

Department for Culture, Media and Sport

Play and Exercise in Early Years: Physically active play in early childhood provision

Louca-Mai Brady, Jennifer Gibb, Amanda Henshall and Jane Lewis

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National Children's Bureau

NCB works to advance the well-being of all children and young people across every aspect of their lives

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Executive Summary

Background

Government guidance relating to early childhood settings, including the Early Years Foundation Stage and The Children's Plan, (DCSF, 2007b) emphasise the importance of physical activity for children, and the need for environments, equipment and support to encourage physically active play.

In 2007 the National Children's Bureau's Research, Evidence and Evaluation Department was asked to undertake a research project on behalf of Play England, funded by the Department for Culture, Media and Sport. The research focuses on the extent to which young children, from birth to five years old, are involved in physically active play whilst in early childhood provision. It explores factors in the child's environment, relationships with others and adult attitudes that affect the extent to which children attending provision play in physically active ways.

The literature review found a large body of literature on the links between physical activity, health and well-being for both adults and children. However we found much less research which focuses on preschool children, the types of physically active play this age group choose to engage in, what encourages or inhibits physically active play or the impact of the environment on it.

Methodology

This was an exploratory study in which the main methodological approach was observation of children in three settings in an inner London borough, triangulated with data on the environment and adult (parent and staff) perceptions collected through semi-structured interviews. Observations involved the collection of both quantitative and qualitative data for a sample of children in each setting, to obtain a detailed record of activity patterns that could be understood in relation to environment, interactions and other factors.

Up to seven children were selected in each setting (19 in total). The sample was stratified as far as possible to give an equal number of children by gender and in younger (birth-three) and older (three-five) age groups, as well as to reflect the diversity of children in each setting (including attendance patterns (full or part time) special educational needs, ethnic origin and social background). The research team spent three-four weeks in each setting. 130 15 minute observation periods were completed in total - an average of seven observation periods for each child.

The role of services and parents – key findings from interviews

- Parents tended to define physically active play in terms of specific activities, such as running or climbing, whereas staff were more inclined to define it in terms of types of movement.
- Parents and staff valued physically active play for a variety of reasons: it offers learning opportunities in a range of areas as well as extending physical development; and children enjoy physically active play and need to do it.
- Neither group of interviewees seemed to be risk averse, understanding the importance to children of taking risks in order to challenge themselves.
- Settings varied in their approach to, and provision for, physically active play, and access to outside space also varied across settings. Two of the settings had a greater emphasis on access to outside space increasing opportunities for physically active play.
- In order for outside space to increase opportunities for physically active play, staff felt that it had to be well staffed and resourced for children across the birth-five age range, as well as managed with an appropriate pedagogy.

- Parents were generally happy with the provision for physically active play in the settings, and had noticed their children had acquired new skills. Having a chance to be active was seen as particularly important for children who did not have a garden at home.
- The most common family physical activity that parents talked about was visiting local parks or other green space. They felt that this gave opportunities for children to play ball games, run or cycle for greater distances or accessing play equipment that they did not have at home.

Observing play – key findings

- Overall, an average of eight minutes in every 15 minute observation period included some physically active play, with variations between settings and children.
- There was substantial variation in activity levels between children, and also between observations for the same child.
- Activity levels were patterned neither by gender nor age, with the exception that two 11-month olds were by some way the least active. However, there was substantial variation in activity levels between children, and also between observations for the same child.
- On average, each child was involved in 2.7 types of physically active play per observation – or 1.9 types other than walking, which was the most frequently noted activity.
- After walking, the most frequently observed activities were running, cycling and creative play.
- The proportion of observed time involving physically active play varied between the three settings, from 61 per cent in one setting to 44 per cent in another.
- The proportion of observed time involving time outside also varied between settings, from 41 per cent to 12 per cent.
- There was a wide range of equipment available both inside and outside in all settings, which was used to support physically active play in a variety of ways.
- Rankings of children and settings differ when we take into account rest periods alongside play (ie interrupted activity), or distinguish walking from other activities. One setting, and several children, then appear comparatively less active.
- On average, four out of 10 observed minutes included active play *without* equipment, twice the proportion recorded *with* equipment.
- Almost half of all *observations* involved time outside, yet the proportion of *minutes* wholly or partly outdoors was closer to a quarter of the total.
- There were clear variations between settings, with observations in one setting far less likely to involve children accessing outside space.
- Overall, there appeared to be little physically active play with peers or adults, although a few observation periods had interaction with staff or peers throughout.

Influences on physically active play

- Whilst the importance of physically active play was stressed in all three settings, there were some differences in their apparent ethos. The importance of children being able to 'free-flow', that is to move independently and freely, and to choose which activities to engage in was emphasised in all three settings, but in only two did this include free-flow between inside and outside space. In the third setting there appeared to be less self-directed activity generally.
- Across the sample, there were clear differences between children in how much physically active play was recorded, how intensive it was, how much of it was inside or out, how far it was self-directed rather than stimulated by a member of staff, the range of activity and use of equipment, and how constructively children engaged in activities and with other children. These aspects of the 'quality' of play were not necessarily linked with a higher level of physically active play.
- In terms of inside play, the physical layout of the settings had a substantial impact on both the type of play children engaged in and how active they were.

- Across all three settings, outside play was thought to be important for a variety of reasons: because of the opportunities afforded children to explore the natural environment and changing weather conditions, opportunities for incorporating features of outside space in creative play, more space to facilitate large movements or particular activities such as cycling and, not least, because children enjoy being outside.
- It was rare for children not to be physically active when they were outside, and some more vigorous activities (eg cycling, climbing and running) occurred more frequently outside than inside.
- As the focus of the observations was on the activity of individual children, only limited data are available on interactions with others during play. But it appeared that interactions with staff supported physically active play, for younger children in particular.

Conclusions

Physically active play in early years appears to be influenced by a range of factors, not least the ethos of the setting and support and encouragement from staff at an individual child level. The research identified other factors that impact on the quality, as well as quantity of play – including layout and design, opportunities for self directed activity (free flow), free access to outside space, and a variety of equipment and activities suitable for all age groups. Age, nature and other characteristics of the individual child also have an impact on how active a child is, and the type of activities they engage in.

Chapter 1 – Introduction

1.1 Defining ‘physically active play’

Play has been defined as ‘freely chosen, personally directed, intrinsically motivated behaviour that actively engages the child’ (NPFA, 2000). This research started with a definition of physically active play as:

“any physical activity where the child is doing what they want to do for their own reasons”.

This distinguishes physically active play from more structured physical activity where children are being instructed, rather than allowed to follow their own interests, or play that does not involve physical activity. However, during the course of the research it became clear that the latter part of this definition was hard to operationalise, as it was not possible to determine from observation a child’s motivation for undertaking an activity, or to separate out the role of staff in prompting or encouraging play. We therefore recorded as physically active play any physically active activity children engaged in during an observation period.

1.2 Background to the research

The Department for Culture, Media and Sport (DCMS), sponsors of this research, measure participation in physical education and school sport in England as part of the National School Sport Programme (which they co-own with the Department for Children, Schools and Families (DCSF)). DCMS consider that embedding an awareness of, and enthusiasm for, physical activity and play in early years is important in itself and to longer-term outcomes, but have identified that there is a lack of evidence relating to physically active play in early childhood settings. DCMS are also interested in gaining an insight into parents’ and early years practitioners’ views on physically active play and the importance it has for young children, as well as how physically active play is facilitated by practitioners and parents, and what play resources and behaviours encourage it. In order to fill some of the gaps in the evidence base, in early 2007 DCMS asked Play England to undertake a research project on physically active play in early years settings, including a review of the existing literature and some settings-based primary research.

The National Children’s Bureau’s Research, Evidence and Evaluation Department was asked to undertake the research on behalf of Play England. The research focuses on the extent to which young children, from birth to five years old, are involved in physically active play whilst in early childhood provision. It explores factors in the child’s environment, relationships with others and adult attitudes that affect the extent to which children attending provision play in physically active ways.

1.3 The policy context

Government guidance relating to early childhood settings highlights the importance of play. Sections 39-48 of the Childcare Act (HMSO, 2006) introduce the Early Years Foundation Stage (EYFS) which brings together Curriculum Guidance for the Foundation Stage (DFEE, 2000), the Birth to Three Matters (DfES, 2002) framework and the National Standards for Under Eights

Daycare and Childminding (DfES, 2003), with the aim of supporting providers in delivering quality integrated early education and care for children from birth to age five.

In September 2008 the EYFS will become mandatory for all schools and early childhood providers registered with Ofsted, and providing care for children aged birth to 5 years old. At the time of carrying out fieldwork for this project the settings were still working with Birth to Three Matters and Foundation Stage guidance, but were looking to adapt their working practice to the EYFS in the coming months. However as EYFS incorporates both of these frameworks and builds on them, it is therefore useful to look primarily at the EYFS for the purposes of this report.

Looking at the relevant guidance relating to physically active play and the creation of environments that encourage it, the EYFS builds on the principles in The Statutory Framework (DCSF, 2007a):

“The physical development of babies and young children must be encouraged through the provision of opportunities for them to be active and interactive and improve their skills of coordination, control, manipulation and movement”.

Six areas are covered by the early learning goals set out in the framework, one of which relates to children’s physical development: by the end of the EYFS children should be able to move with confidence, imagination, control and coordination and travel around, under and through balancing and climbing equipment and also use a range of small and large equipment and tools. The early learning goals also state that children should be given opportunities to play and be creative in a physically active manner such as music, dance, role play and exploring their senses.

Outside space is not a legal requirement for settings under the EYFS. However, the framework does state that wherever possible there should be access to outside space and that when this is not possible children should be taken out on a daily basis. The Children’s Plan (DCSF, 2007b), includes £235 million of new government funding to create more and safer places to play and encourages the promotion of outdoor play where children can learn how to manage risks. The national play strategy outlined in the Plan will be cross-departmental, led by DCSF and DCMS, with significant engagement from Communities and Local Government (CLG) and the Department of Health (DH).

Objectives of the Children’s Plan include securing the health and well-being of children and young people, and safeguarding the young and vulnerable. DCSF has announced that it will work with communities to create new and safer places to play and safe routes to play areas, and to provide positive structured activities for younger children. The Plan states that:

“Supervised and unsupervised outdoor activities are important for children’s development and also to reduce obesity, build social and emotional resilience, develop social skills, strengthen friendships, help children learn how to deal with risks – and of course because children enjoy them” (DCSF 2007b: 28).

Government guidance relating to physically active play emphasises the importance of the environment provided by practitioners. Play England, sponsors of this research, start from the viewpoint that:

“all children and young people in England need to have regular access and opportunity for free, inclusive, local play provision and play space”¹.

Best Play, produced by the Children’s Play Council (the fore-runner to Play England) in 2000 in partnership with the National Playing Fields Association and PLAYLINK looks at how children benefit from play opportunities; how play services and spaces can provide these benefits; and how they can show that they are providing them. The report states that:

- All children should have access to rich and stimulating environments that are free from unacceptable risk and thereby offer children the opportunity to explore both themselves and the world through freely chosen play.
- Children want and need to take risks when they play and therefore provision should respond to this by providing a stimulating, challenging environment for exploring and developing their abilities.
- Provision for play should provide a varied and interesting environment, with things at different levels, spaces of different sizes, places to hide, trees and bushes as well as things that have been made.
- Children should experience challenge in relation to the physical environment, and opportunities for running, jumping, rolling, climbing and balancing.
- The use of natural elements in play, such as digging and experiencing the seasons through outside play should be encouraged, along with using natural and fabricated materials to do, for example, cooking, building dens and using tool. (NPFA, 2000)

Best Play links the provision of play environments to the development of many of the skill acquirements included in the EYFS and Children’s Plan as outlined above, and suggested that play is an essential part of enabling young children to be physically active and develop the skills outlined in the EYFS.

1.4 Research aim and objectives

The aim of the study was to assess the extent to which young children are involved in physically active play whilst in early childhood provision, and identify factors that affect this.

The objectives were to assess:

Parents

- parents’ conceptualisation of physically active play (ie what they understand this to mean)
- understanding of the importance of physically active play to children’s enjoyment, development and learning, health and well-being
- what parents do to encourage their child to play in physically active ways
- how parents react to children’s spontaneous physically active behaviour.

Children

- children’s views on physically active play
- children’s activity levels during the time spent in early childhood provision.

Staff in early years settings

- staff’s conceptualisation of physically active play (ie what they understand this to mean)

¹ <http://www.playengland.org.uk/Page.asp>

- understanding of the importance of physically active play to children's enjoyment, development, learning, health and well-being
- what staff do to encourage the children in their care to play in physically active ways
- how staff react to children's spontaneous physically active behaviour
- the effect of timetables, structures and resources on children's physically active play
- interpretation of relevant standards and targets.

Environment

- the extent to which children's choice of physically active play is related to the physical environment and resources available to them
- the extent to which children's choice of physically active play is related to the freedom of choice they have and the time they are given for free active play.

1.5 Methodology

Overall approach

This was an exploratory study in which the main methodological approach was observation of children in a small number of pre-school settings, triangulated with descriptive data on the environment and adult (parent and staff) perceptions.

Pilot

The methodology was developed through an iterative process. The NCB research team undertook informal observation in two pilot sites, as well as consulting with staff and parents, and then used this experience to inform the development of the research tools, which were tested again before being finalised.

Settings and sample

In order to get sufficiently rich data for in-depth and contextualised understanding, the research took place intensively in three settings in one inner London borough. Settings were selected to provide varied research environments, but all provided a mixture of structured and unstructured activity. The research team spent two to three weeks in each setting.

Given the focus and methodology of project, the research focused on children who are old enough to be independently mobile (ie crawling and older). Up to seven children were selected in each setting (19 in total). The sample was stratified as far as possible to give an equal number of children by gender and in younger (birth-three) and older (three-five) age groupings, as well as to reflect the diversity of children in each setting, including attendance patterns (full or part time), special educational needs, ethnic origin and social background.

Observation

15 minute observations were undertaken by two researchers, one collecting quantitative and one qualitative data, to obtain a detailed record of activity patterns in relation to time, environment, interactions and other factors. 130 observations were completed (an average of seven for each child), across a range of days and times.

Quantitative data were collected using a grid on which researchers marked types of physically active play or activities taking place in one minute periods (i.e. ticking all activities observed in the first minute of observation period, then the same for the second minute etc). Qualitative data were collected simultaneously by another researcher, who completed a narrative description of the context for the activity (weather, equipment available etc), a description of activity taking place during the observation period, and post-observation reflections.

Interviews

Semi-structured interviews took place in each setting with managers, and with a parent and keyworker of each of the 19 children in the study.

Parent and keyworker interviews were designed to gain an understanding of their approach to their child's opportunities for physical activity and the child's activity levels, as well as their conceptualisation of physically active play. Manager interviews, and to a lesser extent keyworker interviews, also explored the culture of the setting, and understanding and interpretation of relevant standards and targets. In the report both managers and keyworkers are referred to as 'staff'.

Environment

At the start of fieldwork a detailed description of each setting was made, in order to describe the physical nature of the environment and the resources available to the children. This information was then triangulated with observation data and the adult interviews.

Quantitative analysis

Observation data were analysed using SPSS statistical software (version 15.0.1 for Windows). Following data entry and data cleaning, extensive recoding was undertaken in order to transform data for separate minutes into observation-level and child-level variables. Subsequently, demographic variables and others derived from qualitative data completed the dataset.

Simple descriptive statistics (percentages and means) are reported where most relevant for all observations at various levels:

- individual children (aggregating data from their respective observations),
- settings (aggregating data from all children observed within each setting)
- types of physically active play (for example walking, running, digging; with/ without equipment)
- location (inside/ outside).

We have generally not reported comparisons by age group or gender. The numbers involved in a sample of 19 children do not support such sub-group analysis. In addition, because children were chosen as representative of the range in each setting in terms of gender, age-group, attendance pattern, ethnicity, SEN and time/day of observation, sub-samples were not matched between settings on demographic criteria.

Qualitative analysis

Data were analysed using the software package QSR NVivo version 7. The various types of data (interview transcripts, site assessments and observation record sheets) were formatted and uploaded into the software.

A coding frame of key categories was developed, some derived from the project's objectives and others emerging from initial exploration of the data. All data were assigned to the relevant codes, and the ordered data was then reviewed for in-depth interpretation.

Chapter 2 - Literature Review

2.1 Introduction

This chapter explores the literature on physical activity and physically active play, focusing where possible on young children (birth – five years) in early childhood care. Section 2.2 outlines the methods used. We then explore definitions of physical activity and physically active play and the literature on levels of physical activity is considered before looking at factors that affect levels and types of physical activity. The articles reviewed identified a number of factors affecting physical activity in young children. These are categorised into social factors; cognitive, behavioural and demographic factors, and environmental factors. The literature on the benefits of physical activity and why physically active play is seen as important is considered, and interventions that have been suggested to help make children more physically active are then briefly explored.

2.2 Methods

The aim of the literature review was to build as comprehensive a picture as possible of the evidence on physically active play in early years settings. This review did not adopt the methodology of a systematic review but was informed by a clear set of parameters, inclusion criteria and a transparent method for conducting searches, assessing and analysing the information collected. It is important to note that the majority of the literature is from North America, so caution is needed in relating the findings to children in Britain.

A broad search of relevant databases and key journals was conducted including ChildData, BL inside, Pub Med, and Google Scholar, and general internet searches were used to identify grey literature. Initial searches were screened for relevance to one or more of:

- definitions of physical activity and physically active play in early years
- measurement of physical activity in children
- factors affecting physically active play
- benefits of physically active play.

Only articles since 1990 were included, and only those published in English, but these included articles from Britain, America, Canada and Europe.

Identified articles were then checked for further references, summarised and key themes and associations drawn out and analysed.

2.3 What constitutes physically active play?

Physically active play is a complex behaviour and therefore is difficult to define simply. Livingstone et al (2003) defines physical activity as

“All locomotor physical activity, which involves large muscle groups to move the body around and to apply force to objects” (2003: 682)

A distinction is drawn in some texts on children's play between free play experiences and fitness and motor skills developed through instructional classes. Although our study focuses on unstructured physically active play, it was difficult to maintain this focus in the literature review since not all texts distinguish between free play and instructional physically active play, or between play and other forms of exercise or physical activity. Levels of activity are sometimes measured by increases in heart rate and other biological indicators, with little description or discussion of the actual activity taking place.

Bob Hughes (1996) suggests 15 types of play, some of which refer specifically to physically active play. They include:

- 'Rough and tumble play'- Close encounter play which is less to do with fighting and more to do with tickling, gauging relative strength, discovering physical flexibility and the exhilaration of display. This includes for example playful fighting, wrestling and chasing where children involved are obviously unhurt and giving every indication that they are enjoying themselves.
- 'Locomotor play'- Movement in any and every direction for its own sake. For example chase, tag, hide and seek and tree climbing.

Pellegrini and Smith (1998) identify three types of physically active play - rhythmic stereotypes, exercise play and 'rough-and-tumble' play. They suggest that rhythmic play peaks in infancy, exercise play during the preschool years and rough-and-tumble play peaks in early childhood. Rhythmic stereotypes involve gross motor movements, and are without apparent goal or purpose. Examples would be foot kicking and body rocking. Exercise play begins at about the age of one and can be social or solitary. They define it as involving gross motor movements, such as running and jumping. Rough and tumble play includes behaviours such as wrestling, grappling, kicking and tumbling, and always involves social interaction.

2.4 Measuring physical activity

Two main points stand out from the research on physical activity patterns. The first is that not much is known about the activity levels of children in early years settings (Brown et al, 2006; O'Connor and Temple, 2005; Pate et al, 2004; Fulton et al, 2001; Pate, 2001). The second is that, from what research exists, children do not seem to be engaged in a great deal of vigorous or moderate physical activity.

The paucity of literature is partly explained by the fact that little research has focused on activity levels in early years settings. But in addition different ways of measuring physical activity have been used without a consistent methodology across the studies, some not taking into account the intermittent nature of children's play activity, and a variety of behaviours have been measured as physical activity. Furthermore, when studies have been carried out they have often been small scale and not looked at wider social and environmental circumstances (McKenzie et al, 1997; Baranowski et al, 1993; Noland et al, 1990).

Many studies have measured physical play or physical activity using objective biological indicators of physical activity, including heart rate, energy expenditure and aerobic capacity. Measurement methods include heart rate monitors, motion sensors and the doubly labelled water method. Heart rate monitors measure changes in heart rate and are therefore a measurement of a *response* to activity rather than activity itself. They are not very useful in measuring low rates of activity. Motion sensors include accelerometers which are small computers that record minute-by-minute movement, and pedometers which measure the number of steps taken (see for example Boldermann et al, 2006). The doubly labelled water method measures energy expenditure. By adding isotopes to water and monitoring the changes

in the levels of these isotopes in the body, it is possible to estimate the body's metabolic rate and the quantity of calories burned during the monitoring period (for extensive discussion of these methods see Livingstone et al, 2003).

Other studies have used qualitative methods – interviewing, self-report, parent report and direct observation –looking more at what the children are doing, how often they are doing it and in what contexts. These studies tend to have a broader definition of what constitutes physical activity and have found higher rates of activity. However, it could be argued that the physical activities they record are not sufficiently intense to raise heart rate and therefore would not be captured in a study that used a biological method of measurement.

Turning to the levels of physical activity found by such studies, American studies seem to suggest that young children spend a large amount of their time engaged in activities of low intensity or where they are sedentary. For example, Pate et al (2004) measured activity in nine preschools using accelerometers. They found that children participated in only seven minutes an hour of moderate to vigorous physical activity, although activity at different preschools ranged from four to ten minutes an hour. An earlier study by Deal (1993) used heart rate monitors and logbooks to record physical activity in day care for children aged three to five. He found that very little time was spent in vigorous activity and that most time was devoted to sedentary or low level activity.

Despite a lack of clear evidence about levels of physical activity in the play of young children, there is an assumption underpinning some of the literature that levels of activity in play have decreased.

2.5 Factors affecting physical activity

As well as measuring how much physical activity occurs, and to some extent what types of physical activity, studies have also considered the factors that affect the quantity and quality of physical activity. The factors affecting physical activity in children have been categorised into three groups: social factors; cognitive, behavioural and demographic, and environmental.

