

Natural Play in the Forest



Forest School evaluation (Children)

A report produced for Natural England (Report 1 of 2)

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Executive Summary

Regular engagement with the natural environment has positive effects on children's physical activity, motor skills, creativity, imaginative play, observation skills and social interactions with others (Fjortoft, 2000; Fjortoft, 2004). In light of increasing concerns that children are becoming disengaged from the natural world, this project aimed to investigate the impact of Forest School sessions on children's perceptions and knowledge of natural play and the environment, identify barriers to natural play, and determine if Forest School is a good mechanism to increase natural play and the use of woodland and green spaces.

Using observations during school playtime, questionnaires and interviews with 6 boys and 11 girls from a Year 2 class in one North-West school, this study found that: a) at baseline, children had a preference for playing in outdoor settings, but were generally not allowed to unless supervised by an adult or older sibling; b) children's social skills and interactions positively developed across Forest School sessions and were observed during school playtime; c) children's confidence increased as a result of the sessions; d) children described imaginative and creative play that linked to activities undertaken during the sessions; e) children's ability to recognise fauna and mini-beasts developed across the project; f) children reported using some skills learnt in the sessions in their own play during leisure time; and g) children reported an increase in natural play activities with their siblings and friends.

Overall, there was evidence that the children positively received Forest School sessions. In addition, this project identified some of the benefits of Forest School on children's play and provides evidence that there was an increase in child initiated natural play both in and out of school time. Lastly, it provides an initial framework that may guide future strategies including play and linking communities with the natural environment and Forest School initiatives.



Cooking on
an open fire



Den building



Tree climbing



Measuring trees

Introduction and context

The activities that children engage in during childhood are broadly defined as play (Lindon, 2002). Play is generally enjoyable, includes a range of self-chosen activities, is an important element of a child's development, and occurs in a range of contexts (Jenvey & Jenvey, 2002; Lindon, 2002). However, a Government review (DCMS, 2004) reported that parents are concerned that the current generation of children have fewer opportunities for play compared to previous generations, and greater adult constraints are being placed on play.

It has been found that when given the opportunity, children choose and enjoy playing in natural environments¹ and/or with natural elements (Titman, 1994; Spencer & Blades, 2006), as the natural environment affords complex, challenging and exciting play opportunities (Fjortoft, 2004). Natural play spaces also stimulate high levels of physically active play in children (Fjortoft, 2004). Indeed, children who play in a natural environment show a higher prevalence of imaginative and creative play (Fjortoft, 2000), and more advanced motor fitness, including co-ordination and balance (Fjortoft & Sageie, 2001). Natural environments also stimulate social interaction between children, and an affinity to nature is developed (Bixler et al., 2000). However, children and young people are becoming disengaged from visiting and playing in the natural environment because freedom to play is much more controlled in a risk adverse society.

Forest School is one approach that may help to encourage children to play within the natural environment. This scheme, which has been successfully used in Nordic schools and was brought to the UK in 1995 (Murray, 2003), has developed as a method for building independence and self-esteem in young children (Forest Education Initiative, 2008), and is introduced through timetabled school sessions. It focuses on the whole child, and how they can progress their learning at their own pace (Murray & O'Brien, 2005). However, whilst the importance of Forest School has been

¹ Fjortoft (2004) defines natural environments as "environments not designed or cultivated by humans" (p.24).

acknowledged (Murray & O'Brien, 2005), there is a need to examine the impact of this approach on children, and to identify some of the changes that occur across the sessions. In addition, there is a need to identify the wider benefits of engaging young people and their parents to use the countryside in and around towns for leisure and natural play.

Consequently, there were two main aims of this project. These were:

- **To evaluate the impact of the Forest School sessions on children's perceptions and knowledge of natural play and the environment, and identify barriers to natural play**
- To use Forest School to encourage families to participate in outdoor leisure activities using areas of The Mersey Forest for Natural Play and leisure time activity.

This initial report (Report 1) will focus on the impact of school-based sessions on children's natural play, their knowledge of the natural environment, barriers to play, and changes observed as a result of Forest School.

Methods

Participants and Settings

Seventeen children (6 boys, 11 girls) aged 6-7 years from one class in a Northwest England primary school participated in the child-centred Forest Schools Project. The school was located in a large urban town that was within the boundaries of The Mersey Forest, which is England's largest community forest. All children returned written informed parental consent and child assent forms to participate in the project. Ethical approval was granted by the University Ethics Committee.

The Mersey Forest is the UK's largest community forest covering 465 sq miles across Merseyside and North Cheshire. The aim of the Forest is to create high quality environments for millions of people by revitalising derelict land, providing new opportunities for leisure, recreation, and cultural activities, enhancing biodiversity, preparing for climate change and supporting education, healthy living and social and economic development. The Forest is made up of a network of green spaces, woodlands, and street trees with a range of habitats. Since 1994 The Mersey Forest has redesigned school grounds and has created school woodland areas to encourage children to engage with the natural environment for play, these are now becoming well established.

