardoor deze natuurclubs het meest doeltreffend lijken te zijn voor de ontwikkeling van empathie voor natuurlijke wezens en gevoel van eenheid. Omdat de verschillende stappen van natuurverbinding afhankelijk van elkaar zijn lijkt een combinatie van spontaan gedrag (vrij spel) en natuurclubs in natuurspeeltuinen de beste manier te zijn om een sterke natuurverbinding te ontwikkelen.

Concluderend, natuurervaringen in natuurspeeltuinen kunnen een belangrijke rol spelen in natuurverbinding bij stadskinderen. Deze natuurverbinding zou tot meer verantwoordelijkheid voor natuur kunnen leiden op volwassen leeftijd. Daarom kunnen natuurspeeltuinen bijdragen aan een groter draagvlak voor natuur in de Nederlandse samenleving.

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1. Introduction

1.1 Problem statement

The contact between nature and children has been decreasing over the past century. Children and young people alienate from nature, since most of them do not experience nature any more (e.g. Louv, 2005; Witt, 2005). What does this alienation mean and will it ultimately lead to an unfixable gap between humans and nature? One reason for the alienation from nature is urbanization (Louv, 2005; Trevors & Saier, 2010), which leads to the fact that children have less possibilities to visit nature areas. Another reason is the digitalization of today's society. Children spend more and more time inside their houses, watching television or playing computer games (Louv, 2005; Christakis, Ebel, Rivara & Zimmerman, 2004). Furthermore, parents seem to be very protective and set restrictions on the independent mobility of children which makes it more difficult for children to play outside (Smith & Barker, 2001). Also, children nowadays are often supervised by adults when playing outside, thereby influencing the way children interact with nature, because adults often decide what children are doing (Giddings & Yarwood, 2005).

Real nature experiences amongst children are however important. On the one hand nature has positive effects on children's health and wellbeing (Chawla, 2015). Contact with nature can for example develop social skills, like self-confidence and responsibility (Kellert, 2002), improve motoric skills (Fjortoft, 2004) and reduce stress (Wells & Evans, 2003) amongst children. On the other hand, nature experiences might lead to nature connection and have a positive effect on the wellbeing of nature. According to different authors, nature experiences and nature connection in people's childhood lead to nature supporting (Veldwerk Nederland, 2006) and environmental friendly attitudes in adulthood (Hoyt & Acredolo, 1992; Thompson, Aspinnall & Montarzano, 2007; Chawla, 2007; Wells & Lekies, 2006; Witt, 2005).

The effects of nature experiences on the health and wellbeing of children are well studied, but the effects on nature connection seem to get less attention in science, not meaning that it is less important. The fact that children nowadays have less nature experiences, has raised the concern that nature connection will be decreasing amongst children, which consequently leads to less nature support amongst people. In his book 'The last child in the woods', Richard Louv (2005) is asking the question if there will still be nature protectors in the future, when children do not interact with nature anymore.

To bring children in contact with nature again, many initiatives have been undertaken in the Netherlands over the last few decades. In primary schools for example environmental education is focusing on real nature experiences (e.g. Het Bewaarde land, 2015; School in Bos; 2015). Also, nature organizations have developed activities for letting children experience nature (e.g. Oerrrr, Natuurmonumenten, 2015; Logeren bij de boswachter, Staatsbosbeheer, 2015). Furthermore, in the policy document 'Natuurlijk verder' (Ministerie van Economische Zaken, 2014), attention is given to the increase of human-nature contact by including nature in the human society. This has led to the increase of natural areas within cities. Over the past decades, many natural playgrounds have for instance been developed for children of which many of them are located in cities (Springzaad, 2015; Gemeente Amsterdam, 2015) and the number of urban natural playgrounds is still increasing. In the policy document 'Agenda Groen' of the

municipality of Amsterdam (2015) for example, one of the goals is the development of fifteen new natural playgrounds in the city within the next three years (Gemeente Amsterdam, 2015). In natural playgrounds the purpose is that children mainly play with natural materials and elements like water, mud, trees and other plants instead of just playing in a natural environment with non-natural elements like swings and metal play objects (LNV, 2009). The goals of urban natural playgrounds are not only focusing on the improvement of social and motoric skills, but also on the increase of nature connection amongst children, by nature experiences (Conversations playground owners, 2015).

1.2 Research objective and research questions

The objective of this research is to find out how nature experiences in urban natural playgrounds relate to nature connection amongst city children. Most of the existing studies about children and nature are focusing on nature experiences in educational settings as part of formal environmental education (e.g. Margadant-van Arcken, 1990; Waal et al., 2008; Kossack & Bogner, 2012). These studies often take place in non-urban settings (e.g. Fjortoft, 2004; Margadant-van Arcken, 1990; Waal et al., 2008). This research is however focusing on natural playgrounds in an urban setting, which are mostly used by children in a non-formal educational setting. Some research has been conducted about natural playgrounds, but focus of these studies was on play behavior, physical activity, concentration and mood amongst children (Berg, Koenis & Berg, 2007; Roade Tato, 2014). This research however focuses on nature connection amongst children, which might lead to more nature support in adulthood. Increasing support for nature and nature policy is a goal of the Dutch government (Ministerie van Economische Zaken, 2014). If nature experiences in natural playgrounds indeed contribute to child-nature connection, they might play an important role in the increase of nature support in the Netherlands, since many people live in cities nowadays and it is more likely that children get in touch with natural areas within the city, than for instance a forest outside of the city (Ministerie van Economische zaken, 2014).

In this research, special attention will be given to differences between children with a non-Western immigrant and a native Dutch background, because in Dutch cities many people with different ethnic backgrounds live together, including many with a non-Western immigrant background (e.g. Gemeente Amsterdam, 2015). People with a non-Western immigrant background in the Netherlands are less familiar with nature than native Dutch people and nature support is even lower amongst this group (Buijs, Elands & Langers, 2009; Kloek, 2015). Therefore, nature experiences and nature connection might be important to increase support for nature and nature policy amongst this group.

Because research about the relationship between nature connection and nature experiences in the specific set of urban natural playgrounds has never been done before, this research is filling a gap in the already existing scientific literature. This research would be interesting for nature policy makers, urban planners, nature organizations and other people who think nature support is important.

The main research question of this research is:

How do nature experiences in urban natural playgrounds relate to nature connection amongst city children?

This research question can be split into different sub questions which are as follows:

- What kind of nature experiences do children in urban natural playgrounds have and which factors play a role in these experiences?
- What kind of nature connection do children in urban natural playgrounds have and which factors play a role in this connection?
- What are the similarities and differences regarding nature experiences and nature connection between (i) children with a native Dutch background and with a non-western immigrant background and (ii) between playgrounds with different environmental features.

1.3 Research outline

The different concepts used in this research will be described in the theoretical framework in the next chapter. In chapter three the different research methods are explained. After that, the different nature experiences amongst children and their influential factors will be elaborated in chapter four. This is followed by nature connection amongst children and its influential factors in chapter five. In chapter six is analyzed how nature experiences relate to nature connection. At last the conclusion and discussion of this research are given in chapter seven.

2. Theoretical framework

In this chapter the concepts used in the research questions will be elaborated. Different theories are used to find out how nature experiences in urban natural playgrounds relate to nature connection amongst children. First, theories of nature experiences will be explained. After that, this chapter will elaborate on nature affordances in relation to nature experiences in natural playgrounds. Theories about nature connection will be described in the third paragraph. This chapter ends with a description of the differences between children with a non-Western immigrant and a native Dutch background in relation to nature and how this is used in this research.

2.1 Nature experiences

Margadant-van Arcken (1990), who did a lot of research to nature interaction amongst children, describes in her book that children have an existential play relationship with nature, because of the attractiveness of nature for children to play. In their playing behavior, children experience different nature values. She distinguishes positive values, which are 'challenging nature', 'useful nature', 'intriguing nature', 'aesthetic nature' and 'recreational nature' and a negative value, which is 'threatened nature'. Margadant-van Arcken (1990) writes in her book that there is a fixed order of importance in these nature values, meaning that the most important value is most experienced amongst children. Although Margadant-van Arcken (1990) uses the term 'nature values' for the different ways children can experience nature, I will use the concept 'nature experiences' as overall term to describe the different ways children can experience nature. An explanation of the different nature experiences is described below according to the order of importance of Margadant-van Arcken (1990).

Challenging nature

Challenging nature motivates children to behave in a vital and explorative way. In challenging nature, the focus lies on the exciting aspects of nature and the experience of adventures and thrills. The research of Margadant-van Arcken (1990) shows that boys behave more vitally and explorative than girls. Boys are more often looking for adventure when they are in natural areas. Behavior that appertains under challenging nature are for example climbing a tree or jumping over a ditch.

Useful nature

According to Margadant-van Arcken (1990), useful nature has approximately the same importance as challenging nature. Useful nature is about children using natural elements in their behavior. This experience can be split into: 'nature to play', 'nature to eat', 'healing nature' and 'nature as material supplier'. Margadant-van Arcken (1990) argues that nature to play is the most important sub experience of useful nature. The difference with challenging nature is that excitement and adventure do not explicitly play a role. In nature to play, children reflect about nature being used for playing. This is not the case in challenging nature, because children are too excited and do not have time to reflect on their behavior. Examples Margadant-van Arcken (1990) gives of nature to play are building a tree house or using nature for decoration. The same examples can be used for nature as material supplier, which means that there can be an overlap of different forms of useful nature. Nature to eat, healing nature and nature as material supplier are about children using products from nature to make food, to heal themselves or to build or decorate things.

Intriguing nature

Intriguing nature is about making use of different senses to perceive nature. Margadant-van Arcken (1990) talks about 'tracing and scouting' the environment to increase knowledge about certain aspects of nature, like plants or animals. Margadant-van Arcken (1990) is pointing out that children often need encouragement of educators or other adults to show this tracing and scouting behavior.

Aesthetic nature

Aesthetic nature is about experiencing the beauty of nature. In her book Margadant-van Arcken (1990) is giving examples of this experience. In these examples children verbally express that they experience the beauty of nature. They could tell for example that they think colorful flowers are beautiful or that they like beautiful landscapes.

Recreational nature

The last positive experience Margadant-van Arcken (1990) mentions in her book is recreational nature. The recreational experience is given when children visit nature, which is not close to their home, during trips with their parents or other adults, like teachers. Margadant-van Arcken (1990) based this experience on reports children wrote about nature experiences. Many children described nature experiences during recreational trips. Recreational nature seems to be of a different discipline than the other experiences, since it describes the setting of the nature experiences of children. It is therefore merely an occasion that could lead to the other nature experiences.

Threatened nature

Margadant- van Arcken (1990) describes a separate 'negative' nature experience, which is threatened nature. This experience reflects on environmental problems children can be aware of, for example environmental pollution, like carbon emission and street waste (Margadant-van Arcken, 1990). In this experience some elements of care and responsibility of children towards the natural environment can be seen.

Van der Waal et al. (2008) used the theory of Margadant-van Arcken (1990) to study nature experiences amongst children during an environmental education program in Baarn, the Netherlands. They added and removed some experiences to the already existing experiences of Margadant-van Arcken (1990). Furthermore, Van der Waal et al. (2008) state in their research however that the hierarchy in nature experiences is not fixed, which means that the relevance of nature experiences can differ in different situations. The experiences they added were 'love for nature' and 'fear and aversion to nature'. They removed the 'recreational experience' in their research.

Love for nature

Van der Waal et al. (2008) included love for nature as nature experience, which refers to children feeling love for nature and having a careful and respectful attitude towards nature and natural elements. Examples they give are children stroking and hugging trees and verbally expressing for example that they have a favorite tree.

Fear and aversion to nature

Van der Waal et al. (2008) also added fear and aversion to nature as nature experience, referring to children having fears or aversions towards nature or natural elements. This fear and aversion to nature amongst children was however already acknowledged by Margadant-van Arcken (1988; 1990), but she did not describe it as a separate nature experience. Fear and aversion to nature has been studied by other researchers before. In research of Seligman (1971) was found that people can have genetically innate fears, biophobia, towards certain aspects of nature. These innate fears were developed to react to stimuli that were threatening the survival of our ancestors. These fears could for example be: fear to spiders, snakes, darkness, height and deep water. Also dirt or possible infectious things in nature could stimulate feelings of fear or aversion (Seligman, 1971). Nowadays, however, these fears and aversions to nature seem to be unrealistic, because people are often scared of things that are not threatening. The alienation between people and nature can be a cause of these exaggerated fears and aversions to nature. People seem to be scared for the unknown and by regular visits to nature, people can learn real dangers and risks of nature (Berg & Berg, 2001).

In this research is studied how nature experiences in natural playgrounds play a role in nature connection amongst children. Therefore it is necessary to find out which nature experiences are present amongst children, playing in natural playgrounds. In the explanation below is described whether or not and why the experiences will be used in my research. When an experience will not be used, it might be replaced by another, more useful experience. Table 2.1 gives an overview of the used experiences.

Most of the nature experiences, described by Margadant-van Arcken (1990) and Van der Waal et al. (2008) will be used to study the behavior of children in natural playgrounds.

'Challenging nature' amongst children in natural playgrounds will be studied, focusing on excitement and adventure of children.

Also, 'useful nature' will be studied. However, the sub experience of useful nature 'nature to play' will not be used, because nature to play refers more to the overall behavior of children in nature than to a specific experience. Van der Waal et al. (2008) also seemed to have difficulties with identifying nature to play. Useful nature therefore refers to the sub experiences 'nature to eat', 'healing nature' and 'nature as material supplier'. This research tries to find out if children experience nature in urban natural playgrounds as useful nature and which factors lead to this experience.

Margadant-van Arcken (1990) and Van der Waal et al. (2008) gave examples of 'nature to play' in which two things seem to be dominant, but which are not described as separate experiences. The first is activeness, which refers to children running, walking, hopping, and other activities, in which children are actively busy. It is however not about the excitement, like in challenging nature. 'Active nature' will be added in my research as a separate experience.

The second dominant thing in 'nature to play' in the studies of Margadant-van Arcken (1990) and Van der Waal et al. (2008) is fantasy. Fantasy plays an important role in the lives of children. During their play, children often imagine about things that are not present in real life (Schousboe & Winther-Lindqvist, 2013) Therefore 'Fantasy in nature' is added in my research as a separate experience. Experiences of 'intriguing nature' will be studied in my research, because it is interesting to find out if children in the non-educational setting of urban natural playgrounds are able to trace and scout the

environment. Furthermore, it can be studied if children are for example also encouraged by adults to show tracing and scouting behavior.

Table 2.1 Linking nature experiences, affordances and environmental features

Nature experiences	Description	Affordances	Environmental features
Challenging nature	Showing vital explorative behavior, focusing on excitement and adventurous aspects of nature	Climbing Jumping Sliding Swinging Making fire	Sloping terrain Rigid fixtures Moving fixtures Water Fire
Active nature	Showing physically active behavior	Running Walking Hopping	Open ground Sloping terrain
Fantasy in nature	Showing imaginative and fantasizing behavior in nature	Fantasizing Imagining	Open ground Sloping terrain Shielded places Rigid fixtures Moving fixtures Loose objects Loose material creatures Water Fire
Useful nature	Using natural features in the environment to create something. Useful nature is split in nature to eat, nature to heal and nature as material supplier.	Eating Plucking Tasting Cooking Smearing Healing Crafting Decorating Making fire Building	Loose objects Loose material Water Fire
Intriguing nature	Showing behavior (tracing and scouting) to gain knowledge about certain aspects of nature.	Tracing Scouting Observing Learning	Loose objects Creatures
Aesthetic nature	Experiencing the beauty of nature.	Watching Listening Observing	Loose objects Creatures
Fear and aversion to nature	Experiencing fears or having aversions towards (aspects of) nature.	Screaming Crying Destroying	Creatures Loose objects Loose material
Non-natural	Making use of non-natural play objects.	Using non-natural elements	Non-natural elements (e.g. swing, cable-way or climbing frame)

‘Aesthetic nature’ will be used, focusing on children experiencing the beauty of nature and natural elements. It will also be studied if adults play a role children’s experience of aesthetic nature. Furthermore, the experience ‘fear and aversion to nature’ will be studied during my research, to find out which natural elements evoke fears and aversions.

The experience ‘non-natural’ is added, because in urban natural playgrounds, some non-natural play objects are present and it is interesting to study the behavior of children is towards these play objects.

'Recreational nature' will be not used in my research, because of its different discipline. This experience is not expressed in behavior, which makes it incomparable with the other experiences.

The experiences 'threatened nature' (Margadant-van Arcken, 1990) and 'love for nature' (Waal et al, 2008) will also not be used. These experiences focus more on thoughts and feelings about aspects in nature, than about behavior of children. The central themes of these experiences (i.e. care, respect and responsibility) will however be conceptualized in nature connection of children, described in paragraph 2.3.

2.2 Nature affordances in natural playgrounds

Traditionally, natural environments have been attractive for playing children (Fjortoft, 2004), because natural environments have rich potential for many different types of play (Wells & Evans, 2003). Fjortoft and Sageie (2000) state that an area should contain different environmental features when nature is used as playground, like green structures (e.g. trees and bushes) loose parts (e.g. rocks and branches) and diversity of topography (e.g. hills and slopes). In a book about natural playgrounds in cities of Van den Bogaard & Lobst (2009) it is stated that a minimum of 80 percent of the surface of natural playgrounds should be without non-natural play objects. Children should be able to change the place by moving loose elements like sand and water. All these criteria make natural playgrounds different than other playgrounds.

One of the main reasons children can have the previously described nature experiences is because of the specific characteristics of the natural environment. Gibson (1979) used the concept of affordances, which are environmental features that can be perceived by people as values for positive or negative action. Environmental features can be described in a functional way by explaining what activities these features permit or afford to do. For example lift-able objects, climb-over-able features or stand-on-able surfaces are features described by their activities. This means that the natural environment can rather be described by its function than its form (Heft, 1988). Gibson (1979) refers to affordances as the meaningful action possibilities of the environment, which means that affordances form the base for nature experiences.

Functional possibilities of places can differ amongst individuals of groups. Affordances of a place may for example differ between children and adults (Heft, 1988). Heft (1988) used the concept of affordances to develop different functional classes of the environment for children to play. He argues that this could be helpful to better understand the relationship between children and the environment, because the focus lies more on function instead of form of the environment. The categories of environmental features studied by Heft (1988) are: 1. Flat, relatively smooth surface. 2. Relatively smooth slope. 3. Graspable or detached object 4. Attached object. 5. Non-rigid, attached object 6. Climbable feature 7. Aperture 8. Shelter 9. Moldable material 10. Water. These environmental features and affordances were used to study children's environment in general, which also includes for example the non-natural environment like the street or the in-house environment.

The concept of affordances was also used by Lerstrup (2016) as well to study outdoor forest activities in preschools in Denmark in a natural environment. By interviewing staff and observing and interviewing children in playgrounds and forest sites, ten different classes of environmental features were found: 1.

open ground 2. sloping terrain 3. shielded places 4. rigid fixtures 5. moving fixtures 6. loose objects 7. loose material 8. water 9. Creatures 10. Fire. These features can afford different actions. Sloping terrain could for example afford rolling, sliding, jumping and clambering and moving fixtures can afford moving with, swinging, swaying and spinning.

Because this research is also taking place in a natural setting, the classes of environmental features and their affordances, found by Lerstrup (2016) are used to distinguish the nature experiences of Margadant-van Arcken (1990) and Van der Waal et al. (2008). In table 2.1 the nature experiences are linked to affordances and environmental features, based on examples given by Margadant-van Arcken (1990) and Van der Waal et al. (2008) to explain nature experiences. The table is used to develop an observation scheme, which will be described in the method section. Furthermore, the classes of environmental features and their affordances are used to get insight in differences between natural playgrounds.

2.3 Children's nature connection

This research aims to find out how the nature experiences, described in the previous paragraphs, in urban natural playgrounds relate to nature connection of city children.

Many researchers have studied people's relation to nature. In the biophilia hypothesis Wilson (1984) stated for example that people have a natural need to feel close to nature. Schultz (2002) studied people's inclusion with nature, which is the understanding of how someone identifies his place in nature, how someone values nature and how someone can affect nature. He states that inclusion involves caring about nature, connectedness and commitment to protect nature.

Mayer and Frantz (2004) studied connectedness to nature. They refer to Leopold (1949) who noted that people need to feel part of the natural world to address environmental issues. Leopold (1949) tried to understand to what extent 1. someone sees himself as egalitarian member of the broader natural community; 2. feels a kinship with this natural community; 3. sees himself as belonging to the natural world in the same way as it belongs to him and 4. sees his welfare in relationship to the welfare of the natural world. Based on these four elements, Mayer and Frantz (2004) designed and tested the connectedness to nature scale (CNS) to study people's affective experiential nature connection. They state that their research does not study the cognitive component of connection to nature. Based on their survey, I argue however that they do study the cognitive component (e.g. *'When I think of my life, I imagine myself to be part of a larger cyclical process of living'*). This survey item is about ideas someone can have (cognitive) and not just about emotions (affective).

Nisbet, Zelenski and Murphy (2009) studied nature relatedness. They argue that nature relationships have three components: the cognitive, the affective and the experiential component. The cognitive component is about knowledge and beliefs about nature, whereas the affective component is about feelings towards nature. The experiential component is about experiences people have in nature. They developed the nature relatedness scale to study these different components. In this research I will study the cognitive and affective component of nature connection, because the experiential seems to be of a different order. Experiences are external stimuli which lead to people's internal feelings (affective) and knowledge (cognitive) about these experiences. On the other hand, previously developed feelings and knowledge also influence how people experience external stimuli (Schwarz & Clore, 2006). In this research I will study how nature experiences in natural playgrounds play a role in the cognitive and

affective connection to nature of children. However, this cognitive and affective nature connection might also be influenced by other experiences of children (e.g. other generic (nature) experiences, television about nature or attitudes of adults towards nature).

The measuring scales described above are focusing on the relationship between nature and adults, which makes them difficult to use in research with children. This because the elements in the scales are not suitable for the perceptions of children, since vocabulary and interests are changing with age (Schousboe & Winther-Lindqvist, 2013). Cheng and Monroe (2012) compared the different elements of some of the scales and instruments with each other and they developed the Connection to Nature Index (a quantitative method), which is understandable for children. This index was tested by Bragg, Wood, Barton and Pretty (2013) who concluded that it is a useful tool to measure connection to nature amongst children. Cheng and Monroe (2012) state that the nature connection amongst children consists of four dimensions:

- enjoyment of nature;
- empathy for creatures;
- sense of oneness;
- sense of responsibility.