2.5.1 Social factors

Parents

The role of parents has been considered by some studies. For example, parents have been observed to assess their encouragement of and involvement with their children when they have been playing actively.

Looking at parents as facilitators, Klesges et al's (1990) work explores how much parents interact with their children while they play and whether this affects activity levels. The study examined demographic, environmental and parent-child interactions correlated with physical activity in a group of preschool children in America. They found that increases in familial interaction were strongly associated with higher levels of physical activity in children.

The position of parents as role models has also been considered. Klesges et al (1990) found that parental obesity was associated with lower levels of physical activity in children. Finn et al (2002) study in America conducted with children aged three to five years found higher levels of activity in children whose fathers had a low Body Mass Index (BMI). Activity levels were assessed using accelerometers. Finn & Johannsen suggest that the father's BMI is a reflection of the father's activity level and that the correlation suggests that families may be exercising

together. They suggest therefore that increasing family activity could increase child activity levels. Moore et al (1990) found that there was a relationship between the physical activity levels of parents and those of their four to seven year old children. Children with two 'active' parents were six times more likely to be active than children of inactive parents.

Some studies have looked at the wider socio-economic status of the family. Kelly et al (2006), in their observational study of Scottish preschool children, found no correlation between low socio-economic status and lower habitual activity or higher engagement in sedentary behaviour. Some studies (for example Mulvihill et al, 2000) have looked at the attitudes of parents to physical activity and found a correlation between this and child activity levels, but there seems to be little research specifically on children under five in this area.

Overall parents' attitudes, biological characteristics and activities do seem to be associated with their children's level of physical activity but there is not enough systematic research to understand the relationship fully.

Teachers

More research has looked at the role of preschool staff in the levels and types of physical activity that children participate in. Research has shown that adults' presence affects the play patterns of pre school children in outdoor play. Taggart and Keegan (1997) looked at movement skills of five-year-old children in preschool settings and found that children continue longer in their physical activities when an adult is present, although these physical activities are ones which are designed to improve their fundamental movement skills, i.e. throwing, catching and kicking, rather than just running and jumping. Other research has found that preschool teachers' prompting of physical activity has a positive impact on levels of activity (McKenzie et al, 1997). Some researchers have found that children take part for longer in physical activities if teachers offer structured activities rather than leaving it up to the children to initiate activities (DeBord et al, 2002; Taggart and Keegan, 1997).

Dowda et al (2004) studied a group of three to five year old children from nine preschools and found that preschool policies and practices influenced children's physical activity. Higher quality preschools, defined as those that had more frequent field trips, fewer children per classroom, and college educated teachers, were associated with lower levels of sedentary behaviour and more moderate to vigorous physical activity.

2.5.2 Cognitive, behavioural and demographic factors

An important element in understanding children's activity in preschool may be to look at children's attitudes to and feelings about physical activity. However there seems to be little research on young children's attitudes towards physical activity. Mulvihill et al (2000) did assess this in their study but they were concerned with children between the ages of five and eleven.

Clark and Moss (2005) explored some aspects of outdoor play using the mosaic approach, which uses different research tools to explore and listen to children's views and experiences. The researchers explored what children thought about the outdoor play spaces in their nursery, how they used particular areas of the nursery outdoor space and what kind of activities took place. The information was then used to inform plans for future outdoor provision.

With the exception of Pellegrini and Smith (1998), who talk about changes in the type of play engaged in, our search found no literature which looks specifically at the way activity amongst preschool children changes as they age.

The issue of gender is more fully explored. Boys are often reported as taking part in more physical activity, or more of particular types of activity, than girls. For example Pellegrini and

Smith (1998) claim that boys participate in exercise play and rough and tumble play more often than girls. Boldermann et al (2006) found higher step counts in boys than girls of similar levels.

Pellegrini and Smith (1998) suggest that hormonal differences may explain these differences, with androgens, which are present in boys, predisposing them to more physical play. However gender differences may also reflect the impact of socialisation on children as they interact with parents, peers and teachers.

2.5.3 Environmental factors

The effect of the environment on amounts and types of physical activity is explored in some of the literature and the association between levels of activity and environment is well established. There seems to be a fairly well established link between outdoor play and increased amounts of physical activity. Indeed Doherty and Whiting (2004) suggest that the amount of time spent outdoors could be the most important factor in children's activity levels and Burdette et al (2004) also found that physical activity was significantly correlated to the time spent playing outdoors.

O'Connor & Temple (2005) found that caregivers cited a lack of space for gross motor movements in family day care as a constraint on physically active play, and said that the weather affected whether and how children were able to utilise the available outdoor space. Childcare workers felt that parental restraints also affected the amount of activity children did. For example parents were worried about the safety issues involved in a trip to the park. Lack of resources, training, time and 'rules' were also seen as limiting factors in children's physical activity. For example, many caregivers did not allow running or throwing indoors.

Finn & Johannsen (2002) found that the early years setting a child attended was a strong determinant of physical activity in the children studied. They conclude that restricted or decreased space in childcare settings may restrict movement, combined with lack of time devoted to physical activity.

Bolderman et al (2006) looked at environmental factors within preschool settings in Stockholm. In particular they looked at whether different outside environments increased levels of physical activity. The children in the study were aged four to six years old. They used step counters to measure physical activity and concluded:

“spacious preschool environments with trees, shrubbery and broken ground trigger physical activity in outdoor play”.

Pate et al (2004) conclude that preschools policies and practices have an important influence on overall activity levels.

Ward et al (2006) found that children in childcare centres in North Carolina that allotted more time for free and structured active play had higher average physical activity levels than those in centres that provided less time for active play. Those centres that were graded highly on the quality of their policies, practices and environments also had higher levels of moderate to vigorous physical activity.

Sallis et al (1995), in an American study which tracked variation in physical activity over a two-year period, found that activity is not constant over time but is affected by the time of the day, the day of the week, the month and even the year, making levels difficult to measure. They argue that variance in children's activity in two different settings was accounted for by differences in the psychological, social or physical environment:

“Analyses of the correlates of physical activity in young children indicate that transient environmental factors, such as being outdoors and being prompted to be active, are the strongest correlates of physical activity”. (Sallis et al, 1995)

They conclude that because the influences that affect children’s activity levels are transitory, children’s physical activity levels are modifiable behavioural states rather than traits, which are resistant to change. Other research supports this. However, Wilkin et al (2006) suggests that children’s activity levels per day are predetermined by their individual genetic make up, and that altering the environment or trying to introduce activity regimes will not change their overall activity level. He argues it may encourage more of one type of activity, such as walking to school, but the child will participate in less activity at a later time.

2.6 Benefits of physical activity

There is a consensus across the literature that physical activity is beneficial, although there is conflicting evidence about the actual benefits of physical activity in children.

Much of the literature focuses on beneficial links between physically active play and obesity. Moore et al (2003) conclude that there is strong support for the hypothesis that higher levels of physical activity during childhood lead to the acquisition of less body fat by the time of early adolescence. They argue that high levels of physical activity beginning in the preschool years may delay the onset of the period of rapidly increasing body fat that usually occurs between the ages of four and six years of age.

Wells and Ritz (2001) found that higher skin fold thickness in childhood was associated with lower levels of activity. Davies et al (1995) also found that low levels of physical activity were associated with increased body fat. Some studies, such as Vanderwater et al (2004) and Reilly et al (2006) have also found that higher levels of television viewing are associated with increased weight.

However other studies have found no relationship between activity and obesity (Bar-Or and Baranowski 1994; Riddoch and Boreham, 1998) or between television viewing and increased weight (Du Rant et al, 1993). Livingstone (2003) argues that even if a relationship is established, it is not clear whether obesity is due to decreased activity levels, or vice versa.

Physical activity is also seen as having other benefits in the literature. It is regarded as beneficial for social, psychological reasons and also because it instils good habits for adulthood (Booth, 2001; Corbin et al, 1994). Livingstone (2003) agrees that the benefits for children’s mental well-being and self-esteem are proven. However most studies that have shown psychological benefits have been studies of children older than five, for example Steptoe and Butler (1996) found that emotional wellbeing was positively associated with the extent of participation in sport and vigorous recreational activity among adolescents.

Pellegrini and Smith (1998) argue that play not only confers benefits in terms of fitness but also that physically activity play serves a developmental function. They say that rhythmic play in babies and very young children may improve motor control. Exercise play helps improve strength and endurance, and provides cognitive benefits.

Bailey et al (1995) also argues that there is evidence that physical activity and play have other physical benefits, leading to increased bone density and mineralisation and helping to regulate blood pressure. Ginsberg et al (2006) state:

“In contrast to passive entertainment, play builds active healthy bodies..”

2.7 Increasing physical activity levels in children

As noted earlier, some studies have shown decreasing levels of physical activity (eg Pate et al, 2004; Deal, 1993) although there is little clear evidence there is an underlying assumption within some text that levels of physically active play have fallen. Some of the literature explores why physical activity levels may have decreased. Ginsburg (2006) argues that the pressures of modern life have reduced the amount of time that children can participate in free unstructured play. He cites organised after-school activities, pressure to achieve academically, lack of safe spaces to play, two parent working households and the pressures of the work life balance as possible causes.

Doherty and Whiting (2004) echo these concerns. They argue that children's declining levels of physical activity are a result of a variety of factors: parental concerns over letting their children out to play due to traffic and perceived threats from strangers; children adopting parent's inactive lifestyles and being ferried about by car; increased TV viewing and computer use, and educational practices which have put teachers under pressure to concentrate on children's literacy and numeracy skills at the expense of physical development.

Physical activity then has come to be seen as something which should be encouraged and various initiatives have been applied to increase levels of physical activity. Within a school environment, physical activity has become part of the Early Years Foundation Stage and is recognised as an important part of education.

Rippe et al (1993) suggest that play may be the most natural way for children to be physically active, and Ginsberg et al (2006) note that it has been suggested that encouraging physically active play may be an exceptional way to increase physical activity levels in children. Burdette and Whitaker (2005) argue that free unstructured play is disappearing from children's lives and that efforts to increase physical activity in children might be more successful if physical activity was promoted as play.

Fox (2004) however suggests that researchers need to look beyond play when considering how activity impacts on a child's life. He suggests that recent research using accelerometry provides insights into how all aspects of a child's life expend energy. He argues that school routines and policies, parent's attitudes, and the neighbourhood environment all impact on a child's physical activity.

So far the success of most interventions designed to increase activity has been measured in terms of whether the children participating lost any weight. A Scottish study conducted by Reilly et al (2006) found that when an enhanced physical activity programme was introduced together with a home based health education plan there was no reduction in body mass of participating children. They emphasise the importance of initiatives beyond school settings:

"Time in nursery is limited and there is pressure on the curriculum. Successful interventions to prevent obesity in early childhood may require not just changes at nursery and home but in the wider environment". (2006: 5)

They argue that although there can be no question that obesity in young children has increased, there is very little evidence of successful interventions, in terms of physical activity programmes which decrease weight. One exception is Gortmaker et al (1999) who attribute the loss of weight in their trial to reduced time spent watching television.

In 2003 Reilly and McDowell conducted a systematic review of the studies that had been conducted up to that point, which looked at physical activity interventions aimed at reducing

obesity. They found that most studies were short term and small scale, and only three studies met their criteria for randomised trials (Epstein et al, 2001; Muller et al, 2001; Sahota et al, 2001) However all these trials looked at children older than five. They failed to find a significant impact on obesity A later review by Flodmark et al (2006) however, reported more positive results, with 41 per cent of the studies they looked at showing a positive preventative effect of physical activity on obesity.

Fox (2004) agrees that the evidence base for the effectiveness of increasing activity or reducing time spent sedentarily for the prevention and treatment of obesity is limited.

2.8 Conclusions

There is a large literature on physical activity as associated with obesity and a significant literature examining the benefits of physical activity for both adults and children. However there is less literature that focuses on the age group birth – five years and which focuses on what kinds of activity this age group are undertaking.

The articles reviewed identify a number of factors that seem to affect the physical activity levels of young children. Higher levels of physical activity seem to be associated with family and social support, and activity friendly policies in preschool provision.

Higher levels of activity also seem to be associated with outdoor environments

Overall the debate around young children and physical activity has been rather overtaken by the worries about increases in childhood obesity

The review identifies gaps in literature relating to how parents' and teachers' interactions with children encourage or inhibit physical activity; attitudes to activity among parents and young children, and how environment impacts on different types of activity. There is also a need for more research using comparable measures of physical activity in young children, and more analysis of what *kinds* of activity children are engaging in and in what contexts.

Chapter 3 - The role of services and parents in physically active play.

3.1 Introduction

The previous chapter noted that factors such as environment and parental and staff attitudes can influence the amount of physical activity undertaken by children. This chapter addresses these issues through data from the interviews conducted with parents, managers and keyworkers, and also from the site assessments we carried out at the start of fieldwork in each setting.

Section 3.2 sets the scene by giving a brief profile of each of the three settings in which we observed children's play. In section 3.3 we explore parents' and practitioners' conceptualisations of physically active play, the reasons they give for any value attributed to physically active play, parents' comments about their levels of physical activity as children, the types of physical activity they do now within their families, and the attitudes of both parents and staff to risk. In section 3.4, we move on to look at the settings in more detail, exploring how they provide for physically active play in terms of the physical environment and the play equipment available, and this section ends with parents' views about physically active play within the settings. Section 3.5 examines how staff relate policy to their practice in the settings, and section 3.6 summarizes the key points made in this chapter.

3.2. Profiles of settings

This section sets the context of the fieldwork with a brief profile of each setting. As mentioned in Chapter 1, in order to get sufficiently rich data for in-depth and holistic understanding, and since this was an exploratory study which did not set out to look at geographical variation, the research took place intensively in three settings in one London Borough. The three settings provided a mix of structured and unstructured activity and are varied in terms of the type of service and physical environment. We spent between two and three weeks in each setting.

3.2.1 Setting A

This setting was a local authority maintained children's centre, attached to a primary school. It served a diverse area that had pockets of both affluence and poverty. The centre was open from 08.00-18.00 each weekday for 49 weeks of the year, and offered a range of family support services. The approximately 40 staff included members of the family support team. There were around a hundred places at the centre and at the time of fieldwork, it was about 80-90 per cent full, as some children were still being enrolled or settled in at the start of the new term. The setting supported a number of children with special educational needs. There was a range of ethnic minorities in the setting, and a large number of children with English as an additional language, the largest minority groups being of Turkish and Somali origin. When we visited, the setting was preparing to move to a new, purpose-built centre the following spring.

Layout and design

The setting had nine rooms that children could use. There were six 'base' rooms (all children were allocated to a base, in the way secondary school children are allocated to tutor or form groups), arranged around a communal area in pairs with communicating door between them. Having bases set up in pairs was a relatively new arrangement, and a watchful eye was being kept by staff on whether it was affecting children's use of inside space as previously they had

been able to move freely between all the rooms. There were also two changing and toilet areas, and a resource room. Two rooms were designated for the children who were less than three years old. The base rooms had some designated areas such as home corners (which contained play cookers and washing machines, for example), and areas for reading or listening to stories. There was also a large communal space in the middle of the centre. There were two climbing frames inside the building, one in the room for younger children and one in the communal area.

The centre had two outside spaces, one for younger children leading off their base rooms, and the other for the children aged three years and over, which was also used occasionally by younger children. Both these outside spaces contained sandpits, beds for gardening, and climbing frames. The playground for older children was a large, concrete area which was formerly a school playground. Both outside spaces had natural areas which provided seating and shade, as well as some private spaces (eg play houses and tepees) and sheds containing bikes and other equipment. Five of the six key base rooms in this setting had a door directly to outside space; the other base room had an outside door near by.

3.2.2 Setting B

This was also a local authority maintained children's centre, standing in its own grounds in a large housing estate. The centre was open from 08.00 to 18.00, Monday to Friday, for 50 weeks of the year. There were roughly 20 members of staff, working a mixture of part-time and full-time hours. The centre had places for around 50 children and all these had been filled when we carried out the fieldwork. A third of the places at the setting were for children referred by the local authority Children in Need panel, and several children with special educational needs attended the centre. There was a range of ethnic minorities amongst the children and the majority came from less advantaged backgrounds. At the time of our fieldwork, the centre was undergoing extensive building work, which meant that certain areas were not in use.

Layout and Design

There were two large rooms in an L-shape, both with toilets and changing areas, linked by a central communal space, near a staff room. The smaller of the two rooms was for children aged under three, and had a small sleeping room at the back. Although the rooms were designated for the two different age groups, children were allowed to move freely between them and use the communal space, though this was restricted during structured group times for the older children. In terms of designated areas within the rooms, there was a sand corner in the room for the children under three, home corners in both rooms, and areas for story time. The room for older children also had a computer, set up with children's seats in front so small groups could work together.

Originally it had been intended to divide the setting into a number of small rooms, but instead it had been opened up into larger areas to encourage the children to move around freely.

There was a purposely designed garden and play area alongside the building, and there were doors to the outside from both rooms and the central space. Children and parents from the centre had collaborated on the design of the outside space, including spending a weekend putting in all the plants. The building had an overhanging roof, which partially covered a play space that had a safe playing surface. This provided a transitional area, so that children were able to move gradually from inside to outside. The play area led to the garden, which had paved paths that children could ride along on bikes, a variety of plants and areas for gardening, a sand pit and a water feature (although this was not working during our fieldwork).

3.2.3 Setting C

This was a private nursery set over three floors of a converted house. The nursery was open from 07.30-18.30, Monday to Friday, for 51 weeks of the year. There were 12 members of staff, and the nursery had places for about 80 children. There were over 50 children registered at the setting when we visited, with an average of 35-40 attending in any one day. None of the children attending the setting were identified as having special educational needs. The majority were White British/European, with several different languages spoken as first languages.

Layout and Design

The rooms in the setting were allocated according to peer groups. The babies used four small rooms on the second floor. Children aged from about 15 months to two years used similar rooms on the first floor, with childproof gates on the main doors to the stairs. These rooms included an area for eating meals and an area for sleeping. There was also a small climbing frame in one of these rooms. The older children used four rooms on the ground floor. The large main room had two areas, one of which had a home corner, and various toys and activity tables; the other had an area for preparing food, and was also carpeted so children could sit and listen to stories. The other three rooms were: the room where children had lunch and snacks, and also did some structured craft activities; the sleep room, which was sometimes used for story time; and the room which was used for numeracy activities.

There was also a very small yard leading off the largest of the downstairs rooms through French windows. This yard was decorated with a brightly coloured mural, and contained plants and shrubs, a Wendy house and a covered ball pool. Outside equipment, such as hoops, balls, bikes and trikes, was stored in the Wendy house for children to take out when using the yard.

3.3. Attitudes to physically active play

This section explores the attitudes to physically active play of parents and staff at the settings. When conducting the interviews we asked people for their own definitions of physically active play. Following this, we discussed with them our working definition, as mentioned in Chapter 1:

“Any physical activity where the child is doing what they want to do for their own reasons.” (NPFA, 2000)

As mentioned in Chapter 2, there is evidence that parents' and staff's attitudes influence the amount of physically active play done by children. We also wanted to explore interviewees' attitudes to risk in relation to physically active play, given that the Children's Plan (DCFS, 2007b) encourages the promotion of outdoor play where children can learn how to manage risk. So section 3.3.1 explores the initial definitions given by staff and parents; section 3.3.2 focuses on their views about the general importance of physically active play; section 3.3.3 discusses parents' comments about their levels of physical activity as children; section 3.3.4 explores the types of physical activity they do now within their families; and section 3.3.5 examines the views of parents and staff about risk in relation to physically active play.

3.3.1 Definitions of physically active play

Parents

When defining physically active play, although there was mention of it being about general movement, parents mainly talked about types of activity eg walking, running, climbing and so

on. Parents spoke about the outdoors: both in definitions of physically active play, and in terms of their children loving or preferring to be outside:

*“It means mostly outdoor play I would say, climbing, running, jumping, that kind of thing.”
(Parent of boy aged four)*

Some parents saw physically active play as directed by the child: it is about them doing what they want to do.

One parent talked about a course that she had been on. This had greatly changed her views. When defining physically active play, this parent said that now she realized the importance of allowing her son to express himself through his play, and of joining in with him.

Staff

Staff talked about physically active play more in terms of movement. There was a range of ways of talking about movement.

- Those who said it was using the whole body in play and performing any kinds of movements for example:

“experiencing things and just playing and just exploring the environment with the whole body from head to toe.” (staff member)

- Those who defined it as mainly large movements, such as running.
- Those who talked in terms of gross motor skills and fine motor skills, such as painting and drawing.

Exploration of the world and self-expression through physical activity was also a key feature of physically active play for staff. Space was seen as important: children having enough space to move around and try out different movements.

3.3.2 Importance of physically active play

Parents

Parents felt that physically active play was important for the following reasons:

- having the opportunity to choose what to do
- developing independence and autonomy
- learning how to interact with others
- good for health eg keeping fit, getting fresh air
- opportunity to ‘let off steam’
- pleasure
- developing physical skills.

One parent (of an eleven-month-old boy) pointed out that levels of physical activity provide a gauge of his child’s health: the child is usually highly active, and if there is a decrease in this, his parents can tell immediately that he is unwell.

Physically active play was felt by parents to have a range of effects, from making children laugh and smile more, to calming them down. Parents were often aware when their child had not had sufficient physical activity, as they may have slept less well, or seemed grumpy or frustrated.

Staff

Staff thought that physically active play was important for a variety of reasons.

Some took a holistic view, seeing physically active play as important in terms of children relating to their body and what various physical sensations feel like:

“I think that if you don’t have the physical experiences then I think you can be somewhat lacking in exploring, well you haven’t explored your whole being so therefore you’re quite not at home in your own body.” (Staff member)

Other reasons were:

- Children need to play in order to burn off energy or they become restless and cannot focus.
- Children play for fun and pleasure.
- It is good for children’s general health and for developing particular skills.

Staff also talked about physically active play as an opportunity for children’s learning:

- exploring what their bodies could do and how this felt
- developing new physical skills
- exploring the world, particularly in outside play
- learning in different areas of the curriculum, eg how to interact with others.