Intervention

The Mersey Forest area contains over 1000 schools located in 7 Local Authorities. This initial pilot project selected one school that had a well established school woodland area within their grounds but which was overgrown and underused prior to the study taking place. The school had shown interest in developing a Forest School on their site. Forest Schools were initially developed and implemented in Nordic countries in the 1960's, where it was seen as good pedagogical practice to use nature and the outdoor environment with young children. The development of Forest School in Britain in its current form began in the 1990's and was first introduced by Bridgewater College following a visit to Denmark in 1995. It is a scheme that aims to encourage children to access natural woodlands and outdoor spaces. It looks to build independence and self-esteem in young children and has been adapted for all age groups (Forest Education Initiative, 2008). Forest School is introduced through timetabled school sessions ranging from a

minimum of 2 hours a week for a minimum of 6 weeks to whole days over a whole school/nursery year depending on the age of the children. During these sessions, children engage in activities such as picture making, den building, and mini beast hunting, for example, and all activities link back to the delivery of the National Curriculum. Other examples of activities are shown in the pictures on page 4.

For the purpose of this study, the children participated in 12 sessions that were 2 hours in length (24 hours total), and were led by external qualified Forest School co-ordinators. All sessions and activities took place outside within a woodland area located in the school grounds.

Procedures

Prior to the start of the Forest School sessions, The Mersey Forest Team visited the school to outline the content of the initiative and the associated research project to the children and their parents. Children who returned written parental consent and child assent were recruited in to the research study. These children participated in small focus groups with The Mersey Forest Team, and completed questionnaires during class time with teacher support. The children were also observed during playtime over a period of three days. Following the completion of baseline measures (February 2009), all children participated in the Forest Schools sessions. At the completion of the 12-week sessions (post-test - June 2009), children repeated all measures conducted at baseline.

Measures

Playtime observations: Children were observed on the playground during lunchtime for three days at baseline and two days at post-test using the System for Observing Children's Activity and Relationships during Play (SOCARP; Ridgers et al., in press). One day was lost at post-test due to poor weather restricting children's access to the school playground. SOCARP simultaneously assesses children's physical activity, social group sizes, activity type, and social behaviour during play, and is a valid and reliable measure for use during playtime (Ridgers et al., in press). SOCARP uses time sampling techniques during which a 10-second observation interval is followed by a 10-second record interval. When the record prompt was signalled at the end of the 10-second observation period, the activity level, group size and activity type recorded reflected what the child was doing at that point.

One trained observer conducted all observations. Children in the research project were observed at random across the lunchtime periods. The target children selected were the major focus of the observations. The first child selected was observed for 10 consecutive minutes (30 observations). At the end of the first pupil's observations, the second target child was located and the observation procedure repeated. This continued until the end of lunchtime was signalled. During the observations the observer placed themselves in a position where they could observe the children's behaviour, whilst at the same time attempting to be as inconspicuous as possible.

For analysis, each observed child's activity levels, group sizes, activity types and social interactions were summed. Individual summaries for all variables were collated by summing the data. Percentages were obtained for each code by dividing the sum of that code by the total number of intervals observed (e.g., frequency of walking observed/total intervals observed).

Questionnaires: All children completed a 21-item questionnaire at the start of the project during class time. The questionnaire was developed for use in this project, and asked children a range of questions in relation to how they travelled to school, whether they played with their parents, friends or family, where they liked to play, where they were allowed to play, and reasons for these answers. They were also asked to record their knowledge of natural play spaces within their local area. The majority of answers asked children closed questions, though some open-ended questions were asked to enable children to provide more information. Frequency analyses were conducted on the quantitative responses to detail their knowledge of the local area for play and physical activity and their perceptions of the local environment.

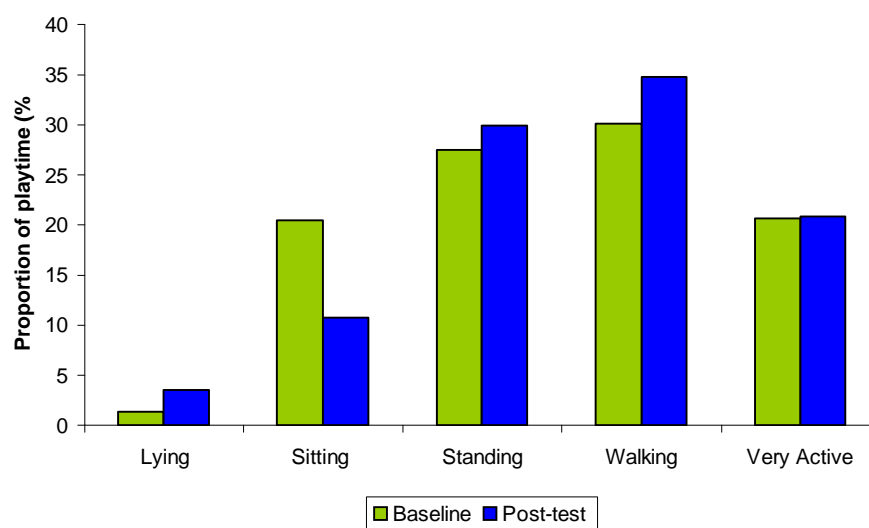
Focus Groups: Small focus groups (2-3 children) were conducted with the children before and after the Forest Schools intervention. Children were asked a range of questions to find out what they thought play was, what was meant by natural play, activities that they liked to do, and to identify whether any barriers to natural play exist. Following the Forest Schools sessions, children were also asked what they enjoyed about the sessions, and to discuss what they learnt from the activities that they participated in. All focus groups were conducted by the same Mersey Forest researchers, were recorded using a digital recorder, and were transcribed verbatim for further analysis.