These four dimensions of nature connection are based on different survey items, which were found to be confirmatory factors for nature connection (appendix A). The title of the research of Cheng and Monroe (2012) refers to 'children's affective attitude towards nature'. However, when there is looked at the survey items, a strong cognitive component can be seen as well (e.g. *humans are part of the natural world* and *my actions will make the natural world different*). Apart from the survey items, the dimensions are not explained by Cheng and Monroe (2012). Therefore, also other literature will be used to describe these four dimensions. This literature will be related to the survey items (appendix A).

Enjoyment of nature

Enjoyment is translated as 'the state or process of taking pleasure in something' (Oxford dictionaries, 2015). The survey items refer to children experiencing different natural elements, but also feelings of happiness and peace refer to enjoyment of nature. These feelings indicate the affective component of enjoyment of nature. The items are very broad and refer to nature in general as well as specific elements, like flowers and rocks. Enjoyment of nature is focusing on the pleasure of children themselves, which indicates that it is about children's own benefit. This can be linked to the anthropocentric values Buijs (2009) uses to describe some of people's images of nature. Anthropocentric values are about considering nature important for the benefit of people. It speaks for itself that positive experiences and feelings in nature lead to enjoyment of nature and therefore this dimension is probably most easy to realize.

Empathy for creatures

Cheng and Monroe (2012) state that empathy is an affective factor, which means that the focus is on emotions and feelings. They refer to Schultz (2000) who describes empathy like 'other-oriented feelings of concern about the perceived welfare of another'. However, when other literature is used, empathy also has a cognitive component, which consists of the understanding of what others feel. This differs

from the affective empathy component which focuses not on understanding but on feeling what others feel (Niezink, 2008). Also Oxford dictionaries (2015) translates empathy as ‘the ability to understand and share feelings of another’, in which both a cognitive and an affective component can be seen. The survey items (Cheng & Monroe, 2012) focus on feelings children might have towards animals and plants in need. This indicates the affective component of empathy. They focus however also on the willingness to help or care for animals and plants in need, which demonstrates a cognitive component, since children should understand that an animal is in need. Empathy for creatures is about animals and plants in specific and not about nature in general. This dimension is not focusing on the child itself, but on other creatures. It therefore can be linked to the biocentric values Buijs (2009) uses to describe people’s images of nature. Biocentric values focus on the wellbeing of individual living beings and not on nature in general.

Cheng and Monroe (2012) suggest that seeing or feeling harmed creatures could increase empathy and motivate people to protect these creatures. Protecting refers to a sense of responsibility which might indicate that the different dimensions influence each other.

Empathy for creatures can also be linked to anthropomorphism, meaning that people give human characteristics to non-human creatures (Korthals, 1998; Harrison & Hall, 2010). Children might for example view animals and plants as human-like with human thoughts and feelings. When children see animals and plants as anthropomorphic, it would be more likely that they have empathy for these animals and plants (Harrison & Hall, 2010).

Sense of oneness

According to Oxford Dictionaries (2015), oneness is ‘the fact or state of being unified or whole, though comprised of two or more parts’. In sense of oneness, people therefore have a sense of being part of a bigger whole, namely the natural world, whilst acknowledging that nature also consists of a non-human part. Cheng and Monroe (2012) refer to the concept of inclusion of nature by Schultz (2002), which can be defined as people’s place in nature and the importance of nature. In the survey items about sense of oneness (Cheng and Monroe, 2012) two (cognitive) aspects are dominant: the first is about humans being part of the natural world, the second is the importance of plants and animals. This might refer to an equal relationship between humans and non-human creatures. Sense of oneness can therefore be linked to the ecocentric values Buijs (2009) uses to describe people’s images of nature. Ecocentric values focus on the wellbeing of nature in general instead of on individual people or creatures. Sense of oneness can also be linked to the theory about images of relationships between people and nature, described by Van der Born (2006). She argues that people in the Netherlands can have four different types of relationships with nature. A person can be master, steward, partner or participant of nature. Sense of oneness can merely be seen in the participant image. In this image, humans are part of nature. Nature is very important for humans and there is a strong bond between them.

Sense of responsibility

Oxford Dictionaries (2015) translates responsibility as ‘a moral obligation to behave correctly towards or in respect of’. The survey items on sense of responsibility are about people being responsible for their positive or negative behavior with respect to nature and the environment. This demonstrates the cognitive component of sense of responsibility, since it is about ideas children can have about their

behavior towards nature. Sense of responsibility can also be seen in the participant image of Van der Born (2006). In the participant image, people are active participants of nature and their behavior has an effect on nature in total.

Cheng and Monroe (2012) argue that nature connection is developed and stimulated by real nature experiences through spending time in nature. In their research Cheng en Monroe (2012) suggest that nature connection leads to interest of children in participation of nature-based activities in the future. The four dimensions of nature connection are used to analyze how and why children in natural playgrounds enjoy nature, have empathy for different creatures, have sense of oneness and have sense of responsibility. Furthermore is studied how the different nature experiences in natural playgrounds, described in paragraph 2.1, are related to the dimensions of nature connection amongst children.

2.4 Non-Western immigrant and native Dutch children in relation to nature

In 2013, the Netherlands inhabited almost 2 million non-Western immigrants, which is about 12 percent of the total number of inhabitants and this number is rising. It is predicted that there will be over 3 million non-Western immigrants in 2050, while the number of native Dutch people is decreasing. Largest part of the non-Western immigrants have their family roots in Turkey, Morocco, Surinam and the Dutch Antilles (CBS, 2014). Currently many refugees from the Middle East and Northern Africa are entering Europe, of whom many decide to stay in the Netherlands. These people might become Dutch inhabitants as well (COA, 2015).

Research of Buijs et al. (2009) shows that immigrants and native Dutch people have different perceptions of nature. Immigrants from Islamic countries seem to have a lower preference for wild and unmanaged landscapes and they have a functional image of nature, while native Dutch people have merely a wilderness image of nature. Next to that, non-Western immigrants in the Netherlands have on average less nature experiences than native Dutch people (Kloek, 2015). Kloek (2015) states however, that there is a lot of heterogeneity within ethnic immigrant groups. On average there are differences in the use of greenspace and the perception of nature between young adults with a Turkish background, young adults with a Chinese background and young adults with a native Dutch background. Turkish youngsters have for example less nature-oriented motivations, but more socially oriented motivations to do outdoor activities than native Dutch youngsters and Chinese youngsters (Kloek, 2015). Furthermore, many non-Western immigrants think nature protection is less important than native Dutch people think it is (Buijs, Langers & Vries, 2006). The amount of non-Western immigrant members in nature organizations is for example much lower than the amount of native Dutch members (Kloek, 2015). These nature organizations see the low support of non-Western immigrants towards nature as a problem (Somers, Kroon & Overbeek, 2005; Kloek, 2015).

There are not only differences in non-Western immigrant adults and native Dutch adults. Margadant-van Arcken (1990) found out that there are differences in nature experiences between non-Western immigrant children and native Dutch children. This was acknowledged by Van der Waal et al. (2008) who found out that native Dutch children seem to be more focused on challenging nature, while immigrant children seem to be more focused on useful nature. Furthermore, immigrant children can have different

views towards certain animals. They show more often anxiety towards some animals than native Dutch children (Margadant-van Arcken, 1988; Margadant-van Arcken, 1990; Waal et al., 2008).

In this research will be studied if there are differences between non-Western immigrant children and native Dutch children in their nature connection and their nature experience in urban natural playgrounds.

3. Research methodology

In this chapter, the different methods used in this research will be described. To find out how nature experiences in urban natural playgrounds play a role in nature connection of children, qualitative research will be done. Qualitative research is about an in-depth understanding and clarification of a phenomenon (Hammersley & Atkinson, 2007).

The epistemology of this research is interpretivism, in which a naturalistic and interpretive approach is used to understand people's behavior (Hammersley & Atkinson, 2007). This means that no changes in the research setting are made by the researcher, but situations are studied as they are in the real world (Walt, Walt & Wayland, 1998).

This research is focusing on the perspective of children. It is about their experiences, meanings and stories in natural playgrounds. By spending a lot of time in the playgrounds and talking with many children, I tried to understand the role of nature in natural playgrounds in the nature experiences and nature connection of these children. Goal of this research is to give an impression of nature experiences and nature connection amongst children in natural playgrounds as realistic as possible and from their perspective.

3.1 Case-study

To find out how nature experiences in urban natural playgrounds relate to nature connection of children, a case-study has been done. A case-study is a good method to get an in-depth understanding of the research topic (Hammersley & Atkinson, 2007). This report gives a rich and detailed description about children's nature experiences and nature connection in urban natural playgrounds. Disadvantage is however that generalizability of the outcomes is difficult, because of the specific characteristics of the cases under study (Hammersley & Atkinson, 2007).

The cases used in this study have to fit in the following criteria:

- The natural playgrounds are located in an urban setting
- The natural playgrounds are visited by non-Western immigrant as well as native Dutch children

The case-study took place in the capital of the Netherlands, Amsterdam. In Amsterdam, six different natural playgrounds are located in different districts of the city. Two of these natural playgrounds were selected for the research, namely 'De Natureluur' and 'Het Woeste Westen', because these playgrounds are both located within the urban boundaries (figure 3.1). They have about the same surface, which is about three hectares big. Furthermore, 'De Natureluur' is located in a district that inhabits over 50 percent non-Western immigrants, whereas 'Het Woeste Westen' is located in a district that inhabits about 30 percent non-Western immigrants. In both districts, most of these non-Western immigrants have a Turkish or Moroccan background (Gemeente Amsterdam, 2015). The fact that the two natural playgrounds are located in neighborhoods inhabited by both native Dutch people and non-Western immigrants leads to the expectation that both natural playgrounds will be visited by children with both ethnic backgrounds. It is however important to notice that within these ethnic groups, there can be a lot of heterogeneity (Kloek, 2015).



Figure 3.1 Locations natural playgrounds (The world of maps, 2013).

3.1.1 Het Woeste Westen

Het Woeste Westen is a natural playground located in the district of Amsterdam called Amsterdam West. It is known to be the first official natural playground in Amsterdam, which opened in 2010. It is run by the foundation called 'Hart voor de Natuur'. Het Woeste Westen is located within the 'Westerpark' and this playground is a public place, which means that it can be visited any time and the entrance is free. Het Woeste Westen organizes activities like birthday parties and school activities as well, but the focus of Het Woeste Westen is on the independent free playing of children, so without supervision of adults. Het Woeste Westen has however a club, called 'de avonturenclub' (adventure club), which is led by an adult. Like the name already suggests, de avonturenclub focuses on adventures for children in a natural setting. This club is organized five times a week all year long and the children have to pay for membership to attend the club. A club consists of approximately ten regular members (for more information about Het Woeste Westen: www.woestewesten.nl).



Figure 3.2 Plan Het Woeste Westen (Photo author, 2015).

3.1.2 De Natureluur

De Natureluur is a natural playground located in the district of Amsterdam called Amsterdam Nieuw-West and it is run by the municipality of Amsterdam. De Natureluur opened in the summer of 2012 as an official natural playground. It is part of the 'Sloterpark' and it is a public place as well. De Natureluur is not only providing children the opportunity to play freely in a natural environment, but they also organize many activities like birthday parties for children and school (holiday) activities. The focus of De Natureluur is on these activities. In De Natureluur a club is organized as well, called 'club Natureluur', which is also organized three times a week except for a few months in winter. This club differs from the club of Het Woeste Westen by the fact that admission for club Natureluur is free and membership is not needed. Therefore the group of attendants can change every time a club is organized (for more information about De Natureluur: www.denatureluur.nl).

3.1.3 Similarities and differences in environmental features between the playgrounds

As described in chapter 2, behavior of children is evoked by environmental features that afford children to behave in a certain way (Gibson, 1979; Heft, 1988). The different classes of environmental features used in this research are 1. open ground 2. sloping terrain 3. shielded places 4. rigid fixtures 5. moving fixtures 6. loose objects 7. loose material 8. water 9. Creatures 10. Fire (Lerstrup, 2016). These environmental features in natural playgrounds determine for a large part how children behave and which experiences they have. There can be seen some similarities and differences in environmental features between Het Woeste Westen and De Natureluur. The playgrounds are about the same size (three hectares) and they both consist of mainly natural elements. Biggest difference between the two playgrounds is that Het Woeste Westen is more rough, whereas De Natureluur is more organized and designed. In De Natureluur more changes have been made to the environment to transform the area into a natural playground (Natureluur, 2015). Het Woeste Westen has one entrance, because the rest of the playground is surrounded by ditches (figure 3.2). De Natureluur can be entered from different places (figure 3.3). In both playgrounds many loose objects are present like beams, branches and rocks. Also, both playgrounds have fire places, which are used when employees are present. Both playgrounds have a large open field (open ground).

3.2 Data collection

Different qualitative methods were used to strengthen the reliability of the research. This triangulation, which is a mixed-methods approach (Hammersley & Atkinson, 2007), gives a better understanding of nature connection and nature experiences amongst children in urban natural playgrounds. In this research observations, focus group discussions with children and informal interviews with adults were done.

Table 3.1 Focus methods towards research topic

	Observations	Focus Group Discussions	Informal interviews adults
Nature experiences	High	Low	Low
Nature connection	Low	High	Low

Table 3.1 shows which method focused on nature experiences and which on nature connection. All methods focused to a certain extent on both nature experiences and nature connection. This focus was however sometimes high and sometimes low. The different methods are described in the following section.

3.2.1 Observations

One of the most important methods used in this research was observations of children in natural playgrounds. Observational methods have their roots in anthropology, but have been adopted in social science through the development of ethnography (Hammersley & Atkinson, 2007). In ethnography, the researcher is participating in events, observing activities, while taking notes and collecting unstructured data to create a better understanding of a situation (Hammersley & Atkinson, 2007). In this method, behavior is analyzed, based on information gained by participating and observing the research field. In observation, the researcher observes the daily activities, rituals, interactions and events of the people being studied (Walt et al., 1998). This means that during this research a lot of time has been spent in the urban natural playgrounds to get a good understanding of why the children behave in a certain way and what this means in their nature experiences and their nature connection. Observing is the most valid method to study behavior, because observations can provide information about what children do and this might differ from what they say they do. This method was suitable in this research, because it could be done without disturbing children in their play.

Observation is a relatively unstructured data collection method, because it is done in a naturalistic setting (Walt et al., 1998), which means that no changes in the research setting are made by the researcher. During the observations, notes are made of relevant situations. The collected data from the observations are based on considerations of the researcher, what he/she thinks is relevant for the research (Hammersley & Atkinson, 2007). The researcher is the research instrument itself and during observations, all senses are used to see, listen, feel and smell what is happening in a situation (Hammersley & Atkinson, 2007). This shows directly the biggest disadvantage of the method observing, which is that data is collected from the researcher's perspective, which makes the research subjective. To minimize this subjectivity, an observation scheme was made in advance, which could be used as a filter to classify the behavior of children. This observation scheme was based on the nature experiences and affordances described in the previous chapter.

The role of the researcher in observations can vary from low participation, in which interaction with study objects is minimal and the researcher is mainly ‘spectator’ of activities, to high participation, in which interaction is high and the researcher is really involved in activities (Bryman, 2016). In my research I had two different roles of observer during data collection, namely non-participating observer and participating observer.

Non-participating observer

As a non-participating observer, I observed spontaneous behavior of children in natural playgrounds, during different observation sessions. During these sessions, I barely interacted with the children to minimize the influence as a researcher as much as possible. I tried to keep a distance of at least ten meters of the children to not interrupt them in their play. Relevant situations were written down in a notebook. First off it was written down if the child was non-Western immigrant or native Dutch, based on the physical appearance (e.g. skin and hair color) of the children. This was followed by a description of the behavior of the child. Also verbal expressions of children were written down, because this sometimes illustrated nature experiences as well. Situations in which more than one child was involved or where adults were present also occurred.

The observation scheme with nature experiences and affordances (appendix B) was used as a filter to categorize the spontaneous behavior of the children. All separate observations were numbered in chronological order. When the situation finished, for example because a child went out of sight or changed its’ behavior, the number of the observation was written down at the correct nature experience on the observation scheme. Some observations included more than one nature experience, for example running (active nature) and swaying with a branch (useful nature) at the same time. During the observations, sometimes certain behavior could not be classified in one of the experiences. This behavior was however written down and when this behavior was seen a few times by different children, it could lead to a new experience, which was added during data analysis.

Table 3.2 Non-participant observations in Het Woeste Westen (WW) and De Natureluur (NAT)

	Playground	Date/time	Weather	Amount of observations
1	WW	19 October 11.30-13.30	Clouds, dry, 12 °C	19
2	NAT	19 October 14.00-16.00	Clouds, dry, 12 °C	19
3	NAT	21 October 11.30-13.30	Clouds, dry/rain, 11 °C	21
4	WW	21 October 14.00-16.00	Clouds, rain, 11 °C	14
5	NAT	22 October 14.00-16.00	Clouds, dry, 15 °C	26
6	WW	23 October 12.00-14.00	Clouds, dry, 13 °C	16
7	NAT	4 December 14.00-16.00	Sun, dry, 10 °C	18
8	NAT	9 December 14.00-15.30	Sun, dry 10 °C	10
9	WW	23 December 13.00-16.30	Sun, dry, 12 °C	33
10	NAT	28 December 12.00-14.00	Sun, dry, 13 °C	16
11	WW	28 December 14.15-16.15	Sun, dry, 13 °C	16
12	NAT	30 December 14.00-15.30	Sun, dry, 8 °C	17

Table 3.2 shows that in the natural playgrounds twelve observation sessions of about two hours were held, during different times of the day and during different days of the week. Most of the observation sessions were held during school holidays (autumn holiday and Christmas holiday), since the rest of the time, especially on weekdays, it was very quiet in the playgrounds. Often no children were present,

because they had to go to school during the day and it started to get dark early. During the observation sessions a total of 225 observations of spontaneous behavior were done (appendix C), consisting of 254 nature experiences. This number exceeds the 225 observations, because some observations consisted of more than one nature experience.

Participating observer

To get a better understanding of the clubs in natural playgrounds, I participated in these clubs a few times. During these clubs, children were observed as well, but the difference was that I was more involved during these observations. I actively participated in the clubs by for example making a spear of a branch myself and gathering mushrooms from trees to make soup together with the children. The participation in these activities gave me a good understanding of what it is like to be part of a club in a natural playground, because I shared these experiences with the children. The data collected from these participant observations differs from the passive observations, since during the participant observations I did not write down all different observations. This because I did not want the children to behave differently, because of the presence of a ‘researcher’. I only put some short notes in my mobile phone to not forget relevant information. After the clubs I worked out these notes on my computer in a general description of what had happened during the clubs, which are called ‘fieldnotes’ in this report. During data analysis, these fieldnotes were however split up in different observations, which were numbered to make it possible to classify the data in different nature experiences. These numbers were added in a separate column of the observation scheme.

Table 3.3 Participant observation in Het Woeste Westen (WW) and De Natureluur (NAT)

	Playground	Date / time	Weather	Amount of observations
1	WW	18 November 15.00-17.15	Sun, dry, 13 °C	9
2	NAT	21 November 14.00-15.15	Clouds, rain, 7 °C	9
3	NAT	26 November 15.45-17.45	Sun, dry, 6 °C	10
4	NAT	28 November 13.30-16.00	Clouds, dry, 7 °C	22
5	WW	2 December 13.15-15.00	Clouds, dry, 8 °C	13
6	WW	2 December 15.00-17.00	Clouds, dry, 8 °C	8

Table 3.3 indicates that six different observation sessions were done during clubs. During these observations sessions, a total of 61 observations were obtained (appendix C), which were categorized in 83 nature experiences. This number exceeds the 61 observations, because some observations consisted of more than one nature experience.

3.2.2 Focus group discussion with children

To get better insight in nature connection and nature experiences children have in urban natural playgrounds, focus group discussions were held. Focus group discussions are often used in social sciences to explore attitudes, experiences and responses of people (Bloor, Frankland, Thomas, Robson, 2000), based on an informal discussion between a group of people (Wilkinson, 2004). This discussion is led by a researcher who introduces the topics and who observes and collects the verbal and non-verbal information that emerges from the discussion (Acocella, 2012). An advantage of focus group discussions over one-on-one interviews is that data from a group of participants can be collected relatively quickly (Wilkinson, 2004). Acocella (2012) argues that it is recommended that participants in a focus group discussion feel equal to each other, so they can freely express their opinions. Focus group discussions

often have an informal character which makes them suitable for young people. They may talk more freely among their friends than during a one-on-one interview with an adult researcher (Wilkinson, 2004; Hammersley & Atkinson, 2007). Therefore in this research, groups of children who visit the natural playground together, and probably knew each other beforehand, were asked to participate in the focus groups discussions. It was assumed that the fact that these children know each other, would lead to a comfortable setting in which they were more open to speak than when they would participate in a discussion with children they do not know. I tried to have an open attitude towards the children during the discussions in which children could tell whatever they liked and not to steer them in their answers. Furthermore I tried to be as objective as possible and for example not react 'negatively' on stories that did not correspond with my own norms and values.

In order to collect relevant information about the research topic, participants should be interested in the topic (Acocella, 2012). The children who played in the natural playgrounds were interested in answering questions, but it was important that the questions and topics in the discussion were introduced in a way that is adapted to their age and experiences. To make the discussion more interesting and attractive for children, some pictures were used to introduce the topics (appendix D).

A disadvantage of focus group discussions is that the researcher can have difficulties with maintaining control over the topic (Hammersley & Atkinson, 2007). Therefore voice recording was done, so that notes did not have to be made during the focus group discussion and full attention could be given to leading the discussions. The voice recordings made it possible to listen to the discussion afterwards again and to transcribe and analyze all collected data.

During the focus group discussions, a maximum of five children was allowed. However in practice, five children appeared to be too much, since I often had difficulties with keeping control over the conversation. Also, giving all children the same amount of attention was hard, because some children were more dominant than others. Therefore the last three focus group discussions were done with two children, which made it easier to listen to both children and adapt questions to their stories. Furthermore, a list with open questions was prepared beforehand to give the focus group discussion structure (appendix E). However, the focus group discussions had an open character, which means that an open discussion between the children was possible and that the sequence of the questions sometimes differed, depending on the development of the discussion.