3.3.3 Parents as children

Given the common view that children today are less active than those of previous generations, we were interested in parents’ own experiences of physically active play as children.

It was difficult for parents to assess how their physically active play compared with that of their child. Parents pointed out that it was difficult to have accurate memories of their physical activity when they were their children’s age, ie under five. Parents who had grown up in different social contexts from their children, such as different countries, or types of community, also felt unable to compare themselves to their children. For example, one interviewee, interviewed via an interpreter, who had grown up in Somalia, had particular problems applying the concept of physically active play to their own childhood. Another parent was a wheelchair user until the age of 16 and was very active, in wheelchair sports, but did not feel that is comparable to what their child does.

Overall, though, parents generally thought they were **less** active than their children. A variety of explanations were given for this: limitations on physical activity coming from their own parents; feeling they had been more cautious than their own child; and the mother of a boy who thought that boys were inevitably more active than girls

3.3.4 Family physical activity

When describing the types of physical activity they do with their families, parents particularly talked about visiting the local park or other green space such as a football field. Trips to the park were used in various ways:

- for walking
- playing football or other ball games
- riding bikes
- using play equipment that was not available at home.

Many of the parents did not have outside space such as a garden or yard at home, so the park was seen as offering much needed space for children to run around. Barriers preventing the use of the park were the weather, and having other small children which made getting there difficult.

The interpreter for the Somali parent also indicated that many North African parents she worked with said that they did not like to take their children outside to play in the winter as it was too cold, and this was reiterated by the parent she was interpreting for.

Parents also talked about limited indoor space affecting their children's physically active play, such as living in flats, although what space there was could be well used eg using a long corridor to practise ball skills. Two mothers who were heavily pregnant talked about their pregnancy limiting their participation in their children's play, saying that they were unable to run about or play active games at that time.

Other types of physical activity that parents spoke about were swimming, gardening and dancing. The latter was particularly important to a parent from South America, who was teaching her children to salsa. One parent of a baby spoke about massage being part of the physical activity they do with their child.

Parents seemed aware that family could be an important influence on children's physical activity. They talked, for example, about having come from backgrounds that emphasised physical activity, and the importance of children playing with or copying older siblings when taking part in physically active play.

3.3.5 Attitudes to risk and challenge

Parents

Amongst parents, there was a widespread attitude that risk is inevitable, that taking risks is part of the learning process and that minor injuries (bumps, grazes and bruises) are a normal part of being a child. Taking risks was seen as important as part of learning about how the world works. This is not to say that parents did not worry, but they were also aware that it was something they had to come to terms with.

Parents managed their concern and anxiety about their children taking risks in various ways:

- by closely supervising their activities, to assist if their child was in difficulties or asked for help
- by reassuring themselves and rationalising the level of risk, eg:

"I know I've got a threshold and I can worry very easily, so whenever I sense something is OK but I'm just the one worrying for nothing, I will try and take a step back." (Mother of a one-year-old girl)

- giving warnings such as not to touch in the case of a hot iron
- setting boundaries for example letting children climb on a fairly low sofa but not on to a table, or very occasionally, vetoing certain activities.

In terms of types of activity, climbing was the one most often used as an example of possibly risky or dangerous activity. Parents of very young children also had some concerns related to their children being injured falling over.

Parents were happy about the management of risk in all three of the settings. There were a small number who said they had had concerns early on, when their children came home with scratches and bruises. This was particularly true when the child was their first-born and the parent had no experience of the behaviour and activities of small children. But over time their concerns lessened as they seemed to get used to the minor injuries and nothing more serious happened.

There was a great deal of confidence expressed in the staff in all three settings, in terms of:

- having enough staff around to ensure safety in the playground

- staff answering parents' questions and reassuring them about their child's safety and development
- feeling that staff relationships with children would add to their child's safety.

"Especially, she talks about her special teacher and ... he takes care of them so she feels more confident around him." (Parent of a girl aged three)

Staff

It was common for staff to think that children need to take some risks to learn and will inevitably have minor accidents and injuries. This was felt to apply particularly to younger children who are still acquiring concepts of risk and danger. It was also felt that overcoming fear and accomplishing a risky feat boosted children's confidence.

Opinion was mixed on how capable children are of assessing their own physical limitations with regard to risk. Staff mainly thought children could be trusted to know what their limits are, but there was also a view that some children do not know their limits and can be overconfident, especially the youngest children.

Staff said they had to balance the importance of individual children taking risks in order to challenge themselves and develop their abilities, with the needs of other perhaps younger or less able and confident children who were in the vicinity. They managed this through:

- having plenty of staff around and a good staff to child ratio
- setting limits where necessary, especially for younger children
- encouraging children to ask for help when they need it
- providing safety equipment eg mats
- doing risk assessments on activities and equipment.

3.4. The approach to physically active play in the settings

This section focuses on the general approach to physically active play in the settings. We look at how the settings structured their days and how they provided for physically active play in terms of play equipment and the internal and external layout.

3.4.1 Structures and systems

Settings A and B had similar structures in place for children aged over three years old, in that both settings had structured group times when the children had to be in their base room. In Setting A, children registered themselves in their base room when they came in, and then could go outside if they wanted to from 9.45 or thereabouts, until 11.30 when they came in to their base before having lunch. Setting A also had group time in bases in the afternoons, from 13.30 to 14.15, which was generally a structured activity. In Setting B, children could go out as soon as they had told their keyworker that they had arrived in the morning. Base times for them were generally between 11.30 and 11.45 and about 3.00 until 3.15 pm. These base times were usually group activities, such as listening to a story, or singing a song. From observations they also seemed to be a time for settling the children down before lunch or being collected by parents. The younger children in both settings did not have such structured group times, their time was mainly spent in free play.

As the children were organised according to age group in Setting C, most of the children's activities took place within their peer groups. At times this included story time, or other staff-led, structured activities, but these were not formally referred to as group time in the way that they were in the other settings. There were set snack times at 9.30-10.00 am and then at 2.00-2.30

pm. Lunch was from 11.00 to 11.45. The children had tea between 4.00 and 4.45 pm and then could play freely until collected by their parents. After 5.30, any children still at the setting were brought in to the main ground floor room, with supervised access to the yard. They played here until they were also collected by their parents.

3.4.2 Free flow and choice

Whilst the importance of physically active play was stressed in all three settings, there were some differences in their apparent approach to this. In Settings A and B, the importance of children being able to 'free flow', that is to move independently and freely, within and between inside and outside space, and to choose which activities to engage in, was emphasised:

"I love how it is, the free flow, I think it's fantastic and they can just do what they want. We put out activities for them but, and they use the activities how they want to use it."
(Staff member, setting B)

Emphasis was placed on the importance of children being able to exercise choice over what they did and where they went, and to do activities at their own pace. Staff at Setting B talked about that setting having the ethos of a traditional nursery school, with an emphasis on outdoor play and 'free flow'. For both Settings A and B, free flow was a key part of their approach to physically active play. This seemed particularly true for the staff who worked with children aged under three years in Setting A:

"If we're talking birth to three, we don't tend to have a structure as such. It's basically free flow play. So there are activities going on inside that are adult led but child initiated, we observe the children to see where their interests lie, so we'll do an activity that goes with that interest. So we'll have somebody inside doing an activity, somebody would be outside doing an activity, and the children are free to go to whichever activity they want to go to. Or just free to access any of the equipment as they choose if they don't want to do an activity." (Staff member, Setting A)

As noted above, in both settings the day was structured so that most of the time could be spent as children determined. During these times there were some adult-led activities, which children could choose to engage with, for example an adult might lead a craft activity. As well as having set times for meals, both settings also had some structured group time. An example of this would be an activity called Jabadao², that was offered at Setting B. Jabadao is a dance-based activity, which is about enjoying and exploring the variety of movements that the human body is capable of. It emphasizes freedom in movement, and has various aspects including balance, rolling and so on. These sessions were structured in the sense that they were planned into the setting's day, but children had free choice when it came to using the various pieces of equipment, and were able to move how they wanted to:

"So there's no everyone jump up and down now, or everyone do star jumps or that sort of thing." (Staff member, setting B)

Although we did not observe any of the sessions, there was a widespread view among staff that Jabadao had enhanced the setting's approach to physically active play. A number of the staff had been involved in training for Jabadao, and sessions were run in the communal space inside the setting. Although it took place inside, staff felt that Jabadao had improved the range of movements that children did outside as well.

In interviews at Setting C, there was less emphasis on free flow and it did not seem to be a core part of the setting's approach to physically active play. It was mentioned by one staff member, in

² www.jabadao.org.

terms of children having free flow within the rooms used by their peer group. This was seen to encourage physical activity as children moved between various activities and toys. The layout of the building, with groups based on different floors, meant that it was not possible to allow the children to have free flow between the different group rooms.

3.4.3 Outside space

As mentioned in Chapter 2, the literature suggests that there is a link between outside space and increased physical activity. This section examines staff opinions on the value of outside space in relation to physically active play, and the practicalities of how access was managed in the settings.

The importance of children spending time outside came across strongly in the interviews. Staff in settings A and B in particular felt that it was vital for children to be outside as much as possible, and to be able to move freely between inside and outside ('free flow') because:

- children enjoy it
- it allows exploration of the natural environment
- there is more space outside to facilitate larger movements eg children can ride bikes, run for longer distances
- it encourages creative and imaginative play through all the features in a garden, eg hiding in long grass pretending to be a monster.
- It is necessary for sensory experiences such as experiencing changes in the weather,
- It is possible to have lots of activities going on at the same time.

Staff in Settings A and B thought it was particularly important for the children they worked with, as many of them lived in flats, or had very small gardens or yards, so needed the opportunity to experience larger outside spaces.

In Setting A children of all ages had free access to outside areas except during meal times and base times. In Setting B the under threes could go outside when they wanted to, but there had to be a member of staff from the team who worked with the under threes outside with them. For this age group, the ratio would be about one member of staff per three children.

We were told at Setting A that not all staff enjoy working outside for long periods of time, but this could be addressed by:

- Emphasising the importance of the outside to children in staff briefings.
- Reinvigorating the outside space (adding or changing features of the space) to re-motivate people.

In Setting B we were told that simply having outdoor access was not sufficient: the space had to be well designed, and there had to be an appropriate pedagogy or understanding of how to use outdoor space to support play and learning:

"You have to have the adults to understand why being outdoors is important, and how to interact with children and play with them outdoors and how to set limits, without setting so many limits that the children are constantly being told off and stopped from doing things." (Staff member Setting B)

This view was based on the experience of the setting having previously had problems with children's behaviour despite having an outside space. We were told that children's behaviour and emotional well being had improved significantly since the outside space had been redesigned, and an appropriate pedagogy adopted.

The arrangements for outside access were rather different in Setting C. The children were only allowed to use the yard in their peer groups, and spent time outside when this was organised by staff rather than being able to move freely between inside and outside space. Those aged between two and three years went outside the most often, three to four times per day, as their room was the one with direct access to the yard. Staff told us that during good weather the door was left open all the time, allowing the children in the ground floor room to come in and out as they chose. However, our observations took place during winter and the door was kept closed. Children aged three to four also used the main ground floor room and so went out several times a day.

We were told that the children aged from fifteen months or so to two years went out about twice a day. The practice was that staff working with the younger children would let the staff based on the ground floor know when they wanted to take them into the yard. If older children were in the yard they would be moved inside, and toys and activities suitable for the younger ones would be set out. Babies were said to go out the least often. Staff said that they were taken out at least once a day but it was a more difficult undertaking as they were situated on the second floor.

Staff spoke of occasions when the mood of the children seemed overexcited, and felt that on those occasions, allowing them to go outside for a 'screaming ten minutes' was beneficial. Staff also thought that the youngest children needed more direction from staff when they were outside, as they had not yet developed the ability to direct their own play.

Staff in Setting C were happy with the outside space, saying that many other private settings in the area did not have any. They spoke about the yard being a good venue for:

- 'ring games' (children playing singing games in a circle)
- movement to music
- dancing with ribbons, as in rhythmic gymnastics.

In all three settings, the view was expressed that all manner of activities can go on outside, such as craft or musical activities. It was also pointed out that some children do not necessarily always want to use outside space in an active way: they may go outside to read a book.

We were told at all three settings that children were taken off the premises to visit other parks and green spaces, to provide access to different play equipment. Staff at setting C also talked about taking to children to other places, such as the library and local shops.

Staff in both Settings A and B stressed that the children went outside in all weathers. The children had rainwear so could go out in the rain, unless it became extremely heavy. It was seen as important because children wanted to go out in all weathers, and also it allowed them to access different weather conditions and experience how those conditions change the environment, eg exploring what a heavy frost does to grass or plants.

In our interviews, the weather appeared to be more of a constraint in Setting C, although it is important to note that it was further on into winter when the fieldwork took place in this setting. We were told that older children went out in the rain, and enjoyed this greatly, but staff said that they did not take the babies (ie those children under about 15 months) out when it was cold or raining. They also said that the yard became a suntrap during summer afternoons, so at that time of year they could only take the babies out there either early or very late in the day.

3.4.4 Environment and equipment

There was a great variety of equipment available in the three settings and, as was pointed out by staff, any type of equipment including musical instruments and art equipment can support physically active play, depending on the vigour with which children use them. However, in the interviews when asked about their settings' approach to physically active play, and the

equipment provided to support it, staff mainly talked about the equipment available in the outside space.

Setting A had the most climbing equipment available; four climbing frames in total. Two were inside, including a small one in the room for younger children, and two were outside. One of these, in the playground for older children, was a challenging piece of equipment, with a fire station pole, slide and a slope. Setting C had a small climbing frame in the room used by the children aged 15 months to two years.

There was some concern from staff at Setting B that they did not have enough climbing equipment, and that the outside space also needed more equipment specifically for the youngest children. There was a small wooden slide that children used in various ways: when we were there it was draped with fabric and being used as a tent. It was also mentioned that a large climbing frame on the other side of the building had been temporarily lost due to the building works.

Other large equipment included a ball pool in the outside space at Setting C, and a basketball hoop at Setting B. All three settings had sandpits outside.

The settings all had a variety of other smaller pieces of equipment available for the children including hoops, balls, bean bags, skipping ropes, large blocks and planks for building mini obstacle courses and balancing on, spades and watering cans. Settings A and B had specific areas for gardening, where children grew a variety of flowers and produce.

Settings A and B had more features in their outside space that children could use in their play such as slopes, digging areas, grassy areas, hillocks, trees and shady areas.

Setting B also had a permanent water feature, although this was not working at the time fieldwork took place. In the other settings, water play was set up as an activity at different times.

Staff in both Settings A and B spoke about the considerable work that had gone into developing the outside space. For example, even though Setting A's outside space was not purpose-built in the way Setting B's garden was, staff at the former had worked to adapt it:

"We've brought in logs and made places for children to sit. We've made a mound, which we know children love running up and down. We've created a mound in it from the earth we took out of the sandpit, and then we grassed that so that they could have at least some sort of differentiation in terms of the height, and being able to run up or roll down or whatever." (Staff member, Setting A)

Staff at Setting B considered that it was important that the inside and outside spaces had been designed in synergy with each other, with the overhanging roof providing an important transition zone from one to the other.

In terms of actual space, the yard at Setting C was the smallest outside space of the three settings. It had various fixtures such as a Wendy house, ball pool and sandpit, which further limited the space available to children to play freely.

3.4.5 Parents' views about physically active play in settings

Parents were generally happy with the provision for physically active play in the three settings.

They seemed particularly to like:

- access to outside space
- the range and types of activities and equipment on offer

- staff knowledge of their children's needs.

One parent whose children were at Setting B felt that it was very important that settings had equipment that would encourage children's development. For example, she was enthusiastic about the wooden bikes at the setting that did not have pedals. She thought that her eldest child had learned to ride a bike without stabilisers very quickly, because riding the bikes without pedals had greatly improved his balance.

The only reservations were voiced by a parent at Setting C, who thought the outside space was quite small and was concerned that children could not go out whenever they wanted to, since peer groups had to take it in turns to go outside.

Parents' awareness of physically active play in the settings seemed to be built on:

- visiting settings and seeing available equipment
- discussions with staff
- children coming home tired (not overtired and fractious, but healthily tired)
- children acquiring new skills eg learning to ride a bike.

3.5. The impact of policy on practice

We asked staff about their familiarity with government guidance relating to physically active play. They often struggled to discuss this at first, asking for clarification about the types of document we meant, and they discussed them at a general level rather than relating their use specifically to physically active play.

Staff referred to foundation stage guidance (both the current Curriculum guidance for the foundation stage and the new Early Years Foundation Stage, statutory from September 2008). Also mentioned were Birth to three matters, Ofsted guidance, Healthy schools guidance and 'the Every Child Matters Agenda'.

Those practitioners who spoke about the Curriculum guidance for the foundation stage and Birth to three matters spoke particularly about the physical development learning area within the Curriculum guidance for the foundation stage, and the section of Birth to three matters called A Healthy Child.

They were using the guidance in various ways:

- planning (in terms of planning activities that interest a child and also ones that will develop them)
- reflexivity (allowing practitioners to review and reflect their own practice)

"I think the thing is that although we're going from the individual holistic way of the child, you also sometimes need to remind yourself of what you haven't covered and what you haven't looked at recently." (Staff member)

- record keeping and developmental checklist (allowing practitioners to note the stages in children's development).

According to some staff in Setting B, they were already using the Early Years Foundation Stage, in anticipation of its start date in September 2008. Staff at Settings A and C were aware of this new document, ranging from those who had read through it, to those who were just aware of its existence and were waiting to go on training.

A staff member who worked with the younger children in Setting A was particularly enthusiastic about the new Early Years Foundation Stage. They felt that having a statutory document that included children aged under three raised their status, and recognised their specific needs. They also felt it raised the professional status of practitioners in this phase:

“I think in the past, people have thought, oh well, you change a few nappies and give a few bottles and that’s so unfair because we work really hard.” (Staff member Setting A)

Ofsted was mentioned by staff at Setting C. They were unclear about the name of the document they were referring to, just that it gave the national standards for early years environments, both in terms of physical activities, and children’s personal hygiene. These standards had formed the basis of the nursery’s policies in this area.

3.6 Conclusions

Parents tended to define physically active play in terms of specific activities, such as running, climbing, whereas staff were more inclined to define it in terms of types of movement. Parents and staff valued physically active play for a variety of reasons: it offers learning opportunities in a range of areas as well as extending physical development; and children enjoy physically active play and need to do it.

Neither group of interviewees seem to be risk averse, understanding the importance to children of taking risks in order to challenge themselves. Parents had confidence in the ability of staff to keep children safe, and staff had strategies for keeping the balance in settings between safety for all children and allowing individuals to pursue challenges.

In terms of settings, there were some subtle differences in their approach to and provision for physically active play. While Settings A and B emphasized the importance of children having free flow through the settings and between the inside and outside, Setting C only had free flow between the rooms inside, and access to outside space was more restricted. In Settings A and B there was greater emphasis on access to outside space increasing opportunities for physically active play. The point was also made that outside space has to be well staffed, well resourced and managed with an appropriate pedagogy.

Parents were happy with the provision for physically active play in the settings, and had noticed when their children had acquired new skills, or come home healthily tired. The most common physical activity as a family that parents talked about was visiting local parks or other green space. This gave opportunities for children to play ball games, run or cycle for greater distances or accessing play equipment that they did not have at home.

Having explored the factors in the attitudes of parents and staff at settings that may influence the amounts of physically active play undertaken by children, the next chapter examines what children actually did in terms of the physically active play when we carried out the observations.

Chapter 4 - Levels and types of Physically Active Play

4.1 Introduction

This chapter presents the main quantitative analyses of the nature and extent of physically active play observed in the course of the research. For the most part, material is derived from the quantitative record sheets as described in Section 1.5.

In this section, we outline the composition of the dataset in terms of the range and spread of observations across settings and the demographic profile of children involved. Further information on the sample is included in Appendix II.

In Section 4.2, we identify ways in which the nature of the data shapes our analytical approach. Section 4.3 focuses on the amount of physically active play recorded overall; Section 4.4 on particular types of play including use of equipment and play with peers and adults; Section 4.5 on activity using indoor and outdoor space. Finally, Section 4.6 summarises key findings across each area.

Throughout, we consider variation across settings and children.

The observations

- As set out in Section 1.5, each observation lasted for 15 minutes.
- 130 observations were completed - an average of seven for each of 19 children, spread Monday to Friday and from early morning to late afternoon.

The sample

- 10 children were under three and nine over three (what about children aged 3); the youngest was 11 months and the eldest almost five years old.
- There were 10 boys and nine girls.
- 11 children were from white and eight from black or minority ethnic backgrounds.
- Five children had identified special educational needs; in another two cases parents or staff highlighted unconfirmed but suspected SEN and for the remaining 12 children there were no indications of SEN.
- 10 attended full-time and nine part-time (six for extended and 13 standard days).
- Seven of the children were observed in Setting A, seven in Setting B and five in Setting C.

Table 1. Demographic profile of children by setting

Child	Age (years)	Gender	Ethnicity	SEN?	Full / Part Time
A1	2	Male	Black British	Yes	Part Time
A2	3	Male	White British	No	Part Time
A3	1	Female	White British	No	Full Time
A4	4 ½	Male	White British	Unconfirmed	Part Time
A5	4	Female	White British	No	Part Time
A6	4 ½	Male	Asian Other	Unconfirmed	Full Time
A7	4 ½	Female	Black British	No	Full Time
B1	1	Male	White Other	No	Full Time
B2	2	Female	White British	Yes	Full Time
B3	1	Male	Black British	No	Part Time
B4	4	Male	Mixed	Yes	Full Time
B5	4 ½	Female	White British	Yes	Full Time
B6	3	Female	Mixed	No	Part Time
B7	3	Male	White British	Yes	Part Time
C1	1	Female	White Other	No	Full Time
C2	2	Male	White British	No	Full Time
C3	1 ½	Female	White Other	No	Full Time
C4	4	Female	Mixed	No	Part Time
C5	3	Male	Mixed	No	Part Time

4.2 Methods and approach to quantitative analysis

4.2.1 Levels of analysis

It is important to bear in mind the differences between sample profiles in each setting, as set out in Table 1 above, and the limitations this places on subgroup analysis. In comparing overall activity levels, for example, we must acknowledge the markedly older mean age in Setting A, and that the only two children yet to reach their first birthdays were observed in Setting B and contribute almost 30 per cent of the observations for that setting.