Results

For the purpose of this report, the results are split in to two sections. Results concerning the playtime observations and questionnaires are presented first, and the interview data results are reported second.

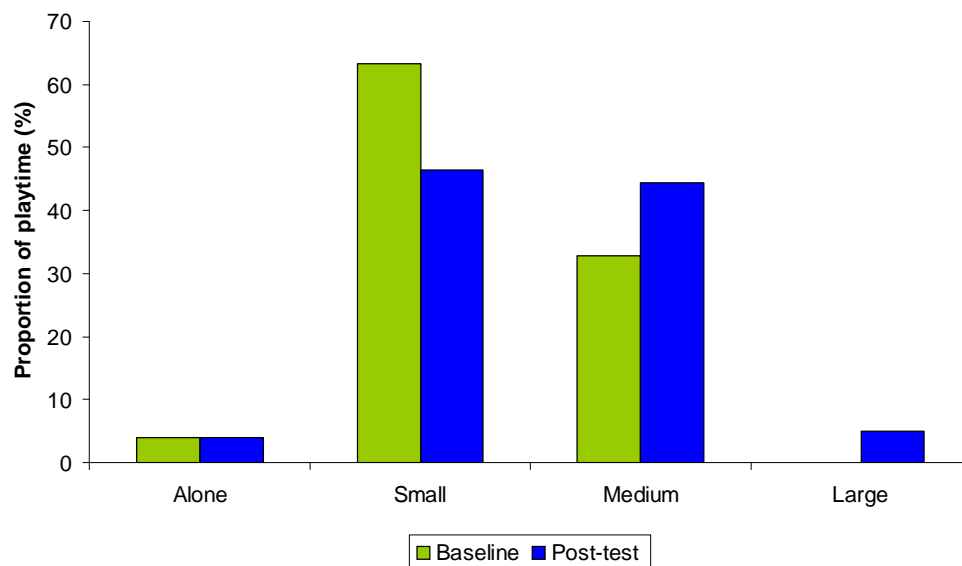
Playtime observations

Figure 1 (below) illustrates the children's physical activity levels at baseline and post-test.



- **Engagement in at least moderate intensity physical activity increased** from 50.8% at baseline to 55.7% at post-test. This was largely attributable to the children spending more time walking during playtime.
- This means that **children were more active during playtime following the Forest School sessions**, and that they were choosing physically active behaviours.

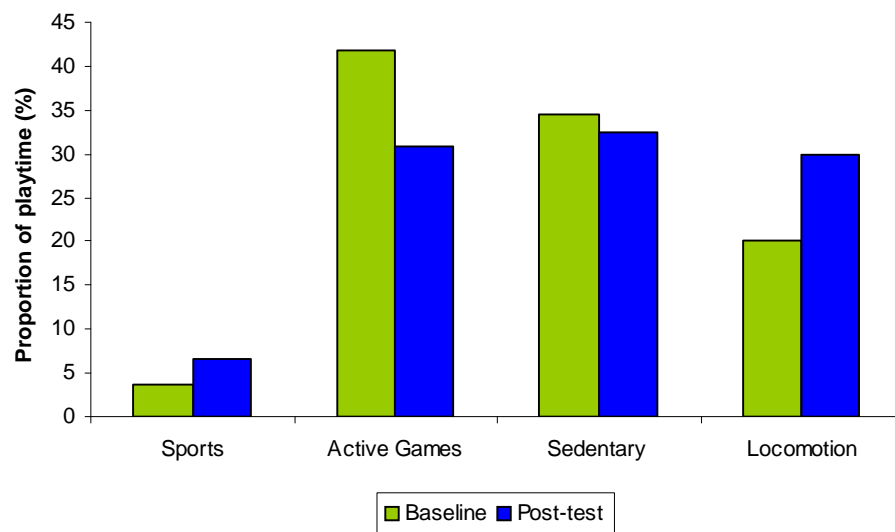
Figure 2 (below) illustrates the proportion of time children spent in different sized groups at baseline and post-test.



KEY: Small groups = 2-4 children; Medium groups = 5-9 children; Large groups = 10 or more children.