The focus group started with some general topics like age of children, frequency of visiting the playground and reasons to visit the playgrounds. I also asked the children if and why natural playgrounds are nature. These relatively simple questions gave me some useful information about the children, but it also made the children feel comfortable towards answering questions.

After the general questions focus was on the four dimensions of nature connection, for which the theoretical chapter of this report and the quantitative survey of Cheng and Monroe (2012) (appendix A) were used as inspiration.

When the topic of the focus group discussions was about enjoyment of nature the conversation remained close to natural playgrounds, focusing on the experiences children have in the playgrounds that could lead to enjoyment of nature. Pictures of different play settings were used to find out if and why children preferred to play in natural playgrounds or in other settings.

When the discussion focused on empathy for creatures, the conversations were merely about creatures in general than about creatures in natural playgrounds, even though pictures of creatures living in the natural playgrounds were used to start the discussion. These pictures were used to find out if and why children were having empathy for the creatures on the pictures. Sometimes, the children referred to their real experiences with creatures, mostly animals. These experiences had however almost never taken place in the natural playgrounds.

When the discussion moved to sense of oneness, the role of the playgrounds was even less discussed than during the topic empathy for creatures. Children were talking on a more abstract level about nature and the world in general and not so much about their own experiences in nature or natural playgrounds. There were no pictures used to introduce the topic, because of the abstract level of the questions, focusing on humans' place in nature.

When the topic of sense of responsibility was introduced during the focus group discussions, the discussions fluctuated from children's own experiences with responsibility to responsibility of humans in general. Pictures of positive (planting a tree) and negative (trash) behavior towards nature were used to find out whether they acknowledged this positive and negative behavior and what their experiences with this behavior were.

Table 3.4. Focus group discussions in Het Woeste Westen (WW) and De Natureluur (NAT)

	Playground	Spontaneous / club	Date / time	Number of children	Age
1	NAT	Club	26 November 16.30	4	5-8
2	NAT	Club	28 November 15.30	3	5-8
3	WW	Club	2 December 14.45	4	6-7
4	WW	Club	2 December 16.45	4	8-10
5	NAT	Spontaneous	4 December 14.30	4	6-8
6	WW	Spontaneous	23 December 15.00	2	11
7	WW	Spontaneous	28 December 15.00	2	8
8	NAT	Spontaneous	30 December 14.45	2	10

Table 3.4 shows that eight focus group discussions of about twenty minutes were held with groups of children. In both playgrounds two focus group discussions were held with children involved in the clubs and two with children not involved in clubs, to determine possible differences between these children. During the analysis of the focus group discussions, the focus was as well on the ethnic background of children to find out if there are differences between non-Western immigrant children and native Dutch children.

3.2.3 Informal conversations with adults

Informal interviews are often done in combination with observations to get additional information about the object that is studied (Hammersley & Atkinson, 2007). In my research, during the observations of the children, informal conversations were held with parents and supervisors of the children. Almost all children who visited the urban natural playgrounds were accompanied by adults. Often I approached these adults myself and sometimes they approached me by asking what I was doing in the natural playgrounds, which gave me the opportunity to talk with them. The conversations with these adults provided me mainly with background information. For example about the frequency of the children visiting the natural playgrounds and who took initiative to visit the natural playgrounds (the adults or the

children themselves). Sometimes, conversations also gave me information that could be used in the analysis of nature connection and nature experiences of the children.

Next to the adults accompanying the children during their visit in the natural playgrounds, I also often had informal conversations with employees of the natural playgrounds, who provided me with information about children's nature experiences and nature connection in natural playgrounds as well. Because of the spontaneous occurrence of the informal conversations, notes instead of voice recordings were made.

3.5 Ethical justification

Permission to do the research in the playgrounds was asked from the owners of both natural playgrounds. During the research, under aged children were the study objects. Therefore, children and their supervising adults were asked for permission to let children collaborate in the focus group discussions and almost all adults and children were willing to participate in the research. A letter with an explanation of the research and signatures of the playground owners and the supervisor of the Wageningen University was given to the adults (Appendix F). During the observations and discussions with children and the analysis of the data, anonymity was guaranteed. Furthermore, the children were given the opportunity to step out of the focus group discussion whenever they like, which happened a few times during the focus group discussions.

3.6 Data analysis

The data was analyzed in different ways. The observations were analyzed by categorizing the data with the observation scheme (appendix B). This made it possible to see which nature experiences were dominant. The raw data was used to illustrate the different nature experiences and their important elements in the report. The recorded focus group discussions were transcribed and coded to make categories of data about nature connection. This structured data made it possible to reveal important elements of the four dimensions of nature connection. Original citations of children were used to illustrate these different elements. The notes of informal interviews with adults were coded as well and they were sometimes used as additional information to illustrate elements of nature experiences and nature connection.

After describing the results of nature experiences and nature connection, these two chapters were compared with each other to find out patterns of overlap in data. These patterns were used to describe how nature experiences relate to nature connection amongst children.

4. Nature experiences in natural playgrounds

In this chapter an answer will be given on the first sub research question: *What kind of nature experiences do children in urban natural playgrounds have and which factors play a role in these experiences?* First a brief overview of the results will be presented. After that, a deeper analysis will be given on the different nature experiences.

The results are based on the observation sessions of spontaneous behavior and of behavior during clubs in the different natural playgrounds. In table 4.1 the total number of observations per nature experience in both playgrounds can be seen. Per playground the observations are separated in spontaneous behavior and behavior during clubs. Readers should take notice of the fact that there are more spontaneous observations than observations during clubs. In appendix C a table with all separate observation numbers can be found, in which a division has been made in non-Western immigrant children and native Dutch children.

Table 4.1 Nature experiences in the natural playgrounds Het Woeste Westen and De Natureluur

Nature experience	Spontaneous Woeste Westen	Club Woeste Westen	Spontaneous Natureluur	Club Natureluur	Total
Useful	26	8	41	16	91
Challenging	19	7	41	3	70
Active	26	7	27	3	63
Intriguing	9	6	11	7	33
Fear/ aversion	7	2	11	3	23
Fantasy		9	6	4	19
Aesthetic	1	2	5	4	12
Non-natural	13	1	10	1	25
	N=101	N=42	N=152	N=41	336

Figure 4.1 represents the distribution of the nature experiences amongst children in natural playgrounds. The experience mostly seen during the observations was useful nature, followed by challenging nature, active nature, intriguing nature, fear and aversion to nature, fantasy in nature and aesthetic nature. A separate experience seen during the observations, which is actually the opposite of a nature experience, was the non-natural experience. This was seen in 7 percent of the experiences.

Nature experiences in natural playgrounds

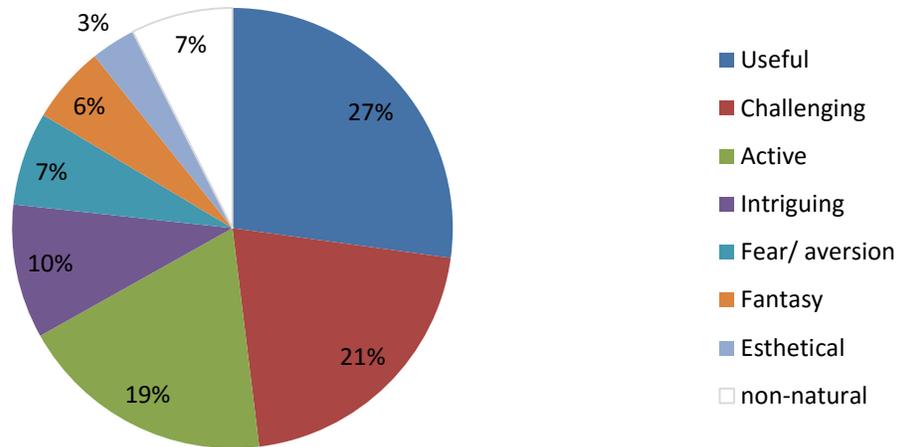


Figure 4.1 Nature experiences in natural playgrounds Het Woeste Westen and De Natureluur (N=336).

In the following paragraphs a description of all nature experiences will be given. These descriptions are based on the observations of spontaneous behavior and behavior during clubs. In the examples, non-Western immigrant children are referred to as 'immigrant' and native Dutch children are referred to as 'native'. The nature experiences are ordered by the amount of observations, starting from the experience with the highest number of observations. The non-natural experiences is explained as last, because this is not a nature experience.

4.1 Useful nature

During both the observations of spontaneous behavior and during the clubs, useful nature was most present (27%). In the theoretical framework it is stated that useful nature is separated in nature to eat, nature to heal and nature as material supplier (Margadant- van Arcken, 1990). During this research nature to heal was not seen. However, a new value is added, which was often seen during the observations of spontaneous behavior: nature as a tool. In this paragraph these different sub values of useful nature will be described.

4.1.1 Nature as material supplier

The first sub experience of useful nature is nature as material supplier. This experience was characterized by children who were making something new from natural elements or objects. Many of the activities of clubs in both playgrounds were focusing on nature as material supplier. In this case, natural elements or objects are used for crafting and building things. For instance, during clubs spears were made, masks were decorated with leaves and fire was made.

During some of the activities in De Natureluur natural features were provided in advance by the employees instead of gathered from the playground, for example chestnuts for making puppets and

lavender for making scented sachets. Some of the examples of nature as material supplier during activities and clubs are:

Three native girls, two native boys and one immigrant boy are helping two employees (m) by making a hut of around twenty young Willows (Salix). They bend the tops of the Willows together with ropes. (Observation 82, 22nd October 2015, Natureluur).

(...) After a few minutes the employee calls the native children together and we walk to a Willow tree. There, the employee cuts off branches for all children and shows them how they have to cut off all side twigs with a pruner. The children start using the pruner one by one to cut off all side twigs of their branches. (...) Then we sit down on a railing (...) and the employee explains the children how to make a spear of the branch with a knife. The kids all get a knife which they attach to their pants (...) I hear two boys talking about making an appointment to catch a tree with the spear. A tree is easy to catch because it stands still. Then they discuss which animals are quiet so they could catch them with the spear. The employee helps the boys with the removal of the bark. (...). (Fieldnotes 42, 47, 48, 49; 2nd December 2015, Woeste Westen1).

However, not only during clubs, but also during spontaneous behavior in the natural playgrounds, many children created things of natural elements.

Three immigrant boys and two immigrant girls stand at the waterside and squat down, picking up sand, that they throw in the water. One of the boys says: "We can build a sandcastle." Another says: "No that's too difficult." One of the girls squats and says, "We can make a drawing of a castle in the sand." She draws with her right index finger in the sand. The other children also squat and start drawing in the sand. Another girl calls out: "I wrote my name." Meanwhile, two boys have built two humps of sand with their hands. One of the boys puts a twig between the two humps and says: "This is a bridge." He puts another twig next to the first and puts leaves on top of it. The other boy stands up and walks around. When he sees twigs and leaves he picks them up and walks back to the humps on which he puts them. Another boy walks to a pit and says: "There are many leaves over here!" He picks up a few leaves and walks back to the humps where he puts the leaves on the 'bridge'. The girls are sitting next to the humps and they put the twigs, found by the boys, on the humps as well. (Observation 136, 9th December 2015, Natureluur).

(...) At the waterside, one of the two native boys picks up a big beam and throws it in the water. The other native boy also picks up a beam and throws it to the other side of the ditch. The second boy balances on a trunk over the water, picks up the beam and throws it in the water. After that they kneel down at the water side and start making a dam of the beams in the water. (Observation 155, 23rd December 2015, Woeste Westen).

Other behavior often seen during the research, which represents nature as material supplier was the use of branches and reed for making fire. At both natural playgrounds campfires are burning during opening hours. This seems attractive for children, because it was often busy around the campfires.

A native boy picks up a branch and sticks one side of it in the fire, while holding the other side. He holds it in the fire for about thirty seconds and then walks to his mother. He says: "Mommy, this branch is burned." After that he walks into a field and picks up another branch. He says: "I am going to burn branches." His mother walks away and he is alone holding a branch in the fire again. He sings: "When I put a branch in the fire, it gets hot." (Observation 68, 21st October 2015, Woeste Westen).

Two native girls and three native boys gather reeds at the waterside and walk to the campfire. They put the plumes of the reed in the fire. One of the boys shouts: "Yes, it burns!" (Observation 145, 23rd December 2015, Woeste Westen).

4.1.2 Nature as a tool

Nature as a tool is added during this research to the already existing sub values of useful nature (Margadant-van Arcken, 1990). Nature as a tool differs from nature as material supplier by the fact that in nature as material supplier, natural objects or elements are used to make new products and in nature as a tool, natural objects are directly used in their original form.

Nature as a tool was mainly seen during spontaneous behavior of children. An example that occurred often was a branch being used to angle the cable way chair, hanging above the water surface, towards the waterside:

Three native girls want to get the cableway chair that is above the water surface. One of them picks up a branch from the grass and angles with it to the cableway chair. After a few seconds she catches it and pulls it with the stick towards her. Then they start using the cable way. One by one they get pushed by a supervisor (f). (Observation 80, 22nd October 2015, Natureluur).

Children also used branches to grab other things they normally could not reach.

A native boy and a native girl are standing in front of a bush. The boy throws a metal cup in a bush which is about 1,5 m high. Then they both pick up a branch from the grass and try to get the cup out. The one who gets this done first throws the cup in the bush again. They do this several times and every time they use their branch to get the cup out of the bush. (Observation 117, 4th December 2015, Natureluur).

Next to that, throwing, swaying and hitting with branches and other environmental features were categorized as nature as a tool, since in these cases the natural features were used for a purpose.

A native boy and an adult (m) walk through the grass. The boy picks up a branch and together they walk towards the water. The boy throws the stick in the water and calls: "Wooooow!"(..) (Observation 109, 23rd October 2015, Woeste Westen).

Furthermore, branches were used to draw or write with in the sand. In this case a combination of nature as a tool and nature as material supplier is seen because the branch is used as a tool, but there is something made in the sand.

An immigrant girl draws with a branch in the sand near the waterside. Afterwards she throws the stick in the water. (Observation 26, 19th October 2015, Natureluur).

4.1.3 Nature to eat

Nature to eat is the sub value of useful nature least experienced during spontaneous behavior, but most experienced during clubs of De Natureluur focusing on preparing food. This was illustrated by an immigrant boy, who visits club Natureluur every week. The first thing he said when he entered De Natureluur was: "What are we going to eat today?" (Fieldnote 19, 26th November 2015, Natureluur).

During this club, the campfire was used to bake little cakes in hollow oranges. During some informal conversations with the employees of De Natureluur I found out that during the clubs often food is made of a combination of both gathered products from the playground and bought products from the supermarket. For example, blackberry cakes (*Rubus*), butter with herbs (e.g. gloud ivy (*Glechoma hederacea*) and nettle (*Urtica*)) and elderflower juice (*Sambucus nigra*) are made (Informal conversation, 25th November, Natureluur). Furthermore, often pre-baked breadrolls were provided and baked on a stick above the fire.

The next example shows a good illustration of children making food from both gathered and bought products in De Natureluur:

*(...) The employee says she wants to make mushroom soup, with some mushrooms she bought. We are also going to search in 'Het Ruige Riet' (a natural area next to De Natureluur) for edible Wood ears (*Auricularia auricula-judae*) that can be put in the soup. (...) we stop at a Black elder (*Sambucus nigra*) where the employee points at a Wood ear. She says that Wood ears are mushrooms, always growing on dead or almost dead Black elders. She picks a large Wood ear from the tree and gives it to one of the native girls. The girls says that it is just like an ear with blood veins. She passes the Wood ear to her sister who says that I should feel too. The immigrant boy says he sees more Wood ears and he starts picking them from the tree. The employee says that the girls also should start searching. We go off the path through the bushes and pick all Wood ears from the trees we pass. One of the girls says that the Wood ears look like bums and that they should be called Wood bums. They all laugh (...) We walk further through the bushes and gather a basket full of Wood ears. The employee says they only should pick large Wood ears, because the smaller ones still have to grow (...) We go inside the house where the girls wash the Wood ears. Outside, the boy cuts parsley. (...) And together we cut the mushrooms in small pieces. Everything is put in a pan on an electric stove (...)The other children sit around the fire with a bread roll on a stick. (...)After a few minutes the soup is ready, and the employee and I put it in plastic soup bowls which we give to the children. One of the girls says the ears are slimy, but everybody likes it. (...). (Fieldnotes 30, 31, 33, 38, 39; 28th November 2015, Natureluur).*



Figure 4.2 Baking bread rolls on the fire (Woeste Westen, 2016).

When looking to Het Woeste Westen, nature to eat was only seen in the case of children baking bread rolls on a stick on the fire during spontaneous behavior. Het Woeste Westen provided dough, which the children had to mold themselves. Although this activity is not about gathering food from the playground itself, the food is prepared on the fire in the natural playgrounds:

A native boy and a native girl are rolling dough balls on a table while an employee explains how to do this. After about two minutes, they put the dough ball on a stick and walk to the fire. They turn the stick around above the fire. One supervisor (m) walks up to them and takes a picture of the children. (Observation 151, 23rd December 2015, Woeste Westen).

4.2 Challenging nature

Challenging nature was the nature experience second most seen during spontaneous behavior of children. During the clubs, challenging nature was a lot less experienced by children. The vital explorative behavior, described by Margadant-van Arcken (1990) in the natural playgrounds was characterized by children taking risks like falling in the water or falling on the ground from heights. During the experience itself children barely spoke, because they concentrated on the activity. Before or after the activity however, children sometimes reflected on the risks and dangers of their behavior:

An immigrant boy stands at a pit of about half a meter (diameter) in the sand and says: "We can jump over this pit!" And he jumps over it. An immigrant girl also runs towards the pit and jumps over it. Then the boy returns to the other side of the pit again and says: "Watch out, I'm going to do something dangerous!". He takes a run-up of three meters and jumps over the pit while he turns around in the air. The girl says: "Yes I can do that too!" She takes a run-up and stops right in front of the pit. She says: "No, just joking." She walks back again takes a run-up and jumps again (without turning) over the pit. (Observation 140, 9th December 2015, Natureluur).



Figure 4.3 Challenging nature (De Natureluur, 2016).

Challenging nature was also often seen at the water, where children balanced over tree trunks. Some examples of this are:

Two native boys balance on a tree over the water from one side to the other. They hold the branches of the tree with their hands for support (Observation 13, 19th October 2015, Woeste Westen).

Three immigrant girls stand in front of a beam over the water. One says: "Are we going to do this?" She steps on the beam and walks two steps with her hands stretched out horizontally. Then she jumps back on the water side and says: "I almost fell in." The second girl steps on the beam, walks three steps and also jumps back. The first girl says: "I also almost fell." The third girl is walking and passes the beam to the other side of the water with her hands stretched out horizontally. The other two girls watch her do it and then follow. The first says: "If we would have fallen in here, it would have been very dangerous." They all make it to the other side (Observation 51, 21st October 2015, Natureluur).

Furthermore, challenging nature was seen in trees, where children climbed in and on hills and bridges, where children jumped off.

Two native boys are climbing one and a half meters in a tree near the waterside. They hang on its branches and let go, so that they are falling down. After that they climb in again and repeat the hanging and falling. (Observation 144, 23rd December 2015, Woeste Westen).

(...) At a bridge over the water the native boys jump one by one from halfway the bridge to the water side. One of the boys walks back to the middle of the bridge and says that he is going to jump again, but further this time. He is standing a bit further from the water side than before and jumps again. When he lands on the waterside he shouts out: "Yes!" and he throws his hands in the air (...). (Fieldnote 5, 18th November 2015, Woeste Westen).

Sometimes the challenging experience children have in the natural playgrounds went wrong and they fell for example in the water or on the ground:

Two native girls balance over some loose tree stems in the water. One of them loses her balance and steps from the tree stem in the water, the water is just below her boots. She stands still and shouts: "Heeeelp!" The other girl replies: "I'm going to save you!" She steps into the water as well and they try to move to the water side. They both fall into the water and they quickly move to the side while calling: "Cold, cold, cold!" When they arrive on the water side, they empty their boots. One calls: "My boots are filled with water, I slipped away." They continue playing on the tree stems in the water on their bare feet. When they make it to the other side of the water, one of them shouts: "Yes, we made it!" (Observation 37, 19th October 2015, Natureluur).

A native boy is sitting on a branch three meters high in a tree, when I hear a loud crackling sound. The branch has broken and the boy falls down to the ground. Later on I see him walking towards a supervisor (m) to show him a scratch on his leg. (Observation 129, 4th December 2015, Natureluur).

It was also often seen that parents told children that their behavior is dangerous and prohibited children to do something. This often led to the children not doing their planned activity. A few times the activity went wrong after that parents told the children about the dangers of the activity. In this last case, it

seems like the children suddenly realize that it might go wrong what they are doing, which leads to the self-fulfilling prophecy of the activity going wrong indeed:

(...) The American boy walks from the hill to the waterside. There he balances over a tree trunk to the other side of the water, holding his arms stretched horizontally. The man calls out: "Careful dude!" Then the boy falls and steps with his leg in the water. (...) (Observation 189, 28th December 2015, Natureluur).

4.3 Active nature

Active nature was added to the already existing nature experiences of Margadant-van Arcken (1990) and it was seen often during spontaneous behavior of children. During the clubs, active nature was observed less. Like the name already suggests, active nature is about active behavior children show in the natural playgrounds, like running, skipping and jumping. The natural environment of the playgrounds seems to invite children to behave actively, because children more often ran than walked to move themselves from one place to another within the playground.

A native boy is running slaloming between trees. He steps on a tree trunk lying in the grass and jumps from it. After that, he runs further. (Observation 64, 22nd October 2015, Woeste Westen).

Two native boys are running to the hanging bridge. They grab the railing and take off with their feet while they lean on their hands. They jump like this to the other side of the bridge. They run via the small bridge over the mud field towards a ditch (...). (Observation 155, 23rd December 2015, Woeste Westen).

Active nature differs from challenging nature by the fact that it is not about risk taking and concentration. Therefore children sometimes talked whilst they were showing active behavior. They shouted for example where they were running to.