Although we tried to obtain an equal number of observations per child, and an equal number of children in each setting, for various reasons this was not always possible. The spread of observations across settings is such that Setting B contributes a noticeably larger proportion (38 per cent), with Setting C accounting for just over a quarter (27 per cent) and Setting A 35 per cent. The majority of children (15 of 19) were observed at least seven times, but in four cases this was not possible, due to children's illness or other absence.

Because some children were observed more than others, the main approaches we have taken are to aggregate information for each child – combining the data for each child from across all of their respective observations – and to aggregate this information for each setting – combining data for all of the relevant children.

Given the small overall sample, and the fact that the sample of children in each setting was selected to be representative of that setting rather than comparable across the settings, it was only possible to undertake limited analysis by sub-groups on the basis of age, gender, disability/special education need or ethnic background.

4.2.2 Measuring physically active play

As outlined in 1.5 *Methodology*, each 15-minute observation was undertaken by two researchers, one collecting quantitative and one qualitative data, to obtain a detailed record of activity patterns in relation to time, environment, interactions and other factors. The qualitative data are further discussed in Chapter 5. Quantitative data, on which this chapter mainly draws, were collected using a grid with the following categories and sub-categories:

- physically active play - without equipment (with sub-categories including crawling, walking, running, jumping/ hopping)
- physically active play - with equipment (with sub-categories including climbing, cycling, building, creative play and ball games)
- interactions (with sub-categories including chase games, rough & tumble, other play with peers, play with adults)
- resting/ non-physically active play
- whether activity took place inside or outside.

On each record sheet, a 'tick' signalled incidence of a particular activity during one of the fifteen minutes comprising that observation slot. When the data were entered into SPSS for analysis, variables were created to record whether or not types of play took place, and during how many minutes within an observation.

In this report, we are careful to avoid reference to activity *lasting* for a set time as our research tools were not designed to distinguish, for example, nine second from *fifty-nine* second stretches of activity. Rather we recorded whether an activity took place *at all* during each minute of the observation. However, in a number of ways, we are able to manipulate the data to describe levels of activity more precisely. For instance, we can distinguish minutes in which there was physically active play *and* time spent resting from those in which there was one or the other. We can also consider the nature and number of distinct types of play in which children engage within each 60-second period and across whole observations. There are, of course, limitations on these calculations: we can no more state the precise duration of 'rest' than we can 'play'. However, as outlined in Chapter 1, the quantitative element of this research was intended not to measure energy expenditure, but rather to be used in combination with the qualitative data to capture the extent and nature of physically active play taking place.

A further point worth recalling throughout is that activity 'observed' relates exclusively to the focus child for that observation. Whereas the qualitative data may include information about activity involving other children, their only appearance on the quantitative record sheets came when 'play with peers' was recorded. Accordingly, statements such as "no 'x' was observed in Setting C" should not be taken to mean that no 'x' occurred during observation time there; simply that none of the focus children were recorded engaging in that activity. For example, in setting C, no boys were observed playing chase games. However, during one observation there, a girl in our sample was recorded chasing - and being chased - by two boys.

4.3 The quantity of physically active play

In this section, we begin our analysis of the nature and extent of physically active play by focusing on the overall volume of activity and how this varies among settings, by age and gender and between individual children. We then consider how relative activity levels – for settings and individual children - may be refined by taking into account the intensity of play, taking as an indicator where minutes with physical activity include periods of rest. Finally, we explore the extent of variation between observations for the same child in terms of physically active play overall, and in the extent to which the 'most active' observations are punctuated by rest.

4.3.1 Overall quantity of physically active play

Across all three settings, the average (mean) proportion of minutes in which **any** physically active play was recorded was **53 per cent** (calculated from aggregate totals for each child across their respective observations). Put simply, eight out of 15, or just over half, of the observed minutes in an average observation period included physically active play.

Among the 19 children, the total proportion of time with physically active play ranged from 29 per cent to 72 per cent of observed minutes.

4.3.2 Variation between settings in the quantity of physically active play

Table 2 below compares the quantity of play observed across settings. It contrasts figures based on child-level statistics (that is, calculating the average per child whether observed six or eight times, and then averaging across the children in each setting) with observation-level equivalents (that is, calculating the average across all the observations in that setting regardless of the number of observations per child). The first line of the table shows that in relation to the average (mean) amount of activity in each setting, the results of analyses at child level and observation level are almost identical. The proportion of observed minutes with physically active play varied between settings, with the highest per child average (mean) in Setting A, at 61 per cent, followed by Setting C at 53 per cent, with the lowest in B, at 44 per cent.

Table 2. Percentage of minutes with physically active play by setting (child and observation)

Percentage of observed minutes with physically active play	Child-level statistics			Observation-level statistics		
	Setting A (n=7)	Setting B (n=7)	Setting C (n=5)	Setting A (n=46)	Setting B (n=49)	Setting C (n=35)
Mean	61	44	53	60	44	53
Median	62	44	45	67	47	60
Std. Deviation	8	13	13	29	33	31
Minimum	50	29	43	0	0	0
Maximum	72	62	72	100	100	100

Looking at the minimum and maximum rows, the child-level data show less variation within setting than do the observation-level data. This is to be expected as the child-level data are based on figures for each child which summarise the total proportion of time with play across all observations – including the most and least active 15-minute periods. Conversely, observation-level data on the minimum and maximum proportion of minutes with activity shows that in each setting, there was at least one observation in which *all* 15 minutes incorporated physically active play, and at least one observation in which *none* of the 15 minutes incorporated physically active play.

The standard deviation, minimum and maximum figures at child-level suggest that there was less variation between the ‘most active’ and ‘least active’ children in Setting A than in Settings B or C. The ‘least active’ child in Setting A was more active than the ‘least active’ elsewhere, while the ‘most active’ in A was more active than the ‘most active’ in Setting B, though not in Setting C.

We can also look at differences between the settings by comparing the median figures – that is, the mid-point between the highest and lowest levels of activity. At child level, the median figures for Settings B and C are much closer than the means. Using this measure of average activity levels, Setting C no longer appears much more ‘active’ than Setting B. This reflects the fact that in Setting C we observed just five children, and that the two most active were *much* more active than the other three. At observation-level, data from those two ‘very active’ children exerts a

strong upward pull on the median figure for Setting C. However, regardless of whether we compare median or mean figures, child or observation-level data, the percentage of minutes with physically active play appears greatest in Setting A.

4.3.3 Variation by age in the quantity of physically active play

Considering younger children (aged from birth to three year old) and older children (aged three to five) as distinct groups, their mean proportions of minutes with physically active play were very similar. That for the younger group was slightly higher, with 54 per cent of minutes involving physically active play, compared with 51 per cent for the older group. However, the range between the most and least active observations was also slightly larger for younger children. In other words, although as a group they had a slightly higher percentage of minutes with physically active play, there was more diversity among them than among the older group.

Table 3. Age - Percentage of children's observed minutes with physically active play

	Younger children (birth to three) (n=10)	Older children (three to five) (n=9)
Mean	54	51
Minimum	29	32
Maximum	72	70
Range	44	37

This variation between individual children *within* the above age groups is clear on the scatter plot below (Chart 1), reinforcing the lack of any simple linear relationship between age of child and percentage of minutes with physically active play. The very small numbers involved do not support further quantitative analysis. However, as Chart 1 shows, two of the three 'least active' children were the very youngest: two 11-month old boys in Setting B.

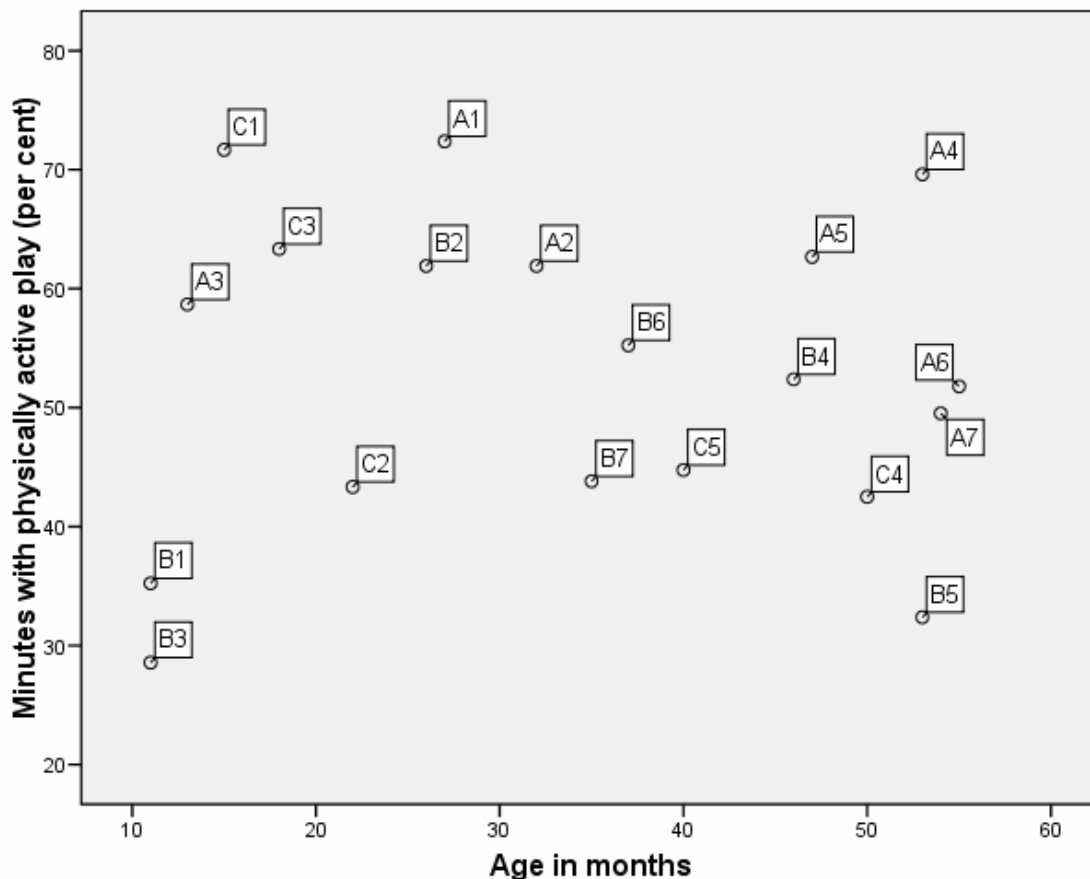


Chart 1. Proportion of minutes with physically active play by age of child

4.3.4 Variation by gender in the quantity of physically active play

Average (mean) values for the percentage of minutes with physically active play did not differ greatly between boys and girls. While girls had a higher mean value of 55 per cent compared to boys (50 per cent), the range was very similar with the least active boy involved in physically active play in 29 per cent and the least active girl in 32 per cent of observed minutes.

Across the sample of 19 children, older boys were more active than older girls and younger girls were more active than younger boys – but as these sub-samples were not evenly matched across settings, we must be cautious in ascribing differences to gender as opposed to other factors.

4.3.5 Variation among children in the quantity of physically active play

Owing to the small sample size it was not possible to do any meaningful analysis by sub-groups other than age or gender, such as ethnic group, SEN or part/full-time attendance. However, as outlined in Section 4.2.1, as well as conducting setting-level analysis, we have used the data to explore difference and similarities between individual children. Chart 2 below illustrates this variation at child-level by indicating, for each child, the proportion of observed minutes with physically active play of any variety.

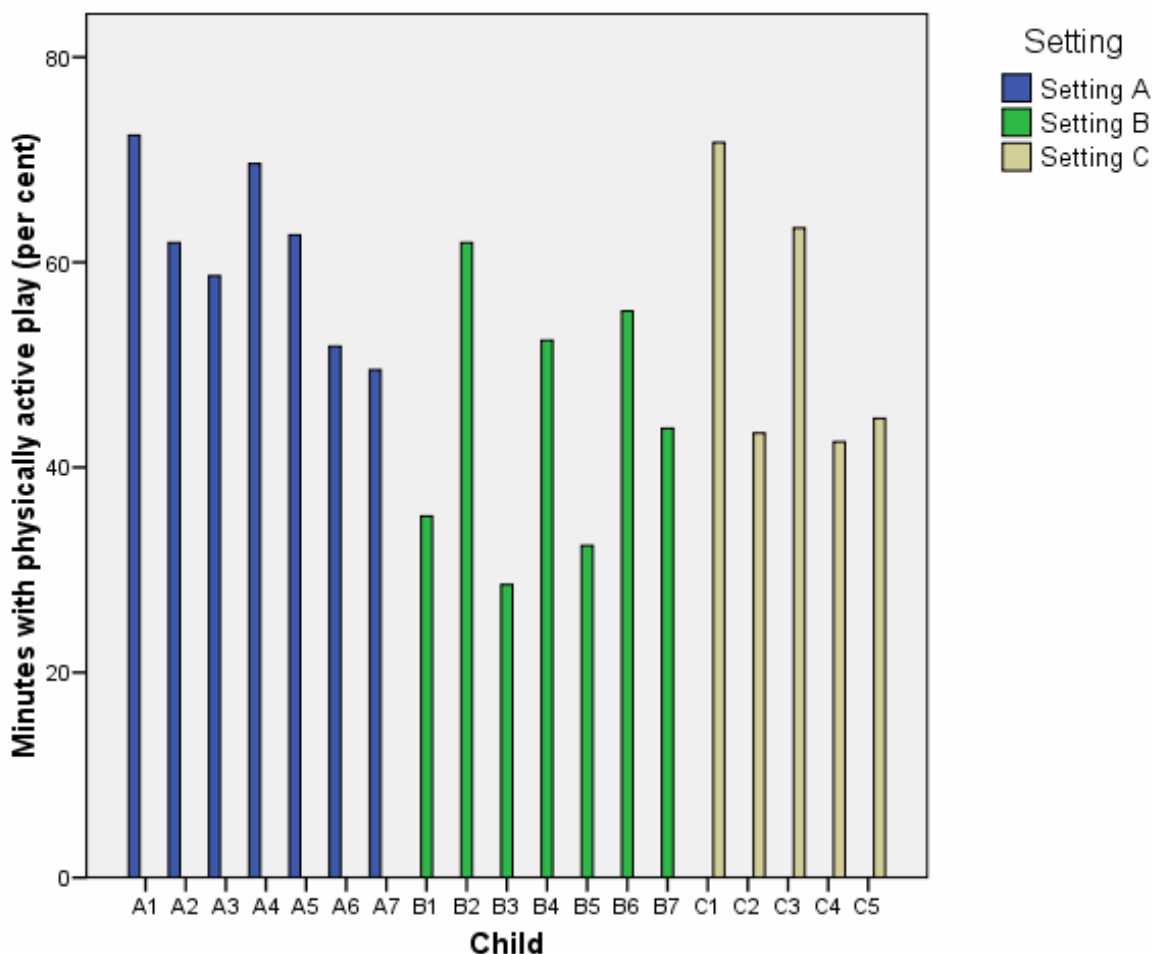


Chart 2. Proportion of observed minutes with physically active play by child

Chart 2 highlights for example the extent to which activity levels for two of the children in Setting C are higher than those of the remaining three. It also demonstrates that three children in Setting B – two of them one year olds - appear by some way the ‘least active’ of the entire sample.

4.3.6 Intermittent or interrupted play

Before looking at the various types of play recorded, it is helpful to introduce one measure of its intensity: an indicator of whether or not minutes with play were minutes with play *only* or punctuated with rest. Charts 3 and 4 below show such activity profiles for settings and for children respectively. If we conceptualise the lightly shaded (green) proportions as ‘diluted’ and the darker as ‘concentrated’ physically active play we may incline towards very different conclusions than were we to consider the height of the composite shaded (green) portions alone. While there is most physically active play recorded for Setting A on both measures, Setting B moves ahead of C when we restrict our focus to ‘concentrated’ play. The chart suggests that a majority of the minutes with physically active play in Setting C may involve quick bursts rather than sustained bouts of activity.

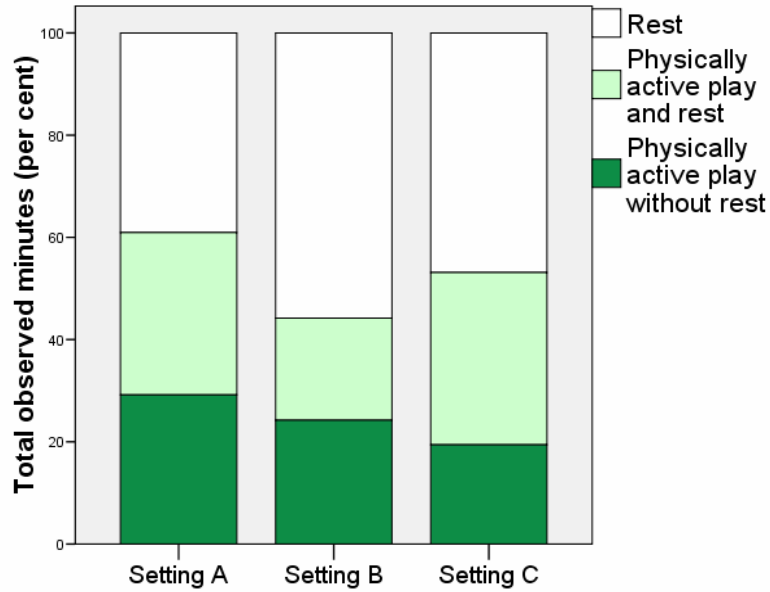


Chart 3. Proportion of minutes with physically active play and/or rest by setting

Turning to Chart 4 (below) we see important differences between children. Notably, those in Setting C with the highest scores for physically active play also had among the highest proportion of total minutes involving play *with rest* – similar to those for the two youngest children in Setting B. In other words, we again see a picture of more diluted physically active play in Setting C.

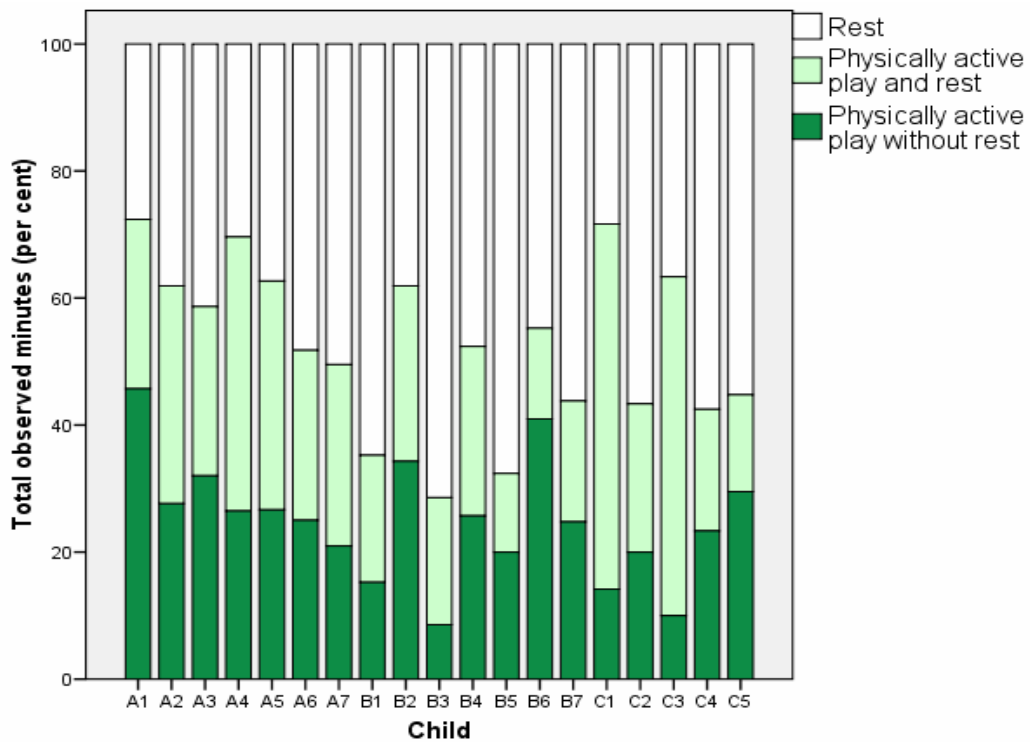


Chart 4. Proportion of minutes with physically active play and/or rest by child

Individual differences are particularly clear when we compare Child A1 and Child C1. For both of these children we recorded 72 per cent of observation minutes as including physically active play – but Child A1 appears to have roughly double the amount of *uninterrupted or concentrated* play (that is, without rest). Age is perhaps significant – Child A1 being approximately twice as old as C1. However, for Child A3, at 13 months slightly *younger* than Child C1, we recorded almost twice the total percentage of uninterrupted play. This suggests that factors other than age, such as individual or environmental differences, are important. In the case of C1, qualitative records include instances of the child being stopped by staff, falling or being knocked over by other children, and ‘wandering’ rather than focused activity (See Sections 5.5 and 5.6).

4.3.7 Variation between observation periods for individual children

So far in this section we have focused mainly on overall summary measures for settings, groups and children. This emphasis is maintained throughout the chapter. However, we can also look at how far there were differences, for individual children, *among* the observations) of each child (of which there were on average seven). Table 4 below details the extent of this variation, presenting the average (mean) minutes with physically active play per child, followed by the *minimum* number in any one observation, the *maximum* number in any one observation, and finally the range – the difference between the ‘most active’ and ‘least active’ observation for each child.

Table 4. Minutes with physically active play per observation period, by child

	Child																		
	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5
Mean	11	9	9	10	9	7	7	5	9	4	8	5	8	7	11	7	10	6	7
Min	5	2	4	3	2	2	0	0	5	0	0	0	1	0	6	0	3	1	1
Max	15	15	14	14	15	15	12	15	15	9	15	14	15	11	15	13	14	15	14
Range	10	13	10	11	13	13	12	15	10	9	15	14	14	11	9	13	11	14	13

For each child, there was a variation of at least 60 per cent of the potentially active time between the ‘most active’ and ‘least active’ observations. In the case of two children (B4 and B1), the range encompassed observations in which *every* minute included physically active play, and observations in which there were *no* minutes of physically active play. It can be seen that the minimum figures for children in setting A are generally higher than in other settings, and this links with the ‘minimum’ figures in Table 2 which also suggest that fewer children in Setting A were *ever* predominantly ‘inactive’.