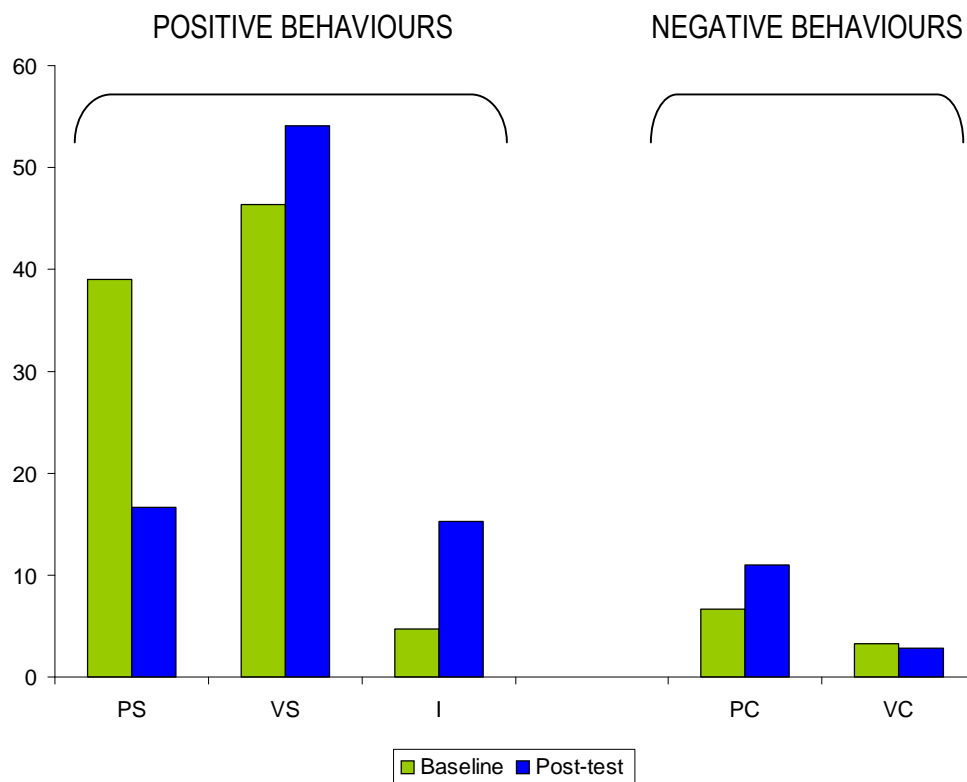
- The proportion of recess that children spent in medium sized groups increased from 33.8% to 44.5%.
- **Children were observed in larger groups at post-test.** There was also little difference between the time spent in small and medium groups.
- **This suggests that children's social network size had increased** between pre- and post-test, and that children appeared to be more sociable during playtime.

Figure 3 (below) illustrates the proportion of time children spent in different activities at baseline and post-test.



- The proportion of time that children engaged in sedentary activities (e.g. board games, watching games) and active playground games (e.g. skipping, chase games) decreased between baseline and post-test, while the **time spent in locomotor (e.g. walking, running) and sporting activities (e.g. football) increased.**
- The trained observer noted on the SOCARP recording forms that a number of children were playing in and around the woodland area within the school grounds during playtime at post-test, and the sedentary activities engaged in were more commonly associated with this area (e.g. sitting within the bushes talking).
- This suggests that the **children were choosing to engage in activities in and around the area where the Forest School sessions took place**, and that **playtime provided a further opportunity for natural play experiences.**

Figure 4 (below) illustrates the percentage occurrence of social interactions at baseline and post-test.



KEY: Physical Sportsmanship (PS) = pro-social (physical) behaviours (e.g. holding hands; hugging); Verbal Sportsmanship (VS) = pro-social (non-physical) behaviours (e.g. organising games; clapping others); Ignore = ignoring provocation by another child; Physical Conflict (PC) = antisocial physical behaviours (e.g. hitting, pushing); Verbal Conflict (VC) = antisocial non-physical behaviours (e.g. name calling; teasing; Ridgers et al., in press).

- The most commonly observed social interactions observed between the children and their peers were positive in nature (90% of total interactions at baseline and 86.1% at post-test). The small decrease in positive behaviours is explained by the small increase in physical negative behaviours, which was largely due to **children getting frustrated when trying to organise activities and others were not co-operating with them**. It is likely that, **over time, these behaviours would decrease as children become accustomed to co-operating with other children** in a sociable environment.

- Positive verbal interactions were the most commonly observed behaviours, and increased from 46.3% of total interactions at baseline to 54.1% at post-test. Examples of positive verbal instructions providing instruction and support, supervising or organising activities, and assisting other children. This suggests that **children were more confident in organising and supporting activities for their peers**, and that they were more prepared to assist other children following Forest School.
- Overall, there was a small increase in more negative behaviours during playtime between baseline and post-test. However, conflict and resolving conflict are important elements of a child's development, and these behaviours accounted for a small proportion of those seen overall.



Hunting for mini-beasts



Focus groups



Hunting for mini-beasts

Questionnaires

Some sample characteristics from the questionnaire responses at baseline and post-test are shown in Table 1 (mean \pm standard deviation (SD) unless otherwise stated).

Table 1: Sample characteristics by gender

	Boys (n=6)		Girls (n=11)	
	Baseline	Post-Test	Baseline	Post-Test
Active travel to school (%)	33.3	33.3	80	54.5
Sports club membership (%)	83.3	83.3	81.8	81.8
Neighbourhood safety	3.5 (1.8)	4 (1.4)	3.4 (1.8)	3.8 (0.9)
Climate change knowledge	3 (2.2)	2.7 (1.5)	1.8 (1.1)	3.4 (1.3)
Local wildlife knowledge	4.3 (1.6)	2.7 (1.6)	4.2 (1.3)	4 (1.3)

Boys reported less active travel to school (e.g. walk, bike) and higher sports club membership than girls. At baseline, boys reported that they knew more about climate change than girls. There were no other differences between boys and girls responses for the remaining variables in Table 1 at baseline. It is notable that **children's perceptions of safety increased between baseline and post-test**, and that their knowledge of local wildlife decreased. This may be explained by the increased knowledge that they had in relation to playing safely around their home environment, and that while Forest Schools taught them a lot about wildlife (see subsequent sections), they may have overestimated their knowledge at baseline.