Two native boys run towards the ditch whilst one of them shouts: "Come on, let's go floating!" They step on the raft and float two times back and forth. Thereafter, they pick up their supervisor (f) and take her to the other side of the water. (Observation 12, 19th October 2015, Woeste Westen).

Two native girls and a native boy run behind each other on a trail between some bushes. The boy is about five meters behind the girls and calls out: "(name), wait for me! I am coming!". (Observation 178, 28th December 2015, Natureluur).

Floating on the raft has also been categorized as active nature, since children mostly do this in a group and they often talk or sing on the raft. This suggests that they are not as concentrated on the activity as in challenging nature and they do not consider it as risky.

Three immigrant girls are floating on the raft in the middle of the water surface. They sing and dance on the raft which makes the raft move a little under water (...). (Observation 135, 9th December 2015, Natureluur).



Figure 4.4 Active nature on the raft (De Natureluur, 2016).

4.4 Intriguing nature

Intriguing nature is about children being fascinated by natural things and they want to learn things about these natural things. This refers to a cognitive component, because it is about gaining knowledge. This can for example be about animals, plants, mushrooms or nature in general. Sometimes children learn things about nature themselves or from other children.

Two native boys are creeping next to a ditch through the bushes. They follow a rabbit, that is eating grass. The boys are about three meters away from the rabbit. When they approach the rabbit, it jumps away. One of the boys calls: "Aaahw. It's so fast!" And then they start following it again. The same boy says: "Look, there is the rabbit. Maybe we can catch it now." (Observation 116, 4th December 2015, Natureluur).

*An immigrant boy walks to a tree trunk and touches a bracket fungus (*Coriolus versicolor*) which is attached to the trunk. He shouts, "Bah!" Another immigrant boy looks at him and says, "Yes, they are poisonous." The first boy points to the mushroom he just touched and asks: "This one as well?" The second boy says: "Oh no, not that one, but this one" And he points to another mushroom on the tree. (Observation 138, 9th December 2015, Natureluur)*

(...) After a minute they walk to another ditch and the native boy says: "I remember there were tadpoles here."(...) Later he calls: "Look a bamboo stick!" (...). (Observation 100, 23rd October 2015, Woeste Westen).



Figure 4.5 Intriguing nature (Woeste Westen, 2016).

There are however often adults involved, who teach children things about natural creatures. This was mostly the case during clubs of the natural playgrounds. The activities were often not only about enjoying nature but they were also focusing on the educational value of nature experiences. During some informal conversations with employees of the playgrounds they told me about their will to teach children things about nature, for example how a bee makes honey (Informal Conversation, 25th November 2015, Natureluur), and how to pick a nettle without being stung (Fieldnote 14, 21st November 2015, Natureluur). Some learning experiences of children during the activities and clubs during the research were for example:

Two native boys make use of a fishnet to fish in a ditch. Two native girls sit on their knees 3 meters from the water side around a plastic box. Three supervisors (1 m, 2 f) and one employee (m) are watching the children, while also standing around the plastic boxes. De boys raise the fishnets many times from the water to look what they have caught. Suddenly one of the boys calls: "Yes!" And he runs towards the employee. The other three children also run towards him. The employee says: "Yes, that is a stickleback." They put it in a small transparent cylinder box and the boy holds it close to his face. One of the supervisors (f) takes a picture, while they all look to the fish in the small box. The employee explains the difference between a three-spined stickleback and a ten-spined stickleback. After that the two boys and one of the girls start fishing again. Now and then they walk to the employee to ask what they have in their nets. (Observation 74, 22nd October 2015, Natureluur).

(...) Along the road we see a big bump of leaves, which all native children climb on. They roll down from it and throw leaves into the air. One of the boys shouts that the leaves are hot. I also climb upon the bump and stick my hands between the leaves. I feel that they are very hot indeed. The employee asks: "What is happening to these leaves?" One of the children answers that they are rotting. The employee says he is right and that it is indeed because of the rotting of the leaves that they are so hot.(...). (Fieldnote 1, 18th November 2015, Woeste Westen).



Figure 4.6. The role of adults in intriguing nature (Natureluur, 2016).

Another interesting factor is that during the clubs, often focusing on useful nature, the children can be intrigued by the fact that natural elements can be used for different purposes, like eating or crafting. This could be seen in the example of the gathering of Wood ears. This is taught by the employees who lead the clubs. Therefore it can be stated that intriguing nature is often combined with useful nature.

4.5 Fear and aversion to nature

Fear and aversion to nature is, in contrast to the other nature experiences, a negative nature experience. During both spontaneous behavior and clubs, fear and aversion was sometimes observed. This experience is about dangerous and unpleasant things of nature and the behavior shown by children was often screaming and crying. Some of the fears and aversions were towards insects and mushrooms.

A native girl runs along the fallen tree with mushrooms and screams: "iiiiiiiiiiii! Mushrooms!" Her face looks anxious.(Observation 9, 19th October 2015, Woeste Westen).

*(...) Then the native girl finds a Wood ear (*Hirneola auricular-judae*) that has been eaten of. She says that we do not take that one and she throws it on the ground. I ask her why she doesn't want it and she replies that it's dirty because insects have eaten it. (...) The eldest girl stops at one meter height and watches a branch. She says that there are many Wood louses (*Porcellio Scaber*) on it and that she won't continue climbing. I ask her why and she says Wood louses are dirty. (...) (Fieldnotes 32, 36, 28th November 2015, Natureluur).*

Other aversions were often seen towards mud. Mud is however also often mentioned by children as very enjoyable and many children said during the focus groups that they like the fact that they can get dirty and play with mud in natural playgrounds. This will be explained more broadly in the next chapter. An aversion towards mud was seen in the following example:

Two immigrant boys and an immigrant girl walk on the small bridge. One of the boys says: "Eeeuw there is a lot of mud. It looks like shit!". (Observation 158, 23rd December 2015, Woeste Westen).

Fears and aversions were also seen when children were in pain or cold after falling on the ground or in the water.

A native boy balances over a tree trunk over the water. He slips out and lands in the water, all the way to his neck. Immediately he calls: "Moooooom!" And starts to cry. His body is shaking because of the cold and he shouts: "I want to go home!" (Observation 42, 21st October 2015, Natureluur).

Other observations, classified as aversion to nature, were children showing disrespectful behavior towards nature of natural objects like trashing or breaking plants.

A native boy runs with a branch in his hand to a bush of nettles and hits the branch against the nettles, which makes the leaves of the nettles break. He runs a few meters further and does the same to another bush of nettles. (Observation 133, 4th December 2015, Natureluur).

A native boy hits with his branch many times on a beam in the grass and shouts out: "Shut up, shut up, shut up, shut up!" (Fieldnote 45, 2nd December 2015, Woeste Westen)

The behavior of the children was also often influenced by adults who point out dangerous or unpleasant things of nature. Often children stopped their activity after an adult told them what negative outcomes the activity might have.

(...) After a while the mother says: "Look, a worm!" She points towards a worm on the ground. The two native children run towards her and the boy tries to grab the worm. The mother says: "Watch out for that nettle!" The boy directly pulls back his hand and walks away. (Observation 65, 21st October 2015, Woeste Westen).

Two native girls stand with their supervisor (f) by the waterside. One of the girls puts her foot on a tree trunk while the supervisor says: "No, don't go in the water. I want you to keep your feet dry!" The girl pulls back her foot and they walk to the cableway. (Observation 83, 22nd October 2015, Natureluur).

4.6 Fantasy in nature

The natural playgrounds seem to invite children to fantasize about different things. Natural elements can stimulate children's imagination, which influences their behavior. Fantasy in nature was seen only a few times during spontaneous behavior, but it was seen many times during clubs. The fantasy seen during the research was very variable, as shown in the following examples:

An immigrant boy picks up a small branch and throws it in the campfire. After a minute he calls: "Mommy, the fire brigade has to come! We have to call the fire brigade!" (Observation 35, 19th October 2015, Natureluur).

A native boy picks up a piece of charcoal from the (almost) extinguished fire. He rubs with the piece of charcoal on his face and says: "I am making a beard." Three other children see this and they grab charcoal from the extinguished fire as well. They all rub with the charcoal on their face which makes it black. One of the guys says: "I want to be a real black Piet." Another boy shouts: "Yes, you are black Piet!" (Observation 121, 4th December 2015, Natureluur).

An immigrant boy draws a cross in the sand with his finger and says: "A treasure is buried here". (Observation 137, 9th December 2015, Natureluur).

There can be seen some central themes as well. The two most prominent themes were animals and prehistoric men.

4.6.1 Animals

During the observations children often fantasized about wild exotic animals living in the natural playgrounds. Some examples of this are:

(...)Later the native boy says: "This water is dangerous, there are leeches and piranhas" (...) (Observations, 21st October 2015, Woeste Westen).

(...)Then we walk along a large pit (2 by 2 meters) and the immigrant boy says that it might be a bears' bed. He says the bear is now searching for food and I ask him what the bear eats. The boy says that the bear eats fish. (...) (Fieldnote 35, 28th November 2015, Natureluur).

(...) A native boy stands near a shallow ditch and hits on the water surface with a branch. When the water splashes he jumps backwards. Another native boy approaches him and asks: "What are you doing?" the first boy says: "I am killing the water." The other boy also starts to hit his branch on the water surface and jumps backwards when the water splashes. He says, "Here is a crocodile." They hit the water for a while and the first boy says, "I cannot beat the water, there is too much! I will not succeed!" (...) (Fieldnote 55, 2nd December 2015, Woeste Westen).

4.6.2 Prehistoric men

Another fantasy often seen amongst children in urban natural playgrounds was the pretending of being a prehistoric man. This behavior was only shown by boys and they always used a stick, which was held above their head.

A native boy picks up a branch and calls to another boy: Look a prehistoric man! While he is looking angry to the other boy (Observation 78, 22nd October 2015, Natureluur).

(...)One of the boys walks while holding his branch up in the air, he says: 'We are apes, we are prehistoric men!' (Fieldnote 56, 2nd December 2015, Woeste Westen).

4.7 Aesthetic nature

Aesthetic nature was only a few times seen by children during both spontaneous behavior and clubs in the natural playgrounds. Aesthetic nature was mostly about natural elements, like rocks, shells, leaves

and reed. It focused less on nature or landscape in general. An example of aesthetic nature was during the club of Het Woeste Westen:

(...)When we walk back a boy sees a shell lying between the reeds. He asks if he can take it, because he thinks it is beautiful. The employee says that it is not so appropriate now. The boy puts the shell back into the reeds and says that it is a treasure that he secretly hides(...). (Fieldnote 43, 2nd December, 2015).

Aesthetic nature is however not only about seeing the beauty of natural elements, it can also be about other senses like smelling.

(...)We walk through a muddy area and the older girl says she thinks mud smells nice.(...) (Fieldnote 37, 28th November, 2015).

Another interesting observation seen a few times during the research was adults showing children the beauty of nature. It seems that aesthetics is a more present during adulthood than during childhood.

*A woman has found a dead Rose-ringed Parakeet (*Psittacula krameri*) and holds it in her hand. A native girl walks towards her and asks: "What happened, mom?" The woman replies: "I don't know, it doesn't seem to have been sick." The girl says: "Maybe it was just old." The woman says: "It doesn't seem to be old either, I have no idea what happened." The girl asks: "It is so beautiful, can we stuff it?" The woman replies: "Yes, that might be possible, it is beautiful." (Observation 41, 21st October 2015, Natureluur).*

(...)Two immigrant boys are looking at the pond, where raindrops are falling on the water. The supervisor (f) says she likes to see the wind and the rain falling on the water. She asks if the boys think so too. They nod and say yes.(...) (Fieldnote 17, 21st November, 2015).

(...)Then the employee tells the children her plans for today: decorate masks with beautiful things from nature. (...)Then we start our quest for natural things children can stick on their mask. We walk through the playground and the employee says they can for example search for leaves. The children gather leaves and twigs and put them in a bucket. An immigrant girl walks to me and shows me what she collected in her bucket. I say the leaves are beautiful and I ask what colors they have. She shows me a green, yellow and a brown leaf. Then she picks up a reed and says that it is also beautiful.(...) (Fieldnote 22, 26th November, 2015).

4.8 Non-natural experiences

An experience of a different order is the non-natural experience. There are some non-natural elements present in both playgrounds. Sometimes these elements are combined with natural elements, like the raft in the water. However, in some cases nature does not play a role and it could also be experienced by children in other (playground) settings. Only experiences in which natural elements do not play a role are classified as non-natural. Non-natural experiences were seen a few times during spontaneous behavior. During clubs non-natural experiences were barely present. In most of the cases the non-natural play objects like cable-ways, swings, hammocks and climbing frames were involved.

Two native boys are sitting together on the cableway chair. One sits on the lap of the other, with their faces towards each other. When they arrive to the other side, one of them says: "I want to go again!" They walk back to the plateau and together they go again on the cable way. (Observation 62, 21st October 2015, Woeste Westen).

Two native boys are swinging on the big round swing. One is lying in the swing and the other is standing. When the swing has made up speed the boy, standing on the swing, jumps off. (Observation 152, 23rd December 2015, Woeste Westen).

Also some non-natural games were played during the observations in the natural playgrounds.

Two women sing “schipper mag ik overvaren ja of nee” (a Dutch game). Three children and the women run back and forth while one child plays the captain who determines how the children have to cross him. The ‘captain’ tries to catch the crossing children and women. (Observation 182, 28th December 2015, Natureluur).

During the clubs of both natural playgrounds, sometimes non-natural products were used to make things.

Then we walk towards the building and take a seat under the shed of the building to decorate the masks. The employee gives a mask to every child and explains that they can stick leaves and other things on it. She also puts coloured feathers on the table. The children start sticking these feathers on their masks. One of the immigrant girls finds yellow paint in one of the baskets and starts painting her mask (...). (fieldnote 26, 26th November 2015, Natureluur).

He (the employee) has brought garbage bags, duct tape and wires. He shows the boys how to make a kite with these elements. After that, the boys are divided in couples and every couple rips off a garbage bag and start to make a kite. (Fieldnote 4, 18th November 2015, Woeste Westen).

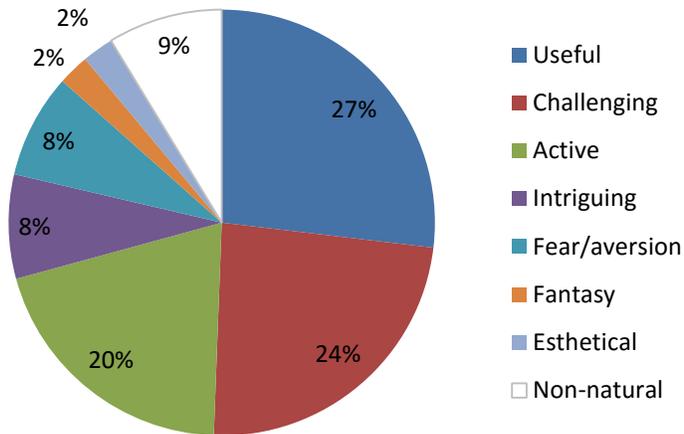
4.9 Factors influencing nature experiences in natural playgrounds

In this paragraph the described nature experiences will be analyzed according to different factors that influence nature experiences of children. These factors are spontaneous behavior versus clubs, differences between playgrounds, ethnic background (non-Western versus native Dutch) and the role of adults.

4.9.1 Spontaneous experiences vs. organized experiences

An important factor, influencing children’s nature experiences in natural playgrounds seems to be whether or not children are involved in clubs. Figure 4.2 depicts the distribution of nature experiences during spontaneous behavior and during clubs respectively.

Spontaneous



Organized

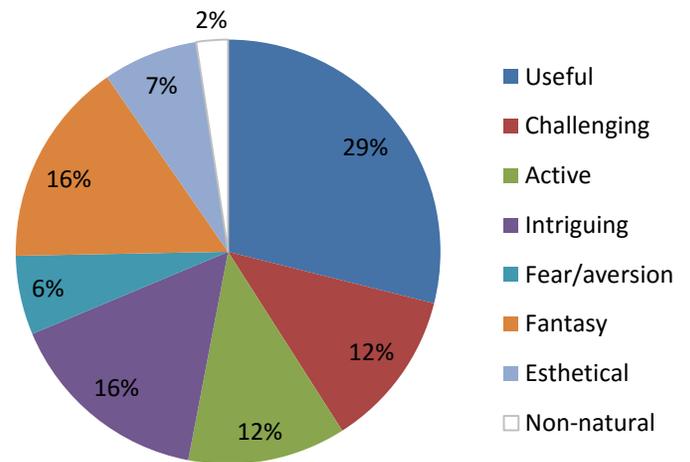


Figure 4.7 Nature experiences during spontaneous behavior (N=254) and organized clubs (N=83).

When children are not involved in activities, children show spontaneous behavior, often based on their own decisions. Sometimes however, adults influence the spontaneous behavior of children, which will be described later in this paragraph. Three nature experiences seem to be most dominant in spontaneous behavior, which are useful nature (mainly nature as material supplier and nature as a tool), challenging nature and active nature. Useful nature seems to be dominant, because of the presence of many loose natural elements in both playgrounds, like branches, rocks and water, which are used as material suppliers or tools. Examples of this are children building huts or using branches to grab things. Also the fire place, which seems to be attractive for children, plays an important role in the dominance of useful nature, because children often burn branches in the fire. Challenging nature is second most dominant, because children are triggered to show challenging behavior. In both playgrounds a lot of environmental features are present, which enable children to show vital and explorative behavior, like beams over water to balance over and hills to jump from.

Furthermore, the environment of both playgrounds invites children to experience active nature during their spontaneous behavior. The open fields invite children for example to run and jump. Furthermore, in both natural playgrounds a raft is present, which is used by children to float on.

The other experiences, intriguing nature, fear and aversion to nature, aesthetic nature and fantasy in nature seem less present during spontaneous behavior of children. These experiences are based more on 'thinking' and 'learning' (cognitive) which children seem to focus less on during their spontaneous behavior. Instead, children seem to focus very much on just 'doing' (reacting on environmental features) and the feelings leading to this 'doing', like excitement or fear instead of 'learning' and 'thinking' about these environmental features.

When children are involved in clubs, three experiences are most dominant, being: useful nature (mainly nature to eat and nature as material supplier), intriguing nature and fantasy in nature.

Many activities of the clubs of the natural playgrounds are focusing on useful nature, because many of these activities focus on making food and crafting. Nature as material supplier was often seen during the clubs of both playgrounds, for example when spears were made of branches or when masks were decorated with leaves. In both playgrounds this was sometimes combined with the use of non-natural products. In Het Woeste Westen kites were for instance made of garbage bags and in De Natureluur the masks were not only decorated with leaves, but also with paint and glitters. Focus was however mainly on natural elements.

Intriguing nature is the second most dominant nature experience during clubs. This is mainly because the activities are led by adults, who teach children about aspects of nature. This is sometimes done during situations that happen coincidentally, but often it is done in combination with the experience useful nature. During activities focusing on nature to eat, children learn for example which plants can be eaten. During activities focusing on nature as material supplier, children learn how natural elements can be used to make things. This 'educative' element demonstrates that the activities often lead to gaining knowledge, which demonstrates the cognitive component.

Fantasy in nature is also dominant during clubs, because during the clubs of Het Woeste Westen for examples spears were made, which invited children to pretend being a prehistoric man. In this example also the cognitive component can be seen, because children seem to think about humans' origin.

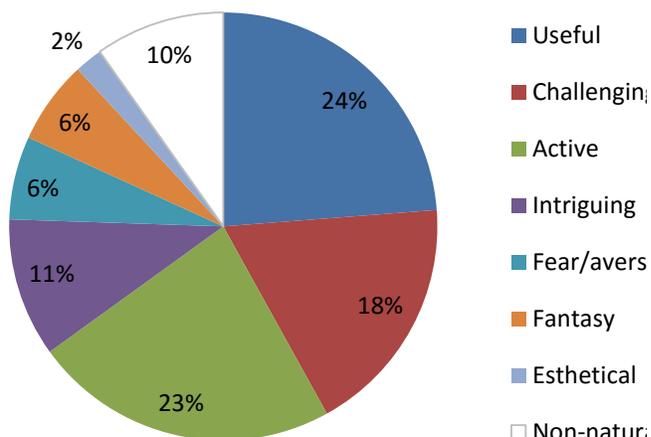
Challenging nature and active nature are less present during the organized activities. This seems to be the case, since the focus of the activities is often on making food or crafting. There were however some examples of active and challenging nature during activities, since the environment of the playgrounds in which the activities took place still invites children to show this challenging and active behavior.

4.9.2 Het Woeste Westen vs. De Natureluur

Another factor, influencing the nature experiences of children is which of the two playgrounds they are visiting. In the analysis differences between playgrounds are declared by the concept of affordances, which lead to differences in behavior amongst children.

The nature experiences of children in the different playgrounds are quite similar. Figure 4.3 shows the distribution of nature experiences per playground. The similarities in nature experiences can be declared by the fact that, even though the natural playgrounds have a different appearance, there are many similarities in environmental features in the natural playgrounds (paragraph 3.1.3). In both Het Woeste Westen and De Natureluur useful nature is the nature experience most seen. This can be explained by the fact that clubs of both natural playgrounds focus on useful nature. Also, during spontaneous behavior in both playgrounds, many children were experiencing useful nature by building huts and dams. Nature to eat was only seen in the clubs of De Natureluur, in which food was made from a combination of gathered and bought products. In Het Woeste Westen nature to eat was however often observed when children were baking bread rolls on the fire, during spontaneous behavior.

Woeste Westen



Natureluur

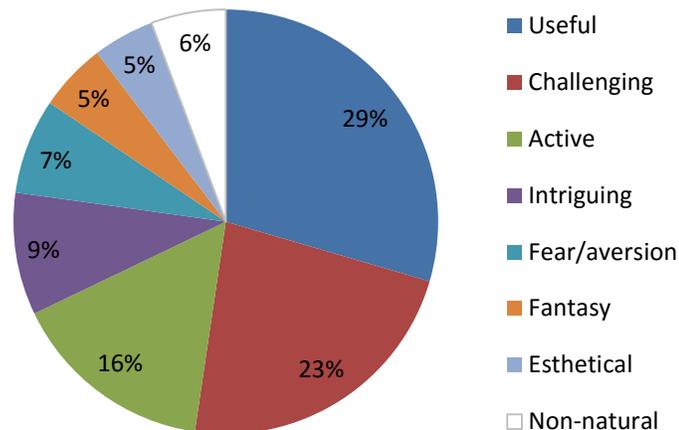


Figure 4.8 Nature experiences in Het Woeste Westen (N=143) and De Natureluur (N=193).