Our analysis also highlights that some children who appear less active overall nevertheless had some 15-minute sessions in which they had a relatively high incidence of physically active play. For example, child B5 who had a relatively low average of minutes with physically active play per observation period (five per cent overall) nevertheless had one observation period where she was active in 14 of the 15 minutes.

Table 5 shows the 12 observation periods in which physically active play featured in *every one* of the 15 minutes. It highlights that there is variation in the extent to which these ‘active’ minutes also involved periods of *inactivity* (Table 5 below). This shows that some children (A1, A2, A6, B6 and C4) were recorded as being active throughout the 15 minutes with no rest periods, whilst at the other extreme, Child C1 was recorded as having a period of rest within each of the 15 minutes of their observation period, even though each of those 15 minutes also involved physically active play.

Table 5. Incidence of rest in observations with physically active play in every minute by child

	Child	A1	A1	A2	A2	A5	A6	B4	B1	B2	B6	C1	C4
Minutes including physically active play	With rest	0	3	0	2	10	0	5	7	2	0	15	0
	Without rest	15	12	15	13	5	15	10	8	13	15	0	15

Having considered overall activity levels, we turn now to the various *types* of physically active play recorded during the course of the fieldwork.

4.4 Types of physically active play

Children engaged in a wide range of activities. Here, we look at the number of different types observed across settings and between children, distinguish walking from other types of activity, and compare the amount of each type recorded.

4.4.1 The number of types of physically active play

On average, each child was involved in 2.7 types of physically active play per observation, or 1.9 types other than walking. On both measures, with and without walking, the average for Setting A was markedly higher than for each of the other two settings (See Table 6).

Table 6. Number of types of physically active play per observation by setting

Setting	Maximum number of types per individual observation		Average (mean) number of types per child per observation			Average (mean) number of types per child per observation—excluding walking		
	Including walking	Excluding walking	Min	Max	Mean	Min	Max	Mean
Setting A	8	7	1.6	5.6	3.3	0.9	4.6	2.4
Setting B	6	5	1.3	3.3	2.4	0.7	2.3	1.6
Setting C	8	7	1.5	3.1	2.4	0.7	2.4	1.5

Although the relevant subsamples are very small, with two to four children each, our analysis shows that the average for the younger (birth to three) children in Setting A was particularly high at 3.9 types, compared to 2.4 and 2.1 in B and C respectively. The differences between settings for older children were less substantial, with means of 2.9 types in Settings A and C and 2.4 in B. Thus the greater range of types of play in Setting A appears to be driven particularly by the younger age group.

4.4.2 Distinguishing walking and other types of physically active play

On average, across the sample of 19 children, almost a quarter (23 per cent) of all observed minutes included walking but no other type of physically active play. We distinguish between walking and other activities on two grounds. Firstly, there was a lot of it, in comparison with other types of play. Secondly, it could at times appear less obviously a form of play, less physical or less intense. Researchers on several occasions recorded children appearing to be not so much engaged in or choosing walking as an activity as slowly moving around or between activities, while watching others or thinking their own thoughts. On the other hand, walking sometimes supplied the physical component of otherwise sedentary activity. Its nature and importance could also vary with children's age and developmental stage. As it is not feasible, using the quantitative data, to rate the 'playfulness' or significance of particular episodes, we draw attention to the issue by presenting figures inclusive and exclusive of walking.

In Table 7, we set out for each setting the overall proportion of children's observation time in four mutually-exclusive categories:

- minutes without walking or other form of physically active play, which accounts for 48 per cent of time across the three settings
- minutes with walking but no other form of physically active play, which accounts for 23 per cent of time
- minutes with walking *and* other physically active play: 11 per cent of time across the three settings
- minutes with physically active play but *not* walking: 18 per cent of time overall.

Table 7 shows, overall, a higher prevalence of walking (compared with other activities) in Setting C than in Settings A or B. Whereas in Setting A the proportions of minutes with 'walking play only' and 'non-walking play only' are identical, in C, the 'walking only' category is larger than the two other 'active' categories combined.

Table 7. Contribution of walking as a percentage of total minutes with physically active play

Setting	Minutes without walking or other active play (% per child)			Minutes with walking but no other active play (% per child)			Minutes with walking and other active play (% per child)			Minutes with active play but no walking (% per child)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Setting A	29	50	40	9	43	23	6	25	13	10	35	23
Setting B	39	71	56	9	29	18	2	18	10	2	26	16
Setting C	29	58	47	10	53	29	8	15	11	8	24	13
<i>Total</i>	29	71	48	9	53	23	2	25	11	2	35	18

Chart 5 shows variation by child within settings, presenting for each child the overall proportion of time in each of the same four categories – listed in the key on the right. The uppermost (blue) portion of the bars indicates 'inactive' minutes; followed by 'walking *and* other active play' (green), 'walking play only' (beige) with 'active play but no walking' (purple) at the base of each one. The latter two categories include many different types of activity, as discussed below, varying from child to child.

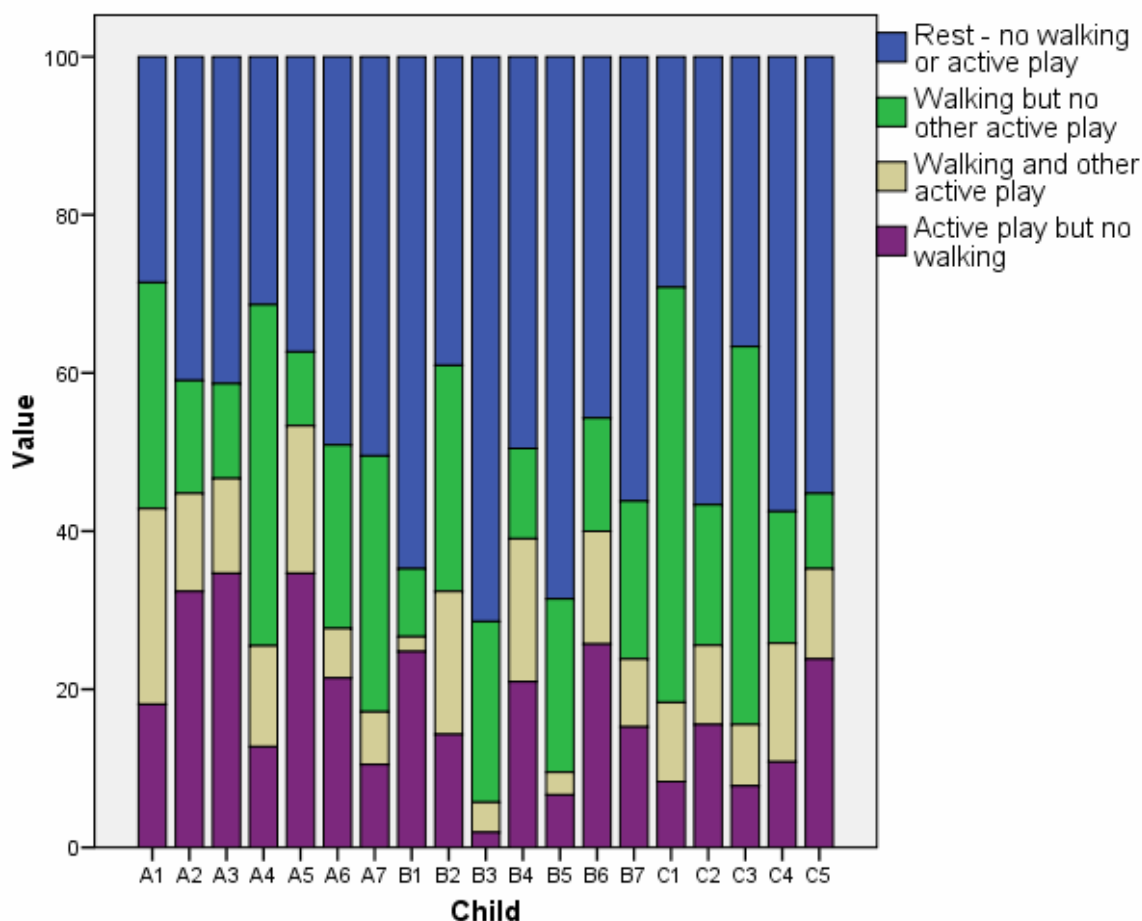


Chart 5. Proportion of minutes with walking and/or other play by child

Paralleling the figures set out earlier in Table 5 on play with *rest*, the comparative activity levels of the two youngest – and apparently most active - children in Setting C (C1 and C3) look very different if we exclude ‘walking only’ play. (On Chart 5, this entails setting aside the green portion of the bars and reading activity levels across the top of the pale ‘walking and other active play’ portions of each one.) Within their higher overall proportion of minutes with *any* type of physically active play, minutes which include walking but no other activity are particularly important for Child C1 and Child C2. To a slightly lesser extent, the same is true of Child A4 and Child A7 and the much less active children B3 and B5. Thus we again see a picture of physically active play in Setting C that differs in terms of its nature and perhaps intensity from those of other settings.

4.4.3 The amount of physically active play by type of activity

As noted in section 4.4.1, the average number of activities engaged in during a 15-minute observation was 2.7. The greatest number recorded in a single observation was eight. In one of these cases this involved walking, climbing, cycling or driving, ball games, sliding, ‘pushing and pulling’, ‘other activities without equipment’ and creative play. From the qualitative records, this ‘creative play’ included imaginative role-play or ‘pretending’; music-making using instruments or improvised materials; painting; and other forms of physically active messy or imaginative play.

As confirmed in Table 8 below, walking was by far the most frequently recorded activity – and the **only** form of physically active play observed for every child. Walking was recorded, on average, in 35 per cent of the total observed minutes, and in 65 per cent of those with physically active play.

Table 8. Incidence of activity by type, number of children, observations and minutes

Activity	Children observed in the activity	Maximum % of total observed minutes with activity (per child)	Mean % of total observed minutes with activity (per child)	Total recorded minutes with activity	Total observations with activity	Mean minutes with activity per observation with activity
Walking	19	63	34.7	678	111	6.1
Running	16	19	7.1	137	52	2.6
Cycling	14	25	7.0	129	27	4.8
Creative play	12	14	3.3	63	17	3.7
Climbing	15	12	3.2	60	25	2.4
Den Play	9	15	2.9	56	12	4.7
Crawling	12	20	2.7	50	22	2.3
Other activity with equipment	6	10	1.7	31	52	0.6
Pushing or pulling	9	14	1.6	28	11	2.5
Other without equipment	8	6	1.5	31	18	1.7
Jumping	9	10	1.2	23	15	1.5
Balancing	2	10	0.9	17	4	4.3
Rough and tumble	2	13	0.7	16	2	8.0
Chase games	1	13	0.7	16	2	8.0
Sliding	4	4	0.6	10	6	1.7
Ball games	6	4	0.5	9	7	1.3
Gardening	2	7	0.4	9	2	4.5
Building	2	5	0.4	8	2	4.0
Digging	2	4	0.2	5	4	1.3
Water play	1	1	0.1	1	1	1.0

Running, cycling and creative play were the next most frequently observed – but far behind walking. Running and cycling each appeared in seven per cent, and creative play in three per cent, of all observed minutes as detailed in Table 8, and in approximately twice those proportions of all minutes with physically active play.

The final two columns of Table 8 show the total number of observations in which each activity was observed and, within those observations, the average number of minutes involved. Evidently, there were some activities which took place less often but appeared to absorb more time. These included den play, balancing, rough and tumble, chase games, gardening and building.

4.4.4 Variation between settings in types of activity

Table 9 below summarises our data on types of play by setting, indicating the average (mean) proportion of children's observed minutes in which each activity was observed, as well as the maximum for any one child. Undue emphasis should not be placed on comparisons, given the varying age profiles and number of children observed across settings. However, in

line with figures presented above on the number of distinct types of activity, several activities were observed in settings A and/or B but not in C (sliding, ball games, building, balancing, gardening and water play) while there was just one type (chase games) recorded exclusively in Setting C.

Table 9. Proportion of children's observed minutes with activities by setting

Activity	Setting A (per child)		Setting B (per child)		Setting C (per child)	
	Maximum	Mean	Maximum	Mean	Maximum	Mean
Walking	57.0	37.3	48.0	28.3	63.0	39.9
Running	19.0	8.5	10.0	5.0	14.0	8.1
Cycling	25.0	8.8	17.0	6.4	12.0	5.3
Creative play	9.5	4.3	14.3	4.2	2.5	0.5
Climbing	12.0	4.7	12.0	3.4	2.0	1.0
Den Play	15.2	4.0	12.4	1.8	5.8	3.0
Crawling	20.0	3.5	12.0	2.3	5.0	2.3
Other activity with equipment	7.6	2.3	4.8	1.0	9.5	1.9
Pushing or pulling	6.7	1.2	3.8	1.0	14.4	3.1
Other without equipment	5.0	1.5	2.0	0.3	6.0	3.4
Jumping	4.0	1.1	2.0	0.4	10.0	2.3
Balancing	0.0	0.0	10.5	2.3	0.0	0.0
Rough and tumble	1.0	0.2	0.0	0.0	13.0	2.5
Chase games	0.0	0.0	0.0	0.0	13.0	2.7
Sliding	3.8	1.1	2.9	0.4	0.0	0.0
Ball games	4.0	1.0	1.0	0.4	0.0	0.0
Gardening	7.1	1.2	0.0	0.0	0.0	0.0
Building	2.9	0.4	4.8	0.7	0.0	0.0
Digging	3.8	0.7	0.0	0.0	0.0	0.0
Water play	0.0	0.0	1.0	0.1	0.0	0.0

Given the small numbers involved, it would be inappropriate to look in depth at differences by age. However, inevitably, crawling was almost exclusively the preserve of the under-threes ($n=10$), while older children were more often observed running and cycling. Interestingly, on average, a greater proportion of the younger children's time featured climbing (12 per cent, compared to nine per cent for the older group). This may reflect that for younger children – as evidenced by qualitative data - a wider range of furniture could provide climbing opportunities.

4.4.5 Variation between children in types of activity

Chart 6 below shows variation in the proportion of total minutes in which activities were observed between individual children. Below the (dark blue) portion at the top of each bar, we can see physically activity play exclusive of walking. The chart reinforces that some activities featured in significant proportions of the observed time for particular children – but for other children were never recorded. For example, cycling was not recorded among the youngest children but was also absent from observations for child A7 (aged four and a half). And for three children (A7, B5 and C3) we observed no 'other play with equipment', a category that included balancing, sliding, ball games, gardening, building, digging and water play.

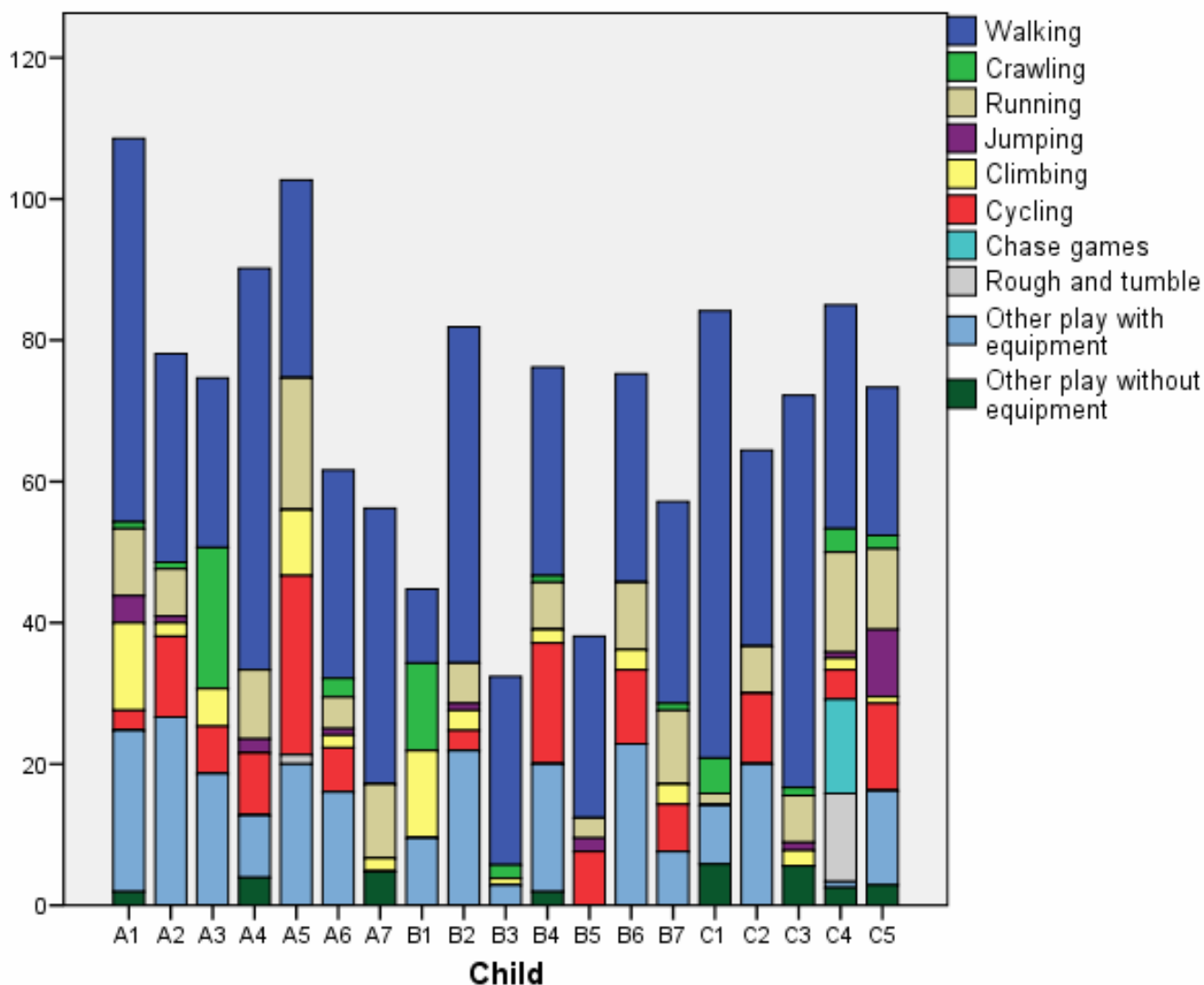


Chart 6. Proportion of minutes with each type of activity by child¹

¹ Note that for two children, sum percentages of minutes involving the listed activities exceed 100 per cent. This stems from the fact that any single minute could involve several types of play. To the extent that this is the case across a child's observations, the overall height of the relevant bar is raised beyond the total percentage of minutes with activity set out earlier in Chart 2.

4.4.6 Use of equipment

Overall, there was markedly more play without equipment than with. On average, across the 19 children, 41 per cent of all observed minutes included physically active play *without* equipment; roughly half that percentage (21 per cent) included physically active play *with* equipment. As shown in Table 10 below, if we look at the subset of minutes actually involving physically active play, there was some *without* equipment recorded in 77 per cent, and some *with* equipment in 40 per cent of such 'active' minutes, on average.

The qualitative data shows that equipment used *inside* included items not listed among the pre-set categories on activity record sheets: musical instruments, dolls, puppets, cars and train sets, bricks and Lego, tools, phones, pictures, puzzles, climbing frames, Wendy houses, toy furniture,

dressing-up clothes, sandpits and a water table, craft tools and a computer. Children also made use of furniture in their inside play, for example climbing on tables and chairs, hiding under furniture, wrapping a curtain around themselves, picking up a cushion, or (for younger children) pulling themselves up holding on to a gate or table.

Equipment used *outside* included bicycles, tricycles and a four-wheeled cycle, buggies, pushchairs, prams and cars, climbing frames with swings, ropes and slides, a see-saw, stilts, planks, gardening space and watering cans, bats and balls, a Wendy house and shop, a den and a tee-pee, craft materials and assorted toys.

As set out in Table 10, in Setting A there was more use of equipment. On average, for children in that setting, 28 per cent of all minutes involved physically active play with equipment, twice the proportion recorded for Setting C. As we note in Section 5.4, the qualitative observation data shows references to the same number of types of equipment in Settings A and B (with more types of outdoor equipment in Setting A and more types of indoor equipment in Setting B), and to markedly fewer equipment types in Setting C.

Table 10. Percentage of children's observed minutes with physically active play with/out equipment²

Percentage of minutes with physically active play	Setting A			Setting B			Setting C			All settings	
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Max	Mean
Without equipment (% of all observed minutes)	31	64	45	22	50	33	28	68	45	68	41
With equipment (% of all observed minutes)	2	47	28	4	34	20	2	26	14	47	21
Without equipment (% of all minutes with physically active play)	51	98	74	58	100	76	64	98	83	100	77
With equipment (% of all minutes with physically active play)	4	74	45	13	65	42	4	59	29	74	40

² Note that the sum of (mean) percentages of minutes involving activity with and without equipment may exceed 100 per cent within and across settings. Whether totals concern all observed minutes or those with physically active play, a single minute could involve play with *and* without equipment.

Across the whole sample, there was little difference between age groups in respect of use of equipment. Acknowledging the very small numbers involved, older children in Setting B used equipment during a greater proportion of minutes (50 per cent of 'active' minutes, compared to 35 per cent in C and 38 per cent in Setting A). Younger children used equipment more often in Setting A (54 per cent of 'active' time compared to 36 per cent in B and 25 per cent in C).

However, there was certainly variation among individual children. As indicated in the 'minimum' values in the last row of Table 10, for two children (in Settings A and C), there was active play with equipment in just four per cent of 'active' minutes; for another child in Setting A equipment was used in 74 per cent of such minutes.

4.4.7 Interaction with peers and staff

The quantitative data collection focused on types of physically active play, recording when interaction took place in the course of such play. The nature of other interaction with peers (ie other children) or adults (for example, in preparing for activities or in more sedentary play) was recorded in qualitative observation data, although the primary focus of the observations remained the activity of individual children. Qualitative findings in relation to the role of staff are discussed in Section 5.5. Here, we concentrate on what can be discerned from the quantitative material.