Interestingly, when children were asked what they knew about climate change at baseline (interviews), there were tentative suggestions that it involved something to do with the weather. Following Forest School, the children were able to explain that it involved the climate changing and the world getting warmer. In particular, at post-test, girls report that they knew more about climate change than they did at baseline. **While climate change was not covered as part of Forest School, it may be that children were more aware of these issues as a result of developing their environmental awareness** during the sessions.

Table 2 shows the boy's and girls' responses to where they like to play and where they are allowed to play.

Table 2: Children's responses to where they like to play and where they are allowed to play (% of children stating yes) at baseline and post-test

	Like to play				Allowed to play			
	Boys		Girls		Boys		Girls	
	Baseline	Post-test	Baseline	Post-test	Baseline	Post-test	Baseline	Post-test
At home**	83	83	73	91	100	100	91	91
Gardens**	100	83	82	91	100	100	82	91
Streets	50	67	45	45	50	50	27	37
Parks**	83	83	73	91	100	83	73	91
Woods**	100	67	64	91	83	83	36	91
Beach**	100	83	73	73	100	100	73	91
Streams/rivers**	50	67	27	63	33	33	27	36
Playgrounds	83	83	82	91	83	100	82	91
Football pitches	83	83	45	55	50	83	55	82

** indicates more natural settings

The table shows that **boys reported greater freedom than girls in where they are allowed to play at baseline**, and that they like to play in more natural settings (e.g. woods, beach). Interestingly, at baseline, the responses to where the children like to play and are allowed in play in relation to more natural, unstructured settings were very similar, suggesting that children did not know that they liked playing in some of the settings, as they were not allowed to. Lastly, **there were relatively big discrepancies at baseline between some of the settings where children liked to play and were allowed to play** (e.g. boys on football pitches, girls in the streets and in the woods).

At post-test, Table 2 indicates that girls, in particular, have a greater interest and enjoyment in playing in more natural settings, and that they experienced some big changes in where they were allowed to play by their parents. Indeed, nearly all girls reported that they were allowed to play in woods at post-test, despite approximately a third being allowed to play there at baseline. Interestingly, the boys reported greater freedom of playing in a range of settings compared to baseline, though they also reported less interest in playing in some natural areas post-intervention compared to baseline. **At post-test, both boys and girls indicated that they were allowed to play more on playgrounds and football pitches, suggesting that parents were removing restrictions** on playing in more structured outdoor environments.

When children were asked to explain why they were not allowed to play in the places that they had indicated, answers were based around safety and parental restrictions.

Because they can be dangerous. [Girl]

My Mum doesn't want me to get hurt. [Girl]

I live on a very busy road. [Girl]

I am not allowed to play in the street because it is dangerous. [Girl]

My Mum and family don't want me to get hurt. [Boy]

The children were also asked what they liked about playing outside. Many of the children reported that they liked it because they liked being outside, and that they were able to play with their friends and/or family.

Playing outside is fun. [Boy]

I like going outside because it is cold and nice. [Boy]

Fresh air. [Boy].

I can run more, I can jump more. [Girl]

It is nice and breezy. [Girl]

I like getting fresh air. [Girl]

Because I like playing on my bike and I like getting fresh air. [Girl]

Interviews

Interviews were conducted with the children to understand children's play, investigate their knowledge of natural play and the local environment around them, identify barriers to natural play, and to identify the impact of the Forest School sessions on their knowledge, self-initiated natural play and their perceptions of the outdoor environment. The comments that the children made in relation to these areas have been grouped under a number of headings, some of which are based on the findings of the England Forest School report (Murray & O'Brien, 2005), and are presented below².

Children's play

There was a general consensus among the children that play was good fun, enjoyable, and it involved either playing with your friends or on your own. They highlighted a number of games that they associated with play, and at baseline these generally consisted of games that could be played on the playground during playtime.

[It's about] having good fun. [Girl]

And playing with your friends. [Boy]

At post-test, the range of playful activities that they identified included activities they had undertaken during the Forest Schools sessions, and through engagement with the environment.

[Play's like] going out into the woods or in your garden and like... even if it's not a very nice day you could always play inside... but you could go outside if it was a nice day and like play. [Girl]

I think it's about having fun and getting exercise [Girl]

Using your imagination. [Boy]

² Names stated during the interviews have been replaced by pseudonyms

[It's] when you do activities what you like. [Boy].

[It's about] working together. [Girl]

Imaginative Play

There is evidence from the interviews that following the Forest School sessions, **the children's imaginative play had developed**, and they were using the natural environment to stimulate some of this play. A couple of children reported games that had an imaginative element to it at baseline, though they were able to describe them in more creative detail post Forest School.