In De Natureluur useful nature is however a bit more present. This is probably because nature as a tool was often seen in De Natureluur when children wanted to use the cable-way, which was hanging above the water and they needed a branch to grab it.

In both playgrounds, children often experienced challenging nature. In De Natureluur challenging nature was a bit more present than in Het Woeste Westen. This is probably because of the many beams in and over the water that afford children to show challenging behavior, like balancing. There are however also beams over the water in Het Woeste Westen, and furthermore there are many ditches, which afford children to jump over. Next to that, in De Natureluur some big trees with low hanging branches are present, inviting children to climb in. In Het Woeste Westen there are many big trees without low hanging branches and some small trees in which children also could climb, but these trees are less suitable to climb than the ones in De Natureluur.

Active nature was observed a lot in both playgrounds, probably because of the presence of open fields, which afford children to run and jump and the presence of the rafts in both playgrounds. Active nature was observed a bit more in Het Woeste Westen, which can be explained by the fact that there are more open fields and these fields are bigger. Furthermore, in the clubs of Het Woeste Westen, children were showing more active behavior than in the clubs of De Natureluur.

The rest of the nature experiences, intriguing nature, fear and aversion to nature, fantasy in nature and aesthetic nature are observed in about the same amount in both playgrounds. These experiences seem to be less dependent on the playground.

4.9.3 Non-Western immigrant and native Dutch children

During this research it was studied if there were differences between non-Western immigrant children and native Dutch children. Of the 336 observations, 116 were of non-Western immigrant children and 241 were of native Dutch children (in 21 observations both non-Western immigrant and native Dutch children were present). Almost all of these observations were in De Natureluur, since in Het Woeste Westen, barely Non-Western immigrant children were present. In figure 4.4, the distribution of nature experiences per group can be seen.

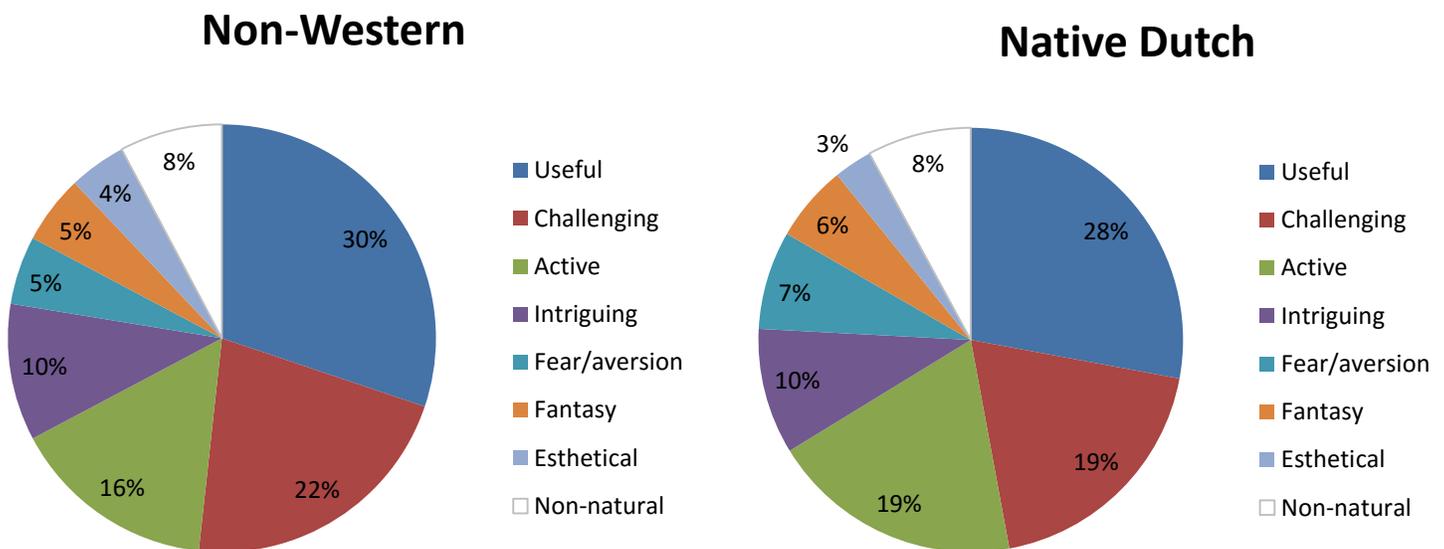


Figure 4.9 Nature experiences non-Western children (N=116) and native Dutch children (N=240).

The figure demonstrates that there are hardly any differences between non-Western immigrant and native Dutch children in nature experiences. During my research, the behavior of children with both backgrounds was quite similar and it did not seem to be influenced by their ethnic background.

4.9.4 Adults

Another dominant factor, influencing the nature experiences of children in natural playgrounds, is adults. The influence of adults is both indirect and direct. The indirect influence of adults, mostly parents of children, is whether or not they think nature is important. During the informal conversations with adults it became clear that parents often thought nature experiences are important for children and they seemed to be nature and environmental aware, whether they were non-Western immigrant or native Dutch. Therefore they went with their children to the natural playgrounds. This might indicate that adults (both non-Western immigrant and native Dutch) who do not think nature experiences are important would not take children to the playgrounds. This will be further elaborated in the discussion of this research.

The direct influence of adults in nature experiences of children is their presence in the natural playgrounds. It was very often the case that adults accompanied the children during their experiences in

the playgrounds. Sometimes they only watched the children from a distance, but often they encouraged or discouraged children to behave in a certain way. Adults warned children for example that they might fall in the water. The presence of adults influenced children's behavior also in the way that children often called the adults to show them certain behavior.

There were however also many examples of adults who were letting their children go inside the playgrounds, while they stayed at the entrance. This was mainly the case for older children, because for the younger children, adults seem to think the playgrounds are too dangerous to visit independently.

5. Nature connection

In this chapter an answer will be given to the second sub question of this research: *How are children connected to nature in urban natural playgrounds and which factors lead to this connection?*

Data on nature connection amongst children is mainly derived from the focus group discussions. However, the results will also be combined with data from the observations to relate children's nature connection with their nature experiences. In the theoretical framework in chapter 2 it is described that nature connection consists of four dimensions: enjoyment of nature, empathy for creatures, sense of oneness and sense of responsibility. I will argue, however, that sense of responsibility is rather a result of nature connection than that it is part of nature connection. This sense of responsibility is influenced by the other three dimensions of nature connection, namely enjoyment of nature, empathy for creatures and sense of oneness. This will be described more broadly in paragraph 5.6. During the discussions the topics varied between the nature experiences in natural playgrounds and generic experiences (e.g. experiences in school) that influence nature connection. During the discussion about enjoyment of nature, topics remained close to the natural playgrounds, whereas during the discussion about empathy for creatures, both experiences in natural playgrounds and other experiences were mentioned. During discussions about sense of oneness, children referred mainly to other experiences.

During the analysis of the data it became clear that there is not always a clear distinction between the three dimensions and that there can be seen a relationship between the three dimensions. The following paragraph will first elaborate on children's view on nature in natural playgrounds. After that the three different dimensions of nature connection will be described in separate paragraphs, followed by a description of sense of responsibility. In the last paragraph an analytic conclusion about nature connection will be given, followed by a description of influential factors on nature connection. Citations of native Dutch children are marked with an 'n' and those of non-Western immigrant children are marked with an 'i'. Citations of myself are marked by an 'L'.

5.1 Natural playgrounds as nature

Before the dimensions of nature connection will be described, it is important to know how children perceive nature in general and whether or not and children perceive the natural playgrounds as nature and why they do so.

If children would not see the natural playgrounds as nature, the playgrounds would probably not contribute to children's nature connection. To describe nature, most children used words referring to natural elements like 'forest', 'animals' and 'trees'. Almost all children thought the natural playgrounds are 'nature' as well. Reasons for this could be quite simple, like the playgrounds having natural elements.

1i: There are many trees and...

2i: And water! (...) and animals as well. (FGD 7, Woeste Westen).

1n: Yes a lot of nature, many things from nature...

2n: Sometimes you can build huts as well!

1n: Building huts is nice... and climbing trees! (FGD 5, Natureluur).

Sometimes there was some discussion between children about whether or not the playground is nature. In the following examples children seem to make a distinction between 'natural' and 'human-made'.

L: (...) Do you think this playground is nature? (...)

3n: Well, a little bit, because it is actually planted... so...

2n: Yes, there are plants and huts everywhere.

2n: It is planted, so actually I don't think it's nature.

1n: I do think it is nature (...) because there are snakes living here and many animal species. (FGD 3, Woeste Westen).

1n: Yes! (...) Well there are growing many things.

2n: Yes and no...

1n: That part where you can climb, that is not nature... but the forest (...) I mean the open playing space, that is nature.

2n: Well, some things are not really nature (...) Like that cable-way... That isn't nature. (FGD 6, Woeste Westen).

One of the children mentioned the possibility to get in contact with nature in natural playgrounds. She referred to city people who have fewer possibilities to connect to nature.

2n: (...) Then you learn about the contact with nature (...) because when you live in a city for example... you can go here... because then you can see nature. In the city you only see shops.. and only pigeons (laughs)... I just think all children and all people should be able to come here whenever they want to. (FGD 6, Woeste Westen).

Overall it can be said that children think natural playgrounds are nature. Therefore it would be possible that the experiences children have in natural playgrounds influence their nature connection.

5.2 Enjoyment of nature

Enjoyment of nature focuses on the pleasure of the individual child. Consequently, it is the most anthropocentric dimension of nature connection, focusing on the benefit for humans. This was demonstrated when children were asked if and why the natural playgrounds are important for children. This question seemed difficult to answer for most of the children. Some said that it is not very important but they just like to play there, and others said it is important for them because they like it. Both these reactions point out the anthropocentric character.

1n: Well, it is not important...but I just like to go there. And yes, I would feel sad when it was not there. (FGD 6, Woeste Westen).

There are different factors that lead to enjoyment of nature amongst children.

5.2.1 Fun

The main element of enjoyment of nature during the focus group discussions is that many children said they think natural playgrounds are 'fun'. When the children were asked why they were visiting the natural playgrounds, answers like 'because it's nice' and 'to make fun' were given, which refer to enjoyment of nature. When the children were given the possibility to choose between playing inside, in a

'normal playground', in a forest or in a natural playground, most of them said they liked the natural playgrounds most and also the forest was often mentioned to be nice. Many of the children said they did not like to play inside and in the non-natural playground and they referred to this as 'boring'. The natural environment seems to be more attractive to most of the children.

The conclusion that children like natural playgrounds might be caused by the fact that most of the children come there in their leisure time, indicating it is their 'free choice' to go to the playgrounds. Almost all children are however accompanied by adults, which means that in some cases adults might have decided or suggested to go to the natural playgrounds. During an informal conversation with a supervisor who visits the playground often with a boy was shown, that this boy decided to go to Het Woeste Westen himself.

I ask if I can join a woman who is watching a group of children from a distance. (...) She says that the native boy she is babysitting really likes het Woeste Westen. They come here together every week. Today she suggested to the boy to go to the beach, but he rather wanted to go to Het Woeste Westen. They have been here from 9.30 (now it is 14.00) (...) she says that the boy likes to jump in the water in summer. Today he had asked her if he could bring his swimming pants. (...)The woman says that during summer, the field is full of reed and that the boy experiences this as wilderness. He likes to get his hands in the mud and put mud on his face. He feels at home in Het Woeste Westen. She herself does not like nature that much, but she likes to see him making fun in Het Woeste Westen. That is the reason she likes the place. She says that the boy also likes to play with the fire a lot. And he likes the male employees of het Woeste Westen, who help him with making fire and cutting branches. Every time they visit Het Woeste Westen, the boy bakes a bread roll on the fire (Observations 21st October, Woeste Westen).

This example illustrates that the boy rather wanted to go to Het Woeste Westen than to the beach. The supervisor said they visit the playground together often, which can be confirmed, since they were seen many times, during different moments of data collection. The examples the supervisor gives why the boy likes the natural playgrounds refer to challenging nature, useful nature (nature as material supplier and nature to eat) and fantasy in nature. This shows that enjoyment of nature can be evoked by different, if not all, nature experiences children have in the playgrounds except for fear and aversion to nature. Fear and aversion for nature can be seen as the opposite of enjoyment of nature and when children would experience fear and aversion for nature a lot, this would lead to less enjoyment of nature.

5.2.2 Variety in experiences

The fact that all the experiences, except for the fear and aversion experience, can evoke enjoyment of nature illustrates the second important element of enjoyment of nature, which is 'variety in experiences'. During the focus group discussions, the reasons for liking the natural playgrounds also varied, pointing out different nature experiences and often more than one reason was given by the children. They were often focusing on the activity they did before the focus group discussion, like baking a bread roll on the fire, gathering mushrooms or searching for things to decorate masks.

However, it seems that children who visit the playground more often, for example because they are joining the club, have had more nature experiences and therefore a richer pallet of what they like about the natural playgrounds. Some of these children also referred to activities in other seasons. The broad

variety of why children like natural playgrounds can be seen in the following examples. Many different nature experiences can be seen in these examples.

L: and if you could choose yourself, what do you like to do most in De Natureluur?

3n: Uhm... I think that boat...that raft... and (...) I like the water... the first time we were here, we all put mud shampoo in our hair... we were very little back then... but it was very funny though. (FGD 2, Natureluur).

L: (...)What do you like the most in Het Woeste Westen?

1n: Building huts!

3n: No a birthday party!

2n: Oooo I like the fire the most!

3n: (...) I also like the birthday parties a lot, because you end up with popcorn! (...) You just make it yourself, in a pan on the fire and then you make it yourself. (FGD 3, Woeste Westen).

4n: When it is summer... I like to put on my swimming pants and jump in the water. And when it is winter I like the big swing. (FGD 4, Woeste Westen).

Some children mentioned the non-natural play objects in the natural playgrounds as well, like the swing and the cable-way. This was also seen during the observations, in which often non-natural play objects were used by children during their visit to the natural playgrounds. These non-natural objects seem to make the playgrounds attractive for children and enjoyment of nature in natural playgrounds can therefore not be seen separated from the non-natural play objects.

3n: Uhm.. Happy... I just feel happy. (...) Because you can do many things here and uhm... there are many play objects here. (FGD 3, Woeste Westen).

(...)I chat a little more with the grandmother. She tells me that she likes this playground a lot. She would like to see that the small forest in (small city in Noord-Holland) would be transformed into a natural playground, with play objects like the one around the tree in De Natureluur. One of the native granddaughters says that she would like that a lot, because the little forest is a dull place now.(...) Then she starts telling me what she did in the playground, like walking through the water with her boots and using the cableway. (Observations 22nd October, Natureluur).

5.2.3 Self-determination

The third element for children to enjoy the natural playgrounds and nature in general, was the fact that they can determine themselves what to do. This refers probably to the fact that normally adults decide what children should do. Playing in natural playgrounds without supervision of adults can be seen as more enjoyable for some children.

3n: (...) and that we can decide ourselves a bit. Yes, that we are allowed to decide ourselves what we want to do. (FGD 2, Natureluur).

1n: I like it, because uhm... I love to climb trees and uhm... I actually like to do things in the forest, like for example... I like it a lot to do what I want, because I can do what I want in the forest. (FGD 4, Woeste Westen).

1n: Nobody is watching you saying: "You are not allowed to get dirty"... and... you can just go anywhere to do nice things...and yes... it is just very nice! (FGD 6, Woeste Westen).

5.2.4 Positive feelings

The last aspect of enjoyment of nature seen during the research was when children were asked how they feel in the natural playground. They all mentioned positive feelings and emotions like 'free', 'open' and 'happy'.

L: and when you are here, how do you feel at these moments?

1&2n: FREEEEE!

Ln: Free? What do you mean?

2n: You can let yourself go. (FGD 6, Woeste Westen).

1n: Yes, then I feel happy..

L: And why is that?

1n: Because (...) I only come here sometimes, so when I haven't been here for a while, and I come back, then I am very happy! (FGD 5, Natureluur).

The description of these feelings and emotions by children shows that enjoyment of nature has a strong affective component.

5.2.5 Comfort zone

The children also answered the question if and why they did not like aspects of nature or natural playgrounds. Some children said they could not come up with things they did not like, because they liked everything about nature and natural playgrounds. Other children however mentioned things like 'pain', 'dirt' and 'getting wet'. This was also seen during the observations of the experience 'fear and aversion to nature' and therefore this experience can be seen as the opposite of enjoyment of nature.

3n: That it hurts...

L: What is hurting then?

3n: Well... when you cut yourself or something. And that you fall in a dirty pond sometimes... and that you get all dirty!

1n: Yes! I once fell in a pond...

4n: And that there are many nettles. (FGD 3, Woeste Westen).

Getting dirty was however not only seen as negative. Some of the children like the fact that they can get dirty and play with mud in the natural playgrounds. This was both said by children in the focus group discussions and seen during observations.

1n: (...)And when you go to this place, you just know... I just have to... put on some clothes that can get dirty... and then you just can get nice and dirty! (FGD 6, Woeste Westen).

Two native girls walk through the mud along a ditch. One of them is wearing a long pink dress, which she holds up with one hand. The other girls falls down in the mud and starts to laugh. After that, the girl in the dress also falls down and starts laughing as well. They both stand up and watch their muddy hands. They hold their hands in front of their face, and laugh again. Then they stamp through the mud puddles and the

girl in the dress falls down again. They run away and I do not see them for a few minutes. Then they show up again and I see the dress is completely black of mud. (Observation 176, Woeste Westen).

Enjoyment of nature mainly has an affective component. Children seem to focus on their experiences in natural playgrounds and the feelings (mainly positive) that lead to these experiences. The children mentioned varying aspects of what they like about nature and natural playgrounds, which means that enjoyment of nature can be evoked by many different experiences in nature.

5.3 Empathy for creatures

Empathy is not about children themselves, but about feelings and emotions of ‘others’, in this case non-human creatures. To introduce the topic about empathy for creatures, the children were asked if they knew whether or not there are animals living in the playground. This was asked to get some general insight in the awareness of children about the existence of creatures in the playgrounds, since this would show that children take notice of creatures around them. All children in the focus group discussions were aware of the fact that there are animals living in the natural playgrounds. They referred to many different animal species, like birds, frogs, fish, rabbits, and different insect species. When subsequently was asked what the children thought about these animals living in the playgrounds, they all said they liked this. This awareness of creatures in natural playgrounds and the fact that children like this indicate that empathy for creatures might be present amongst children in natural playgrounds. Empathy for creatures depends however on different factors.

5.3.1 Empathy is species-dependent

Many children seemed to be empathic towards different kinds of creatures and often anthropomorphic characteristics were given towards creatures. However, an important factor revealed during the research, is that empathy for creatures depends a lot on the species. When showing children pictures of different creatures and asking whether or not these creatures have feelings and emotions, the answers differed per species.

Most children responded in a cognitive empathic way, referring to reasons for creatures to have or not have certain feelings and emotions. The children did not talk much about their own feelings towards feelings of creatures (affective), except when they were specifically asked how they felt about the examples they gave.

Rabbits and birds evoked empathy most, because all children said rabbits and birds have feelings. One of the children referred to the rabbit as ‘sweet’ and many children could give reasons why these animals would have certain feelings.

L: And the rabbit?

2n: Well I think he can get angry when he gets shot.

3n: Poef poef poef!

L: And can he be happy?

1n: Yes! When he gets babies!

L: And the bird? (...)

2n: Yes, then he whistles, fieet fieet fieet! (FGD 3, Woeste Westen).

Most of the children had an aversion to wasps, because of their aggressiveness and the chance to get stung by a wasp. Many children said a wasp cannot feel happiness, but it can feel anger. The next example is about two children who understand that wasps have feelings (cognitive), but do not feel bad themselves about a wasp feeling for example pain (affective).

L: And what does he feel?

1n: Well.. that he gets hit to the wall (laughs).

L: And what do you think about the wasp feeling that?

2n: uhm... not too bad.

1n: it is ...bad, but they are just animals and it is funny to hit them.

2n: Yes, you can get stung. (FGD 5, Natureluur).

There were however also children who were talking about wasps in a more respectful way.

1n: (...)actually, I think, wasps and bees might not be nice, but it is ... they do belong to nature. So it is sad actually if we would kill them. So you could put him for example in a cup, but you should not kill him on purpose (...) because when he is bothering you, you could lock him up. And when you are ready, you can release him, I think. (FGD 8, Natureluur).

L: And can a wasp be sad you think?

4i: When his friend is dead, then he will cry (rubs his eyes with his fists). (FGD 1, Natureluur).

Many children see the worm as an animal without feelings. Words as 'dumb' and 'having no brains' were used to describe why worms do not have feelings. Many children think that a worm stays alive after cutting it in half.

2i: Yes, yes, yes! All animals have feelings..

1i: Except for the worm!

2i: Yes, except for the worm... you cut him in pieces... and they are all walking again... (1&2 laugh) (FGD 7, Woeste Westen).

4n: Worms are dumb. I would not want to live when I got cut in half and then still keep living. (FGD 4. Woeste Westen).

However not all children thought worms do not have feelings. Some empathy towards worms was seen as well.

L: Did you ever see a sick or hurt animal in De Natureluur?

3n: Yes, I once saw a worm.

L: And how did you see that?

3n: Well... I saw a little bit blood (...) I saw two worms that were cut in half, but they were still alive. (...) and there was a boy, who had a bag filled with worms... and they were dying.

L: And what did you think about that?

3n: Well I thought it was sad. (...)I thought: "Hey, that is wrong" and I was a little angry at that boy! (FGD 2, Natureluur).

Almost all children thought that trees have feelings, because they are alive. This was often described in a cognitive way.

2n: Because they do like this (puts her arms in the air). With their branches up!

3n: When a tree gets a lot of water, he is happy. And when he doesn't get enough water he will get limp and not happy (FGD 2, Natureluur).

1n: Yes, when you rip a branch of a tree...the tree feels it. A tree has feelings as well, because a tree has a life, just like a leaf or a flower. When you rip a flower from the grass...than it dies... (FGD 6, Woeste Westen).