Overall, there was little activity recorded as physically active play with other children or adults – on average, neither took place in as much as one minute per 15-minute observation. However, in some cases, involving Child B4 (aged four) and Child C5 (aged three), all 15 minutes of one observation included physically active play with peers, and one observation of (one year-old) Child A3 had 14 minutes involving physically active play with adults.

Table 11 presents percentage of minutes involving physically active play with peers and adults by setting and age group. Across the whole sample (19), observations of younger children (birth to three) involved, on average, twice as many minutes with physically active play with adults as observations with older children (9 per cent of minutes for the younger and 4.2 per cent for the older group). Conversely, observations of older children involved, on average, twice as many minutes with physically active play with peers as among younger children (7.4 per cent of minutes for the older children compared with 3.6 per cent among younger children).

Table 11. Minutes involving physically active play with peers and adults by setting and age (%)

Percentage of minutes involving interactions		Maximum		Mean	
		Birth to three	Three to five	Birth to three	Three to five
Setting A	Play with peers	7	4	3.1	1.0
	Play with adults	43	7	25.0	2.3
Setting B	Play with peers	8	25	3.8	12.4
	Play with adults	10	12	3.8	6.7
Setting C	Play with peers	10	15	3.9	12.6
	Play with adults	0	8	.0	4.2
All settings	Play with peers	10	25	3.6	7.4
	Play with adults	43	12	9.0	4.2

The quantity of physically active play with *peers* varied very little between the three settings among younger children (birth to three). However, in Setting A, we recorded a substantially greater amount of ‘physically active play with adults’ for the younger children compared to the other settings – on average, in one quarter of their observed minutes. This contrasts most dramatically with data for Setting C – where for younger children we recorded *no* recorded physically active play with adults.

Looking across all the observational data for each child, the highest proportion of time spent in physically active play with peers was 25 per cent (Child B4, a four year old boy). The highest proportion of time spent in physically active play with adults was 43 per cent (Child A3, a one year old girl). Overall, the analysis reinforces other research outlined in Chapter 2 which emphasizes the influence of staff in higher levels of physically active play.

4.5 Use of indoor and outdoor space

In this final section, we consider the amount of time spent in outside spaces as a proportion of all observation time, and consider related variations by setting, between children, and in the amount and types of physically active play according to the location of the activity.

4.5.1 Use of inside and outside spaces by setting

Of all 130 observation periods, almost half ($n=60$) involved *some* time outside. However, on average, the proportion of actual *minutes* for each child involving time outside was closer to a quarter of the total at 28 per cent (Table 12).

There were clear differences between the settings in the use of inside and outside space, although it is important to note here that the weather was colder at the point when we carried out observations in Settings B and C. On average, just 20 per cent of observation periods in Setting C included any time outside, compared to 59 per cent in Setting A and 53 per cent in Setting B. Differences between Settings A and B with respect to *minutes* were more pronounced, with 41 per cent of minutes in Setting A involving time outside compared with 26 per cent in Setting B (and 12 per cent in Setting C). Possibly attributable in part to colder weather, on average those in Setting B seemed to *stay* outside for less time than those in A, despite accessing outside space in almost as many observations.

Table 12. Percentage of observations and minutes with time outside

	Setting A	Setting B	Setting C	All settings
Percentage of observations with time outside (per child mean)	59	53	20	47
Percentage of minutes with time outside (per child mean)	41	26	12	28
Minimum percentage of minutes with time outside (per child)	15	4	0	0
Maximum percentage of minutes with time outside (per child)	65	45	37	65

While simply *having* time outside may be beneficial, this needs to be considered in relation to the amount and nature of play taking place. Overall, children in our sample were outside for a little more than a third (35 per cent) of the total minutes in which they were involved in physically active play. Table 13 also illustrates variation by setting in this respect, based on figures averaged across the children in each one. It shows that 46 per cent of minutes of physically active play observed involved outside play in Setting A, compared with 41 per cent in Setting B and 14 per cent in Setting C.

If we compare the percentages of minutes with time in outside space (line two, Table 12) with the corresponding percentages of 'physically active' minutes (line one, Table 13) we can see that in all three settings, minutes in which children accessed outside spaces accounted for a disproportionately high percentage of minutes with physically active play. In other words, 15-minute slots in which there was time outside tended to involve more activity than those spent wholly indoors. In fact, we observed some form of physically active play in roughly seven out of 10 minutes *with* time outside, compared to four out of 10 minutes *without* time outside.

The extent to which physically active play took place disproportionately outdoors was particularly marked in Setting B, where on average less than a quarter of all observed minutes – but over 40 per cent of all those *with physically active play* - involved time outside.

Table 13. Percentage of minutes with physical activity with and without time in outside spaces

Percentage of all minutes with physically active play	Setting A	Setting B	Setting C	All settings
With time in outside spaces (per child mean)	46	41	14	35
Without time in outside spaces (per child mean)	54	59	86	65

4.5.2 Use of inside and outside spaces by child

As well as differences between the settings in the use of inside and outside space, there were also substantial differences between children. Chart 7 (overleaf) shows the percentage of each child's total observation minutes in each of four categories:

- rest or inactive play inside only: 43 per cent of minutes overall
- rest or inactive play outside: 4 per cent of minutes overall
- physically active play inside only: 29 per cent of minutes overall

- physically active play outside: 24 per cent of minutes overall.

It was rare to record time inside and outside in the same minute. We therefore distinguish here between minutes spent inside *only* (the first and third categories), and minutes where there was at least *some* time spent outside (the second and fourth categories, which also include some time spent inside).

The bottom two portions of the bars indicate the total proportion of minutes with physically active play, with the upper limit shown by the lightest (beige) portion. The bottom (dark purple) portion shows physically active play *outside*.

The chart shows that physically active play outside featured strongly for just one of five children in Setting C. Notably, one child in Setting C was never observed outside (C1), while another child in the same setting (C3) was recorded as outside during just one *minute* across all the observations. The two children in Setting B (B1 and B3) who spent very little time outdoors also appeared to be less active overall than their counterparts in Setting C.

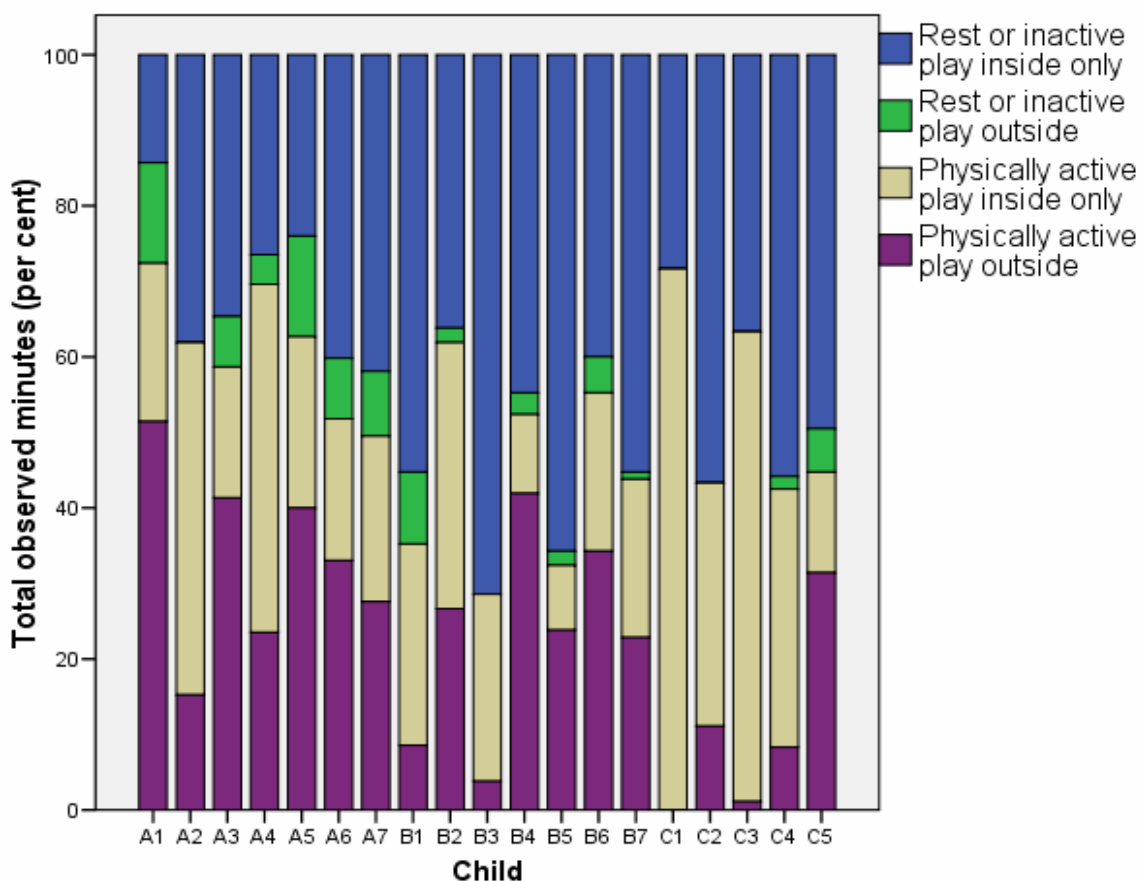


Chart 7. Proportion of minutes with activity by time in inside and outside space

In both settings A and B, five out of seven children were outside during the *majority* of their minutes with physically active play. Contrastingly, in Setting C, four out of five children were outside during less than a fifth of such ‘active’ minutes. Focusing on individual children, the highest proportions of physically active play minutes which were spent outside were 70 per cent in Setting A (Child A1), 61 per cent in Setting B (B4) and just 39 per cent in Setting C (C5).

4.5.3 Types of activities observed in inside and outside spaces

Almost all activities were observed both inside and outside. However, on average, for children across the three settings, some activities in particular were observed disproportionately when children accessed outside spaces. It is worth reiterating here that just 28 per cent of observed minutes, overall, were spent wholly or partially within outside spaces. Not surprisingly, all cycling or driving (of model cars or trucks) took place outside. In addition, based on aggregating figures from each child, 62 per cent of all climbing, 58 per cent of all running, 49 per cent of physical activity with 'other' equipment and 40 per cent of all walking took place during minutes when we observed children outside. Conversely, 94 per cent of crawling, 74 per cent of jumping/ hopping, 74 per cent of creative play, all rough and tumble and 83 per cent of rest was observed during minutes spent wholly inside.

Other activities observed *outside* included crawling, jumping and hopping, balancing (on equipment or on one leg), pushing or pulling objects, digging, craft activities (such as painting a shed), kicking balls, chasing or racing each other, hiding and imaginative or role play.

During observation *inside*, we often observed non-physical activity, for example where children sat to eat or to listen to a story. The qualitative observation data suggests that more time in setting C was spent sitting (listening to a story or singing, sometimes with actions). Children here also spent time waiting to be allowed outside.

It is important to recall that quantitative data on inside and outside activity may reflect the characteristics of the children actually observed outside, particularly in relation to age – which is why examining data for each child is important. Variation between settings also needs to be considered, with averages predominantly pulled down by those for Setting C, where the younger (birth to three) children were rarely observed outside, but nevertheless, overall if not outside, engaged in a broader range of activities than their counterparts in A and B. For example, in both Settings A and B, more than three-quarters of running took place outside, compared to less than one-fifth of that in Setting C where the averaged figure for running better reflects the running activity of the under threes than older children. Contrastingly, the youngest among the Setting B sample were barely walking – and thus not counted in calculating the average for running activity there. In both Settings A and B, however, unlike C, young children were observed *crawling* outside.

4.6 Conclusions

Overall, eight of 15 minutes per observation period included physically active play, with the highest level of activity recorded in Setting A and lowest in B. However, rankings of settings and children differ when we take into account rest periods alongside play, or distinguish walking from other activities - with the result that Setting C and several children there appear comparatively less active.

Activity levels were patterned neither by gender nor age, with the exception that two 11-month olds were by some way the least active. However, there was substantial variation in activity levels between children, and also between observations for the same child.

On average, each child was involved in 2.7 types of physically active play per observation – or 1.9 types other than walking. After walking, the most frequently observed activities were running, cycling and creative play. On average, four out of 10 observed minutes included active play *without* equipment, twice the proportion *with* equipment. Overall, there was little active play with peers or adults, but there were some unusual observations where we recorded interaction throughout.

Almost half of all observations involved some time outside, yet the proportion of *minutes* wholly or partly outdoors was closer to a quarter of the total. There were clear variations between settings, with observations in Setting C far less likely to involve children accessing outside space.

In Chapter 5, some of the questions raised by the quantitative data are explored with the aid of qualitative findings from interviews with parents and staff, and from observation records.

Chapter 5 - Influences on physically active play

5.1 Introduction

In this chapter we look at the key factors that emerge from the data as influences on children's physically active play. We look first at how the structures and use of free flow in the three settings (as described in Chapter 3) appears to be enacted in children's play. We then look at the influence of the environment of the three settings, both inside and outside and particularly how children access outside space. In section 5.4 we discuss the role of equipment in physically active play. We then look at staff and how their behaviour encourages, and sometimes for a variety of reasons inhibits, physically active play. In section 5.6 we explore how physically active play differs between children, reflecting individual behaviour patterns. Finally, in section 5.7 we highlight the key issues that emerge in the chapter.

In the chapter we draw mostly on the qualitative observation data, but we also draw on the data from the interviews, particularly in relation to staff comments about the layout of the settings, and the quantitative data from Chapter 4.

5.2 Influence of ethos on physically active play

As we noted in Chapter 3, the importance of children being able to move freely around the space and choose their own activities, with some structured group activity, was stressed in all three settings but particularly in Settings A and B. The role of outdoor space was also particularly emphasised in Settings A and B. These aspects of the settings' ethos did appear to be enacted in the observation data.

In settings A and B, we observed children moving freely within and between inside and outside space. Although they were sometimes encouraged or asked by staff to go to a different part of the setting, or to take part in a particular activity, their movement was generally self-directed. They moved freely between activities, generally apparently with a purpose – they walked to a specific activity or area, and then engaged in the play opportunities on offer there. Most children made active use of equipment and activities – discussed further below – and there were also several instances of imaginative play, both using props (for example a doctor's toy set) and without props (for example being monsters). The outside spaces supported a range of physically active play behaviours – see further section 5.3 below. Particularly in setting A, there were several examples of children whose pattern of behaviour appeared to be self-directed, with concentrated engagement with activities and constructive interaction with other children.

In setting C the overall pattern of behaviour appeared to be somewhat different. Although children moved freely between parts of their own floor, they were not able to move freely to other floors nor to the outside space. Although there was a considerable amount of walking inside (see Section 4.4.2), there were more instances where children did not seem to be walking with an obvious purpose, and where they walked between activities, areas or people without actually engaging with them.

There was more organised group activity inside in Setting C, such as story or song sessions. There were several activities that were recorded in Settings A and/or B but not C and there were fewer instances of some activities, particularly creative play – which appeared in on average just 0.5 per cent of observed minutes per child in C, compared to 4 per cent in Settings A and B

(see Table 9, Section 4.4.4). Finally, there was less free-flow behaviour outside in Setting C, reflecting the more restricted nature of the outside space.

5.3 Influence of environment on physically active play

5.3.1 Use of internal space

As noted in Chapter 3, the internal layout of the settings varied. Setting A had base rooms arranged in pairs around a communal space. Setting B had two large rooms either side of a small communal space. And Setting C had a number of small rooms arranged over three floors, with age groups on different floors.

In all three settings, the rooms had several designated areas within them. This made it difficult for children to travel any distance in a straight line and to move with any speed. Setting B's room for older children was the largest single room in the three settings, with the largest number of activity tables and designated spaces. Children were observed walking from one end of the room to the other, and to and fro between different activity tables. In moving this way, children covered some distance during the course of the day. The spaces in settings A and C were smaller, offering less diversity in walking patterns.

Settings A and B both had communal areas. Setting A's communal area contained more resources and also a large climbing frame. Children used this space, particularly the climbing frame, more than in Setting B, where the communal space was mainly used for Jabadao sessions. In setting A, the communal space was also used as an area for parents to spend time with their children when leaving them in the mornings: watching them on the climbing frame, or using various resources that were set out. In setting C, the large ground floor room became an informal communal space at the end of the day, when children were waiting to be collected by their parents. At this time, the children were observed playing with children older and younger than themselves, and using the space for physically active play.

As mentioned in Chapter 4, the majority of time that children spent resting was observed inside. All three settings had spaces for the younger children that were specifically designed for nap times. But in addition, there were also areas that lent themselves to quiet, sedentary activity, such as carpeted areas where children were observed looking at books and playing on the floor with small-scale toys such as blocks, small cars and trains. Setting B also had two large comfortable sofas, one in each room. Children were observed sitting on these or leaning against them, during periods of non-physically active play.

A final point worth mentioning is that children made use of furniture inside in their physically active play, for example climbing on chairs and tables, climbing into toy boxes, and playing behind curtains.

5.3.2 Movement between inside and outside space

The arrangements for accessing outside space varied, with children in Setting A free to go out whenever they wanted outside meal and base times, older children in Setting B able to go out freely and younger ones as they wanted but with an accompanying adult, and children's access in Setting C more restricted and needing to be coordinated in groups by staff.

Again, these arrangements clearly affected the observed use of outside space, and overall the quantitative observation data showed much less use of outside space in Setting C, with both a lower proportion of observations and a lower proportion of minutes involving time outside (see Section 4.5.1). We observed children clearly moving in a self-directed way between inside and outside space in settings A and B. They were sometimes encouraged to do so by a staff

member, and the youngest children were sometimes carried inside or outside. There was one instance where a child asked permission to go out and another where a group waited for an adult to go outside with them, after everyone had been inside for key base time. In setting B our observations took place during a spell of particularly cold weather so that children almost invariably went to the coats area to put their coats on to go outside, and to return their coats on coming inside. Younger children were sometimes encouraged to do so by staff and sometimes given some help. But overall the general pattern was of children deciding whether they wanted to be inside or outside and moving freely.

In Setting C children only went outside when this was organised as a group activity by staff, and as noted earlier one child did not go outside in any of the observations, and two went out only once across all the observation sessions. To go outside, children had to put on their outside shoes which involved waiting for help from staff, or waiting while others were helped. In one instance a child was told they could not go out when others in the group did because they did not have spare socks. Children also sometimes became distracted or bored as they waited, in one instance the observed child and his friend, who were ready to go outside, pulling each other across the slippery floor surface, with increasing vigour.

5.3.3 Use of outside space

Earlier chapters have highlighted the importance of outdoor space in physically active play. Staff saw outdoor space as important for a number of reasons (see Section 3.4.3), and some activities were done only, or predominantly, outside (Section 4.5.3). Time spent outside was generally more active than time inside, with physically active play observed in roughly seven out of ten minutes with time outside, compared with four out of ten minutes spent inside (see Section 4.5.1). In the qualitative observations there were occasional instances where a child sat down outside, but this was unusual and sometimes led to them being taken inside, or encouraged to do something else, by a staff member.

The layout of the outside space in the three settings also influenced the physically active play that took place there. In settings A and B, children incorporated features of the landscape into their physically active play. This occurred for example where they walked, ran or cycled up and down a slope or a mound, hid behind bushes or a shed, went in and out of various dens, or balanced on a wall. They were able to be self-directed in the use of the space, making their own decisions about where to cycle, run or walk to. There were also clear instances where they made use of tracks or paths that had been set up, cycling or running along them.

In setting C their options were more limited. When children cycled they frequently did so just cycling round and round the small space not taken up by fixed equipment in the yard. They were limited not just in terms of how far they could cycle, but also frequently had to stop to make way for children doing other activities.

5.4 The influence of equipment on physically active play

5.4.1 Available equipment

Overall, as we noted in Section 4.4.6, there was markedly more physically active play without equipment than with: 41 per cent of observed minutes included physically active play without equipment, and 21 per cent with. There was some variation in the range of equipment or activities noted in our qualitative observation data in each of the settings. There is inevitably some imprecision in this since the qualitative observation data collection involved writing a real-time narrative of everything the observed child did. Thus the same piece of equipment might have been described in different terms by different researchers during the observations and we

sometimes recorded that a child was playing with a toy without specifying exactly what. With that word of caution, it is worth noting that in setting A our qualitative observations recorded 29 individual pieces of equipment or materials for activities being used outside, and 30 being used inside. In setting B our observation recorded 23 pieces of equipment or activity materials being used outside, and 36 inside. And in setting C our observation recorded only 7 pieces of equipment or activity materials being used outside and 25 inside.

This is consistent with the finding from the quantitative data that play with equipment accounted for a much lower proportion of minutes of physically active play in Setting C than in A or B (29 per cent compared with 45 and 42 in Settings A and B respectively, see Section 4.4.6).

5.4.2 Use of equipment

Equipment supported physically active play in a number of ways. In more intensive or vigorous activity outside, equipment meant that children could cycle, push bikes for example up a slope, or use them pushing on the ground with their feet. They also pushed and pulled other wheeled equipment. They lifted and carried heavy objects such as planks or built things with planks and bricks. They used spades to dig in earth or in sandpits. Finally, their use of craft materials was sometimes quite vigorous, such as when one observed child took part in an activity painting a shed.

Inside, equipment could also be used quite vigorously, for example children sometimes used musical instruments with great gusto, banging hard on a drum or banging an instrument or another object on a table. Using a sandpit or a water table could also be quite vigorous, involving pouring from and filling containers from different heights, and splashing and sweeping movements.

Equipment also supported less vigorous physically active play, particularly inside. Children were physically mobile when they used dressing up clothes, for example a young child walking around in adult play shoes. Children could spend large parts of observation sessions walking between activities, to take part in them, to watch other children do them or simply to move on to another area without engaging with the activity in either. It was also striking that children often walked carrying an object, and a staff member in Setting A reported that this was a popular type of activity for children in early years settings. Sometimes this was apparently because they wanted to show it to a member of staff or to use it elsewhere, but more often they simply walked around carrying an object. This was particularly noticeable in setting C.