Me and Oliver, when he came to my house we pretended that there were zombies coming, and we were going like this [*machine gun sound*], and my Mum, I said my Mum was a mummy zombie. [Boy]

In our group, we were pretending that we were in the real army and we didn't know where to go back to get back, so we were saying get in the war now, they were going, okay, go on. [Boy]

We got to... went this secret little way to the beach. [Girl]

Well I think that I had the most fun doing, making my own fire. [*Int: Did you do a pretend one by your den?*] Yeah, and you put dirt on the top; make it look like you've used it. [Girl]

Barriers to Play

A range of barriers to the children's general play was identified. **The main barrier identified was parental constraints to play, often imposed because of safety concerns.** Children noted that stranger danger, road traffic and minimising injury risks were the main reasons for not being allowed to play in some places. These were stated both before and after the Forest School sessions.

I'm not allowed to play on my street because... I live on a really, really busy road. [Girl].

I'm not allowed to go by myself [*to the park*] because there's always strangers. [Boy]

Well I'd like to play out the front but I don't think I should because my mum doesn't say I can but she never lets me. [Girl].

I want to play on the front but I'm not allowed because my mum said somebody might take me. [Girl]

There were several instances where barriers to play could be described as unintentional barriers. These included objects that restricted access to play equipment and areas where children liked to play, and while they have been imposed by adults it could be argued that these were not linked to general safety concerns.

I've got like this garage and its [*bike*] right at the back... I've got my car in the garage that I really can't get past. [Girl]

Normally when I'm about to go to my friends house there's a car blocking our pavement so I'm not going to my friend's house... sometimes I can because I climb over the car when my mum or dad isn't looking. [Boy]

Children reported that when they could play away from their home environment, an older sibling or a parent generally supervised them.

I'm not allowed to go out of sight. [Girl]

I'm not allowed to go out of Mummy's sight at the park, because we like to go and play on the field and in the bushes but if Mummy can't see us we can't go and play. [Girl].

I used to go to my next door neighbours because there didn't used to be a fence, and my next door neighbours is nice to explore as well because he has lots of plants and things that you can spin around and chimes that I can play with... but now my dad has built a fence. [Girl]

The weather was also a barrier to children playing outside, whether it was in their home garden or in the wider local community (such as the local park). There was a general feeling that children were not permitted to play outside when it was raining or it was too cold, with safety and general well-being reasons offered.

Well, my Mum says that I'm not allowed to go out when it's raining. [Girl].

She [*Mum*] nags me but I don't [*come inside*] because it's just water. [Boy]

I'm not allowed to go on the trampoline because it's all wet...you'll slip on it... you might get a cold because it might be freezing cold water. [Girl]

... in the winter we wouldn't be allowed to go on it [*trampoline*] every day... because it would be a bit too cold. [Girl].

Interestingly, the weather was not seen as such a barrier following the Forest School sessions, particularly as a number of sessions were conducted when it had been raining or it was cold. This suggested that there had been a change in their attitudes towards the weather and its impact on their daily lives.

No I don't mind the rain... and sometimes when you're having too much fun, it doesn't bother you. [Boy].

It's just water coming down... and it doesn't bother me because I've got like a tree covering me up so I don't get wet. [Girl]

Well, I might start playing outside in the rain... we went outside and we liked to get soaked. [Girl]

Confidence

Murray and O'Brien (2005) noted that children who lack regular contact with the natural environment require time to become comfortable and familiar with it. At baseline, some of the children stated that they already played in local woodlands, and had experience of outdoor activities. Other children appeared to lack confidence.

Sometimes when I go up small trees I climb up and I go upside down. [Boy]

When I went to the butterfly house, one flew on my head... I was scared of them. [Girl]

I want to climb trees but I can't. [Girl].

Following the Forest School sessions, it was notable that a number of children had encountered things in the natural environment that they feared, and had tried to overcome these fears, or engaged in activities that they had not done so previously. The comments were generally positive, and linked in to a sense that they were becoming more familiar with the outdoor environment.

I'm still scared of earwigs... but I can look at them now. [Girl]

I was really shy and I was like 'Ah there's nettles' ... 'Ah there's a bug' ... [laughter]. And when ... when it came to like the second or third week I was really like ... 'Oh there's nettles!' 'Who put that bug in there' [laughter]. [Girl]

The first week... ... I thought I saw a big monster... it was a just a little tiny bee [Girl]

I was scared of bees and flies and wasps because they do make a loud buzzing noise when they go near your ear but when ... when I went into Forest School I learned that bees can't hurt you and flies can't hurt you. [Girl]

I learned about worms, and now I'm not scared of worms anymore. [Girl]

Only a small number of comments reflected a continuing reluctance to try some of the activities.

I never wanted to [*play on the hammock*]. [Boy]

Social Skills

An important aspect of children's play is the development of social skills (Jenvey & Jenvey, 2002). There is evidence from the interviews that the **Forest School activities enabled children to develop their social skills** through working and playing co-operatively, learning about their own strengths and weaknesses, and identifying how they can help and lead activities for other children.