Some children also gave trees anthropomorphic characteristics, like crying, thinking and talking. In these cases fantasy seems to play a role in their experiences with trees.

2n: Sometimes he can be sad, because sometimes we climb in it and then yes... (...) the tree can sometimes feel a little bit, because sometimes he cries and... that are strange drops that stick like honey. (FGD 5, Natureluur).

L: And we cut off some branches a moment ago, do you think the tree feels this?

2n: No he doesn't feel it, but he notices it in the end... "O no, I lost my braches!" (...) really like "I lost five arms again!" (FGD 4, Woeste Westen).

A picture of a telephone was used to test if children were having empathy towards lifeless non-natural things as well. Many children started to laugh when the question was asked whether a telephone has feelings and almost all of them said telephones do not have feelings. Two children however (after they had said a telephone does not have feelings) said that a telephone could be happy or sad, but they were laughing about it, which indicates that they were making a joke.

In the results above, children seem to be more empathic towards mammals and birds than towards insects and invertebrates, since they have a certain aversion towards these creatures.

Enjoyment of creatures seems to be necessary to feel empathy for these creatures. As illustrated above a wasp and a worm are not seen as enjoyable, since they are 'aggressive' or 'dumb' and therefore empathy is less present for these creatures. However rabbits, trees and birds are seen as 'cute' or 'challenging' (enjoyment) and therefore empathy towards these creatures is more present.

5.3.2 Vulnerability

During the conversations with children, vulnerability of creatures was also discussed, for example because these creatures are sick or hurt. Almost none of the children had ever seen an animal that was sick or hurt in the natural playgrounds. Therefore they were asked if they had experience with sick or hurt animals in general. Some children had seen hurt animals, which they called 'sad', which demonstrates that children understand feelings of creatures and that they can be empathic towards vulnerable animals. However, most of the children referred to dead animals they had seen. They also referred to these dead animals as being 'sad', which shows that children can have empathy for both living and dead animals. Dead animals seemed to be fascinating for some of the children, because they were talking enthusiastically about it.

2n: A mole rat, which was dead!

L: What did you think about that?

2n: (...) I thought it was sad... but is also an example of what...nature is like. I think that was a cool thing to see!

4n: It actually is part of nature. (FGD 4, Woeste Westen).

In the example above about empathy for dead creatures a certain sense of oneness can be seen, because the children refer to these creatures as being part of nature. This demonstrates a relationship between empathy for creatures and sense of oneness.

When children were giving examples about vulnerable creatures, they almost all referred to mammals and birds, which might indicate again that empathy is bigger towards these creatures than towards for example insects and invertebrates. This can be explained by the fact that children are more empathic towards creatures they enjoy, which are often mammals and birds as was described before.

5.3.3 Learning about creatures

Empathy for creatures can be increased by children's knowledge about creatures, which show a learning element. In this learning element often adults are involved. Parents, can for example play a role in encouraging empathy for creatures and children seem think their parents' opinion is important.

2i: (...) Look, my father always says... some people, when they have planted an apple tree and birds eat these apples... (...) then they shoot the birds, because they eat the apples... but my father always thinks it is alright that the birds eat it. (FGD 7, Woeste Westen).

Not only parents of children, but also other adults (e.g. employees of natural playgrounds) can influence children's empathy for creatures. This role of adults in empathy for creatures was also mentioned during the informal conversations with some employees of De Natureluur.

The employee gives an example of disrespectful behavior towards nature. She sometimes takes children catching water animals. The children empty their nets on the grass. When she explains them that this is not right, children ask her if these animals can feel as well. When she explains that this is indeed the case, children are a lot more careful with the animals. They put them in cups and release them in the ditches. (...) The other employee adds to this that she sometimes works with trees during the club 'toddlers in the wild', which is also taking place in De Natureluur. She shows children that trees have feet (roots), skin (bark) and arms (branches). In this way, she shows toddlers that trees are also living creatures. (Informal conversation, 25th November, Natureluur).

This example shows that the activities in natural playgrounds, in which creatures are involved in children's nature experiences, can play an important role in empathy for creatures. It demonstrates that learning about creatures, which is about the cognitive component, can increase empathy. During these activities adults teach children about animals and plants being living creatures just like humans, in which both empathy for creatures and sense of oneness can be seen. This again points out a relationship between empathy for creatures and sense of oneness.

Empathy for creatures seems to focus on both the cognitive and the affective component, which can be developed by nature experiences with natural creatures (e.g. climbing a tree or seeing a vulnerable

creature). The cognitive component seems to be most dominant, since children often focus on their knowledge about why creatures would have certain feelings and emotions or not. The affective component of empathy for creatures is about feelings children can have towards feelings of creatures, in which often is referred to vulnerable creatures.

5.4 Sense of oneness

Sense of oneness focuses on nature in general. It is about children's understanding about being part of this nature and about feeling equal to non-human creatures. These and other factors of sense of oneness are elaborated below.

5.4.1 Humans place in nature

The first factor of sense of oneness is about children feeling themselves part of a bigger whole, in this case nature. Many children said that humans are part of nature, because of the fact that humans originate from animals or apes and they referred to prehistoric men sometimes.

2n: Because humans are made by nature...

1n: Uhm... they are made by nature... and animals... that is a part of nature... and humans originate from animals. (FGD 6, Woeste Westen).

Sometimes, however, the question whether humans are part of nature was causing interesting discussions between children. The following example is about two girls doubting about whether or not humans are part of nature.

2n: Humans part of nature...uhm... that is a difficult question.. (...) Well I don't know...(silence)...

L: Why would you think yes?

2n: Well because there are many animals who also have lungs, who also breath through their nose.

1n: And animals are also important... and they also want to have a nice place to live. (...) animals also need freedom and humans as well and they also need just oxygen and going outside, so it is kind of the same.

L: And why would you think no?

2n: Because we ruin nature a little bit as well.

1n: Polluting so to say.

2n: With plastic...cans...greenhouse gasses. (FGD 8, Natureluur).

In this case the two girls are agreeing on both the fact that humans are part of nature and not part of nature. Humans are on the one hand seen as part of nature because they are animals. On the other hand however, humans are seen as being not part of nature, because they are bad and destructive for nature. This indicates a form of responsibility. It was however also often the case that children did not agree with each other and they were choosing between humans being part of nature or not.

1n: (...) Because a human is an animal and an animal is nature.

Ln: And what he is saying (points to child 1) a human is part of nature, do you think that as well?

3n: No, because a human first destroys nature, instead of... yes, destroys nature.

4n: I also think not nature (...) because humans are actually not animals, only in the past.

(...)

2n: But humans are making plants and plants also belong to nature... and when there were no humans, there would be also less plants (FGD 3, Woeste Westen).

Some children also mentioned a perspective in which human-made elements are seen as nature as well. This is not only about humans being part of nature, but also their products, which are normally often seen as non-natural.

3n: Everything is nature... the whole world... because in the end plastic is also made of nature... in the end, even though it is bad for nature.

L: So plastic is nature?

2n: Yes.

4n: They are raw materials (...) and paint is also made of raw materials.

2n: And without nature, we cannot live. (FGD 4, Woeste Westen).

In this last sentence, the next factor of sense of oneness, humans dependency on nature, can be seen. This demonstrates that these factors are related to each other and overlap in a certain way.

5.4.2 Humans dependency on nature

The second factor of sense of oneness is about children seeing the importance of nature. When the question was asked who are most important (plants, humans or animals), almost none of the children said humans were most important. Answers varied between humans being equally important or being less important than plants and animals.

L: And why animals and humans?

2i: Look, they also have a heart, they live as well.

4i: Yes, they live as well!

1i: They both have hands. (FGD 1, Natureluur)

In the example above, humans are seen as equally important as animals, because they are both living things. This argument was given by most of the children. There were however also two children who said animals are important for the food of humans, which points out that children can unconsciously see humans as more important than other creatures.

L: And animals? Are they important?

4n: For food.

L: Food for who?

4n: For people. A nice rabbit, omnomnomnom. (Waves his hand next to his cheek). (FGD 3, Woeste Westen).

The next examples show that many children see plants and animals as being more important than humans, because humans are seen as being bad and destructive for nature. This was also the reason for some of the children to not see humans as part of nature. In this case sense of responsibility can be seen again as well, because these children are aware of the bad influence humans can have on nature. This responsibility has a holistic character, since it is focusing on nature in general.

L: (...) Who do you think are most important? Plants, humans or animals?

3n: All, all!

1n: Animals and plants. Humans destroy everything.

2n: Yes, nature can renew itself

1n: And humans only produce factories, which is bad for nature.

5n: Except for when they are like us (...) we do not make factories...

4n: Yes, some people do! We are also cooking on gas!

2n: Some people want to earn more money! It's not about money! It's not all about money! (FGD 4, Woeste Westen).

Many children referred to plants being most important because plants are seen as creatures which are not respected enough. In this case, also the dimension empathy for creatures can be seen, which shows the relationship between empathy for creatures and sense of oneness.

1n: (...) I actually think plants, because...how to say... because plants are often just seen as normal things and when you step on it they don't care...and when you step on an animal they think it is sad. (...)

2n: I think, I think that plants actually have the same life. They can't even move so you have to have a bit of respect for plants. (FGD 5, Natureluur).

Plants are also considered important because of their production of oxygen, which is needed for animals and humans to live. In this case it is not about the lives of plants themselves, but about the importance of plants for the benefit of other creatures, which might indicate that these children value humans (and sometimes animals as well) unconsciously as more important. This understanding of the role of different creatures in nature seems to be of big importance for the dimension sense of oneness of children.

1n: I think plants, because they give us oxygen.

L: And why is that important?

1n: Because otherwise you cannot live... oxygen makes everything work.

2n (Talking through): Trees have leaves and other things

1n: So they have to be able to grow. (FGD 8, Natureluur).

L: Who are the most important: plants, humans or animals?

2n: Animals and plants.

1n: No, I think humans and plants. Because trees and leaves...give oxygen and without oxygen humans cannot live.. (...) without plants humans cannot live.

2n: But that's also the case with animals. Without plants, animals also cannot live.

1n: Yes! So plants are actually the most important! When there would not be plants, there would not be life. (FGD 6, Woeste Westen).

5.4.3 Learning about humans' place nature

The examples above illustrate the role of adults and education in sense of oneness, since children probably learned in school about plants providing oxygen for other creatures. This was mentioned mostly by children of an older age, since younger children probably have not learned this yet. The role of adults in sense of oneness was already mentioned in the previous paragraph about empathy for creatures, which was illustrated by employees of the playgrounds teaching and showing children that they are equal to other creatures, for example trees.

Furthermore, knowledge about for example humans' originating from primates makes children think about their place as a human in nature. Parents and teachers can play therefore an important role in children's sense of oneness with nature. This was illustrated by the following example.

L: And how important is nature for you?

3n: Well quite important... but that is because mom and dad also think it is very important... and....I think it is also important because when there is no nature, we do not have oxygen (...) because the trees are making oxygen, through the air. (FGD 2, Natureluur).

Sense of oneness has mainly a cognitive component. This cognitive component is about knowledge children can have about humans' place in nature and the importance of nature for humans. This was for example illustrated by children talking about the importance of trees, because of the oxygen they produce used by humans and animals. Furthermore, many children were talking about humans being bad and destructive for nature, which demonstrates that children know the influence of their positive and negative actions on nature.

Sense of oneness can be developed by nature experiences in which knowledge is gained (e.g. seeing similarities between animals and themselves or learning about functions of nature).

5.5 Sense of responsibility

Sense of responsibility is characterized by children having the understanding of their positive or negative actions towards nature. During data analysis it became clear that sense of responsibility seems to be present in different forms. These forms exist within the three previously described dimension of nature connection instead of sense of responsibility being a separate dimension. The different forms of responsibility will be described below.

5.5.1 Anthropocentric responsibility

The responsibility of children can have an anthropocentric character, focusing on the wellbeing of people. This would mean that children would only feel responsible for nature, when this nature is functional for people, for example because children have the ability to play in it.

When the question was asked what children did not like about natural playgrounds, some of the children referred to trash which demonstrates a certain form of responsibility. This responsibility seems to have an anthropocentric character, mainly based on children's own benefit, because it is about the playgrounds children enjoy visiting. Trash seems to make the natural playgrounds less enjoyable and some children referred to it as 'dirty'.

2n: Pollution... just like that thing over there (points to an empty can on the ground).

1n: Yes that is a little bit a shame for nature. (FGD 8, Natureluur).

1n: Before, there were many plastic bags and bottles laying around here, but now it is a lot more clean.

L: And what do you think about that?

1n: I think that's good. (FGD 4, Woeste Westen).

When the children were asked what they would do if they would see trash in the natural playground, many said they would take action like throwing it away. One of the children of the club of Het Woeste

Westen, mentioned that he had cleaned the playground once. During the observations, however, children picking up trash were not seen, even though in both playgrounds some trash was present. On the other hand, polluting behavior was seen once during the observations.

Two immigrant boys are sitting on a tree trunk, eating crisps and drinking from a small pack. One of them throws his empty bag on the ground. His supervisor (f) says that he has to pick up his empty bag. He picks it up and brings it to his supervisor. After a few minutes, he throws his drink pack on the ground as well. (...) One of the supervisors asks him: "Do you like this park?" He answers: "No, when are we leaving?" The supervisor replies: "In twenty minutes." The boy says: "Yay, that is almost". (Observation 23 & 24, Natureluur).

In this example, a child who does not like the playground, is irresponsible towards nature. Even though this disrespectful behavior, combined with aversion to nature was only seen once, it might refer to a relationship between the enjoyment of nature and sense of responsibility. Sense of responsibility for the playgrounds might be more present amongst children when enjoyment of nature is present.

5.3.2 Biocentric responsibility

Responsibility can have a biocentric character, focusing on the wellbeing of individual non-human creatures, instead of the child itself. Children seem to feel responsible for creatures they have empathy for. Some children said for example that they would try to help or call the animal ambulance if they would see a sick or wounded animal.

L: (...) and what would you do if you would see a sick or wounded animal?

1n: I would go here... (points towards the little house on the playground) and uhm... I would tell them that there was a sick animal... and when I was with someone else I would let stay one of us with the animal while the other one is going for help.

L: And why should stay one of you with the animal?

1n: Uhm... to keep the animal quiet... and that it won't get away... when it has a sprained leg or something... it should not try to walk, because then it gets worse. (FGD 6, Woeste Westen).

Biocentric responsibility was also seen after showing children a picture of trash. Many children said they did not like this, because of animals and plants dying because of trash, in which empathy for creatures can be seen as well. One of the children even said he would call the police, which shows that children can see throwing trash in nature as a crime, since the trash is seen as bad for animals.

3n: Well, because there is a lot of trash and that...that makes nature dirty. And that is not good at all for nature and it will kill trees. (FGD 2, Natureluur).

1n: Yes it is pollution and when a bird comes there.. he will think it is nice food and then he will eat it and then he might choke.

L: And what do you think of that?

1n: Well then he will die... and many animals might die like that and they are quite important. (FGD 6, Woeste Westen).

2i: Call the police!

3i (Talking through): (...) In the trash bin! I am going to throw it in the trash bin!

2i: If I would have seen who did it, I would call the police. Because that is really... look, animals might think

that it's food and they swallow it, which kills them.

1i (Talking through): Yes, little ducks. (FGD 7, Woeste Westen).

5.4.4 Ecocentric responsibility

Responsibility can also have an ecocentric character, which can be linked to sense of oneness, because a sense of respect towards nature and the environment as a whole can be seen. Ecocentric responsibility is often about environmental problems, like pollution caused by humans. As showed in the paragraphs about sense of oneness, environmental problems were often mentioned when children explained why humans are not part of nature. This was mostly amongst the older children, which indicates that children seem to realize at a certain age that humans (negative) actions can influence nature.

The understanding of humans' influence on nature sometimes seems to make children want to show environmental friendly behavior, focusing on nature in total and not on nature nearby or on natural creatures only.

(...) He (the father) tells me that he made a walk with his native son a while ago and that his son picked up a lot of plastic because of the 'plastic soup' he had learned about in school. He says that he thinks school can play an important role in nature and environmental awareness of children. (Fieldnotes 18th November, Woeste Westen).

L: (...) And is there something you could do to help nature?

3n: Yes, taking less showers (...) using less electricity (...) it's in my 'nieuwsbegrip', a schoolwork. (FGD 3, Woeste Westen).

The examples above show that responsibility is not only about pollution in the form of trash, but also on responsibility for energy use, like water and electricity.

Ecocentric responsibility was also seen in helping nature by planting plants. Sometimes children came up with this by themselves, but often they were triggered by showing them a picture in which a tree is planted. Many children said planting trees is good, because it might help nature and humans because of the oxygen trees produce. None of the children had experience with planting trees, but some had experience with planting other things like vegetables at home or during the project 'school gardens' at their school. Furthermore, in both playgrounds, some children referred to the activity of planting flower bulbs, which they had done during the clubs.

5.6 Nature connection and its influential factors

In this paragraph an analysis on nature connection will be given. First will be described how the different dimensions of connection to nature relate to each other. After that, the influential factors on nature connection will be elaborated. The influential factors studied in this research are ethnic background (non-Western immigrant versus native Dutch), the different playgrounds and learning and age.

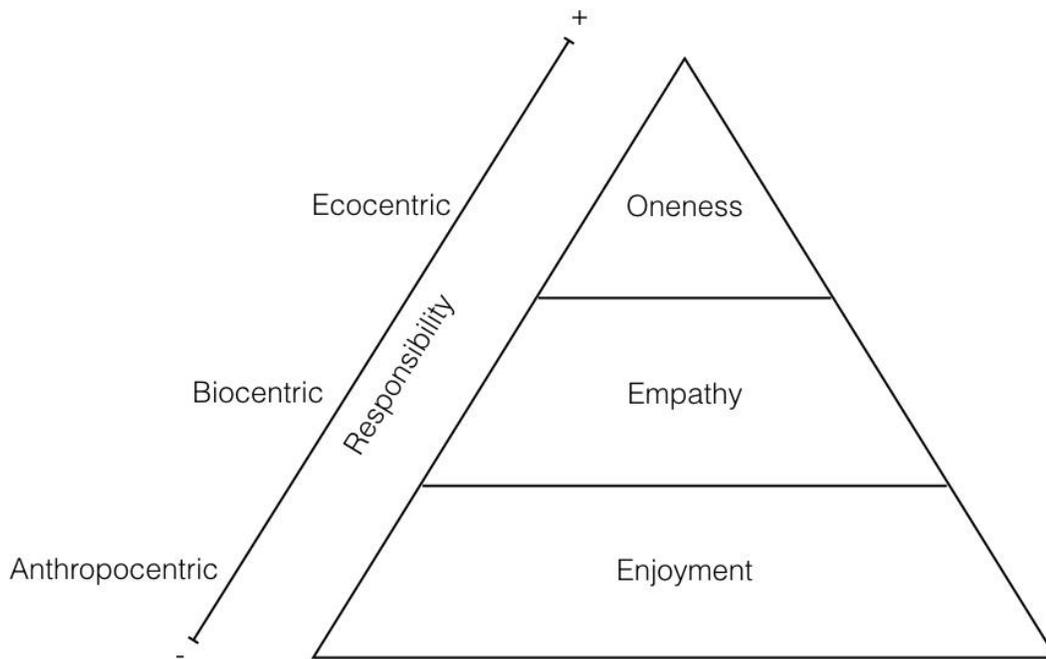


Figure 5.1 Nature connection

Figure 5.1 illustrates that nature connection consists of three dimensions. The dimensions of nature connection are: enjoyment of nature, empathy for creatures and sense of oneness. Sense of responsibility is rather a result of nature connection than that it is part of nature connection. Also, the way responsibility is characterized might change with the dimension of nature connection, which will be further elaborated in paragraph 5.6.2.

5.6.1 Three steps of nature connection

The figure demonstrates that the different dimensions are dependent on each other, rather than separate dimensions that could be present amongst children independently of each other. The different dimensions could be seen as different steps of nature connection. Therefore I will replace the concept 'dimensions' by 'steps' of nature connection, in which the first step seems to be necessary to develop the second step and the second step seems to be necessary to develop the third step of nature connection. This means that enjoyment of nature seems to form the basis of nature connection.

Enjoyment of nature can be realized in natural playgrounds, since children referred to natural playgrounds as being 'fun'. This is mainly because of the variety in nature experiences, the self-determination and the feelings of happiness they have in natural playgrounds.

Empathy for creatures is the second step of nature connection. Empathy for creatures and the acknowledging of vulnerability of creatures is species-dependent. The figure demonstrates that before children develop empathy for creatures they first have to enjoy nature. This means on the other hand

that when children do not enjoy nature, they will not feel empathy for nature's creatures. This was demonstrated in the example of the wasp and the worm. Children do not like these creatures and therefore they mostly do not have empathy for them. However, when they do like creatures (enjoyment) they have empathy towards them. This can be seen in the example of children referring to trees feeling that they climb in it. An important influential factor of empathy for creatures is learning, in which children get the understanding of animals and plants being living creatures with feelings.

For the third step of nature connection, sense of oneness, the first two steps of nature connection seem to be necessary. This means that children should have to enjoy nature and feel empathy towards natural creatures, before they can have sense of oneness. Sense of oneness is mainly about humans being part of nature and being equal to other creatures. This shows the role of empathy for creatures, which makes children aware of the fact that creatures also have feelings just like humans. Next to that, sense of oneness amongst children is influenced by learning about humans' origin in nature and the importance of non-human creatures. For example, trees giving oxygen and animals and plants giving food and materials.

5.6.2 Responsibility for nature

Another important element in figure 5.1 is the fact that sense of responsibility can be increased by the different steps of nature connection. The line of responsibility shows the 'amount' of responsibility and the form of this responsibility.

When children would have a nature connection only focusing on enjoyment, the responsibility would be mainly anthropocentric. This would mean that a child would only show supportive behavior towards nature when this would contribute to its' own benefit. This was demonstrated by the children telling that they would clean trash in the natural playgrounds.

When a child would have a nature connection based on the first two steps, enjoyment of nature and empathy for creatures, the responsibility of children would have a more biocentric character. Not only focusing on a child's own benefit, but also on the benefit of creatures they have empathy for. They might for example show supportive and responsible behavior towards animals and plants, which they like (enjoyment) and for which they have empathy. This was demonstrated by the children telling that they would call the animal ambulance when they would see a sick or hurt animal.