A final way in which equipment was used to support physical activity was when children tidied away toys or swept up materials such as sand or lentils. This was sometimes prompted by staff asking all the children to tidy things away (something that would be outside our definition of play as children doing what they wanted to do, but that could nevertheless be apparently enjoyable to children), and sometimes initiated by children themselves.

It is also worth noting here that equipment was not necessarily used in physically active play in obvious ways. For example in our observations we noted a storage box being used to climb into or to push other children around in.

Equipment was not necessarily a prompt to physically active play. For example going into a Wendy house or tepee sometimes meant the interruption of physically active behaviour, and children could be relatively sedentary when they were doing craft activities, or could just sit or lie holding a toy rather than moving with it. In fact this was sometimes encouraged by staff who, in our observations, occasionally encouraged a child to sit at a table where they were standing to do a craft activity. The computer in setting B also appeared to lead to inactive play: our observations showed it being used by one child in three of the seven observation sessions, and for two of those sessions it was the sole activity recorded in that fifteen minute period. A staff

member commented on this saying that staff were expected to intervene to discourage such intensive use of the computer.

Children could also be physically active in their play without using equipment or objects. In their inside and outside play, this occurred when we observed running, chasing and racing, walking, role play or imaginative play without props, crawling, jumping, hopping, playing peekaboo, doing movements in an organised way such as to a song or story, or wriggling, tickling and tussling with each other.

In line with the quantitative finding that a *higher proportion* of the physically active play in Setting C was without equipment, our analysis of the qualitative observation data suggests that there was also a *wider range* of physically active play without equipment in setting C. We saw more examples of organised activity, such as role play and actions to stories and songs, and it was here that we observed children being led in a 'warm up' involving exercises. We observed more instances of children running inside in setting C. However, we also saw more instances where children walked around the inside space apparently without a particular purpose and not engaging with the activities or people they walked to or by – consistent with the quantitative data which showed much more walking in Setting C (see Section 4.4.3). There appeared also to be more sitting, or lining up and waiting to be taken outside.

5.5 How staff behaviour encourages physically active play

Overall, as Section 4.4.5 noted, there was relatively little play with adults. It accounted for nine per cent of observed minutes for under three year olds, and four per cent for three to five year olds. Using the qualitative observation data we can look in more detail at how staff encouraged physically active play. They did so with *individual* children where they:

- suggested an activity to a child or led a child to where other children were doing a physical activity, for example going on a bike or suggesting a racing game
- suggested to a child that they should go outside together, which led to physically active play
- helped a child to do a physical activity, such as steering a bike while a child pushed, filling a sandpit with pasta or helping them push a bike uphill. In the examples we observed this appeared to occur where a child seemed to need help rather than representing an adult taking over what a child was managing to do
- played actively with a child themselves, such as digging together in a sandpit or playing peekaboo
- encouraged a baby to stand or to walk
- told a child to go, or to take something, somewhere else.

Staff encouraged *groups* of children in physically active play where they:

- encouraged a group to do a chasing or racing game
- led a story, song or music session with activities
- encouraged a group of children to stomp their feet loudly, or to do exercises together
- told a group of children to come in for a meal or to go somewhere else. For example in setting A there was a fire alarm, which led to all the children having to go to a part of the outside site (initiating activity for those who had not been active, but then leading to the children waiting to be told to go back in). And in setting C, as noted, staff organised groups of children into going outside.

There were very clear differences between the children we observed in how much of such adult-led or adult-initiated physically active play we saw. At one end of the spectrum were children

who were given encouragement in most or all of our observations, and indeed little of whose physically active play was self-directed. This was true for the youngest babies, but also for example for an older child with special educational needs. Staff in these instances were sometimes very attentive, being on hand to stimulate and encourage play during most of the observed sessions.

At the other end of the spectrum were children for whom we recorded no staff encouragement to physically active play. In some cases there was no obvious need for such encouragement – the child was playing actively and apparently constructively in a self-directed way, engaging with activities and with other children. In other cases, though, there did appear to be a role for more adult encouragement, particularly where children were wandering in a rather aimless way without engaging with the activities around them.

It is also worth noting that younger children's physical activity was often directed towards a member of staff - for example following them, walking towards them, or climbing on them. This suggests that a close relationship with a member of staff may encourage children of this age to be more physically active.

There were differences here between the settings too. In Setting A we noted encouragement to physical activity for all the observed children at some point in our observations, and some experienced a lot of encouragement. The quantitative data shows a much higher level of playing with younger children than in other settings, although a lower level of playing with older children. In setting B, although there was overall more adult play with older children than in other settings, we noted no staff encouragement to play for some children. There were also fewer instances of staff encouraging children in more creative or interactive play. Instances of encouragement for *individual* children were particularly rare in setting C, although as noted there was more staff-led *group* activity around songs, stories and exercise here.

There were also instances where staff *discouraged* or intervened to stop active play, although not usually in circumstances where this appeared inappropriate. This arose in a range of ways:

- where children were disturbing or endangering other children or themselves, for example carrying planks, picking up a large spade, jumping in a sandpit beside other children, playing a pushing/pulling game with a sofa, or about to cycle into a Wendy house. As noted in Chapter 3, staff talked about having to ensure that children's play did not endanger other children, and we observed staff intervening to encourage an alternative here. For example in one case children were building a very steep incline with bricks and planks, and a staff member suggested they rearrange the equipment to make the incline less steep. It should be noted there were few occasions where staff stopped activities completely because of risk, and none of these occasions were when children were using equipment appropriately, such as climbing on a climbing frame.
- where children were asked to come together for an organised activity, such as a story or tidying up time, which might mean interrupting physically active play for some
- where children who were walking around but seemed a little lost or distracted were invited to sit down and join in an activity, or to join one that they had walked towards
- where children were not doing what they were meant to be doing, such as doing something active when they should have been registering at the start of the day, lining up to be taken outside, or sitting during a story session
- where children were told they were not allowed to do something active, such as playing with a broom inside
- where children were told to sit down at the table when they were eating, or to stop doing something more vigorous and go to the table for lunch
- where young children who had been playing actively were taken to the bathroom.

As noted there was one instance in setting C where a child who had been getting ready to go outside was told they could not because they did not have spare socks.

As with staff encouraging physically active play, there was considerable variation in whether and how often children experienced staff intervening to stop an activity. For some children we recorded no such instances. At the other end of the spectrum, a child whose play involved a lot of movement from one activity to another, who seemed to find it particularly difficult to sit for meals or organised activity, and whose interaction with other children was more problematic (ending in quarrels, fighting or tears) experienced a high level of staff intervention.

5.6 Variation between children in the nature and amount of physically active play

So far in this chapter we have looked at how different aspects of the settings and staff behaviour influence physically active play. The final influence we consider here is children themselves. Clearly, this is not necessarily independent of the play environment in which we observed them – we cannot identify the aspects of a child's play behaviour that represent their own choices and preferences rather than the play environment. However, there were considerable differences between children within the same setting as well as in different settings. These are likely to reflect a combination of differences in ages (see Section 4.3.3) and differences in the influence of the home environment, as well as differences in children's own psychological makeup and preferences.

From our observations, it was clear that there were substantial differences between children in:

- how much physically active play we recorded
- how much of this was 'full minutes' of physically active play
- how much of their physically active play took place inside and outside
- how far it was self-directed rather than stimulated or encouraged by a member of staff
- the nature of the activity, and particularly the role of activities other than walking
- their use of equipment
- their engagement with other children
- and how far they appeared to engage constructively in activities, rather than walking between activities, areas or groups without engaging in them.

The case studies below illustrate different patterns among the observed children.

It is clear that higher levels of physically active play can take different forms. Looking at the six children with the highest levels of physically active play overall, their play involved, to varying degrees:

- quite disjointed movement from one activity, piece of equipment or object to another
- a high level of walking around without engaging with people or activities
- little interaction (or little constructive interaction that did not end in tussling or crying) with other children
- a high level of staff input encouraging engagement with activities or stopping disruptive behaviour
- by comparison, one of the children among the six with highest levels of activity was a girl who appeared to interact well with other children and played constructively and with concentration, in a self-directed way, with a range of equipment and activities.

Among the six children with lowest levels of physical activity overall there were different patterns:

- young children who were not yet walking, or just beginning to
- children who were very active when outside but who spent little time there and who were much more sedentary inside
- children whose play involved a limited range of activities, with for example intensive use of the computer or a lot of time spent in sedentary play with or without toys
- as with more active children, a pattern of wandering with frequent short stops, not really engaging with children or in other activities.

Below are some case studies which explore some of these examples in more depth:

Case Study 1

Femi is a four year old girl in Setting A who had just started her third term at the nursery when the research took place. Femi lives with her parents and brother in a flat on an estate near the nursery. Her parents are both of North African origin and speak little English, so the interview with her mother was conducted through an interpreter. Femi's mother said that she was "a very quiet child and ...always acting like an adult", and that she didn't play much with other children and tended to play quietly and watch TV when at home. Her mother seemed very unfamiliar with the concept of physically active play, and was more focused on her daughter being good, quiet and self-sufficient. They didn't have a garden at home, but her mother said she took Femi and her brother to the park, but that "in wintertime we don't let the children out in case they get sick... people from my country are very frightened of the weather here".

Femi had the lowest percentage of observed minutes with physically active play in Setting A (50%), and some sessions with no physically active play at all. The majority of her physically active play was walking, which was more significant for her than for other children in Setting A. She was also more likely than other children in the setting to spend time inside.

Staff at the nursery said that Femi was a 'very, very quiet' and quite serious child who tended to play alongside, rather than with, other children at the nursery. There was a feeling that this was partly due to a recent switch of classroom and keyworker and was starting to change. The fact that English was not her first language was also mentioned as a possible cause, but on the whole the perception was that she was a happy child. Her favourite activities were playing in the 'home corner', dressing up, or creative play and imaginative games, and she spent a lot of the time we observed her playing quietly by herself without seeking input from others. Femi was particularly good at tasks that involve concentration and following directions ("when it's tidy up time she likes to do her bit") but was very hesitant about doing things she found difficult to do on her own. We observed her taking part in a limited range of activities, especially compared to other children of her age. For example we never observed her jumping, cycling, chasing, doing rough and tumble play or other activities with equipment, and she did very little climbing.

Her keyworker said that Femi tended to stick within the boundaries of the classroom, where she felt safe ("she's more into herself, into her own cosy corner"), and that she was more likely to engage in physically active play, and to go outside, in the company of a familiar adult. Staff said she was happier with adults than her peers, and this was backed up by the observations. We observed that she did play on several occasions with one particular friend, but unless directly invited by staff or peers to get involved in something, she tended to stand back and watch what was happening without getting involved.

Case Study 2

Amy is a two year old girl in Setting B who has been coming to the nursery for around six months. She has been diagnosed with a special educational need, and lives with her parents and two older siblings in a flat on a nearby estate. Amy's mother has mental health problems

and was only able to undertake a brief interview, but said that she thought Amy was very active and that, although they didn't have a garden at home, they went to the park regularly where Amy enjoyed playing in the adventure playground.

Amy was the most active child we observed in Setting B, with physically active play occurring in over 60 per cent of the minutes for which she was observed. Her physically active play was quite concentrated, with relatively few minutes involving both rest and physically active play. Walking and 'other play with equipment' were particularly significant elements in her physically active play,

Her keyworker said that when she first came to the nursery she has seemed unused to, and unsure about, being physically active. But although tentative and careful at first, she was now confident and active:

"She's really into the balls and the rolling on them and jumping. Sometimes she'll just run round, which she wasn't doing at first".

Amy liked the garden and spent quite a lot of time outside. Almost all the time she was outside was spent engaged in physically active play. She enjoyed using the bikes and the other equipment available, and was often interested in what other, older children were doing – possibly because she had two older siblings. She spent a lot of the time we observed her with staff members and was generally happy to engage in activities when invited to do so. Her keyworker felt that her growing confidence was linked to feeling comfortable and safe in the setting, as well as developing relationships with her keyworker and other trusted adults. She was increasingly willing to take risks and do things that seemed to be challenging, and seemed to like trying new things, particularly if she got attention and positive reinforcement for doing so.

Case Study 3

Sarah is a girl aged one year and three months, who has been coming to Setting C for almost a year. She lives in a flat with her parents, who both work full time, but has regular trips to the park and shops at weekends.

Sarah was one of the most active children we observed in Setting C, with physically active play occurring in over 70 per cent of the minutes for which she was observed. Her keyworker said that she had just started walking and was "one of those children who would sit down for a minute and then shoot up again...she likes to try everything". Although we recorded high levels of minutes of physically active play, the majority of this was walking, and most of these minutes involved rest as well as physically active play – consistent with her age. Similarly, the range of her activities was limited. Overall Sarah spent a lot of time walking around the room, picking up toys or other objects and playing with them briefly before either putting them down or wandering off holding the object. She sometimes seemed interested in what other children were doing, but did not often engage in play or other activity with peers.

Of particular interest is that she did not go outside at all in any of the sessions for which she was observed (the room in which she was in was on the second floor of the nursery building). Her keyworker said that Sarah liked to run, climb and use bikes but as she didn't go outside at any point while we were observing her, we didn't see her full range of physically active play. Her mother also said that Sarah "runs around a lot". This suggests that she might have been able to engage in more intensive types of physically active play if she had had more frequent access to outside space.

5.7 Conclusions

In all three settings we saw the principle of free-flow play clearly enacted, with children moving freely around their space. However, there was some variation between the settings and between children in how focused or purposeful this movement was, with some children's movement better characterised as 'wandering', sometimes holding an object, but without engaging with the people or activities their movement took them past.

The internal layout seemed to lead to different patterns of movement, with more scope for more varied walking patterns and for walking further without stopping in Setting B which had the largest space. Similarly, the size of the outside space could offer more or fewer opportunities for intensive play. Children also made use of the features and landscaping of external space.

Equipment supported children's physically active play in a number of ways, including being used for vigorous and intensive play, and not always in obvious ways. We observed a smaller range of equipment being used in Setting C, and in both Setting B and C we observed a smaller range of equipment outside than inside. This may be relevant to the lower use of outdoor space, particularly in Setting B (in Setting C access arrangements were clearly relevant too). Equipment could also be used in non-active ways, and Setting C in particular highlights the range of ways that active play without equipment can be encouraged.

Staff were influential in encouraging physically active play for both individual children and groups. There was variation between children in how much we observed staff encouraging physically active play or interacting with children while they played actively. Although there were examples of adults clearly playing an important role in encouraging it – particularly for some younger children – and examples of children playing constructively without apparently needing adult encouragement, there were also some examples where it appeared that there was more of a role for adult encouragement. It was rare that staff discouraged or inhibited physically active play, and this usually reflected the fact that children were doing something they were not meant to be doing.

Across the sample, there were clear differences between children in how much physically active play was recorded, how intensive it was, how much of it was inside or outside, how far it was self-directed rather than stimulated by a member of staff, the range of activity, the use of equipment, and how constructively children were engaging in activities and with other children. Thus the 'quality' of physically active play varied, even among children with similarly high levels of it, and a high level of physically active play did not necessarily indicate self-directed, purposeful and constructive play. We discuss these issues, and how physically active play is supported in early years settings, in Chapter 6.

Chapter 6 – Discussion

6.1 Introduction

In this chapter we explore the implications of the findings from this research. In Section 6.2 we discuss the key messages emerging from the research, including how physically active play is supported by early years settings, the impact of layout, quality and issues around inside and outside play. In Section 6.3 we discuss the implications of the research for policy and practice, then reflect briefly on the research process in Section 6.4 and outline our recommendations for further research in Section 6.5.

6.2 Physically active play in early years settings – key messages from the research

Supporting physically active play in early years settings

The literature review found that staff affect the amount and intensity of activity a child undertakes, both through practice and the development of policies that encourage activity. This was supported by this research, which found that interactions with staff supported both variety and intensity of physically active play for younger children in particular, except in instances where staff discouraged or intervened to stop play that appeared to be dangerous or inappropriate.

Staff told us in the interviews how much they enjoyed engaging in physically active play with the children, and this was also very evident from our observations. Staff encouragement of physical activity varied across the settings, in the setting with highest observed levels of physically active play we noted more encouragement for individual children to engage physical activity. In the other settings there was less staff encouragement to play, and more staff-led group activity, which was often more sedentary. Staff encouragement at an individual level also appeared to play a role in encouraging children to engage in more active or purposeful play rather than wandering in an apparently aimless manner (eg suggesting an activity to a child).

Impact of layout on physically active play

Whilst the importance of physically active play was stressed in all three settings, there were some differences in their apparent ethos. The importance of children being able to ‘free-flow’, that is to move independently and freely, and to choose which activities to engage in was emphasised in all three settings, but in only two did this include free-flow between inside and outside space.

In the third setting there appeared to be less self-directed activity generally. Children in the this setting were more restricted to particular areas due to the layout of the building, which consisted of small interlinked rooms on three floors, whereas the other two settings had a more open plan layout at ground floor level with access to outside space from most rooms, and a focus on encouraging children to move around freely.

Quality of physically active play

Quality in physically active play emerged as an issue of particular interest during the research, as the activity we recorded varied in terms of perceived intensity, purpose and enjoyment. There are of course considerations about whether what we termed ‘aimless wandering’ and ‘quality’ play would be seen in this light by the children involved, and we need to remain aware of our adult interpretations of childrens behaviour. Nonetheless the points raised in the interview data

regarding the benefits of physically active play in relation to health, happiness, learning skills and developing independence as indicators of quality in play are also borne out in the literature review.

This research started with a definition of physically active play as ‘any physical activity where the child is doing what they want to do for their own reasons’. However, during the course of the research it became clear that the latter part of this definition was hard to operationalise, as it was not possible to determine from observation a child’s motivation for undertaking an activity, or to separate out the role of staff in prompting or encouraging play (see above).

As much of the physical activity recorded was walking, it would be particularly interesting to do further research with this age group on the intensity of physically active play using objective measures (see 2.5.1), in relation to both the intensity of types of play engaged in and within-child and external factors which influence intensity. We did observe play of varying intensity during the observations, but as this was not collected quantitatively it is not possible to make objective comparisons of intensity between settings, activities or individual children. While there is a general consensus in the literature that young children do not engage in large amounts of high intensity physical activity, further exploration is needed of intensity in relation to different types of play, as well as childrens’ own views of quality in play.

Indoor physically active play

The physical layout of the setting and children being able to move freely, as outlined above, played a key role in how active children were inside. Encouragement and support from staff was also an important factor in supporting indoor physically active play, as was having a sufficient space, freedom of movement (free flow) and a variety of equipment and activities available so that they could choose what they wanted to do and when. Freedom of movement also played a key role in how, and when, children accessed outside space.

Physically active play outside

Across all three settings, outside play was thought by staff to be important for a variety of reasons: because of the opportunities afforded for children to explore the natural environment and changing weather conditions, opportunities for incorporating features of outside space in creative play, more space to facilitate large movements or particular activities such as cycling, and not least, because children enjoy being outside.

The observation data indicate that it was rare for children not to be physically active when they were outside, and some more vigorous activities (eg cycling, climbing and running) occurred more frequently outside than inside, although factors such as age also need to be taken into consideration. As with inside space, size, layout, equipment and activities available all appeared to impact on the quality and intensity of physically active play outside. Staff also played a key role in encouraging children to go outside, or encouraging them to engage in physically active play when they were outside (eg supporting them to go on a bike, showing them activities taking place, asking them to help with tidying up).

6.3 Implications for policy and practice

Both the Early Years Foundation Stage (EYFS) and The Children’s Plan, (DCSF, 2007b) emphasise the importance of physical activity for children, and the need for environments, equipment and support to encourage physically active play.

The literature review found that staff affect the amount of activity a child undertakes in a number of ways, including through implementation of policies that encourage activity. This was

supported by our research, in which staff in the settings referred to the Early Years Foundation stage and other guidance as useful tools for developing their practice in terms of planning and recording activity, as well as raising their status as professionals, but rarely made explicit links between policy and their practice in relation to physically active play. So as well as the lessons from this research informing policy on physically active play, it is also important to reflect on how that policy is translated into practice.

6.4 Reflections on the research process

The biggest challenge faced by this project was the lack of previous research on measuring play, and physical activity, which meant that the project was as much about developing a methodology as on collecting data. This learning will be explored and written up further in a separate paper.

In order to get and make best use of time and resources in a relatively unexplored area of research, this project focused on a small sample of children in one geographical area. This provided sufficiently rich data for an in-depth and holistic understanding of how young children engage in physically active play, but meant we could only look in a very limited way at differences between sub-groups of children. The quantitative data we collected also focused on the type of physically active play children were engaged in rather than intensity, which would have required objective biological indicators (ref: section 2.5.1). While information was collected on staff and parent attitudes through interviews, the focus of the observations on what individual children were doing means that we have limited data on the impact of interactions with staff and other children.

Observation was considered to be the most appropriate method for collecting data on self-directed activity (what children chose to do), and much previous research using more objective measures has not focused on types of activity and whether or not it was child-initiated. Objective measures, such as accelerometers or heart rate monitors, were considered at the early stages of the project, but we felt that, given the focus of this research on factors which affect physically active play, it was more appropriate to focus on observing the type and duration of activity.

6.5 Recommendations for further research

Further research is needed to build on the work started in this project. In particular:

- childrens' views of play – eg using the Mosaic approach which uses observation, interviewing and other participatory tools to listen to young children's perspectives (Clark and Moss, 2000)
- intensity of physical activity in different play activities in early years
- exploring differences between sub-groups of children in early years settings – for example ethnic group, social background, disability/special education needs
- geographical variations
- variations between types of early years setting, and between levels and types of physically active play for children attending childcare and at home
- cultural differences in attitudes to, and experiences of, physically active play
- staff behaviours and their impact on physical activity levels
- play with peers and impact on activity levels.

6.6 Conclusions

Physically active play in early years appears to be influenced by a range of factors, not least the ethos of the setting and support and encouragement from staff at an individual child level. The research identified other factors that impact on the quality, as well as quantity of play – including layout and design, opportunities for self directed activity (free flow), free access to outside space, and a variety of equipment and activities suitable for all age groups. Age, nature and other characteristics of the individual child also have an impact on how active a child is, and the type of activities they engage in.