Because we had... we worked together to build something in the trees that we could hide in [Girl]

We had to work together as a group and then we made it like an Indian hut. [Girl]

I was helping four groups at once... I was helping Adam, Liam and Gerard the most, because they had to do some untying and move it. [Girl]

We were in a group, and we made a campfire outside. [Girl]

I learned how to ... I learned to ... respect everyone else. [Girl]

I found out that I get sad easily. I learnt that I can get sad easily because I really didn't want to do it and when I went home I told ... I was like, really like 'I want to go back'. [Girl]

There was evidence of children working together and with adults to achieve the completion of a task, such as den building and using tools (see images on p19).

There was also some evidence that the children had transferred these skills to their play outside of Forest School, and were teaching friends and family about some of the activities they had participated in.

I've started building like jungles in my garden... and I made a little jungle as well. [Girl]

Yes I teach my friends it [*one, two, three, where are you*] and we play it together. [Girl]

I've built [*a den*] again in the park... it's not fell down yet... I went with my brothers and found lots of wood... and I taught them how to do it. [Boy].

Knowledge and Understanding

There is evidence from the interviews that as a result of the Forest School sessions, the **children began to develop their knowledge and understanding of the outdoor environment**. They commented that they learnt about recognising mini-beasts, respecting the environment and the woodland creatures, and safety in relation to fires and using tools. There was also an increased awareness of the natural environment at home as well as in the woodland.

We learned how to be safe around the fire... you can't walk through it... When the fire is going or if it is even going you might even get burnt... We got to learn how not to stand too close to the fire... We sit on a log, we sit on a log... You have to kneel up like this and you get it like that and then you toast it. [2 girls, one boy together; see photo on p19]

Not to go near nettles and touch things that are dangerous. [Girl]

We don't kill the creatures and we don't break or kill the trees by ripping them off. [Boy]

There is, there is, are some snakes in that forest... I've seen one, I have... It was green and it was a grass snake. It was in a bush. [2 boys together]

What I learnt is if there is a tree in your garden there is wildlife on it. [Boy].

Looking at millipedes [*Int: where did you find them?*] You know near the entrance [yes] if you keep going down there and then you go ... you know where the parents came to finish [yes] what their big thing was ... And you come a little bit there and you could find lots of millipedes [*right*] because lots of people don't walk there.

The Natural Environment

At baseline, it was clear that the children understood that the natural environment generally meant things were outside and encompassed woods, trees and gardens. The children were able to list a number of plants and animals that they thought lived outside (e.g. ants, bugs, trees, bark, birds, flowers, bushes), though these were generic classifications rather than specific species. They also often discussed their pets when discussing nature. Some children were able to discuss elements of the natural environment. While they did not recognise the term natural play, it was interesting that they used different colours to describe what they thought nature was.

[*Int: What colour is nature?*] Brown, light green, dark brown, green. [One boy, two girls]

I had to dig it [compost heap] up with her, and put some of the scraps of vegetables into the soil. And I had to cover it up. [Boy]

Following Forest School, children were able to talk about the natural environment in more detail, and there was evidence that they had learnt about plant growth cycles, and they were able to identify species of animals. They also associated natural play with the Forest School activities, including building dens, making flags, and climbing trees.

Playing stuff outside... building dens... climbing trees... making your own dens at your own houses. [2 boys, one girl]



Den building



Using tools



Cooking on an open fire

[Girl 1] There's a wasp next to the swing and there was a bee on the ground and it's was like this big... like a dragonfly but it isn't one but it's just like... [Girl 2] Is it a daddy long legs? [Girl 1] And there's a robin out there.

In my garden and I ... like to plant seeds, because I planted some of the ones you gave me at the session and I've ... they've ... they've already turned into little shoots... the peas and beans and things have just gone up and they're growing ... they've got like tiny peas. [Girl]

And Kathleen brought in the thyme. [Girl]

Interest in nature

At baseline, some of the children discussed that they were curious about nature and wildlife, and had already begun to explore and look at wildlife in their gardens.

I water the plants and one of them died. I don't know [why] because we usually water them quite a lot and because it had been left a long time it went all black and small. [Girl]

I've got an eco-garden. There's a little pond made out of a plastic tub, and I planted some seeds and there's a little rockery made out of little rocks and seashells. [Girl].

Sometime I plant like... potatoes, lettuce, strawberries, bulbs and like flowers... the other day I got some seeds. [Girl]

Sometimes I find like snails and stuff and I put them in this pot with like all holes in so I can watch them, and I put leaves in but when they start climbing up then I let them out for a bit so that they can like go in the fresh air again. [Girl]

Following Forest School, it could be seen from some of the comments that an interest in nature had been stimulated, and children were motivated to find out more about their environment, and were becoming

aware of local environmental issues. Indeed, some of the children were able to discuss their opinions on these issues based on their own experiences.

Did you see on the news that all these ladybirds are coming? [Int: Are they foreign?] Yes. [Boy]

I saw a grey squirrel once. [Girl 1]

I did. They're all dying now. Disease, I think. [Girl 2]

No, no. It's because the red squirrels are taking away their food. [Boy]

No, they're not. Liam's answer wasn't right because... [Girl 2]

... they don't run out of food, because when you're driving, and there's a little hut and you ask for some nuts... so it's, he's not right. [Girl 1]

Self-initiated natural play

Some of the **children reported that they had tried activities that they completed in the Forest Schools sessions at home** or in their local neighbourhood. They had given thought about what they could use in the natural environment to develop their play, and how to use the skills they learnt during the sessions.