When children would have a nature connection, based on all three steps of nature connection, including sense of oneness, their sense of responsibility would have an ecocentric character. This means that children would have responsibility for nature in general and focus on the benefit of nature. They would not only show nature supportive behavior that benefits themselves or creatures they have empathy for, but also show more nature and environmental friendly behavior. This is because of the understanding that this might contribute to the wellbeing of nature in general. This was demonstrated by children talking about the bad influence of humans on nature and that they could for example use less energy and water to help nature.

5.6.3 Influential factors in nature connection

Nature connection seems to be varying amongst the different children in the natural playgrounds, because every child reacted different to the questions. There were however also many similarities between children. When they spoke about the different steps of nature connection and during data analysis I tried to find out which external factors influence nature connection amongst children. I focused on differences between immigrant and native children, children in Het Woeste Westen and De Natureluur, involvement in clubs, learning and age.

Non-Western immigrant versus Native Dutch children

The most important factor I focused on is whether there are differences in nature connection between non-Western and native Dutch children. Of the 25 children involved in the focus group discussions 7 had a non-Western immigrant background and 18 children had a native Dutch background. There seem to be no big differences in nature connection between these groups. In both groups, some children had more nature connection than others, but this difference seems to occur within both groups and not between the groups. The fact that there are no differences found between the two groups might be linked to the fact that the parents of the non-Western immigrant children in natural playgrounds were very environmental aware (observations 28th December, Woeste Westen). This might indicate that the non-Western immigrant children in this research are not a good representation of the average non-Western immigrant child.

Het Woeste Westen versus De Natureluur and the involvement in clubs

In both playgrounds, four focus group discussions were held, of which two during clubs. When data obtained amongst children in Het Woeste Westen is compared with data obtained amongst children in De Natureluur, there seem to be no big differences between these groups. This is the same for children who are involved in clubs or not. In the clubs of both playgrounds, nature connection seems not to be depending on whether they are involved in the clubs or not.

Learning and age

An important factor influencing nature connection amongst children is learning. As described before, learning plays a role in empathy for creatures and sense of oneness. This can be stimulated by adults who teach children about the role of nature and natural creatures. This was demonstrated by the children who referred to the importance of their parents opinions. Also other adults, for example school teachers and employees of the natural playgrounds, can explain children about the importance of nature and its creatures. Learning is related to the age of children, because older children often know more about nature and its functions than younger children. There were some differences in answers between younger and older children. Older children referred for example more to environmental problems and the production of oxygen by trees.

6. Nature experiences in relation to nature connection

In this chapter the relation between nature experiences and nature connection will be analyzed, based on data of both the observations and the focus group discussions. The results of the previous two chapters are combined in this chapter. In the first paragraph the influence of nature experiences in nature connection is described, followed by the second paragraph about the role of natural playgrounds.

6.1 The influence of nature experiences in nature connection

The different nature experiences children have in natural playgrounds could influence the different steps of nature connection. Figure 6.1 demonstrates which nature experiences might lead to which steps of nature connection. The experience aesthetic nature is not included in the figure, because this experience was barely observed during the research. Also the non-natural experience is not included, because nature does not play a dominant role in this experience and therefore it does not facilitate nature connection. Non-natural experiences do however seem to play an indirect role, since children seem to find the non-natural experience (e.g. using the cable-way) attractive. Therefore children might be attracted by playgrounds with non-natural elements, which facilitates them to have other nature experiences that do influence their nature connection.

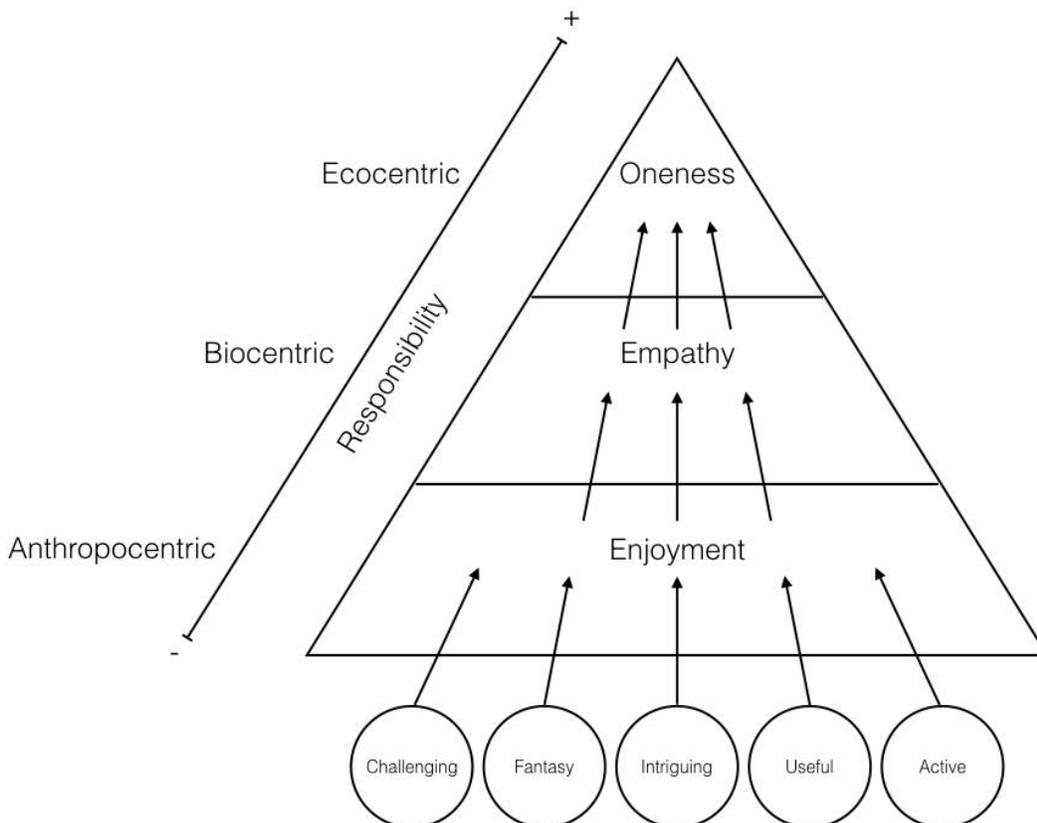


Figure 6.1 The influence of nature experiences in nature connection

6.1.1 Nature experiences and enjoyment of nature

Figure 6.1 illustrates that challenging nature, fantasy in nature, intriguing nature, useful nature and active nature could facilitate the first step of nature connection, which is enjoyment of nature. Enjoyment of nature is about pleasure and fun children have in natural playgrounds. The fact that all experiences facilitate enjoyment of nature is because enjoyment of nature seems to be evoked by real nature experiences. These experiences lead to positive feelings amongst children, like happiness and freedom. This demonstrates the affective component of enjoyment of nature. An important element of enjoyment of nature is the variety in experiences. It is expected that enjoyment of nature would be more present when there is more variety in experiences. On the other hand, when children would only have one experience, for example active nature, enjoyment would probably be less present. This means that the presence of many different environmental features in natural playgrounds, affording children to have different nature experience, is important in enjoyment of nature.

Another important element of enjoyment of nature is self-determination. Nature experiences during spontaneous behavior therefore seem to facilitate enjoyment of nature more than experiences during clubs, because during these clubs adults decide what children are doing.

The experience fear and aversion to nature is the opposite of enjoyment of nature and therefore does not facilitate enjoyment of nature. Fear and aversion to nature seems to be child-dependent, because some children enjoyed natural aspects which other children had an aversion to. Some children for example laughed about falling in mud, whilst others cried about it.

As illustrated in figure 6.1, enjoyment of nature might lead to an anthropocentric sense of responsibility. This means that children might show responsible behavior towards nature for their own wellbeing (e.g. nature close-by or natural playgrounds).

6.1.2 Nature experiences and empathy for creatures

Figure 6.1 illustrates that the second step of nature connection, empathy for creatures, is mainly facilitated by the nature experiences intriguing nature, useful nature and fantasy in nature. Empathy for creatures has a strong cognitive component, because it is about understanding the vulnerability and feelings of creatures. Empathy for creatures also has an affective component, which is about feelings of children towards feelings of creatures. My results show that intriguing nature can facilitate empathy for creatures, because this experience is mainly focusing on gaining knowledge about creatures and their ways of living. Learning was found to be an important element of empathy for creatures, in which often adults are involved teaching children about creatures and their vulnerability.

Useful nature can facilitate empathy for creatures as well, especially in combination with intriguing nature. In that case children might get the understanding that natural elements they use are (part of) natural creatures for which they might have empathy. Useful nature in natural playgrounds was often focusing on plants (and fungi) instead of animals. For example when children cut off branches from trees to make spears or gathered mushrooms to make soup. The use of non-living features, like rocks and sand probably does not facilitate empathy for creatures.

Fantasy in nature also can evoke empathy for creatures, since children were often fantasizing about animals living in the playgrounds. Especially when children gave creatures anthropomorphic characters and fantasized about creatures talking and laughing. Children referred for example to trees noticing that

people cut off branches. This indicates that these children have the understanding of creatures having feelings.

Chapter 4 about nature experiences shows that intriguing nature, useful nature and fantasy in nature, were dominant experiences during activities of the clubs. Therefore, clubs seem to contribute to empathy for creatures more than spontaneous behavior amongst children does.

As illustrated in figure 6.1, empathy for creatures might lead to a biocentric sense of responsibility. This means that children might show responsible behavior for the wellbeing of individual creatures.

6.1.3 Nature experiences and sense of oneness

Figure 6.1 illustrates that the third step of nature connection, sense of oneness, can be facilitated by the same nature experiences that evoke empathy for creatures. These experiences are intriguing nature, useful nature and fantasy in nature. Difference is however that the focus of these experiences is about nature in general instead of natural creatures. Sense of oneness is about children's understanding of their place in nature and the importance of the natural world. Learning was found to be an important element in sense of oneness, in which often adults are involved who teach children about humans place in nature. This demonstrates the large cognitive component of sense of oneness. Intriguing nature can facilitate sense of oneness, because children learn about the importance of nature. For example, learning about functions of different natural elements, like plants, animals, rocks and sand. Children might also be intrigued by the similarities between themselves (humans) and creatures, which might make children understand that they are part of nature.

Useful nature can evoke sense of oneness as well, especially in combination with intriguing nature. In this experience children see the importance of nature, because of the dependency of humans on natural elements and creatures. Children might learn about this dependency by their experiences, for example by making food of products gathered in nature and using natural elements to build things. Fantasy in nature can stimulate sense of oneness when children fantasize about being prehistoric men, which might give children a more vivid understanding of human origin and place in nature. This was often seen by children who had made a spear of a branch, which demonstrates that fantasy in nature could be present in combination with other experiences (in this case useful nature).

Chapter 4 shows that intriguing nature, useful nature and fantasy in nature, were more dominant during activities of clubs than during spontaneous behavior. Therefore, clubs seem to facilitate sense of oneness more than spontaneous behavior.

Figure 6.1 demonstrates that sense of oneness might stimulate an ecocentric responsibility, which means that they might show responsible behavior to contribute to nature in general.

6.2 The role of playgrounds

Nature experiences in natural playgrounds can play a role in nature connection amongst city children, since these children have the opportunity to have different nature experiences in these playgrounds without visiting nature areas outside cities.

For some children nature experiences might only lead to the first step, which is enjoyment of nature, for example because they are not intrigued by nature and natural creatures, but only experience for example challenging nature and active nature in the natural playgrounds.

For other children however, intriguing nature, useful nature and fantasy in nature might facilitate the other steps of nature connection, empathy for creatures and sense of oneness. Natural playgrounds can play a role in these steps of nature connection mainly by the organized activities and clubs, because these activities often focus on intriguing nature and useful nature. This does however not mean that spontaneous behavior, because it leads to other experiences, is not important for the second and third step of nature connection. Variation in nature experiences is an important element of enjoyment of nature and this is on the basis of nature connection. This means that when children would only have experiences of intriguing nature and useful nature in natural playgrounds, they would probably enjoy this less than when these experiences are done in combination with other experiences like challenging nature and active nature.

Therefore a combination of spontaneous behavior and organized activities (in clubs) led by adults, seems to facilitate the highest nature connection.

7. Conclusion and discussion

In this chapter the conclusion of this research will be given, followed by a discussion of the results. First the conclusion is given, based on the answers to the different research questions. After that, the results of this research will be discussed with other scientific literature to connect it to wider scientific debates about nature experiences and nature connection. In the third paragraph the usefulness of theories and methods of this research will be described. After that, recommendations for further research will be given, followed by practical recommendations for urban natural playgrounds.

7.1 Main conclusions

In this paragraph the main question of this research will be answered. First a summary of the answers on the sub research questions answered in the previous chapters will be given.

Chapter 4 answered the question: *What kind of nature experiences do children have in natural playgrounds and which factors lead to these experiences?* Practically all different nature experiences, presented in the theoretical framework, were observed amongst children in natural playgrounds. Ranking them from most to least observed: useful nature, challenging nature, active nature, intriguing nature, fear and aversion to nature, fantasy in nature and aesthetic nature. Furthermore, children had non-natural experiences when they made use of the non-natural play objects in the natural playgrounds.

The experiences were realized, because of different influential factors. The most important factor is whether children show spontaneous behavior or whether they are involved in clubs. The main experiences observed during spontaneous behavior were useful nature, challenging nature and active nature, whereas the main experiences during clubs were useful nature, intriguing nature and fantasy in nature.

Another dominant factor influencing the nature experiences of children in natural playgrounds is adults, who accompany children in the playgrounds and who often encourage or discourage children to show certain behavior.

A less important factor seems to be whether children are visiting Het Woeste Westen or De Natureluur. Nature experiences amongst children in both playgrounds were quite equal. This can be explained by similarities in specific environmental features in the playgrounds (e.g. water, hills and a raft). These environmental features afford children to show certain behavior and therefore have certain nature experiences. Some differences between the playgrounds were however observed. The environmental features in Het Woeste Westen (e.g. open fields) seem to afford active behavior a bit more, whereas the environmental features in De Natureluur (e.g. beams in water) seem to trigger challenging behavior a bit more.

Ethnicity of children (non-Western immigrant or native Dutch) does not seem to play a role in their nature experiences, because the distribution of nature experiences between these groups was almost identical.

Chapter 5 gives an answer to the question: *What kind of nature connection do children in natural playgrounds have and which factors lead to this connection?* Nature connection seems to consist of three different steps, namely enjoyment of nature, empathy for creatures and sense of oneness. The first step seems to be necessary to develop the second step and the second step seems to be necessary to

develop the third step. Enjoyment of nature mainly consists of an affective component, meaning that it is about feelings children have in nature. Empathy for creatures seems to consist both cognitive and affective components, with focus on cognitive. This means that it is mainly focusing on knowledge about feelings of creatures. It is however also about feelings towards the feelings of creatures. Sense of oneness mainly consists of a cognitive component. It is about knowledge on humans' place in nature and the dependency of humans on nature. The different steps of nature connection might lead to a different amount and form of responsibility amongst children, namely anthropocentric, biocentric or ecocentric responsibility. Anthropocentric responsibility is focusing on the wellbeing of humans. Biocentric responsibility is focusing on the wellbeing of individual (non-human) creatures. Ecocentric responsibility is focusing on the wellbeing of nature in general.

Nature connection could be influenced by different factors. The most important factor seems to be learning, where children gain knowledge about nature and natural creatures, often with the help of parents and other adults. This can be linked to age of children, because older children often have more knowledge about nature, because in general they have learned more than younger children. A factor that seems to influence nature connection less is ethnicity (non-Western immigrant or native Dutch). There were no differences discovered in nature connection between non-Western immigrant and native Dutch children. Also, the different playgrounds and the involvement of clubs did not seem to influence nature connection.

Nature experiences also seem to play an important role in nature connection. This brings us to the answer of the main question of this research. *How do nature experiences in urban natural playgrounds relate to nature connection amongst children?* Different nature experiences in natural playgrounds can facilitate the different steps of nature connection. Useful nature, challenging nature, active nature, intriguing nature and fantasy in nature can facilitate enjoyment of nature. Self-determination was an important element in enjoyment of nature and therefore spontaneous behavior (independent playing) seems to be the most beneficial for enjoyment of nature. The nature experiences useful nature, intriguing nature and fantasy in nature can facilitate both empathy for creatures and sense of oneness as well. During clubs these experiences were most dominant and therefore these clubs seem to be beneficial for the development of empathy for creatures and sense of oneness. Since the steps of nature connection seem to be dependent on each other, a combination of spontaneous behavior (independent playing) and clubs in urban natural playgrounds seems to be the best way to develop a strong nature connection amongst children.

7.2 Discussion results

In this research was studied how nature experiences in natural playgrounds relate to nature connection amongst children. In this paragraph the results of this research will be discussed in comparison with other available literature about nature experiences, nature connection and natural playgrounds.

7.2.1 Nature experiences

This research studied what kind of nature experiences children have in natural playgrounds and which factors lead to these experiences. Many different experiences were observed.

When these experiences are compared with other literature about nature experiences (Margadant-van Arcken (1990) and Van der Waal et al. (2008), there can be seen some differences. The biggest difference with the experiences found in my research is that in both these other studies, there seems to be no attention for the fact that children can behave actively in nature without experiencing challenges (e.g. running and jumping). This active nature was however often observed during my research and is therefore seen as an important nature experience amongst children.

Next to that, Margadant-van Arcken (1990) and Van der Waal et al. (2008) did not observe fantasy in nature as a separate experience, but probably included this in the sub experience of useful nature, nature to play. During this research however, fantasy in nature was observed as a separate nature experience, because nature to play could contain all nature experiences and therefore seems to be of a different order. Central themes of fantasy in nature amongst children in natural playgrounds were animals and prehistoric men. These fantasies are not described by Margadant-van Arcken (1990) and Van der Waal et al. (2008).

Variable nature experiences during different situations

Another finding of this research is that the order of importance of nature experiences can be variable during different situations, caused by influential factors. During spontaneous behavior for example other experiences were dominant than during clubs. Margadant van Arcken (1990) describes however a 'fixed' order of importance of nature experiences amongst children in nature, meaning that the most important experience is observed the most amongst children. Van der Waal et al. (2008) calls this the 'nature value hierarchy', to describe the order of nature experiences. They state that this hierarchy can change per situation, which is in line with my results.

Influential factors on nature experiences

During my research I tried to find out which influential factors play a role in the nature experiences amongst children. The biggest influential factor seems to be whether children are involved in clubs or show spontaneous behavior. As described above, the order of nature experiences during clubs differed from the order of nature experiences during spontaneous behavior. Margadant van-Arcken (1990) and Van der Waal et al. (2008) did not make a distinction between spontaneous behavior and behavior during organized activities, probably because their studies focused on nature experiences during educational programs, which means that all experiences were during 'organized' activities.

Another important factor is the influence of supervising adults, who encourage or discourage children to show certain behavior in nature. This was the case during both spontaneous behavior and clubs in the natural playgrounds. During clubs this influence is necessary, since the activities are organized by adults. During the clubs adults teach children for example things about nature, which leads to intriguing nature. During spontaneous behavior, the influence of adults is not necessary and it seems to be that nature experiences would be different when adults would not interrupt children during spontaneous behavior. The influence of adults on the behavior of children was already acknowledged by Giddings and Yarwood (2005) who state that adults, often parents often decide what children should or not should do. Also Smith and Barker (2001) state that parents nowadays often want to accompany their children, influencing the interaction of children with nature. However, even though the children in the natural playgrounds are often accompanied by adults, some of them stated during the focus group discussions

that they can decide what they want to do their selves in the natural playgrounds. This self-decision is an important goal of especially Het Woeste Westen. The owner of this playground, Hup (2015) wrote an article about parents being overprotective and the importance of independent free playing of children. He argues that as soon as there is an adult involved in children's behavior, children do not really play anymore. In the playground he created the opportunity for adults to stay at the entrance of Het Woeste Westen, while the children go inside the field and 'disappear'.

7.2.2 Nature connection

Different steps of nature connection

Nature connection seems to consist of three different steps, namely enjoyment of nature, empathy for creatures and sense of oneness. These different steps seem to be depending on each other, meaning that the first step is necessary to develop the second step and the second step is necessary to develop the third step (figure 5.1). These different steps might lead to a different sense of responsibility.

These result differs from nature connection described by Cheng and Monroe (2012), stating that nature connection consists of four dimensions, namely enjoyment of nature, empathy for creatures, sense of oneness and sense of responsibility. Even though these dimensions are the same as the steps discovered in this research, Cheng and Monroe (2012) do not write about the sequence in which these dimensions occur. It seems that the dimensions they describe could be independent of each other, whereas in this research was found out that they are depending on each other (steps).

Results of this research showed furthermore that sense of responsibility can be present within the three steps of nature connection instead of being a different step. This sense of responsibility for nature seems to have different forms, within the steps of nature connection: anthropocentric in enjoyment of nature (wellbeing of humans), biocentric in empathy for creatures (wellbeing of creatures) or ecocentric in sense of oneness (wellbeing of nature in general). This can be linked to the theory of Buijs (2009) who studied different images of nature amongst people in the Netherlands. He argues that people can have different images of nature, which can be partly explained by their different views (anthropocentric, biocentric and ecocentric) on nature.

The cognitive and affective components of nature connection

Cheng and Monroe (2012) write about nature connection being children's affective attitude towards nature. An important finding of this research however, is that nature connection consists of both the affective component and the cognitive component. This means that nature connection is not only about feelings towards nature, but also about knowledge on nature. The presence of the components differs per step of connection to nature. Enjoyment of nature, based on feelings children have towards nature, has an affective component. Empathy for creatures consists on both components, with the focus on the cognitive component. Niezink (2008) also acknowledged that empathy has a strong cognitive component. Sense of oneness consists mainly a cognitive component, based on knowledge about humans' place in nature.

Influential factors

Nature connection can be influenced by different factors. In this research, the most important factor seems to be the learning element, which points out the importance of knowledge (cognitive) about

nature in nature connection. In this learning, often parents and other adults are involved. This can be linked to the fact that adults can be role models for children, who can demonstrate positive attitudes to children to influence their behavior in general (Linden, 2007) but also towards nature (Kals, Schumacher & Montada, 1999). Also age of children seemed to play a role in nature connection amongst children in natural playgrounds, because in general they have more knowledge (learning experience) about nature.