As well as researching adults' attitudes to childrens' play, the research also focused on developing a methodology for collecting both qualitative and quantitative data on physically active play in early years. The exploratory and in-depth nature of this research, and the lessons learnt, should therefore provide some useful markers for future research on play and other physical activity in preschool children.

References

- Bailey, R. C., Olson, J., Pepper, S. L., Porszasz, J., Barstow, T. J. and Cooper, D. M. (1995) 'The Level and Tempo of Children's Physical Activities: an Observational Study'. *Medicine and Science in Sport & Exercise*, 27: 1035-1041.
- Baranowski, T., Thompson, W. O., DuRant, R. H, Baranowski, J. and Puhl, J. (1993) 'Observations on physical activity in physical locations: Age, gender, ethnicity and months effects'. *Research Quarterly for Exercise Science*, 64: 127-133.
- Bar-Or, O. and Baranowski, T. (1994) 'Physical activity, adiposity and obesity among adolescents'. *Pediatric Exercise Science*, 6: 348-360.
- Boldermann, C., Blennow, M., Dal, H., Martensson, F., Raustorp, A., Yuen, K. and Wester, U. (2006) 'Impact of preschool environment upon children's physical activity and sun exposure'. *Preventative Medicine*, 42 (4): 310-308.
- Booth, M. (2001) 'Preventing Overweight and Obese Children and Adolescents'. *The Australian Health Consumer*, 2: 18-19.
- Brown, W. H., Pfeiffer, K. A., McIver, K. L., Dowda, M., Almeida, C. A. and Pate, R. (2006) 'Assessing Preschool Children's Physical Activity: The Observational System for Recording Physical Activity in Children-Preschool Version'. *Research Quarterly for Exercise and Sport*, 77 (2): 167-176.
- Burdette, H. L, Whitaker, R. C. (2005) 'Resurrecting free play in young children: looking beyond fitness and fatness to attention, affiliation, and affect'. *Archives Pediatrics Adolescent Medicine*, 159: 46-50.
- Burdette, H. L, Whitaker, R. C. and Daniels, S. R. (2004) 'Parental report of outdoor playtime as a measure of physical activity in preschool- aged children'. *Archives of Paediatrics & Adolescent Medicine*, 158 (4): 353-357.
- Clark, A. and Moss, P. (2000) *Listening to Young Children: The Mosaic Approach*. London: National Children's Bureau for the Joseph Rowntree Foundation.
- Clark, A. and Moss, P. (2005) *Spaces to Play. More listening to young people using the mosaic approach*. London: National Children's Bureau.
- Corbin, C. B., Pangrazi, R. P. and Welk, G. J. (1994) 'Toward an understanding of appropriate physical activity levels for youth'. *The Presidents Council on Physical Fitness and Sports Readers Digest*, 1 (8): 1-7.
- Davies, P. S. W., Gregory, J., White, A. (1995) 'Physical activity and body fatness in preschool children'. *International Journal of obesity*, 19(1): 6-10.
- Deal, T. B. (1993) 'The preschool mover. A comparison between naturally occurring and program directed physical activity patterns'. *Early Childhood Development and Care*, 96: 65-85.
- DeBord, K., Hestenes, L. L., Moore, R. C., Cosco, N. and Mc Ginnis, J. R. (2002) 'Paying attention to the outdoor environment is as important as preparing the indoor environment'. *Young Children*, 57 (3): 32-35.

DCSF (2007a) Statutory Framework for the Early Years Foundation Stage: Setting the standards for learning, development and care for children from birth to five. London: Department for Children, Schools and Families.

DCSF (2007b) The Children's Plan: Building brighter futures. London: Department for Children, Schools and Families.

DFEE (2000) Curriculum guidance for the foundation stage. London: Department for Education and Employment.

DFES (2002) Birth to Three Matters: A framework to support children in their earliest years. London: Department for Education and Skills.

DFES (2003) The Day Care and Child Minding (National Standards) (England) Regulations 2003. London: Department for Education and Skills

Doherty, J. and Whiting, M. (2004) 'All about tackling Childhood Obesity'. *Nursery World*, 322: 113-114.

Dowda, M., Pate, R. R., Trost, S. G., Almeida, M. J. C. A. and Sirard, J. R. (2004) 'Influences of Preschool policies and practices on Children's physical activity'. *Journal of community health*, 29 (3): 183-196.

Du Rant, R. H., Baranowski, T., Davies, H., Rhodes, T., Thompson, W. O., Greaves, K. A. and Puhl, J. (1993) 'Reliability of indicators of heart rate monitoring in children'. *Medicine and Science in Sports and Exercise*, 25: 389-395.

Epstein, L. H., Gordy, C. C., Raynor, H. A., Beddome, M., Kilanowski, C. K. and Paluch, R. (2001) 'Increasing fruit and vegetable intake and decreasing fat and sugar intake in families at risk for childhood obesity'. *Obesity Research*, 9 (3): 171-178.

Finn, K., Johannsen, N. and Specker, B. (2002) 'Factors associated with physical activity in preschool children'. *Journal of Paediatrics*, 140: 81-85.

Flodmark, C. E., Marcus, C. and Britton, M. (2006) 'Interventions to prevent obesity in children and adolescents: a systematic literature review'. *International Journal of Obesity* 30: 579-589.

Fox, K. A. (2004) 'Childhood obesity and the role of physical activity'. *The Journal of The Royal Society for the Promotion of Health*, 124 (1): 34-39.

Fulton, J. E., Burgeson, C. R., Perry, G.R., Sherry, B., Galuska, D. A., Alexander, M. P., Wechsler, H. and Caspersen, C. (2001) 'Assessment of physical activity and sedentary behaviour in pre-school-age children: Priorities for research'. *Pediatric Exercise Science*, 13 (2), 113-126.

Ginsburg, K. R., (2006) 'The importance of play in promoting healthy child development and maintaining strong parent bonds'. *Pediatrics*, 119 (1): 182-191.

Gortmaker, S. L., Peterson, K., Wiecha, J., Sobol, A. M., Dixit, G., Fox, M. K. and Laird, N. (1999) 'Reducing obesity via a school based interdisciplinary intervention among youth: Planet Health'. *Archives Pediatrics Adolescent Medicine*, 151: 409-418.

HMSO (2006). *Childcare Act 2006*. London: HMSO.

Kelly, L. A., Reilly, J. J., Fisher, A., Montgomery, C., Williamson, A., McColl, J. H., Paton, J. Y. and Grant, S. (2006) 'Effect of socioeconomic status on objectively measured physical activity'. *Archives of Disease in Childhood*, 91:35-38.

Kleiges, R. C., Eck, L. H., Hanson, C. L., Haddock, C. K. and Kleiges, L. M. (1990) 'Physical Effects of obesity, social interactions, and physical environment on physical activity in pre-schoolers'. *Health Psychology*, 9 (4): 434-449.

Livingstone, M. B. E., Robson, P. J., Wallace, J. M. W. and McKinley, M. C. (2003) 'How active are we? Levels of routine physical activity in children and adults'. *Proceedings of the Nutrition Society*, 62: 681-701.

McKenzie, T. L., Sallis, J. F., Elder, J. P., Berry, C. C., Hoy, P. L., Nader, P. R., Zive, M. M. and Broyles, S. C. (1997) 'Physical Activity levels and prompts in young children at recess: A two year study of a biethnic sample'. *Research quarterly for exercise and sport*, 68 (3): 195-202.

Moore, L. L., Gao, D., Bradlee, L., Cupples, A., Sundarajan-Ramamurti, A., Proctor, M. H., Hood, M. Y., Singer, M. R. and Ellison, R. C. (2003) 'Does Physical Activity predict body fat change throughout childhood'. *Preventative Medicine* 37: 10-17.

Moore, L. L., Lombardi, D. A., White, M. J., Campbell, J. L., Oliveria, S. A. and Ellison, R. C. (1991) 'Influence of parents' physical activity levels on activity levels of young children'. *Journal of Pediatrics*, 118: 215-219.

Muller, M. J., Asbeck, I., Mast, M., Langnasek, K. and Grand, A. (2001) 'Prevention of obesity – more than a concept'. *International Journal of Obesity*, 25 (1) Supp: 66–74.

Mulvihill, C., Rivers, K. and Aggleton, P. (2000) 'A Qualitative study investigating the views of primary-age children and parents on physical activity'. *Health Education Journal*, 59: 166-179.

Noland, M., Danner, F. F., DeWalt, K., McFadden, M., & Kotchen, J. M. (1990) 'The Measurement of Physical Activity in Young Children'. *Research Quarterly in Exercise Science*, 61 (2): 146-153.

NPFA (2000). *Best Play: what play provision should do for children*. London: Children's Play Council with National Playing Fields Association, PLAYLINK and DCSF.

O'Connor, J. P. and Temple, V. A. (2005) 'Constraints and Facilitators for Physical Activity in Family Day care'. *Australian Journal of Early Childhood*, 30 (4): 1-9.

Pate, R. R. (2001) 'Assessment of physical activity and sedentary behaviour in preschool children: priorities for research'. *Pediatric Exercise Science*, 13 (2): 129-130.

Pate, R., Pfeiffer, K. A., Trost, S. G., Ziegler, P. and Dowda, M. (2004) 'Physical activity among children attending preschools'. *Pediatrics* 114 (5): 1258-1263.

Pellegrini, A. D. and Smith, P. K. (1998) 'Physical activity Play: The Nature and Function of a Neglected Aspect of Play'. *Child Development*, 69 (3): 577-598.

Reilly, J., Armstrong, J., Dorosty, A. R., Emmett, P. M., Ness, A., Rogers, I., Steer, C. and Sherriff, A. (2005) 'Early life risk factors for obesity in childhood: cohort study'. *British Medical Journal*, 330: 1357-1359.

Reilly, J. R., Kelly, L., Montgomery, C., Williamson, A., Fisher, A., McColl, J. H., Lo Conte, R., Paton, J. Y. and Grant, S. (2006) 'Physical activity to prevent obesity in young children: cluster randomised controlled trial'. *British Medical Journal*, 333: 1041-1043.

Reilly, J. J. and McDowell, Z. C. (2003) 'Physical activity interventions in the prevention and treatment of pediatric obesity; systematic review and critical appraisal'. *Proceedings of the Nutrition Society*, 62: 611-619.

Riddoch, C. J. and Boreham, C. A. G. (1995) 'The health related physical activity of children'. *Sports Medicine* 19: 86-102.

Rippe, J. M., Weissberg, R. P. and Seefeldt, V. (1993) 'The purpose of play: a framework for improving childhood health and psychological and physical development'. *Medicine, Exercise, Nutrition and Health*, 2: 273-80.

Sahota, P., Rudolf, M. C. J., Dixley, R., Hill, A. J., Barth, J. H. and Cade, C. (2001) 'Randomised controlled trial of primary school based intervention to reduce risk factors for obesity'. *British Medical Journal*, 323:1027-1029.

Stephoe, A. and Butler, N. (1996) 'Sports participation and emotional well being in adolescents'. *Lancet*, 347: 1789-1792.

Taggart, A., and Keegan, L. (1997) 'Developing fundamental movement skills in outdoor settings: Three case studies of children playing'. *ACHPER Healthy Lifestyles Journal*, 44 (4): 11-17.

Vandewater, E. A., Shim, M. and Caplovitz, A. G. (2004) 'Linking obesity and activity level with children's television and video game use'. *Journal of Adolescence*, 27: 71-85.

Ward, D., Bower, J. Tate, D., Ball, S. and Benjamin, S. (2006) 'Impact of the Child Care Environment on Physical Activity of Preschool Children'. *Obesity*, 14 (9) Supp: 576-P

Wells, J. C. K. and Ritz, P. (2001) 'Physical activity at 9-12 months and fatness at 2 years of age'. *American Journal of Human Biology*, 13 (3): 384-389.

Wilkin, T. J., Mallam, K. M., Metcalf, B. S., Jeffery, A. N. and Voss, L. D. (2006) 'Variation in physical activity lies with the child, not his environment: evidence for an 'activitystat' in young children (EarlyBird 16)'. *International Journal of Obesity*, 30: 1050-1055.

Appendix I – Further note on methodology

Fieldwork timing

The fieldwork took place from mid-September to mid-December 2007. As fieldwork took place in the three sites consecutively, for three-four weeks in each setting, this meant that we were in Setting A from mid September to early October, Setting B from mid October to mid November, and Setting C from late November to mid-December. In order to minimise the impact on services it was necessary to carry out the fieldwork in as short a time as possible, and this also enabled the research team to gain an in-depth understanding of both the setting and the children being observed. However the time of year meant that the weather got progressively colder as winter approached, which may have had some impact on outside play.

Sampling

In order to get sufficiently rich data for in-depth and contextualised understanding, the research took place intensively in three settings in one inner London borough. Settings were selected to provide varied research environments, but all provided a mixture of structured and unstructured activity. Given the exploratory nature of the project, focusing the research on a small number of sites enabled the research team to generate a more intensive understanding of the issues being explored.

The research focused on children who are old enough to be independently mobile (ie crawling and older). Up to seven children were selected in each setting (19 in total). The sample was stratified as far as possible, at the start of fieldwork in each site, in discussion with the service manager. A grid was used to give an equal number of children by gender and in younger (birth-three) and older (three-five) age groupings, as well as to reflect the diversity of children in each setting (including attendance patterns (full or part time) special educational needs, ethnic origin and social background. Given the reliance on information from service managers, small sample sizes, and availability of children (ie due to holidays or illness) it was not possible for samples to be completely random or stratified, but as far as possible they were selected to be representative of each setting. The varying profiles of the three settings (see 4.1 and Appendix II), and the fact that it was only possible to observe five children in Setting C, mean that analysis focused on aggregated child-level data rather than sub-group analysis. Further discussion of the sample and implications for the analysis are contained in Appendix II.

Scheduling observations

15 minute observations were undertaken by two researchers, one collecting quantitative and one qualitative data, to obtain a detailed record of activity patterns in relation to time, environment, interactions and other factors. 130 observations were completed (an average of seven for each child), across a range of days and times.

Observations were spread across the working week, Monday to Friday, and conducted within four different time slots, from early morning until late afternoon, in an attempt to best capture the range of activity for each child.

In line with attendance patterns there were notably fewer observations conducted during the late afternoon period, comparatively few on Fridays, and large variations in spread between settings.

One issue that emerged during the course of the fieldwork was that it was not always possible to stick to scheduled observation times. This was sometimes due to children being absent due to illness or last minute changes to their scheduled days in the setting, which meant that observations then had to be slotted in when time was available. Staff also occasionally

requested that an observation did not take place around meal and sleep times, and in one setting this placed considerable restrictions on when it was possible for observations to take place.

All of these factors militated against quantitative analysis by time of day or day of the week. In any case, the significance of particular times will be child-specific, depending on attendance patterns and daily routines.

Interviews

Semi-structured interviews took place in each setting with managers, and with a parent and keyworker of each of the 19 children in the study. The manager interviews took place at the start of fieldwork in each setting, and were generally combined with sample selection. Keyworker and parent interviews then took place before the start of observations, in order to obtain parental consent and also to gather background information for each child in the sample which could be triangulated with observation data. In one setting where most parents were working keyworker interviews were conducted and parental consent obtained before starting observations, but more flexibility was needed around parent interviews.

Researcher effect

While every effort was made by the research team to be as unobtrusive as possible during observations, and to maintain objectivity and rigour, inevitably there were some researcher effects. While the children being observed were not told why the adults were there, and observations were carried out as discretely as possible, it would be impossible for two adults with clipboards to be completely unobtrusive. Some children were curious at first (often not the children actually being observed), but lost interest when they realised that the researchers were not going to do anything of interest to them. Some staff members also seemed more aware than others of the presence of researchers, and this may occasionally have had an impact on how they interacted with children. Observation is an increasingly common method of collecting data on child development, and several staff members we spoke to had been involved in action research projects in the past, so generally our presence did not appear to have a negative affect. But nonetheless it would be interesting to explore further the impact of observation, and the relative advantages and disadvantages of non-participant and covert observation with preschool children.

Appendix II – Further data on the sample

The sample and spread of observations

The quantitative dataset comprised information from 130 observations for 19 children across three sites. With the exception of two observations, terminated early after eight and 13 minutes respectively, each lasted for 15 minutes. In total, therefore, observation time across all the three settings amounted to almost 2000 minutes.

As is clear in Table A1 below, the spread of observations across settings is such that Setting B contributes a noticeably larger proportion (38 per cent), with Setting C accounting for just over a quarter (27 per cent).

Table A1. Observations by setting

	Frequency	Percent
Setting A	46	35%
Setting B	49	38%
Setting C	35	27%
Total	130	100%

The majority of children (15 of 19) were observed at least seven times, but in four cases this was not possible due to illness or absence.

Table A2 shows the distribution of observations by child and setting. It is important to highlight that as a result of variation in the numbers of observations, the data come disproportionately from individual children – mandating additional caution with regard to overall, between-groups and individual-level analysis of observation-level data. For this reason, as stated in Section 4.2.1, we make extensive use of data aggregated at child-level, such that each child contributes once to a set of figures on the basis of average figures drawn from across the number of valid observations for that child.

Table A2. Observations per child by setting

Setting A				Setting B				Setting C			
Child	No.	% setting	% total	Child	No.	% setting	% total	Child	No.	% setting	% total
A1	7	15%	5%	B1	7	14%	5%	C1	8	23%	6%
A2	7	15%	5%	B2	7	14%	5%	C2	6	17%	5%
A3	5	11%	4%	B3	7	14%	5%	C3	6	17%	5%
A4	7	15%	5%	B4	7	14%	5%	C4	8	23%	6%
A5	5	11%	4%	B5	7	14%	5%	C5	7	20%	5%
A6	8	17%	6%	B6	7	14%	5%	Mean	7	20%	5%
A7	7	15%	5%	B7	7	14%	5%				
Mean	6.6	14%	5%	Mean	7	14%	5%				

Age group

Overall, across the sample, the youngest child was 11 months old; the oldest just over 4½. The sample in each setting was selected to include as far as possible an equal number of younger children (aged birth-three) and older children (three-five). But as set out in Table A3 below,

there is a substantial difference in the mean age across settings, from 29 months in Setting C to 40 months in Setting A.

Table A3. Age range of children by setting

	Minimum age (months)	Maximum age (months)	Mean age (months)	Mean age (years)
Setting A	13	55	40	3 yrs 4 months
Setting B	11	53	31	2 yrs 7 months
Setting C	15	50	29	2 yrs 5 months

Dichotomising age, while useful in enabling tentative comparisons, downplays differences between settings. Table A4 below shows the distribution by setting of the ten younger children (birth to three) and the nine aged three to five.

Table A4. Age group of children by setting

Ages group	Setting A	Setting B	Setting C	Total
Birth to three	3	4	3	10
Three to five	4	3	2	9
Total	7	7	5	19

Focusing on the breakdown of observations by age-group *within* settings, the differences are particularly pronounced – with 59 per cent of observations in Setting A of children aged three-five, compared to 43 per cent in each of the other settings. This provides one illustration of why the small sample size precludes meaningful subgroup analysis.

Gender

There were ten boys and nine girls in the sample, and accordingly more observations relating to boys than girls (70: 60). As with age-group, while every effort was made to include equal numbers of boys and girls, there are differences by setting in the balance of observations of boys and girls, with 63 per cent of observations in Setting C of girls, compared to 37 per cent in Setting A. Fewer than one in five observations of boys took place in Setting C.

Table A5. Children and observations by gender and setting

		Children		Observations	
Setting		Frequency	Percent	Frequency	Percent
Setting A	Male	4	57%	29	63%
	Female	3	43%	17	37%
Setting B	Male	4	57%	28	57%
	Female	3	43%	21	43%
Setting C	Male	2	40%	13	37%
	Female	3	60%	22	63%

Ethnic group

Overall, the majority of children in the sample (11 of 19) and in each setting were White; however, of these just eight were White British. In Setting A, four of seven were White British; in Setting C, just one of five was White British. Given the small numbers involved (and confounding variables, particularly age and gender), subgroup analysis is not attempted in relation to ethnicity and engagement in physically active play.

Table A6. Ethnic group by Setting

Ethnic group	Setting A	Setting B	Setting C	Total
White British	4	3	1	8
White Other	0	1	2	3
Black / Black British African	2	1	0	3
Asian other	1	0	0	1
White and Black Caribbean	0	1	0	1
White and Asian	0	0	1	1
Mixed other	0	1	1	2
Total	7	7	5	19

SEN

Across the sample as a whole, five of the 19 children were identified by parents and/or staff as having Special Educational Needs (SEN), with a further two flagged as having unconfirmed but potential SEN. None of the children in Setting C were considered to have Special Educational Needs. In Setting B, four of the seven had identified SEN while in Setting A, three of seven had confirmed or possible SEN.

Table A7. Special Educational Needs (SEN) by children in each setting

		Children		Observations	
Setting		Frequency	Percent	Frequency	Percent
Setting A	No	4	57%	24	53%
	Yes	1	14%	7	15%
	Unsure	2	29%	15	33%
Setting B	No	3	43%	21	43%
	Yes	4	57%	28	57%
Setting C	No	5	100%	35	100%
Total	No	12	63%	80	62%
	Yes	5	26%	35	27%
	Unsure	2	11%	15	11%

Attendance patterns

Overall, at the time fieldwork was conducted, 10 children were attending their respective settings on a full-time and nine on a part-time basis. Six of the 19 (five full-time and one part-time) were on extended days, typically attending from 8am until 5 or 6pm. In setting C, three of the five children were attending on a full-time, extended hours basis. Just one child in each of settings A and B attended for extended hours.

Table A8. Attendance patterns – Full-time, part-time, normal and extended days

Setting		Children		Observations	
		Frequency	Percent	Frequency	Percent
Setting A	Part Time – Normal day	4	57	26	57
	Full Time – Normal day	2	29	15	33
	Full Time – Extended day	1	14	5	11
Setting B	Part Time – Normal day	2	29	14	29
	Part Time – Extended day	1	14	7	14
	Full Time – Normal day	3	43	21	43
	Full Time – Extended day	1	14	7	14
Setting C	Part Time – Normal day	2	40	15	43
	Full Time – Extended day	3	60	20	57