I've been thinking about making my own den because I've got a little playhouse, it is made of plastic, but still, I could move it to my mum's apple tree and put the roof under the apple tree and then I can climb under and put the sidings on. [Girl]

I tried to kick mine down but it wouldn't even kick down because I just put some wood at the bottom in wood then hammered a big log into a tree and then another one in to the fence and then get a sheet, rip it apart and hammer it to the bottom and hammer it to the side then you just hit and hammer it on the fence then you just need to sew it so it is waterproof. [Boy]

Natural play with friends and siblings

Following Forest School, **children reported that they had both taught and played a number of activities learnt during the sessions with their friends and siblings.** Den building was one of the most commonly reported activities by the children. There was also evidence that some of the children had continued other activities, which linked in to their increased interest in their natural environment.

Because it's fun and when Kathleen came we picked different kinds of leaves and put them in the bag and then I was going to for a sleep over at Nicola's and we picked more leaves and put them in the bag... Then we went on the computer and tried to find out which type of leaves they were. [Girl]

I went with my brothers and found lots of wood. ...Branches. they got a ladder and I put it under a tree and pulled the tree down over it. [Girl]

We were on a day out with my Mum and Gran and we collected snails in a bucket and we took them home and we asked... we picked up logs on the way... and we built a snail house. [Girl]

We [my Dad, brother and I] just made a camp like in Forest School. [Boy]

(One, two, three where are you?) I play with my brother... Yes and sometimes he want to play but when he loses he gets bad tempered. [Girl]

I teach my friends it and we play it together. Well we hide in the garden. [Girl]

Synthesis of results

There is increasing concern that children are becoming disengaged from visiting and playing in the natural environment because freedom to play is much more controlled in a risk adverse society. The results of this study suggested that boys generally reported greater freedom in where they could play in comparison to the girls (Table 2), and they had a greater preference of natural environments. There were also discrepancies between where children were allowed to play and where they wanted to play, particularly in relation to natural environments where children wanted to play but were not allowed. The reasons given for play restrictions followed previous research, with greater adult constraints being placed on play to minimise safety risks (DCMS, 2004; Strong et al., 2005). Some of the children noted barriers that could be classed as unintentional barriers, which may not have been deliberately imposed but still restricted play opportunities. It may be that as part of future sessions or interactions with parents that these issues are brought to attention, and whether removing such barriers may facilitate greater outdoor play.

Previous research has indicated that natural environments stimulate social interactions between children (Bixler et al., 2000). From the playtime observations undertaken and the interview results, there is evidence that the Forest School sessions increased the amount of social interactions between children. There was a 7.8% increase in the amount of pro-social interactions observed between children (Figure 4), which typically encompasses instructions, support, supervising or organising activities, and assisting other children. Moreover, the observation results indicated that the amount of time children spent playing in medium and large groups increased between baseline and post-test (Figure 2). Lastly, many of the children discussed situations where they had worked as a team to complete a task. Such social skills are an important part of a child's development as they learn to get along with and work with their peers (Murray & O'Brien, 2005), and it is apparent that this scheme helped children to develop and practice these skills.

Natural environments provide opportunities for challenging play that tests children's competencies, enables them to manage their own perceptions of risk, and helps them to develop creativity and observation skills (Crain, 2001; Fjortoft, 2004; Murray & O'Brien, 2005). There was evidence from this project

that children had built on the experiences and activities from Forest School sessions and introduced them to their play at home. Moreover, number of children had tested and developed their competencies and fears in relation to elements of the outdoor world. The children had developed their ability to make sensible and informed judgements about different activities and situations, highlighting that Forest School is effective for encouraging children to push their own barriers within a safe environment.

One of the key findings from this project concerns the development of children's knowledge and understanding of the outdoor environment. Furthermore, there was evidence some children had been inspired to continue their learning about the environment beyond the structured sessions. Following Forest School, children were able to talk about a variety of woodland creatures and fauna, and they learnt to recognise the habitats of mini-beasts. Focus groups with the children post study highlighted the children's enthusiasm to revisit, increase competence and share their skills and knowledge of Forest Schools and the natural environment with those around them. Natural play initiated by the children included involving the wider family, siblings, relatives and friends, which further increases the impact of Forest school and connection with the natural environment. Bixler et al (2000) noted that a love of nature could be developed through regular contact with the natural world, and it is possible that future school sessions should be used to encourage and facilitate this initial learning.

In summary, the evidence from this project suggests that the Forest School sessions helped develop children's confidence, social skills, an interest in nature and the natural world, and their knowledge and understanding of the natural environment. Children positively received Forest School sessions, and many respondents reported that they enjoyed the sessions and wished that they could continue. Indeed, children built on the initial experiences by incorporating their learning experiences in to their play outside the Forest School sessions. Overall, this project has identified some of the benefits of Forest School on children's play, and provides an initial framework, informed by the children's experiences, that may guide future strategies including play and linking communities with the natural environment and Forest School initiatives, as key areas of development have been acknowledged.

Final thought

We learnt [from Forest School] that playing, you can play more when you go to Forest School because they can make experiences, and they you can go outside to play at home, that gives you more experience. [Girl]

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