7.2.3 Non-Western immigrant versus native Dutch children

One of the factors that has been studied during this research was the influence of ethnicity of children (non-Western immigrant or native Dutch). During this research in natural playgrounds however, no differences were found between non-Western immigrant children and native Dutch children in their nature experiences as well as in their nature connection.

Both Margadant-van Arcken (1990) and Van der Waal et al. (2008) write about differences in nature experiences amongst non-Western immigrant children and native Dutch children. According to them, non-Western immigrant children seem to focus more on useful nature, whereas native Dutch children focus more on challenging nature. They also found out that non-Western immigrant children have more fears and aversions towards nature than native Dutch children. The absence of differences between the ethnic groups in this research (non-Western immigrant and native Dutch) can be explained by the fact that many parents (of both ethnic backgrounds), brought their children to the natural playgrounds, because they thought nature experiences were important for their children. Adults seem to play an important indirect role in the nature experience of children Their attitude towards nature seems to determine if they bring children to the natural playgrounds to have nature experiences or if they do not bring their children to the playgrounds at all. The role of parents in taking or not taking children to nature areas was already acknowledged by other scientists (e.g. Louv, 2005; Chawla, 2006). The studies of Margadant-van Arcken (1990) and Van der Waal et al. (2008) took place in an educational setting, meaning that parents did not have influence on whether or not and which nature experiences children had. During this research however, mainly children with nature supportive parents were studied.

The fact that children had nature supportive parents also might explain why there were no differences in nature connection between non-Western immigrant and native Dutch children. Both groups of children seemed to be quite nature connected, probably because of the nature supportive attitude of their parents. Also Kals et al. (1999) state that young children's behavior and attitudes towards nature are influenced by family members, transmitting values about nature.

7.2.4 Nature experiences in relation to nature connection

This research shows that different nature experiences can facilitate the different steps of nature connection (figure 6.1). Challenging nature, active nature, useful nature, intriguing nature and fantasy in nature can facilitate enjoyment of nature. Furthermore, useful nature, intriguing nature and fantasy in nature can facilitate both empathy for creatures and sense of oneness.

This result demonstrates that nature experiences (in natural playgrounds) do not only contribute to health (Wells & Evans, 2003), social skills (Kellert, 2002) and motoric skills (Fjortoft, 2004), but also to nature connection amongst children. This nature connection, evoked by nature experiences in natural

playgrounds, might lead to more nature and environmental friendly behavior during adulthood (Chawla, 2007). This might therefore play an important role in nature support in the Dutch society in the nearby future, which is a goal of the Dutch government (Ministerie van Economische zaken, 2014).

7.3 Discussion of theories and methods

In this paragraph, the different theories and methods used in the research will be discussed. Both strengths and weaknesses of theories and methods will be mentioned.

7.3.1 Usefulness theories

The theories about nature experiences, mainly from Margadant-van Arcken (1990) and Van der Waal et al. (2008) appeared to be very useful during this research. Most of the nature experiences (in their reports called 'nature values') they described were used to categorize behavior of children in natural playgrounds. Some of the experiences seemed to be however not applicable in this research, and were therefore replaced by other experiences.

The theory about affordances (Gibson 1979; Heft, 1988; Lerstrup, 2016) was useful, because it made it possible to link nature experiences amongst children to specific characteristics (i.e. environmental features) of the natural playgrounds. In the research the classes of environmental features of Lerstrup (2016) were used, because she also focused about features in the natural environment, whereas Gibson (1979) and Heft (1988) focused on the environment in general. Behavior of children in the two different playgrounds could be explained with the concept of affordances, because there were some differences in environmental features between the two playgrounds.

The theory about nature connection, mainly from Cheng and Monroe (2012) seemed to be a bit more difficult to use during research in the natural playgrounds. The dimensions of nature connection were useful, but they did not elaborate and substantiate these concepts. Therefore I used other literature to describe the four dimensions of nature connection. Furthermore, Cheng and Monroe (2012) used a quantitative approach in their research, while I used a qualitative approach. They used a survey with statements that could be rated by children (on a scale from 1 to 5). I had to transform these statements of their survey into open questions, which could be used in the focus group discussions.

7.3.2 Methods

The qualitative approach of this research seems to be a good method to get an in-depth understanding of nature experiences and nature connection in urban natural playgrounds. The case-study in Amsterdam seemed to be suitable to study nature experiences and nature connection amongst children, but the specific characteristics of the playgrounds make generalizability difficult. The triangulation, which is a mixed method approach, increased the reliability of the results, because the data obtained during observations was compared with the data obtained during the focus group discussions and vice versa. There were however some weaknesses during data collection that might have influenced the outcomes of the results.

Timespan of research

Because of the short time span of the research, research was only done in the autumn and winter. This might have influenced the outcome of the research, especially during observations. During my visits to

the playgrounds, sometimes no children were present. This can be explained by the fact that it was often cold and rainy. Also it was starting to get dark early during the months of my research.

Next to that, behavior of children is expected to be different during autumn and winter than during spring and summer. Some environmental features might change over the seasons. During spring and summer the 'open' fields in Het Woeste Westen are for example covered with reed of about 1,5 meters high (Conversation owner Woeste Westen, 2015). This might lead to different behavior amongst children than when the reed has been mown (in autumn and winter). Also, during autumn and winter there are probably less (other) plants and animals present in the playground than during spring and summertime, which influences children's experiences with these creatures. This was acknowledged by Jong (2015) who studied play behavior amongst children in Het Woeste Westen. He found out that behavior was different during summer and winter, because of differences in flora and fauna. However, behavior of children in natural playgrounds is not always related to animals and plants. Therefore a lot of behavior of children in natural playgrounds during autumn and winter is expected to be similar during spring and summer.

Observations

The observations during both spontaneous behavior and during clubs gave me a good understanding of the nature experiences amongst children in natural playgrounds. The observations scheme, which was made in advance, was useful because behavior could be easily classified to the right nature experience.

During the observations I had two different roles, namely non-participant observer during spontaneous behavior of children and participant observer during clubs. These different observer roles, might have influenced my perception on the nature experiences, because during the participant observations I had nature experiences myself, whereas during non-participant observations I watched children having nature experiences. Also the differences in participation might have influenced the behavior of the children, even though this does not seem to be the case, since children seemed to be comfortable of my presence during both spontaneous behavior and during clubs.

During the different roles I obtained different forms of data. During the non-participant observations, I immediately wrote down the observations. During the participant observations, I only put some short notes in my telephone which I afterwards worked out to fieldnotes. During data analysis I used both forms of data in the same way, because I classified the observations (during spontaneous behavior) and fieldnotes (about clubs) with the observation scheme. Also, I used examples of both observations and fieldnotes to illustrate the results of this research.

Focus group discussions

The focus groups discussions gave me a good understanding of nature connection amongst children in natural playgrounds and the role of nature experiences in this. Because of the open character of the focus group discussions, children gave variable answers. The focus group discussions went quiet well, since the children seemed to be comfortable answering questions. However, during some conversations the discussions went a bit chaotic, because of the size of the discussion groups. Many children were talking at the same time. Halfway the research I therefore changed the maximum amount of children from five to two, which makes it rather a double interview than a focus group discussion. This made it more easy to keep control during the discussion and to listen to and react on the answers of children.

The fact that I changed the group sizes halfway the research might have influenced the results, because children were better able to explain their stories and they were less interrupted by other children.

The prepared questions and the pictures seemed to be useful to structure the focus group discussions and to introduce the topics. The pictures used to introduce sense of responsibility (picture of trash in nature and a planted tree) seemed to be however a bit too obviously 'wrong' or 'right' for nature. It would probably have been better to use different pictures for sense of responsibility or to not have used pictures at all.

Differences between non-Western immigrant and native Dutch children

One of the factors in this research was if there are differences in nature experiences and nature connection between non-Western immigrant and native Dutch children. There was, however, much more data obtained about native Dutch children than about non-Western immigrant children. This was the case, because during many visits in the natural playgrounds (especially in Het Woeste Westen), mainly native Dutch children were present. During the focus group discussions I randomly selected children to participate, not based on their ethnic background. Because of the higher presence of native Dutch children, more children with this ethnic background participated.

7.4 Further research

This research gives insight in the relation between nature experiences in natural playgrounds and nature connection amongst city children. Thereby this research contributes to nature support by providing a possible solution to the decreasing nature support amongst Dutch citizens. A longitudinal study is however needed to provide more insight in whether nature experiences in natural playgrounds (leading to nature connection) contribute to nature support in adulthood. A comparison could be made between people who did or did not visit playgrounds during childhood.

Another recommendation for further research is to get more insight in whether the three different steps of nature connection indeed are depending on each other and if they lead to the different forms of responsibility (anthropocentric, biocentric and ecocentric) amongst children. This research is only based on data derived from children in two natural playgrounds and therefore a causal relation cannot be indicated. More research (e.g. quantitative research) is needed to find out if this conclusion can be generalized. Next to that, an interesting factor would be if, on the other hand, these different forms of responsibility would lead to the different steps of nature connection. In other words, if children would be given for example the responsibility to take care of an animal or plant, would they develop empathy for this creature?

In this research mainly children were studied with nature supportive parents. However, it would also be interesting to find out how nature experiences in natural playgrounds amongst children with non-nature supportive parents relate to nature connection. This could for example be done during visits of schools to the natural playgrounds, because in this case parents do not influence whether children visit the natural playgrounds.

7.5 Recommendations

Nature experiences seem to evoke nature connection amongst children. In cities, natural playgrounds seem to be suitable for this, because children can have a large variety in nature experiences in these playgrounds, without leaving the city.

Spontaneous behavior seems to contribute especially to the first step of nature connection, enjoyment of nature, because of the self-determination of children. Behavior during clubs seems to contribute to the second and third step of nature connection, empathy for creatures and sense of oneness, because of the learning element during clubs. To develop nature connection based on all three steps, a combination of spontaneous behavior and clubs seems to be most efficient. A recommendation for clubs is to make use of non-natural products as less as possible, because the use of natural products seems to be more contributing to nature connection. Also, gathering of natural products by children themselves, instead of providing them in advance, seems to develop a better understanding of the origin and importance of natural elements. This understanding might increase sense of oneness amongst children. Next to that, during activities attention could be given to insects and invertebrates, since empathy for these creatures was low. Knowledge about these creatures might increase the empathy towards these creatures amongst children.

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Appendix A. Quantitative survey connection to nature

(Cheng & Monroe, 2012, pp. 41)

Enjoyment of nature

I like to hear different sounds in nature

I like to see wild flowers in nature

When I feel sad, I like to go outside and enjoy nature

Being in the natural environment makes me feel peaceful

I like to garden

Collecting rocks and shells is fun

Being outdoors makes me happy

Empathy for creatures

 I feel sad when wild animals are hurt

 I like to see wild animals living in a clean environment

 I enjoy touching animals and plants

 Taking care of animals is important to me

Sense of oneness

 Humans are part of the natural world

 People cannot live without plants and animals

 Being outdoors makes me happy^a

Sense of responsibility

 My actions will make the natural world different

 Picking up trash on the ground can help the environment

 People do not have the right to change the natural environment

Appendix B. Observation scheme

Observatie nr..... Datum..... Tijd..... Locatie.....			
Weer:			 WAGENINGEN UR For quality of life
Leeftijd kinderen:	Laagste:	Hoogste:	Gemiddeld:
Aantal kinderen:	Laagste:	Hoogste:	Gemiddeld:
Bijzonderheden:			
Samenstelling bezoekers (ouders/kinderen autochtoon/allochtoon groepjes):			
Natuurwaardes	Affordances (uit vb. Margadant-van Arcken)	Fysieke kenmerken natuur	Observatie nummer
Uitdagende natuur grenzen verleggen spanning avontuur	Klimmen Springen Slingeren Glijden Vuurtje stoken	Hellend terrein (bv. Slootkant/helling) Vaste objecten (bv. Bomen) Bewegende objecten (bv. Takken aan bomen) Water (bv. Slootjes) Vuur	
Actieve natuur	Lopen Rennen Huppelen	Open vlaktes Hellend terrein Pondje	
Fantasie in natuur	Fantaseren Inbeelden Verbale expressie	Hellend terrein (bv. Slootkant/helling) Bescherpte plaatsen Vaste objecten Bewegende objecten Losse objecten Los materiaal Dieren Water Vuur	
Gebruiks natuur			
• <i>Eetnatuur</i>	Eten Plukken Proeven Bereiden	Losse objecten: onderdelen van planten die eetbaar zijn(bessen etc.)	

<ul style="list-style-type: none"> • <i>Heilzame natuur</i> 	Genezen Plukken Eten Smeren (vb. op huid)	Losse objecten: onderdelen van planten die geneeskracht hebben	
<ul style="list-style-type: none"> • <i>Natuur als leverancier van grondstoffen</i> 	Knutselen Decoreren plukken Vuur maken Bouwen (b.v. hutten)	Losse objecten: (bv. Losse takken, zaden, bloemen, etc.) Los materiaal (bv. Zand, modder) Water Vuur	
Intrigerende natuur	Speuren Spieden Observeren Leren	Losse objecten (bv. planten/bloemen/bomen/paddenstoelen) Dieren (Vogels, insecten, zoogdieren)	
Esthetische natuur	Kijken Luisteren Verbale expressie	Losse objecten (bv. planten/bloemen/bomen) Dieren (Vogels, insecten, zoogdieren)	
Angst en afkeer voor natuur	Gillen Huilen	Losse objecten (bv. planten/bloemen/bomen) Dieren (Vogels, insecten, zoogdieren) Water	
Niet-natuurlijke ervaring	Gebruik maken van toestellen	Schommel Pondje klimtoestellen	

Appendix C. Nature experiences in natural playgrounds

(Blue numbers refer to experiences of non-Western immigrant children, black numbers refer to experiences of native Dutch children and orange numbers refer to experiences of both immigrant and native children).

Nature experience	Affordances	Environmental features	Spontaneous Woeste Westen	Activities Woeste Westen	Spontaneous Natureluur	Activities Natureluur
Challenging nature	Balancing Climbing Jumping Swinging Hanging Gliding	Sloping terrain Rigid fixtures Moving fixtures Water	1, 13, 17, 70, 101, 108, 111, 115, 144, 155, 160, 166, 168, 171, 175, 197, 204, 207, 208	3, 5, 7, 41, 57, 60, 61	28, 31, 37, 42, 45, 46, 50, 51, 54, 55, 56, 57, 58, 79, 81, 86, 87, 90, 91, 93, 94, 95, 98, 123, 127, 128, 129, 134, 140, 143, 183, 184, 188, 210, 212, 215, 216, 219, 221, 223, 224	25, 36, 40
Active nature	Running Jumping Skipping Floating	Open field Sloping terrain Water	2, 12, 63, 64, 67, 102, 103, 112, 146, 149, 154, 155, 165, 167, 169, 170, 172, 173, 175, 176, 195, 197, 199, 200, 204, 205	1, 4, 7, 41, 44, 51, 60	27, 33, 34, 39, 43, 75, 88, 89, 92, 96, 116, 135, 139, 142, 177, 178, 179, 186, 187, 191, 209, 211, 214, 217, 218, 222, 224	16, 24, 40
Fantasy in nature	Playing Verbal expression	All environmental features		2, 6, 49, 50, 52, 54, 55, 56, 58	30, 35, 78, 121, 131, 137	12, 31, 34, 35
Useful nature						
<ul style="list-style-type: none"> <i>Nature to eat</i> 	Eating Gathering Tasting Cooking	Loose objects	19, 150, 151, 153, 159, 164, 196, 202			10, 11, 13, 18, 19, 27, 28, 29, 30, 33, 38, 39

<ul style="list-style-type: none"> <i>Nature as material supplier</i> 	Making fire Crafting Decorating Gathering Building Water (e.g. huts)	Loose objects Loose material Water Fire	16, 60, 61, 65, 68, 76, 113, 145, 146, 147, 155, 163, 164, 194, 199	8, 42, 47, 54, 57, 58	20, 21, 26, 29, 35, 44, 48, 82, 84, 120, 121, 124, 130, 132, 136, 181	13, 20, 21, 26,
<ul style="list-style-type: none"> <i>Nature as a tool</i> 	Angling Throwing Swaying Hitting	Loose objects	100, 109, 112	44, 51	26, 33, 47, 52, 53, 77, 80, 97, 99, 117, 119, 122, 131, 133, 136, 180, 188, 189, 190, 192, 210, 211, 212, 214, 224	
Intriguing nature	Tracing Spying Observing Learning Verbal expression	Loose objects Animals	7, 14, 15, 18, 100, 104, 109, 196, 201	1, 2, 9, 44, 46, 48	25, 36, 38, 41, 74, 116, 118, 125, 138, 185, 225	10, 14, 15, 23, 29, 30, 33
Aesthetic nature	Watching Listening Verbal expression	All environmental features	8	43, 53	22, 32, 36, 41, 59	17, 20, 22, 37
Fear and aversion to nature	Screaming Crying Breaking	Animals Loose material Loose objects	9, 65, 73, 147, 158, 159, 203	45, 59	23, 24, 42, 51, 83, 133, 138, 190, 213, 220, 225	24, 32, 36
Non-natural experiences		Climbing frames	3, 4, 5, 105, 106, 107, 110, 149, 152, 156, 157, 162, 206	4	40, 47, 49, 53, 77, 79, 85, 99, 182, 224	26

Appendix D. Pictures focus group discussions







References pictures

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Appendix E. Question list focus group discussion

Algemene vragen

Hoe oud zijn jullie?

Waar wonen jullie?

Hoe vaak komen jullie hier?

Waarom komen jullie hier?

Wat is voor jullie natuur?

Vinden jullie deze speeltuin ook natuur? Waarom wel/niet?

Natuurbeleving

Als je zelf mag kiezen wat doe je dan het liefst in Het Woeste Westen/De Natureluur? *(Mogen meerdere dingen zijn)(Naar welke natuur ervaringen verwijst dit?)*

Enjoyment of nature

Plaatjes: Natuurspeeltuin, binnen, gewone speeltuin, bos

Vraag: Waar spelen jullie het liefst? Waarom?

Ervaringen en gevoelens

Hoe voelen jullie je in Het Woeste Westen/De Natureluur? Hoe komt dat? *(Welke gebeurtenissen/elementen leiden tot deze gevoelens)*

Eventueel: Wat is er leuk aan Het Woeste Westen/De Natureluur? Waarom?

Zijn er ook dingen niet leuk aan Het Woeste Westen/De Natureluur? Wat? Waarom?

Hoe voel je je dan?*(Negatieve emoties bv. Angst)*

Empathy for creatures

Plaatjes: boom, konijn, telefoon, wesp, merel, worm.

Vraag: Welke van deze dingen kunnen blijheid of verdriet voelen en waarom?

(Een voor een vragen: Kan een boom blijheid of verdriet voelen? Etc.)

Ervaringen en gevoelens

Weten jullie of er dieren in De Natureluur leven? Welke? *(Openingsvraag om te kijken of ze oog hebben voor dieren?)*

Hebben jullie wel eens een ziek/gewond dier gezien in de Natureluur? Hoe zag/wist je dat?

Hoe voelde je je toen?

Eventueel: Wat zou je voelen als je een gewond dier zou zien? *(Bijvoorbeeld konijn, insect, vogel).*

Sense of oneness

Vragen:

Wie zijn het belangrijkste, planten, mensen of dieren? Of zijn ze even belangrijk? Waarom?

Horen mensen bij natuur? Waarom (niet)?

Ervaringen

Hoe belangrijk is Het Woeste Westen/De Natureluur voor jullie?

Sense of responsibility

Plaatje

Vervuilde natuur: Vraag: Wat vinden jullie hiervan? Waarom?

Boom planten: Vraag: Wat vind je van dit plaatje?

Ervaringen

Hebben jullie wel eens iets gedaan om de natuur (in Het Woeste Westen/ De Natureluur) te helpen? Wat dan? Hoe vond je dit?

(Als nee, vragen hoe ze de natuur zouden kunnen helpen.)

Hebben jullie wel eens iets gedaan wat niet goed was voor de natuur (in Het Woeste Westen/ De Natureluur)? Wat dan? Hoe vond je dit?

Appendix F. Letter of declaration



Geachte bezoeker van Het Woeste Westen/De Natureluur,

Kinderen komen tegenwoordig minder vaak in contact met de natuur. Dit kan leiden tot minder interesse in de natuur. Daarom worden er in de gemeente Amsterdam natuurspeeltuinen ontwikkeld. Wageningen Universiteit en het team van Het Woeste Westen/De Natureluur willen weten of natuurspeeltuinen ertoe bijdragen dat kinderen een sterkere band ontwikkelen met de natuur. De hoofdvraag van het onderzoek luidt:

Hoe draagt natuurbeleving in natuurspeeltuinen bij aan verbinding met natuur bij stadskinderen?

Louwra Postma studeert Bos- en Natuurbeheer aan Wageningen Universiteit en voert dit onderzoek uit. Het maakt deel uit van haar studie en zij hoopt op dit onderzoek af te kunnen studeren.

Voor het onderzoek zullen kinderen worden geobserveerd. Verder zullen er na toestemming van kinderen en hun begeleider(s) een aantal focus groep discussies gehouden worden met groepjes kinderen. Hierbij worden vragen gesteld, waarop de kinderen mogen reageren. Dit zal ongeveer 15 minuten in beslag nemen. Hierbij zal gebruik gemaakt worden van audio opnames, die later uitgeschreven zullen worden. Het onderzoek is **anoniem** en alle gegevens worden uiterst **vertrouwelijk** behandeld in de scriptie.

Het team van Het Woeste Westen/De Natureluur is op de hoogte van dit onderzoek en de directeur van Het Woeste Westen/De Natureluur, (naam), heeft hiervoor toestemming gegeven. Voor verdere informatie en vragen over het onderzoek kan er contact worden opgenomen met de begeleidster van het onderzoek van de Wageningen Universiteit (zie informatie onder aan de brief). Mocht u geïnteresseerd zijn in de resultaten van het onderzoek, dan kunnen wij het eindrapport opsturen. Hiervoor kun u mailen naar louwra.postma@wur.nl.

Bedankt voor uw medewerking!

Met vriendelijke groet, namens het onderzoeksteam,

Birgit Elands
Docent
Wageningen Universiteit

(Contact gegevens
natuurspeeltuin)

Louwra Postma
Student
Wageningen Universiteit